Bundle of documents for Oral hearings commencing from 13 May 2025 in relation to the Queen Elizabeth University Hospital and the Royal Hospital for Children, Glasgow

Bundle 43 – Volume 6
Procurement, Contract, Design and Construction, Miscellaneous Documents

SCOTTISH HOSPITALS INQUIRY

Table of Contents

GENERIC WARDS

Number of Beds		**28**			
Percentage Single Rooms		**100%**			
Description	**Qty**	**Unit Area m²**	**Total Area m²**	**ADB Code**	**Comment**
Bed area facilities					
Acute single bedroom (incl family & clinical support space)	28	16.5	462.0	B0303	(100% Single rooms)
Patients en-suite wc & wash double assist	28	4.5	126.0	V1610	(as per HBN 00-02)
Gowning lobby: single bedroom	1	5.0	5.0	G0507	
Sub-Total			**593.0**		
Patient support facilities					
Interview/sitting room	1	9.0	9.0	M0712	
Resuscitation trolley parking bay: 1 trolley	1	2.0	2.0	G0103	
Pantry/Beverage making area	1	12.0	12.0	P0607	
Ward Food trolley parking bay	1	1.5	1.5	G0305	
Wheelchair bay	1	4.0	4.0	G0119	
Nurses Station	1	8.0	8.0	T0112	
Touch Down Spaces	4	2.0	8.0	T0999	(as per HBN 04-01)
Sub-Total			**44.5**		
Backup Storage					
Linen trolley parking bay	1	1.5	1.5	G0118	
Clinical supplies trolley	1	1.5	1.5	G0123	
Clinical Store/Controlled drug Cupboard	1	1.5	1.5	W1411	
Clean Utility Room	1	12.0	12.0	T0505	
Large Eqpt Store	1	7.5	7.5	W0126	
Sub-Total			**24.0**		
Utilities					
Dirty utility/Sluice/Test Room - small	1	6.5	6.5	Y0407	
Dirty utility/Disposal hold	1	8.0	8.0	Y0405	Interim Disposal Hold on Ward
Cleaners room	1	7.0	7.0	Y1501	
WC/WHB - type 1	1	2.0	2.0	V1005	
Switchgear cupboard	1	1.0	1.0	N/A	
Sub-Total			**24.5**		
Office and Administrative Services					
Reception - 2 position - open	1	8.0	8.0	J0206	
Office - 1 position + meeting area	1	12.0	12.0	M0218	
Charge Nurse/Sister's Office	1	9.0	9.0	M0202	
Printer/IT/Admin Store Room	1	6.0	6.0	M0409	
Waiting Area - 5-10 persons	1	16.0	16.0	J1201	
Sub-Total			**51.0**		
Additional Accomodation and Services					
Socialisation Space	1	24.0	24.0	J1110	Could be dispersed and/or informal socialisation space
Medical Hot Desking (2 Places)	1	10.0	10.0	M0307	
Sub-Total			**34.0**		

Total net (Incl Optional Accom)			771.0
Planning	5%		38.6
Sub-Total			809.6
Engineering	3%		24.3
Circulation	31%		251.0
Total			**1084.8**

HAEMATO-ONCOLOGY WARD

NB: 3 Beds are to be plumbed for haemodialysis

NB: All bedrooms will require positice pressure

Number of Beds		**14+ 4 day recliners**			
Percentage Single Rooms		**100%**			
Description	**Qty**	**Unit Area m²**	**Total Area m²**	**ADB Code**	**Comment**
Bed area facilities					
Acute single bedroom (incl family & clinical support space)	14	16.5	231.0	B0303	Positive Pressure
Patients en-suite wc & wash double assist	14	4.5	63.0	V1610	(as per HBN 00-02)
Sub-Total			**294.0**		
Day Case Zone					
Day Case Room - Recliner Space	4	13.5	54.0	B2417A	
Staff Base	1	3.0	3.0	T0110	
Treatment Room	1	16.5	16.5	X0112	
WC - W'chair	1	4.5	4.5	V0904	
Sub-Total			**78.0**		
Patient support facilities					
Consulting/examination (or treatment) room	1	16.5	16.5	C0201	pentamidine treatment
Treatment Room	1	16.5	16.5	X0112	Intrathecal chemotherapy
Interview/sitting room	1	9.0	9.0	M0712	
Resuscitation trolley parking bay: 1 trolley	1	2.0	2.0	G0103	
Pantry/Beverage making area	1	12.0	12.0	P0607	
Ward Food trolley parking bay	1	1.5	1.5	G0305	
Wheelchair bay	1	4.0	4.0	G0119	
Nurses Station	1	8.0	8.0	T0112	
Touch Down Spaces	4	2.0	8.0	T9999	(as per HBN 04-01)
Sub-Total			**77.5**		
Backup Storage					
Linen trolley parking bay	1	1.5	1.5	G0118	
Clinical supplies trolley	1	1.5	1.5	G0123	
Clinical Store/Controlled drug Cupboard	1	1.5	1.5	W1411	
Clean Utility Room	1	12.0	12.0	T0505	
Large Eqpt Store	1	20.0	20.0	W1410	
Sub-Total			**36.5**		
Utilities					
Dirty utility/Sluice/Test Room - small	1	6.5	6.5	Y0407	
Dirty utility/Disposal hold)	1	8.0	8.0	Y0405	Interim Disposal Hold on Ward
Cleaners room	1	7.0	7.0	Y1501	
WC/WHB - type 1	1	2.0	2.0	V1005	
Switchgear cupboard	1	1.0	1.0	N/A	
Sub-Total			**24.5**		
Office and Administrative Services					
Reception - 2 position - open	1	8.0	8.0	J0206	
Office - 1 position + meeting area	1	12.0	12.0	M0218	
Charge Nurse/Sister's Office	1	9.0	9.0	M0202	
Printer/IT/Admin Store Room	1	6.0	6.0	M0409	
Waiting Area - 5-10 persons	1	16.0	16.0	J1201	
Sub-Total			**51.0**		

Essential Complementary Accomodation					
Assisted Bathroom	1	16.0	16.0	V1708	
Sub-Total			**16.0**		

Additional Accomodation and Services					
Medical Hot Desking (2 Places)	1	10.0	10.0	M0307	
Sub-Total			**10.0**		

Total net			**587.5**
Planning	5%		29.4
Sub-Total			616.9
Engineering	3%		18.5
Circulation	31%		191.2
Total			**826.6**

GENERIC WARDS
INPATIENT FLOOR (3 WARDS)

Description	Qty	Unit Area m²	Total Area m²	ADB CODE	Comment
Bed Area					
Single bedroom: Children/young people, with relatives overnight stay	20	16.5	330.0		
Lobby: air lock to bedroom	2	7.0	8.0		
Shower, WC & wash: accessible, wheelchair assisted	20	4.5	90.0		
Multi-bed room & day space: Children/young people, 4 beds, with relatives overnight stay	1	68.0	68.0		
Shower, WC & wash: accessible, wheelchair assisted	1	7.0	7.0		
Office Area with workstations (x4)	1	18.0	18.0		
Office - clinical - 2 person	1	12.0	12.0		
Staff & communication base, open 2 staff	1	5.0	5.0		
Touchdown	2	2.0	4.0		
Sub Total			**542.0**		
Utility Area					
Bath, WC & wash: treatment, assisted	1	14.0	14.0		
Clean utility	1	14.0	14.0		
Cleaners Room	1	7.0	7.0		
Parking bay: resuscitation trolley	1	1.0	1.0		
Dirty utility: bedpan disposal & urine test	1	12.0	12.0		
Store: linen & Clothing Back-up	2	2.5	5.0		
Store: general	1	5.0	5.0		
Store: equipment	1	5.0	5.0		
Sub Total			**63.0**		
Patient Support Area					
Treatment room: child	1	16.5	16.5		
Interview & counselling room: 5 persons	1	9.0	9.0		
Parking bay:	1	5.0	5.0		
Pantry: serving ward	1	12.0	12.0		
Ward Food trolley parking bay	1	1.5	1.5		
WC & handwash: ambulant - staff	1	2.0	2.0		
Sub Total			**46.0**		
Recreation, Play & Dining Area					
Dining room & Playroom: 10 - 15 patients	1	25.0	25.0		
Store Room	1	5.0	5.0		
WC & handwash: accessible, wheelchair assisted	1	4.5	4.5		
Sub Total			**34.5**		

Total Net			**685.5**
Planning	**5%**		**34.3**
Sub-Total			**719.8**
Engineering	**3%**		**21.6**
Circulation	**34.0%**		**244.7**
Total			**986.1**

DESIGN ACCEPTANCE PROCEDURE FORM

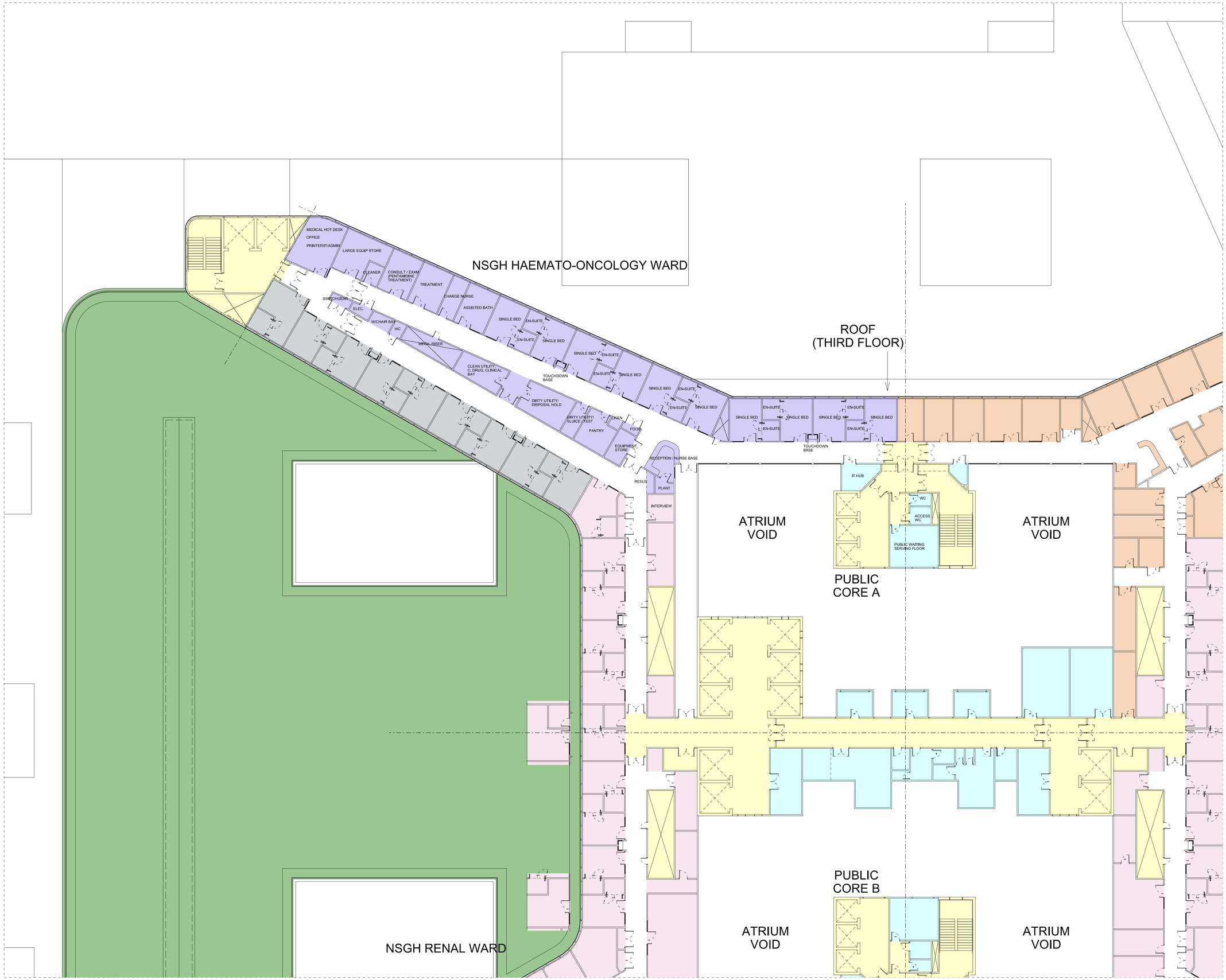
Generic Ward User Group meeting 20/1/10
ACTION POINTS

Generic Wards

- Can isolation lobby area be used to provide additional storage space? Architect to check. If not, can space be taken from socialisation area to achieve this?
- Controlled drug cupboard should be within the clean utility
- Relocate food trolley bay adjacent to pantry
- Wheelchair bay : merge the two areas (keep fire partition at one side of area)
- Clinical supplies bay : merge into the clean utility
- Centralise the Resus trolley bay (relative to beds)
- 2 x single bedroom at end of ward finger : can window be relocated to improve observation? Architect to investigate.
- Socialisation space : investigate options for an open plan area in an alternative location of ward (i.e. end of ward finger), or open plan area in current location
- Reception area : utilise this area for additional waiting space

Ward Support Cluster

- No action points



Notes:
- This drawing is copyright.
- Do not scale dimensions from this drawing.
- All discrepancies on this drawing are to be reported to the architect.
- Do not modify any element of this drawing.
- Use drawing only for purpose(s) issued.

No	Design Risk Register

Rev	Date	Revision Notes
03	22/03/10	FURTHER REVISION BASED ON PROJECT OFFICE COMMENTS
02	22/03/10	REVISED FOLLOWING ISSUE OF AMENDED SCHEDULE OF ACCOMMODATION.

Client
NHS Greater Glasgow and Clyde

Contractor
Brookfield

NIGHTINGALE associates architects
www.nightingaleassociates.com

Project
NEW SOUTH GLASGOW HOSPITALS (NSGH) PROJECT

Drawing Title
FOURTH FLOOR
HAEMATO-ONCOLOGY WARD
1:200 DESIGN DEVELOPMENT

Job No	Date	Scale@A1
09080	22/03/10	1:200

Status
PRELIMINARY

Drawing No						Rev
Origin	Zone	Level	Type	Content	Sequential	
NA	ZE	04	PL	252	403	03

A52825963

New South Glasgow Hospitals (NSGH) Project

Adult Hospital

Clinical User Group Meeting: No. 3 (1:200 Stage 3)
Department: Renal User Group
Date of Meeting: Thursday 22 April, 2010
Time: 19.00am -1.00pm

Attendance Sheet

Name	Organisation / Role	Attendance
Isabel Brown (Ippy)	NHS Greater Glasgow & Clyde	[redacted]
Stewart Campbell	NHS Greater Glasgow & Clyde	
Chris Deighan	NHS Greater Glasgow & Clyde	
Bill Fisken	NHS Greater Glasgow & Clyde	
Marjorie Johns	NHS Greater Glasgow & Clyde	
Julie Little	NHS Greater Glasgow & Clyde	
Margaret McLucas	NHS Greater Glasgow & Clyde	
Heather Griffin	NHS Greater Glasgow & Clyde	
Stephen Gallacher	NHS Greater Glasgow & Clyde	
Karen Connelly	NHS Greater Glasgow & Clyde	
Frances Wrath	NHS Greater Glasgow & Clyde	
Fiona McCluskey	NHS Greater Glasgow & Clyde	

DAVID MCLEOD — DOIG T SMITH
T SULLIVAN — NIGHTINGALES
M DRANE — "
PAUL BRITTON — TRISTEL
Jackie Stewart — NHS GGC
Karen Connelly — NHSGGC
STEPHEN CRACKNELL — NHS

[redacted]

NEW SOUTH GLASGOW HOSPITALS & LABORATORY PROJECT
DESIGN ACCEPTANCE PROCEDURE

Building:	**Issued by**:
Subject:	**Date issued**:
Aspect for Review:	**Date returned**:

DESIGN REVIEW HISTORY

	Level of Approval	Approval Date	Remarks
Design Review 1			
Design Review 2			
Design Review 3		22/4/2010	

BOARD RESPONSE

Level of Approval [ ] 1:200 SIGNED off on basis of mark up

Information referred to: _____

Detailed comment: _____

Approval Levels: A = No comment. B = Proceed to comments. C = Resubmit with amendments. D = Rejected.

User Group Lead [redacted] Date: 22/4/2010

Design Manager [redacted] Date: 22/4/10

Project Manager: [redacted] Date: 22/4/2010

Infection Control [redacted] Date: 22/4/10

FM Lead: [redacted] Date: 22/4/10

DESIGN ACCEPTANCE FORM

ACTION POINTS

1/ Internal ~~development~~ arrangement of patient & staff change to be further developed at 1:50 stage.

2/ Physical Measurement room to be swapped with Pantry - to be redesigned in accordance with Architect's sketch and revised S.O.A.

3/ Patient Changing area includes 2nr assisted WC's - only 1nr is required

4/ Doors at Clean Utility to be moved to between office and Isolation room

5/ Water Treatment to be renamed Plant Room

WARD

6/ Staff base to be omitted. Area to be added to main Staff base to increase area to 12m². 2nr touchdown bases to be created at 2m² each.

(ie/ End Staff base in higher acuity area to be split as follows — x2 touchdown @ 2m² with remaining 4m2 to be reallocated to the other staff base at entrance of Acuity ward)

[redacted] 22/4/10

[redacted] /4/2010.

New South Glasgow Hospitals (NSGH) Project

Adult Hospital

Clinical User Group Meeting: No. 3 (1:200 Stage 3)
Department: Haemato-oncology User Group
Date of Meeting: Friday 7th May, 2010
Time: 9.00am - 12.30pm

Attendance Sheet

Name	Organisation / Role	Signature
Jonathan Best	NHS Greater Glasgow & Clyde	[redacted]
Gary Jenkins	NHS Greater Glasgow & Clyde	
Myra Campbell	NHS Greater Glasgow & Clyde	
David Dunlop	NHS Greater Glasgow & Clyde	
Marjorie Johns	NHS Greater Glasgow & Clyde	
Anne Parker	NHS Greater Glasgow & Clyde	
Sandy Sharp	NHS Greater Glasgow & Clyde	
Rosemary Twohig	NHS Greater Glasgow & Clyde	
HEATHER GRIFFIN	PROJECT MANAGER	
FIONA MACLEAN	GGTC NHS	
JACKIE STEWART	NHS GGC	
BILL MCGAUGHIE	DOIG + SMITH	
M. DRANS.	NURSING ALBS.	
KEREN CONNELLY	NHSGGC	
PAUL BRITTON	TRIBAL	
~~MARJORIE JOHNS~~	NHSGGC	
STEPHEN CHALKLEY	AMD	

NEW SOUTH GLASGOW HOSPITALS & LABORATORY PROJECT
DESIGN ACCEPTANCE PROCEDURE

Building:	**Issued by**:
Subject: HAEMATO – ONCOLOGY	**Date issued**:
Aspect for Review:	**Date returned**:

DESIGN REVIEW HISTORY

	Level of Approval	Approval Date	Remarks
Design Review 1			
Design Review 2			
Design Review 3		7/5/2010	

BOARD RESPONSE

Level of Approval [ ] 1:200 SIGN OFF

Information referred to: (No action points)

Detailed comment:

Approval Levels: A = No comment. B = Proceed to comments. C = Resubmit with amendments. D = Rejected.

User Group Lead: [redacted], General Manager Date: 07/05/10

Design Manager [redacted] Date:

Project Manager [redacted] Date: 7/5/2010

Infection Control [redacted] Date: 7/5/2010

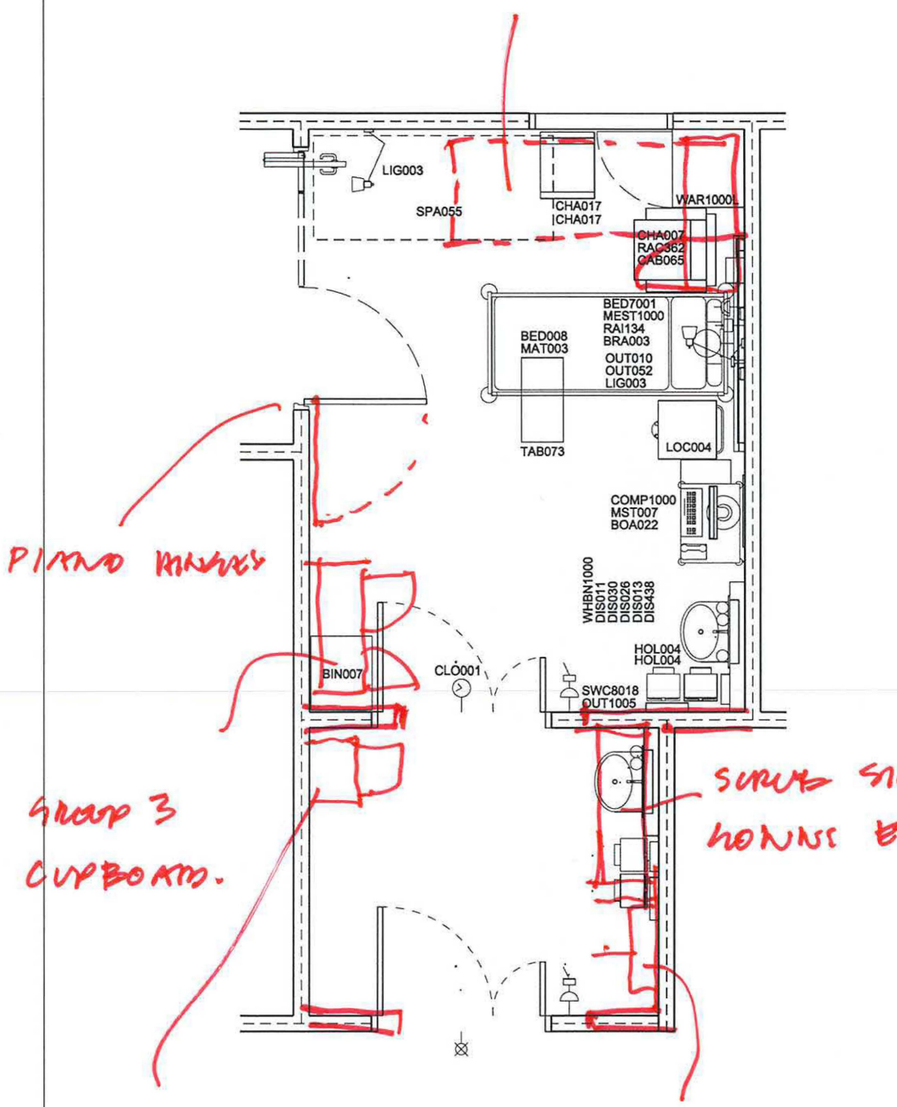
FM Lead: [redacted] Date: 7/5/2010

DESIGN ACCEPTANCE FORM

ACTION POINTS

1. No action points

SHOW STANDARD
PULL DOWN BED / WARDROBE



PIPED HANGERS

GROUP 3 CUPBOARD.

SERVED SINK AND HOUSE ER.

WALL CUPBOARD (SMALL).

DRUGS CUPBOARD LOCKABLE

1 Single bedroom: isolation: Children/young people:
with relatives overnight stay

Grp	ADB No	Qty	Description
3	BED008	1	BED, Kings Fund, child, variable height, two-way tilt, adjustable backrest, on castors
1	BED7001	1	BED HEAD BUFFER/DOCKING device, bed and wall protection, horizontal, to design
3	BIN007	1	BIN, storage, complete with drop on lid, mobile, 550H 610W 610D
2	BOA022	1	BOARD, display/notice, magnetic, wall mounted, 900H 600W
2	BRA003	1	BRACKET, holder, suction unit, wall mounted
2	CAB065	1	CABINET, drugs, self dispensing medication, lockable, wall mounted, 315H 210W 155D
3	CHA007	1	CHAIR, easy, with open arms, high back, upholstered
3	CHA017	2	CHAIR, upright, upholstered, stacking
2	CLO001	1	CLOCK battery, wall mounted
3	COMP1000	1	COMPUTER, complete with keyboard, screen and telephone. - 1 No. COM031 (grp 3) COMPUTER CPU - 1 No. COM033 (grp 3) COMPUTER KEYBOARD - 1 No. COM1000 (grp 3) COMPUTER MONITOR, TFT, digital flat panel display, desk top. - 1 No. TEL1000 (grp 3) TELEPHONE, handset, wall mounted
2	DIS011	1	DISPENSER, barrier cream, disposable single cartridge, wall mounted
2	DIS013	1	DISPENSER, paper towel, wall mounted
2	DIS026	1	DISPENSER, Medical hand sanitizer, lever action, wall mounted
2	DIS030	1	DISPENSER, soap, disposable single cartridge, lever action, wall mounted
2	DIS438	1	DISPENSER, disposable gloves set of 3 and disposable apron, wall mounted
3	HOL004	2	HOLDER, sack, with lid foot operated, small, freestanding
1	LIG003	2	LUMINAIRE, reading, adjustable arm, 100 watt
3	LOC004	1	LOCKER, bedside, 4 compartment with lockable section /drawer, towel rail at rear, on castors, 902H 485W 485D
3	MAT003	-	MATTRESS, Kings Fund bed, child, standard backrest, 1655L 865W 125D
		1	1940 x 825 mm
1	MEST1000	1	MEDICAL SERVICE TRUNKING, acute bed/trolley space, to HTM 08-03 requirements. - 1 No. CAL008 (grp 1) PUSH BUTTON staff crash call, reset and integral/adjacent indicator lamp, wall/trunking mounted. - 2 No. CAL012 (grp 1) RESET UNIT, with repeat lamp, patient/staff call - 1 No. CAL043 (grp 1) PUSH BUTTON patient/staff call with socket for extension pear push, trunking mounted - 1 No. CAL047 (grp 1) PUSH BUTTON staff emergency call, reset and integral/adjacent indicator lamp, trunking mounted - 1 No. ECS1000 (grp 1) ENTERTAINMENT SYSTEM, to client specification. - 4 No. OUT012 (grp 1) SOCKET outlet switched 13amp twin, trunking mounted - 4 No. OUT131 (grp 1) SOCKET outlet double data/voice, wall/trunking mounted - 1 No. OUT151 (grp 1) SOCKET outlet patient monitoring, wall/trunking mounted - 1 No. OUT453 (grp 1) OUTLET, 4 kPa compressed air, medical - 1 No. OUT470 (grp 1) OUTLET, oxygen, medical - 1 No. OUT475 (grp 1) OUTLET, vacuum, medical - 1 No. TRU1001 (grp 1) MEDICAL SERVICE TRUNKING, horizontal, length as drawn.
3	MST007	1	TROLLEY, lockable, closed, with worktop, approx 900H 660W 500D, 600mm facing
1	OUT010	1	SOCKET outlet, switched, 13 amp, twin
1	OUT052	1	CONNECTION UNIT, switched, 13 amp
1	OUT1005	1	CLEANERS SOCKET outlet, switched, 13 amp, single, wall mounted
2	RAC362	1	RACK, catheter, vertical, 2 compartments, 420H 160W 65D
1	RAI134	1	RAIL, clinical equipment, wall mounted, 1600mm
3	SPA055	-	Space for bed/reclining chair
		1	2000 x 866 mm
1	SWC8018	1	SWITCH 10A retractable, integrated with lighting control system
3	TAB073	1	TABLE, overbed, cantilevered
3	WAR1000L	1	WARDROBE, 2100H 650W 600D
1	WHBN1000	1	WASH BASIN, clinical, with non touch panel mounted tap/s. - 1 No. BAS101 (grp 1) BASIN, medium, hospital pattern, vitreous china, no tap holes, no overflow, integral back outlet, 500W 400D. HTM64LBHM - 1 No. OUT052 (grp 1) CONNECTION UNIT, switched, 13 amp - 1 No. TAP894 (grp 1) TAP bib, hospital pattern, integral thermostatic mixer, automatic action with sensor operation. HTM64TBH6 - 1 No. WAS100 (grp 1) WASTE, unslotted flush-grated, metal, 1. 1/4 in. HTM64WT1 - 1 No. WAS1000 (grp 1) TRAP, concealed waste, for back outlet basins.

Required equipment, missing from drawing.

1	OUT010	3	SOCKET outlet, switched, 13 amp, twin
1	OUT131	2	SOCKET outlet double data/voice, wall/trunking mounted
1	SAF005	1	SAFE, wall, recessed, 150H 200W 150D

Equipment in drawing, extra to requirement.

2	CLO001	1	CLOCK battery, wall mounted
2	DIS011	1	DISPENSER, barrier cream, disposable single cartridge, wall mounted
2	DIS030	1	DISPENSER, soap, disposable single cartridge, lever action, wall mounted
1	LIG003	1	LUMINAIRE, reading, adjustable arm, 100 watt
1	OUT052	1	CONNECTION UNIT, switched, 13 amp

1:50 scale bar: 0, 1, 2, 3

A52825963

Notes:
- This drawing is copyright.
- Do not scale dimensions from this drawing.
- All discrepancies on this drawing are to be reported to the architect.
- Do not modify any element of this drawing.
- Use drawing only for purpose(s) issued.

Designer Identification of Hazard/Risk

SINGLE BEDROOM
NCH-02-SCH-010
Req Area:16.5m²
Designed Area:17.6m²

UGM | 02 | 06 Schiehallion Ward (Haemato - oncology), Day Case & TCT

Rev	Date	Drw	Revision Notes	Chk	App
01	05/08/10	KA	FIRST ISSUE FOR USER GROUP MEETINGS	AvB	EW

2010 - 08 - 17
1:50 UGM 1.

Client: NHS

Contractor: Brookfield

NIGHTINGALE associates architects
87-91 Newman Street
London
W1T 3EY
Tel: 0207 079 9900
Fax: 0207 079 9901
www.nightingaleassociates.com

Project: NEW SOUTH GLASGOW HOSPITALS (NSGH) PROJECT

Drawing Title: SINGLE BEDROOM: ISOLATION Children/Young persons B1805C1

Job No	Drawn	Checked	Approved
09080	KA	AvB	EW
Status: PRELIMINARY		Date: 03/08/2010	Scale@A3: 1:50

Drawing No

Origin	Zone	Level	Type	Content	Sequential	Rev
NA	SZ	XX	AS	400	041-01	01

ADULT SCHEDULE OF ACCOMMODATION
Review of Schedules 24th November 2010

There are a number of anomalies with the adult schedule of accommodation which are causing concern and will need to be considered at the next stage. The following are examples of the issues:

> Some of the DSR's have been squeezed (5.4m^2 in one)

> A number of the waiting areas are listed at far smaller m^2 than required e.g. Ground and First Floor Outpatient Waiting Areas have required areas of 96m^2 and 90m^2, are listed at 58m^2 and 24m^2. This does not tie in with the 1:200' drawings, please confirm actual size. Other examples are the waiting areas for Critical Care and Theatres AODOS are listed as much smaller than the requested space, require review.

> Some of the outpatient consulting clinic rooms are listed substantially below required area, for example in Orthopaedics, Consulting Room listed at 11.70m^2 (required area 16.5m^2)

> Some hot desk area is below required area, therefore query may affect functionality e.g. Dermatology 2 Person Hot Desk listed at 6.6m^2 (instead of 10m^2)

> Number of Disabled Toilets and Ensuites throughout listed as 3.7m^2 instead of 4.5m^2, need to review functionality once department is loaded

> Some of the Resus Bays are half or less the requested area, may be ok but need to check functionality at next stage

> Some of the Clean and Dirty Utilities are smaller than requested, for example in Rehab and Therapy Outpatients the Dirty Utility is listed as 7.6m^2 instead of the requested 12m^2 and in outpatients it is 8m^2 instead of the requested 12m^2, the Clean Utility in Imaging (041) is listed as 7.6m^2 instead of 9m^2. Again will need to check functionality at the next stage

> Storage within Theatres is less than requested for example the satellite pharmacy store is 21% less than required.

> Theatres – quite a few of the Recovery Spaces are less than requested – need to confirm functionality and that the bed spacing is 3.5 between bed heads as discussed and confirmed by architect in the user group meetings

> Theatres - The large recovery bay at 16.5m2, which will be used for undertaking procedures, blocks etc has been listed as 17.6% below space required – need to review to ensure functionality is not affected .

> Within the Renal Wards, 2 of the Quiet Sitting Spaces are listed as 45% or more below that requested, leaving questionable functionality - will need review at the next stage. In addition, 2 of the Touchdowns are at 0.8m^2, 60% reduced from required area

> An Interview Room in AAU is listed as 7.5m^2, will need to check functionality at the next stage

- In Imaging QA Room (058), is listed as 18.8m^2 instead of the 24m^2 required and the MRI Scanner Room (109) is listed at 62.8m^2 as opposed to 68.3m^2. In both cases the QA and MRI Rooms reviewed at 1:50 did not include the rooms above, therefore will need to review 058 and 109 for functionality at the next stage

- The Wash Up Area on floor 6 is listed at 58% below that requested, again will need to review for functionality

- Renal Dialysis 8 Chair Treatment Area (036) is 8m^2 below area requested – this is not one of the rooms which was drawn at 1:50, therefore need to review functionality at the next stage.

- Shared Core Ward Cluster – the schedules issued currently only show Cluster Type A – please note that here are 4 different multi-functional clusters, the floor location of these is yet to be agreed by the Board

IN PRINCIPLE OK. BUT SUBJECT TO REVIEW & SIGN OFF OF SAMPLES

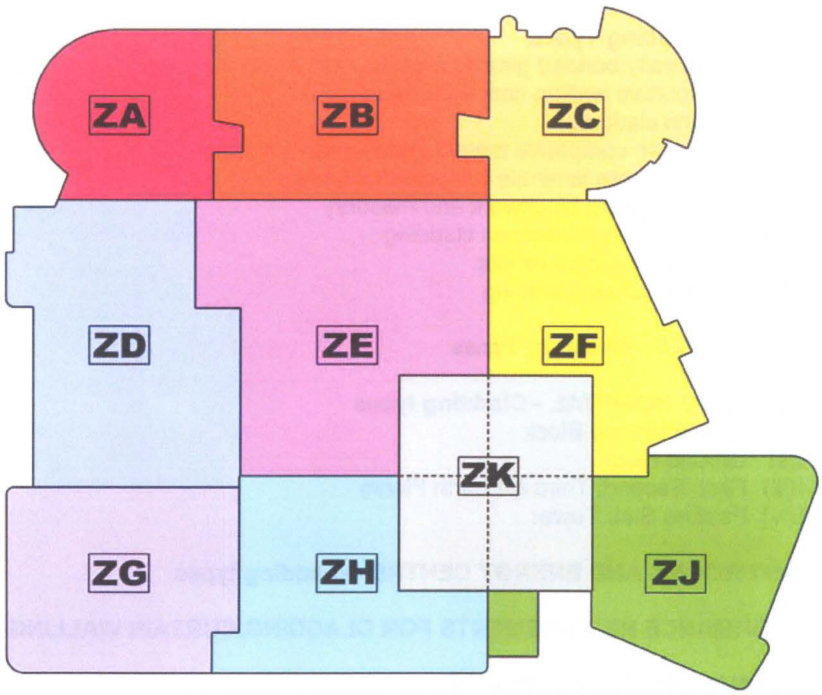
NSGH Project (Full Business Case) FBC APPENDIX K

	BROOKFIELD	NSGH BOARD
Name:	[redacted]	
Date:	28/4/11	11.11.10
Sign:		[redacted]
Status: (A or B)	A	D

NHS Greater Glasgow and Clyde

NEW SOUTH GLASGOW HOSPITALS

ADULT & CHILDREN'S HOSPITAL



NIGHTINGALE associates

Document Name
NSGH OUTLINE SPECIFICATION

Status
DESIGN DEVELOPMENT

Prepared By	J. Wiggett & A.Brown
Checked By	E. White

26/10/2010	N/A
DATE OF 1ST ISSUE	REVISION DATE

Document Number	Revision
NA-SP-001	01

A52825963

CONTENTS

1.0 INTRODUCTION

This outline specification gives locations and general description of building elements. For detailed NBS specifications see NA-SP series documents and Contract drawings.

2.0 EXTERNAL OUTLINE SPECIFICATION

SECTION MATERIAL / DESCRIPTION

There are several different types of cladding which are proposed on the New South Glasgow Hospitals Project; below is a brief description of the location of where they are used, and outline specification of each type. The cladding type descriptions have been separated for clarity into the Tower, Podium, Children's Hospital, Plant Rooms and Energy Centre.

2.1 TOWER:
Cladding Types

2.1(i) Unitised Cladding Capless Structurally Bonded Glazed Spandrel System

A fully glazed sleek envelope with a capless frame detail to the mullions and transoms of the Ward Tower. Each corner of the tower 'wing' is curved to continue the wrap-around effect of the façade and to express the flexibility of the ward form and internal clinical functionality.

The full-height, fixed light panels consist of double glazed units, with laminated/toughened high performance and low E glass. Polyester powder coated aluminium panels behind the double glazing at slabs and ceiling voids. The blanking panels have back enamelled, single glazing.

The frames are hung from the face of the floor slabs utilising cast-in channels and mild steel galvanised brackets. The 3800mm high units vary in width from 400mm to 1600mm. Polyester powder coated internal finish to frames.

Vertical coloured fins/caps at the ward tower ends and horizontal fins at the central elements on the East and West facades. A continuous pressed profiled metal shadow detail is applied to every second floor to express the horizontal layers.

Central tower elements of Eastern and Western elevations to have aluminium composite material panels fixed to unitised cladding panels.

2.1(ii) Soffit Cladding

Pressed aluminium soffits to the underside of podium and tower generally.

2.2 PODIUM:
Cladding Types

2.2(i) Structurally bonded glazing system

Fully glazed frameless curtain walling forms the main entrance draught lobby.

Clear silicone joints to the glass panels. Manifestation will be provided as required.

2.2(ii) Stick curtain walling capped system

The Main Entrance double height façade is a stick curtain walling system with a standardised unit size.

Department entrances, feature corners/areas and the interstitial floor horizontal light

slots to the west and east façades will consist of standard sized curtain walling modules.

2.2(iii) **Column Cladding**
Polyester powder coated pre-formed aluminium cladding to columns at main entrance.

2.2(iv) **Aluminium composite material rainscreen cladding on structural framing system**
Podium cladding to the second and third floor levels on the North elevation near Main Entrance and Ground floor South elevations at AAW entrances. Strip windows with glazed back enamel blanking panels on the North Elevation second and third floors near main entrance.

2.2(v) **High pressure laminate rainscreen cladding on structural framing system**
Feature coloured cladding panels at the North elevation of the NCH. Refer to separate section for structural framing.

2.2(vi) **External facing blockwork on structural framing system**
Podium cladding to all ground floor areas on the Southern end of East and West facades and South elevation. Half-lap stretcher bond. Refer to separate section for blockwork/ masonry. Refer to separate section for structural framing.

2.2(vii) **Natural stone rainscreen on structural framing system**
On North elevation, Ground floor at NCH and ground, first & second at OPD. Half-lap stretcher bond. Refer to separate section for blockwork/ masonry. Refer to separate section for structural framing.

2.2(viii) **External insulated render on structural framing system**
Podium cladding generally to all internal courtyards and Southern end of East and West facades and South elevation. Refer to separate section for Render. Refer to separate section for structural framing.

2.2(ix) **Zinc rainscreen on structural framing system**
Podium cladding to the NCH Main Entrance Block. Refer to separate section for Render. Refer to separate section for structural framing.

2.3 LINK BRIDGES TO MATERNITY & NEUROLOGY:
Cladding Types

Aluminium composite panel on structural framing system
Generally vertical composite panels, on a structural framing system. Intermittent slot windows will be provided to the ramped elements of the bridges, with full height vertical-fritted glazing panels to the landing areas and bridge entrances.

Aluminium flashings will be chased into the existing buildings to provide a weather-tight detail. These will be slip-jointed to the bridge cladding to allow for the structural movement differentials.

2.4 CHILDREN'S HOSPITAL:
Cladding Types

The Children's Hospital has been designed to ensure that it provides the integrated clinical model where required, but maintains its own building typology and architectural language and form to distinguish it from the main Adult Hospital.

2.4(i) **Main Entrance Block**
The Main Entrance is pronounced by a feature zinc clad element which wraps-around and from the Entrance Plaza into the Children's Park. This consists of zinc rainscreen cladding on a structural framing system. Strip windows provide views inside and outside towards the Entrance Plaza and Central Park beyond.

A combination of stick curtain walling and feature coloured high pressure laminate rainscreen cladding on structural framing system provide the background external wall to the main entrance element, with structurally bonded frameless glazing forming the entrance lobby surrounds. Refer to separate section for structural framing.

The ground and first floor Southern end of the West elevation consists of a stick curtain walling. This glazed element will provide a visual interaction with the Children's Park, in addition to clear views from the main entrance into the building and through the atrium.

2.4(ii) **Ground Floor – Natural stone rainscreen on structural framing system**
Half-lap stretcher bond. Refer to separate section for blockwork/ masonry. Refer to separate section for structural framing.

2.4(iii) **First, Second, Third & Fourth Floors - External insulated render on structural framing system**
White render to the west and south elevations of the NCH, each level separated with feature continuous horizontal metal channel. Refer to separate section for structural framing.

2.4(iv) **Feature Stair Tower**
This element will be generally insulated through-colour render on a structural framing system with full height vertical-fritted glazing panels to the landing areas.

2.5 PLANT ROOMS & ENERGY CENTRE:

Cladding Types

Composite metal panel cladding system incorporating louvers
Aluminium micro-rib panels with 'top hat' vertical joints on cladding rails/purlins to plant room walls. Horizontal louver band to tower and children's roof plant areas, louvers to podium plant as required.

The third floor level 'interstitial' plant level will consist of aluminium and louver panels.

Vertically laid panels on the energy centre.

Polycarbonate panels
Colour translucent feature panels, vertically laid (energy centre)

Metal mesh to stair core
Open galvanised steel mesh to external stair core (energy centre)

2.6 PERFORMANCE REQUIREMENTS FOR CLADDING/ CURTAIN WALLING TYPES:

- Reference: NBS H11 and Architect's SE-251-200 series drawings

Unitised cladding on all elevations of the Adult's ward tower (fourth to twelfth floor). Core G (helipad) and central elements of East and West elevation to be aluminium composite material cladding on unitised system, all other panels either double glazed fixed lights or single glazed, back enamel blanking panels.

Stick curtain walling on ground and first floor North elevation around Adults and Children's main entrances and at various levels on East, South and West podium elevations. Stick system with fixed lights and back enamel glazed blanking panels.

Interstitial blinds generally to all ward bedrooms and other clinical rooms as identified in Architect's Glazed Screen Strategy drawings (PL-321-150 series).

PERFORMANCE REQUIREMENTS :

The cladding system must achieve a noise reduction from outside to inside and prevent flanking transmission at the slab edge and mullions in line with the Acoustic Report.

The system will be designed to transmit all loads safely back to the primary structure in accordance with BS 6399-Part 2.

The cladding will meet the U-values of by the Non-Domestic Technical Handbook 2009, the ERs and ER logs and the requirements of the Energy Model to meet the carbon emissions target.

Weather-tightness to meet the requirements. Condensation will not form on the inside face or within the system at the agreed temperature and humidity range.

The external and internal faces of the cladding are of limited combustibility (Class O surface for spread of flame). All gaps between the cladding and the slab edge shall be filled with a non-combustible material to achieve the appropriate fire separation (permeability, integrity & insulation).

Low level glazing is designed to safety requirement in the BS 6262.

2.7 EXTERNAL INSULATED RENDER:

- **Reference: NBS M21 and Architect's SE-251-200 series drawings**

External insulated render is utilised generally as a cladding material to the façades of the podium courtyards, the Southern ends of the East and West elevations and South elevation of the Children's and Adult's Hospitals.

Accessories to be provided include pre-painted aluminium stop beads, corner trims and base rails including at all junctions with differing materials and stop beads/shadow gaps between areas of different coloured renders. PPC aluminium pressing to form window reveals at NCH.

PERFORMANCE REQUIREMENTS :

The facade will meet the U-values of by the Non-Domestic Technical Handbook 2009, the ERs and ER logs and the requirements of the Energy Model to meet the carbon emissions target.

2.8 EXTERNAL BLOCKWORK AND MASONRY:

- **Reference: NBS F10 and Architect's SE-251-200 series drawings**

Blockwork
Fair faced concrete blocks on podium ground floor to Southern end of East and West facades and South elevation.

Bonding to be half-lap stretcher bond.

PERFORMANCE REQUIREMENTS:

Vertical joints in face work are to be filled and to be of even widths, plumbed at every fifth cross joint. Blocks to be laid on full beds.

2.8(i) Facing Brick Plinth

Engineering blue brick plinth generally to perimeter of ground floor at base of natural stone and other rainscreen cladding systems and curtain walling.

2.8(ii) **Natural Stone rainscreen**

- Reference: NBS H92 and Architect's SE-251-200 series drawings

Natural stone rainscreen cladding on North and East elevations of OPD, at ground, first and second floor levels and at ground floor around Children's entrance.

Natural stone rainscreen courses to be of varying depths, with half-lap stretcher bond.

2.9 **WINDOWS AND DOORS:**

- Reference: NBS L10 and Architect's EL-251-100 series drawings

2.9(i) **Window Types**
Powder coated aluminium framed fixed lights.

Any fire rated windows to be steel framed fixed lights.

Manifestations will be applied to all full height glazing to meet Building (Scotland) Regulations.

PERFORMANCE REQUIREMENTS:
Safety glazing used to glazing to low level areas in accordance with BS 6262.

Windows will meet the U-values of by the Non-Domestic Technical Handbook 2009, the ERs and ER logs and the requirements of the Energy Model to meet the carbon emissions target.

Interstitial blinds generally to all ward bedrooms and other clinical rooms as identified in Architect's Glazed Screen Strategy drawings (PL-321-150 series).

Windows will achieve a noise reduction from outside to inside and prevent flanking transmission at mullions in line with the Acoustic Report.

2.9(ii) **Door Types**

- Reference: NBS L20 and Architect's EL-251-100 series drawings

Main entrance doors will be fully glazed with powder coated aluminium frames to match with adjacent cladding system.

Automatic sliding doors with entrance lobby will be provided to the Adult Main Entrance, the Adult Emergency Centre Entrances (Ambulance and Walking Wounded), the Children's Main Entrance and Children's Emergency Centre Entrances (Ambulance and Walking Wounded) and the Acute Assessment Entrance.

Doors in unitised cladding and composite panels provide maintenance access to roofs. Doors in solid cladding for public access must provide barrier-free access, i.e. level access thresholds.

All service and fire escape doors will be manufactured from solid core material.

Doors to incorporate privacy film where required to sensitive rooms.

PERFORMANCE REQUIREMENTS:
Glazing to low level areas in accordance with BS 6262.

Manifestations to be applied to all full height glazed doors to meet Building (Scotland) Regulations.

All doors to meet the clear opening requirements of Non-Domestic Technical Handbook 2009.

Doors will meet the U-values of by the Non-Domestic Technical Handbook 2009, the ERs and ER logs and the requirements of the Energy Model to meet the carbon emissions target.

Doors will achieve a noise reduction from outside to inside in line with the Acoustic Report.

2.10 STRUCTURAL FRAMING SYSTEM:

- Reference: NBS H92 and Architect's SE-251-200 series drawings

Light-weight structural steel framing (SFS) for the external walls generally to Adult's podium areas and the Children's Hospital.

All studs, joists, tracks and accessories shall be of a type, size & gauge and shall be set out to satisfy structural calculations.

Cementitious sheathing board applied to outside face of SFS.

Framing coordinated with partition setting-out to allow acoustic separation at wall line where required, and fire separation at (sub) compartment lines.

PERFORMANCE REQUIREMENTS:

Provide adequate support for all podium elevation treatments (stick curtain walling, aluminium panel rainscreen, high pressure laminate rainscreen cladding, insulated render, facing masonry etc) and suitable framing to all window and louver openings and service terminations.

Interfaces with the primary concrete frame, ground bearing & upper floor slabs (including structural movement joints) and with elements of external glazing.

All secondary supports for all elements to be fixed externally to the cladding and for all internal fixtures and fittings fixed to the internal linings.

2.11 SINGLE PLY MEMBRANE ROOF:

- Reference: NBS J42 and Architect's PL-240-100 series drawings

Single layer polymeric sheet roof covering system generally to plant rooms supported by a structural metal deck substrate on cold-rolled steel purlins. Falls at 2°, in line with manufacturers' recommendations.

Colour to be light grey. Non-slip walk-able surface to be provided on access routes.

An integral non penetrative guided type fall prevention system will be provided using a fixed length lanyard of 3m allowing access to all areas of the roof.

Walking-in gutters, of sufficient width and strength, to allow maintenance and cleaning access of the roofs from the cat ladder access points.

PERFORMANCE REQUIREMENTS:
Roof build-up will meet the U-values of by the Non-Domestic Technical Handbook 2009, the ERs and ER logs and the requirements of the Energy Model to meet the carbon emissions target.
All services penetrations through the roofing system will include trimming sections to the purlin support system to frame up the openings where required, and welded

penetration soakers will be provided as appropriate.
All vapour control barriers to prevent interstitial condensation and will be sealed with butyl rubber tape and securely sealed around all penetrations.

Wind, snow & other loadings to be transferred safely back to the main structure in accordance with BS 6399

2.12 LIQUID APPLIED MEMBRANE ROOF:

- Reference: NBS J31 and Architect's PL-240-100 series drawings

Generally applied to all flat concrete roofs on podium and tower, laid directly onto the structural deck without the use of screeds.

Precast concrete paving slabs provided for as required to personnel/plant access and maintenance and hard standing for façade cleaning. Round washed shingle to be provided as ballast in areas without paving. Ballast of sufficient weight in close proximity to helipad.

Movement joint detail to incorporate concrete up-stand and flashing.

Pitch pockets/upstands to be provided for as required for the weathering of all elements to be fixed to the roofs.

PERFORMANCE REQUIREMENTS:

Ensure weather tightness at all junctions with cladding, atrium, and penetrations etc including thermal insulation preventing cold bridging.

Includes sealing and weathering around all services penetrations ensuring continuity of insulation.

Roof build-up will meet the U-values of by the Non-Domestic Technical Handbook 2009, the ERs and ER logs and the requirements of the Energy Model to meet the carbon emissions target.

2.13 LIQUID APPLIED MEMBRANE ROOF TO ENERGY CENTRE

Fully reinforced, heavy duty, cold applied waterproofing system to energy centre roof. Small enclosed rooftop areas have profiled metal deck roofs, polyester powder coated.

No insulations requirements.

2.14 SEDUM ROOF:

Sedum roof to selected podium roof areas.

(refer to the Landscape Architect's Specification for further details)

2.15 RAINWATER GOODS:

(refer to the M&E Specification for further details)

2.16 ENTRANCE CANOPIES:

Aluminium Soffit Canopies

- Reference: NBS H31 and Architects PL-240-001 series drawings

NSGH (Adult) Hospital Main Entrance
The aluminium soffit to the underside of the second floor tower 'Entrance Wing' and the picture frame 'lid' to Main Entrance double height façade will provide the building with its canopy.

Lower height glazed canopies are provided for the bus drop-off zone to the Main Entrance – see Landscape architect's specification for these canopies.

NSGH (Adult) Emergency Department Entrance
The aluminium soffit to the underside of the first floor forms the canopy to both the Ambulance and Walking Wounded Entrances. This will incorporate feature downlights.

Glass Canopies

- Reference: Architects AS-340-200 series drawings

NCH (Children's) Hospital Main Entrance
A high-level laminated planar glazed entrance canopy part-suspended from the zinc cladding covers the Children's Hospital Main Entrance. This incorporates aluminium flashings into the external wall.

NCH (Children's) Emergency Department A&E entrance
A laminated planar glazed entrance canopy part-suspended from the insulated render cladding at the A&E entrance. This incorporates aluminium flashings into the external wall.

NCH 24h Staff entrance
A laminated planar glazed entrance free standing canopy from the insulated render cladding at the A&E entrance. This incorporates aluminium flashings into the external wall.

PERFORMANCE REQUIREMENTS:
External entrance canopies are to meet the recommendations of CIRIA publication 'Guidance on glazing at height' document ref. C632 and CWCT Technical Update no. 10 'Use of glass overhead'.

2.17 ETFE ATRIA ROOFS:

- Reference: NBS H80 and Architect's DT-340-200 series drawings

NSGH (Adult) Hospital Atrium
ETFE roof above the twelfth floor level, below the level of the twelfth floor plant room roofs.

The roof covering will consist of triple-layer ETFE air-filled pillows fixed to aluminium extrusions. The ETFE is to include fritting of a pattern to be agreed at the next stage.

Pillows made up of ETFE layers as follows:

I) Top layer: standard printed or clear (to achieve solar performance)

II) Middle layer: clear

III) Bottom layer: clear

ETFE panels form the vertical faces and are mechanically operated to provide natural ventilation and smoke clearance to suit M&E engineers atrium ventilation strategy and fire engineer's atrium fire strategy. Actuators integrated into the Building Maintenance Systems.

The atrium structure will be circular painted steel trusses.

Access panels provided to allow maintenance access to underside of ETFE roof.

Walkable gutters and flashing into surrounding composite metal panel facades.

PERFORMANCE REQUIREMENTS:
The ETFE is to provide a light transmission and solar heat transmission performance to prevent overheating of the atria and meet the criteria set out by the M&E engineer.

Roof build-up will meet the U-values of by the Non-Domestic Technical Handbook 2009, the ERs and ER logs and the requirements of the Energy Model to meet the carbon emissions target.

NCH (Children's) Hospital Atrium
The atrium ETFE roof will sit at the fourth floor level partly below, and partly above, the plant roof, and will undulate to form a wave.

The roof covering will consist of triple-layer ETFE air-filled pillows fixed to aluminium extrusions. The ETFE is to include fritting of a pattern to be agreed at the next stage.

Pillows made up of ETFE layers as follows:

I) Top layer: standard printed or clear (to achieve solar performance)

II) Middle layer: clear

III) Bottom layer: clear

ETFE panels form the vertical faces and are mechanically operated to provide natural ventilation and smoke clearance to suit M&E engineers atrium ventilation strategy and fire engineer's atrium fire strategy. Actuators integrated into the Building Maintenance Systems.

The atrium structure will be circular painted steel trusses.

Access panels provided to allow maintenance access to underside of ETFE roof.

Walkable gutters and flashing into surrounding composite metal panel facades.

PERFORMANCE REQUIREMENTS:
The ETFE is to provide a light transmission and solar heat transmission performance to prevent overheating of the atria and meet the criteria set out by the M&E engineer.

Roof build-up will meet the U-values of by the Non-Domestic Technical Handbook 2009, the ERs and ER logs and the requirements of the Energy Model to meet the carbon emissions target.

2.18 ROOFLIGHTS:

- **Reference: NBS L10 and Architect's DT-340-200 series drawings**

At the Children's Chapel Roof and Children's Hospital Lightwells. These will consist of powder coated aluminium framed double glazed units.

Glazing to be walk-on type.

PERFORMANCE REQUIREMENTS:
The glazed rooflights are to meet the recommendations of CIRIA publication 'Guidance on glazing at height' document ref. C632 and CWCT Technical Update no. 10 'Use of glass overhead'.

2.19 EXTERNAL METALWORK:

- Reference: NBS L30 and Architect's PL-240-100 series drawings

2.19(i) Feature Roof Terrace Areas

Stainless steel handrails (2xheights) and supports with galvanised steel perforated powder coated infill panels (anti-climb) to the Children's roof top areas.

Increase height fencing (anti-climb and anti-ligature) to External sensory play area (DCFP department).

Stainless steel handrails and supports with stainless steel infill cables to the restaurant terrace in Adults.

2.19(ii) Service Access Metal Work

Galvanised and zinc-coated free-standing galvanised tubular steel guard rails to provide edge protection to plant access areas and maintenance only roofs.

Steps over and metal mesh panels to provide maintenance access over roof level services/movement joints/changes in roof levels etc.

2.19(iii) Steel ladders

Vertical steel ladders, fixed to structure at top and bottom, or through façade, to provide maintenance access to roofs without access via doors. Steel hoops and safe access over parapets provided to prevent falls from height.

3.0 INTERNAL OUTLINE SPECIFICATION

SECTION TYPE OF MATERIAL

3.1 Partitions and Dry Lining

- **Reference: NBS K10 and Architect's 252-100 series drawings**

To internal face of external walls, stairs and to internal partitions generally.

Dry lining to podium internal face to be fixed to structural framing of external wall system.

Dry lining to internal face of tower unitised cladding to be fixed to stud framing.

The various dry lining types will incorporate the following design criteria;

- Acoustic performance - to comply with SHTM 08-01 and to co-ordinate with the Acoustic Report and Acoustic Strategy drawings.
- Minimum periods of fire resistance – specified to co-ordinate with the Fire Safety Design Strategy and Fire Strategy drawings.
- Requiring security protection (where required in SHTM 69 and Volume 2/1: Employer's Requirements [Hospitals])
- Requiring radiation protection
- Requiring moisture resistance to areas of high humidity

Radiation Protection and the requirements for lead-lining and Radiofrequency shielding will be provided to meet the Board's Radiation Protection Adviser's requirements.

The studwork is to accommodate and support all of the fixtures and fitting specified in the ADB Room Data Sheets and shown on the 1:50 layouts.

3.2 Ceilings

- **Reference: NBS K10 & K40 and Architect's 332-150 series drawings**

The various types will incorporate the following design criteria;

- Acoustic performance - to comply with SHTM 08-01 and to co-ordinate with the Acoustic Report and Acoustic Strategy drawings.
- Minimum periods of fire resistance – specified to co-ordinate with the Fire Safety Design Strategy and Fire Strategy drawings.
- Requiring security protection (where required in SHTM 69 and Volume 2/1: Employer's Requirements [Hospitals])
- Requiring radiation protection
- Requiring moisture resistance to areas of high humidity

Radiation Protection and the requirements for lead-lining and Radiofrequency shielding will be provided to meet the Board's Radiation Protection Adviser's requirements.

The framework is to accommodate and support all of the ceiling mounted fixtures specified in the ADB Room Data Sheets and shown on the 1:50 layouts.

Ceilings heights generally to be +2700mm AFFL. In addition, certain rooms and circulation spaces will be +3000mm AFFL as required in 7.3.3 and 7.3.4 of Volume 2/1: Employer's Requirements [Hospitals] and to comply with Volume 2.1 Appendix E: ADB Room Data Sheets.

GENERALLY:
The Ceiling Type Strategy has been developed in response to Volume 2/1: Employer's Requirements [Hospitals] - Section 7.3 Ceilings, Volume 2.1 Appendix E: ADB Room Data Sheets and to ensure compliance with SHTM 60 Ceilings. These are performance related ceiling types and where necessary additional ceiling types have been created to satisfy the client brief for feature & speciality areas. A list of the proposed ceiling types is listed below:

Performance Based Ceiling Types:

(A) Plasterboard Ceiling
Smooth, imperforate and jointless membrane with concealed grid system, normal humidity and Class 1 surface spread of flame (SHTM 60 Category 1)

(B) 600 x 600mm Moisture-resistant Ceiling Tiles Imperforate and jointed membrane with concealed or exposed grid system, normal humidity and Class 1 surface spread of flame (SHTM 60 Category 2)

(C) 600 x 600mm Mineral Fibre Tiles
Imperforate and jointed membrane with concealed or exposed grid system, normal humidity and Class 1 surface spread of flame (SHTM 60 Category 3 & 5)

(D) 600 x 600mm Mineral Fibre Tiles
Imperforate and jointed membrane with exposed grid system, normal humidity and Class 0 surface spread of flame (SHTM 60 Category 4)

(E) 600 x 600mm Mineral Fibre Tiles
Jointed membrane with exposed grid system, normal humidity and Class 1 surface spread of flame (SHTM 60 Category 4 & 6)

(F) 600 x 1200mm Suspended Mineral Tile Plank System with perimeter plasterboard margin detail
Imperforate and jointed membrane with exposed grid system, normal humidity and Class 0 surface spread of flame (SHTM 60 Category 4)

(G) 300 x 1200mm (and or 300 x 1500mm) Suspended Mineral Tile Plank System with perimeter plasterboard margin detail
Imperforate and jointed membrane with exposed grid system, normal humidity and Class 0 surface spread of flame (SHTM 60 Category 4)

Additional & Specialist Ceiling Types:

(H) Suspended Fabric Stretch Ceiling System with Backlights
For use within soffit of 'feature' spaces to be Class 0 surface spread of flame.

(J) Timber Sheathing/Cladding with Acoustic Properties
For use within 'feature' spaces such as the Sanctuaries and the Medicinema. To have acoustic properties e.g. perforations and concealed insulation, as required and recommended by the acoustic consultant. Also to be Class 0 spread of flame.

(K) Special Acoustic Ceiling for Audiology Booths
Specification to be in line with the acoustic booth design within Audiometric rooms and as per the acoustic consultants recommendations.

(M) Large Module Metal Ceiling Panel System
Smooth and flush with a concealed grid, set out in feature wave formation within NSGH main entrance in line with the design of the soffit of the main entrance external canopy. Size approximately 2.4m x 0.3m.

(N) Small Module Metal Ceiling Panel System
Smooth and flush with a concealed grid within the NSGH main entrance, atrium and public spaces. To have acoustic properties as recommended by the acoustic consultant. Size approximately 1.2m x 0.6m

(R) Lockable Metal Access Ceiling Panel
Secure, imperforate and jointless membrane for use within various plasterboard ceilings where M&E access is required to ceiling void.

FEATURES:
Ceiling features will be incorporated with the following criteria:

(1) Plasterboard Bulkhead – Reception Desks and Staff bases
A plasterboard bulkhead is to sit above all department reception desks and staff bases.

The bulkhead is to match the shape of the desk beneath.

The bulkheads are to be co-ordinated with the overall lighting strategy.

(2) Plasterboard Bulkhead – Selected feature Waiting Areas
The bulkheads are to be co-ordinated with the overall lighting strategy.

The bulkhead is to match the shape and dimensions of the waiting area zone below which will also be dictated in the floor covering layout.

(3) Plasterboard Bulkhead – Lift Lobbies A, B, F & L.
A plasterboard bulkhead is to sit above lifts in main public lift lobbies. Overall width/ diameter of the bulkhead to span the full width of lift core structure to create interest and demarcate the lift area.

The bulkheads are to be co-ordinated with the overall lighting strategy.

(4) Plasterboard Margin to Hospital Streets and Department Corridors
The general mineral tile plank system to hospital streets and department corridors will include side feature infill plasterboard panels of varying dimensions to fit between plank and wall.

(5) Plasterboard Ceiling – Department Entrances
A smooth plasterboard ceiling is proposed for certain entrances into departments. The ceilings may also include feature soffits and are to be co-ordinated with the overall lighting strategy.

3.3 Internal Fire Escape Stairs

- **Reference: NBS L30**

Treads to be formed from precast concrete to accept vinyl sheet flooring finish.

Rise and going of each step to be consistent within flights. Rises are to be closed

Guarding (balustrade infill panels) are ppc perforated mild steel sheet.

Handrails and uprights are stainless steel. Handrails will comply with the requirements of Scottish Building Regulations (Non Domestic Technical Handbook) and BS 8300 with regard to size, shape, texture and colour.

Children's Hospital stairs have been design with an additional lower handrail at 600mm.

All fire escape stairs have been designed to suit mattress evacuation with clear shaft sizes extending the full height of each shaft and floor level being served. Physical separation of the stair flights will be provided at ground floor level where the stairs serve the basement FM tunnel.

3.4 Atrium Feature And General Balustrades

NSGH (Adult) Hospital Atrium
To the First floor Restaurant: Timber (plywood or similar approved) fins between 1375 – 2450mm height with glass infill panels with stainless steel patch fittings and stainless steel handrails to comply with the requirements of Scottish Building Regulations (Non Domestic Technical Handbook) and BS 8300 with regard to size, shape, texture and colour.

To the Upper Level Balconies and Bridge Links: Extruded aluminium twin uprights with double offset panel holders to support toughened glass infill panels. Natural hardwood handrail to comply with the requirements of Scottish Building Regulations (Non Domestic Technical Handbook) and BS 8300 with regard to size, shape, texture and colour.

NCH (Children's) Hospital Atrium
To the Upper Level Balconies and Bridge Links: Extruded aluminium twin uprights with double offset panel holders to support toughened glass infill panels. Natural hardwood top handrail and lower handrail at 600mm to comply with the requirements of Scottish Building Regulations (Non Domestic Technical Handbook) and BS 8300 with regard to size, shape, texture and colour.

Glazing generally is to comply with BS 6262: part 4:1994 'Code of practice for glazing for buildings Safety related to human impact and Scottish Building Regulations (Non Domestic Technical Handbook).

3.5 Doors And Shutters

- **Reference: NBS L20 and Architect's 322-150 and 322-160 series drawings**

GENERAL DESIGN
The proposed Doorset sizes comply with the table of minimum door widths in Section 7.5.1 of Volume 2/1: Employer's Requirements [Hospitals].

The Door Grades have been specified as solid-core construction and to meet SHTM 58 Internal Doorsets. These are generally Heavy Duty Doorset Grades, with Medium Duty specified to administration areas and associated WC's. Severe Duty Doorset Grades will be required to Hospital Streets generally, FM areas generally and specific stores.

The design of internal door-sets is generally to meet the requirements of Scottish Building Regulations (Non Domestic Technical Handbook), BS 8300:2001 'design of buildings and their approaches to meet the needs of disabled people – code of practice (amd 15617)' and the applicable sections of The Disability Discrimination Act 1995.

Minimum periods of fire resistance
The internal doorsets have been designed to meet the required fire-protection performance. The Fire Ratings of the Doors have been specified to meet SHTM 81 (version 3) Fire precautions in new hospitals and to co-ordinate with the Fire Strategy Drawings and Fire Strategy Report.

Radiation Protection
Radiation Protection and the requirements for lead-lining and Radiofrequency shielding to doors will be provided to meet the Board's Radiation Protection Adviser's requirements.

Acoustic performance
The Acoustic Ratings of the Doors have been specified to meet SHTM 08-01, and to co-ordinate with the Acoustic Report.

Glazing performance
Vision panels incorporating glazing and hardwood beads are to meet the specified period of fire resistance from BS 476: part 22: 1987. Safety glazing is to comply with BS 6262: part 4 and Scottish Building Regulations (Non Domestic Technical Handbook).

The Vision Panel Type Strategy has been developed in response to Volume 2/1: Employer's Requirements [Hospitals] - Section 7.5 Doors, Volume 2.1 Appendix E: ADB Room Data Sheets. The size of vision panels has been allocated according to the functional requirements of each room type. Large full height vision panels are provided to all Inpatient Bedrooms to ensure maximum visibility is maintained. Half height vision panels are provided where the function of the room requires an element of privacy/security. Standard full height vision panels are provided generally to all staff administration offices, meeting rooms, staff rest/beverage rooms, all rooms associated with being places of work, generally to the public areas (such as the atria) and to all corridors to ensure DDA compliance.

The vision panels to the Children's Hospital doors have been designed with their own identity in response to Volume 2/1: Employer's Requirements (Hospitals) - Section 7.5.5 bb.

The design of vision-panels is to satisfy the varying requirements for observation, safety and privacy. The Privacy Requirements for the door glazing has been developed in response to Volume 2/1: Employer's Requirements (Hospitals) - Section 7.5 Doors, Volume 2.1 Appendix E: ADB Room Data Sheets. Where a door is noted in the Schedule as being 'obscurable', within 'patient sensitive' areas, this equates to a vistamatic type vision panel or interstitial blinds. Other rooms not noted may additionally require privacy; it is assumed that this can be provided by other means such as a blind (externally).

Protection
The Door Protection has been specified in consultation with the Board to ensure that a strategic approach is undertaken, utilising the 'minimum' quantity of protective devices to ensure the Hospitals do not appear over-protected and institutional, and thus improving the quality of the interior environment.

Finishes
All doors, except plantroom and some FM rooms will be laminated or veneered with solid hardwood lippings.

All plant room doors and some FM doors will be pre-finished door-sets for painting.

All finishes to natural timber to suit the particular environment and ease of maintenance/infection control.

Shutters
Where required these will be powder coated aluminium or steel if fire-rated.

3.6 Ironmongery

- **Reference: NBS L20 and Architect's 322-250 series drawings**

GENERAL DESIGN
Internal door-sets including all architectural ironmongery will be designed to meet the required fire-protection performance standards.

The design of all architectural ironmongery to internal door-sets is generally to meet the requirements of Scottish Building Regulations (Non Domestic Technical Handbook), BS 8300:2001 'design of buildings and their approaches to meet the needs of disabled people – code of practice (amd 15617)' and the applicable sections of The Disability Discrimination Act 1995.

Door closers to be incorporated to internal door-sets shall be carefully selected to meet the requirements of Scottish Building Regulations (Non Domestic Technical Handbook).

With the exception of doors to which are kept locked shut, fire-doors are to be fitted with self-closing devices. Closers to fire-doors shall meet the requirements of BS EN 1154 category of use 4 to close a door from up to 180 degrees in accordance with the association of building hardware manufacturers code of practice 'hardware for timber fire and escape doors'.

Electromagnetic hold-open devices will be required on a number of swing doors on main circulation routes and department entrances.

Lever assemblies generally shall be non-sprung and manufactured to meet the requirements of BS EN 1906.

Bolts generally shall be of a high-quality, lever action, flush-type manufactured to suit the requirements of BS EN 12051.

Suitable door stops of concealed fixing types will be provided with robust holders matching other ironmongery on the door and rubber inserts which are easily replaceable using simple tools.

Ironmongery installed to certain doors in DCFP to comply with requirements of anti-ligature guidance.

Finishes
All exposed architectural ironmongery to be satin finished stainless steel to BS EN 1670 class 4 corrosion resistance.

Cubicle and Vanity Units
Fittings and ironmongery to be anodised aluminium or satin finished stainless steel to BS EN 1670 class 4 corrosion resistance.

3.7 Glazed screens

- **Reference: NBS L10, L40 and Architects 321-150 series drawings**

TYPES
Aluminium polyester powder coated or varnished timber frames. Where fire resistance is required the frame will be required to be steel or timber.

PERFORMANCE
Glazing within compartment walls should have the same period of fire resistance to meet the SHTM 81 (version 3) and the Scottish Building Regulations (Non Domestic Technical Handbook). The exception to this are the glazed screens in the atria which require smoke retardant performance only as part of the atrium fire strategy.

Glazing generally is to comply with BS 6262: part 4:1994 'code of practice for glazing for buildings. Safety related to human impact' and Scottish Building Regulations (Non Domestic Technical Handbook).

The Acoustic Ratings of the screens are required to meet SHTM 08-01, and to co-ordinate with the Acoustic Report and Acoustic Strategy drawings.

Safety glazing generally is to comply with BS 6206:1981 'specification for impact performance requirements for flat safety glass and safety plastics for use in buildings' (reprinted, incorporating amendment no's 1, 2, 3, 4 and 5)'

The design of manifestations to be applied to internal glazed screens will meet the requirements of the Scottish Building Regulations (Non Domestic Technical Handbook)

3.8 Protection

- **Reference: NBS P20 and Architects PL-410-150 series drawings**

GENERAL DESIGN
The Wall Protection has been specified in consultation with the Board to ensure that a strategic approach is undertaken, utilising the 'minimum' quantity of protective devices to ensure the Hospitals do not appear over-protected and institutional, and thus improving the quality of the interior environment. The strategy has also been developed in response to Volume 2/1: Employer's Requirements (Hospitals) - Section 7.16.

PROTECTIVE DEVICES
Handrails
Mid-height rails, 100mm to 200mm deep, usually mounted about 1000mm above floor level. Fixed with a gap between rail and wall, they may also serve as a crash rail.

Crash Rails
Mid-or low-height rails, 200mm to 250mm deep, usually mounted from 200mm to 1000mm above floor level, singly or in banks of two or three; they may be fixed directly to walls or with a gap between rail and wall face.

Buffer Rails
Mid-or low-height rails, 75mm to 100mm deep, usually mounted from 200mm to 1000mm above floor level, singly or in two or three: they may also be fixed vertically to protect the opening edges of doors and as bed locators.

Corner Guards
50mm to 100mm in each dimension, usually fixed from top of skirting to about 1000mm but sometimes up to 2100mm above the floor level.

Trolleys with four wheels can be kept away from walls by low level crash rail, or kerbs/skirting.

All materials shall be those which are not prone to splinter or produce sharp edges or snags.

Bed Locators
Located as the 1:50 layouts.

Other Areas
In other special areas, such as operating theatres, hygiene considerations may take precedence over the above Design Philosophy. Rails may be omitted in favour of overall durable, washable finishes.

DOORS
Kick Plates
In general public circulation areas for pedestrian traffic kick plates will be provided to corridor side of the doors into rooms, push side of single swing corridor doors, and both sides of double swing corridor doors.

Buffer Rails/Part And Full Height Protection
Additional protection has been specified in consultation with the Board to ensure that a strategic approach is undertaken.

3.9 Fixtures and fittings

- **Reference: NBS N10, Room Data Sheets and Architect's 1:50 fully loaded drawings**

TYPES
Fixed pieces of joinery furniture are covered by the following groups;

Reception desks
Refer to separate section below

Fixed cupboards benching and worktops generally
Laminate on MDF carcass. Laminate lipped shelving on adjustable steel brackets. Post formed laminate worktops.

Shelving
Laminate faced lipped chipboard shelving on adjustable steel brackets generally with stops as required.

Blinds
Blinds are specified where patient privacy is required and solar glare control to areas such as offices.

Raked seating to Medicinema
This will be a specialist framing system incorporating handrails.

3.9 (i) Fixed cupboards, benching and worktops generally

Fixed storage components (compliant with SHTM 63)
Fixed storage components consist of either base units located under worktops or upper storage units attached to the wall. Carcasses are to be MDF with melamine faced finish. Sloping tops are required to the top of the wall units for infection control issues.

All storage components shall comply in general with the requirements of BS 4875. Storage components fall into the categories listed below.

For dimensions: height, length and depth of worktop, refer to the fullu loaded equipment drawings and ADB Room Data Sheets (see section Volume 2/Section 2.9).

General worktops and workbenches (compliant with SHTM 63)
Worktops/workbenches under this section refer to generic worktops only and do not include counters to reception desk / staff bases or specialist workbenches such as carpenters, engineers, dental, welding and casting workbenches.

Worktops are to be plastic laminate faced to all with a common profile that is compatible between abutting components of differing materials. Lippings and edge details to match the colour and material of the overall finish.

Worktops are to be solid end capped.

Laminate faced worktops:
To be constructed from highly durable, 0.9mm post forming grade laminate and bonded onto either MDF or moisture resistant particle board core. Where worktops are made up of more than one piece a precise factory made joint will be made. They will be factory finished and have laminated faced ends. The front edges are to be rolled.

Stainless steel faced worktops:
Stainless steel worktops are either dished and may include a 50mm upstand or integrated splash back panel where specified. Where worktops include sink bowls, drainers, hoppers and taps reference will be made to SHTM 64 – 'Sanitary Assemblies' for size and location of sink bowls, details of taps, traps etc. Stainless steel worktops, with or without sinks or hoppers will be fitted with an earthing terminal.

Leg supports to worktops:
Leg supports will be in accordance with the nominal heights outlined in SHTM 63 'fitted storage system, 920mm or 720/740mm to the underside of the worktop, with the facility for vertical adjustment and for the incorporation of a floor anchoring device. Refer to Equipment plans / elevations /Room Data Sheets for dimensions.

Generic worktop supports are outlined below:
Single leg support: powder coated leg, 30mm diameter with plastic insert at the bottom. Leg attached by steel plate to underside of worktop.

Cantilevered leg: powder coated leg, 25mm box section fixed to wall and worktop, resting on floor with adjustable foot. Plastic insert to the bottom of the foot.

Carcass units fixed back to partitions / walls may be used to support worktops and side cheeks. Knock out panels will be incorporated to accommodate service runs.

3.9 (ii)

Shelving
For exact dimensions: height, length and depth of shelving and coordination with other equipment, windows and doors, refer to loaded equipment drawings and Room Data Sheets.

Shelving to include slatted horizontal adjustable, plastic coated, sloping, plinth mounted.

Laminate faced shelving:
Laminate faced MDF shelves attached to wall with brackets.

Stainless steel shelving:
Attached to walls on brackets.

3.9 (iii)

Tracks for cubicle curtains (compliant with SHTM 66)
For exact dimensions: height, length and depth of tracks and coordination with other equipment, windows, screens and doors refer the Architect's 1:50 fully loaded drawings and reflected ceiling plans.

Cubicle curtain tracks will be provided in wards, treatment examination rooms and single bedrooms generally. According to SHTM 66 each cubicle curtain track system should comprise:

Gliders or runners will be designed to enable attachment of curtains by hooks or buttons and a device which will facilitate the loading or unloading of curtains from the track.

The system must not contain material capable of supporting the growth of bacteria, fungi etc.

The track height of suspended installations will normally be 2100mm (subject to

coordination with equipment drawings / Room Data Sheets).

The suspended track must be restrained to prevent horizontal movement.

Curtain and cubicle tracks in stalled in DCFP will comply with requirements of anti-ligature guidance.

3.9 (iv) **Pharmacy Aseptic Suite**
Specialist fit-out to match signed off architect's 1:200 & 1:50 plans.

3.9 (v) **Fixed feature seating**
Fixed seating is to be located in the main entrance atrium and the children's atrium and both the emergency department waiting areas. The seats are to be made of polypropylene and wood. Circular combined seating units fixed to a circular floor mounted beam of varying diameters. Seats in combined units to be different colours. They will have integrated arm rests and tables.

3.10 Reception Desks / Staff Bases

- **Reference: NBS Z10 and Architects NA-SZ-XX-DT-401-100 series drawings**

Desk type 1 to be constructed as a steel box section for greater impact resistance, desk type 2 and 3 to have a soft wood construction. All desks to have steel L shaped leg supports powder coated to selected RAL colour. Desk legs must be set back and allow for a free run of space beneath desk for storage units.

Desks where indicated are to have a lowered work surface extending 1500mm along and 750mm high to allow for disabled access from both sides of the desk. The lowered surface will also include a knee recess of at least 500mm deep.

Where desks are situated behind partitions and are accessible via a hatch or window (for example the cash office) disabled access will be accommodated.

3.10 (i) **Desk Type 1A – Reception Desk; Main Adult Atrium:**
The desk is to have wood veneer to the facade with back lit polyester/resin art panel inserted around the curved front. Images and natural textures are to be encapsulated into the resin such as grass and leaves.

Jointless homogenous acrylic polymer (Corian) in a neutral colour to worktops and drawer/cupboard fronts with rounded edges. Routed port holes for cable management to be inserted into desk top.

Integral trunking to underside of desk.

Pigeon hole storage to be integrated into the desk, all ironmongery to be stainless steel, contrasting with surround. Lockable computer storage to be supplied with suited key.

Glass writing shelf to be raised on stainless steel fin supports 1100mm from floor.

1500mm wide wheelchair access will be provided with 500mm deep knee recess in line with requirements of BS 8300.

Stainless steel laminate recessed kick plate.

3.10 (ii) **Desk Type 1B– Reception Desk; Children's Atrium:**
The overall desk structure is to be an irregular ellipse shape with varying heights, widths and thicknesses. The desk will have smooth worktops, lockable storage,

electrical services and lighting and patient accessible writing shelves and DDA recesses integrated within it.

The desk will be clad in a smooth, seamless high gloss finish such as corian, fibreglass, polycarbonate or resin. The shape will be irregular and will need to be of a specialist design specific to the project. The worktops are to be made of the same material as the cladding or corian.

All or certain parts of the cladding will be translucent and able to filter light from within. The transparent desk carcass may house objects such as balls / objects that can be lit from behind to create a playful feature appropriate to a children's hospital, whilst being non age specific. The desk will therefore require an internal light source such as cold cathode or LED lighting.

Certain sections of the desk will have interactive play panels inserted for children to play with. These will include lights and moving parts.

There may be the need for kick space heaters to be installed under the desk to supply extra heat for the staff. This is subject to an assessment of heating levels nearer the time.

3.10 (iii) **Desk Type 2 – Reception Desk, Department Reception:**

Wood veneer to facade of desk and storage/drawer fronts, ironmongery to be stainless steel contrasting with surround. Coloured laminate panel/strip to desk façade.

Integral trunking to underside of desk.

Worktops to be inlaid with vinyl set in 20mm from desk edge, 25mm thick bullnosed or chamfered hard wood to front edge of desk top. Routed port holes for cable management to be inserted into desk top.

300mm wide glass writing shelf to be on stainless steel fin supports.

1500mm wide wheelchair access with knee recess, stainless steel laminate to recessed kick plate.

3.10 (iv) **Desk Type 3 – Staff Base, General Department:**

Wood veneer to facade of desk and storage/drawer fronts, ironmongery to be stainless steel, contrasting with surround.

Coloured laminate panel/strip to desk façade.

Integral trunking to underside of desk.

Worktops to be inlaid with vinyl set in 20mm from desk edge, 25mm thick bullnosed or chamfered hard wood to front edge of desk top. Routed port holes for cable management to be inserted into desk top.

300mm wide writing shelf to be made of joint less homogenous acrylic polymer (Corian) and supported on stainless steel fin supports.

1500mm wide wheelchair access with knee recess to be installed where indicated.

Stainless steel and laminate to recessed kick plate.

3.11 Soft Furnishings

Soft furnishing used within the scheme will be selected and a suitable strategy fully developed in conjunction with the Hospital board. All soft

furnishings used will comply with the requirements of SHTM 87 and the performance requirements in turn comply with BS 5852 in line with the Fire Safety Regulations 1988. All curtain fabric used should comply will comply with BS 5867 in addition to the standard fire compliances for soft furnishing.

3.12 Equipment

- **Reference: NBS N10, Room Data Sheets and Architect's 1:50 fully loaded drawings**

All Hospital Equipment is categorised using the NHS standards for Group 1 – contractor supplied; Group 2 – Hospital Board free issue/supplied, fixed by Contractor; Group 3 – loose items and Group 3* - Specialist fit-out items (e.g. Imaging Equipment). The full equipment list items have been specified and priced as the BoQ Equipment Estimate produced by Codebook as a result of the ADB Briefing Room Codes, and the subsequent development within 1:50 Room Type process.

The key Room Types have been loaded with equipment according to the Health Planner's ADB Room Code briefing and adjusted to meet the requirements of the Board. This information is contained within the Architects current 1:50 fully loaded Room Type drawings, Room Data Sheets and the BoQ Equipment Estimate.

3.13 Sanitary Appliances

- Reference: NBS N13, Room Data Sheets and Architect's 1:50 fully loaded drawings

General:
Sanitary installations comply with the requirements of current legislation including relevant parts of Scottish Building Regulations (Non Domestic Technical Handbook), provisions of The Disability Discrimination Act 1995, SHTM 64, HTM 04-01, HBN 00-02 and other instruments whether referred to in this specification or not.

Where sanitary fittings abut worktops/walls/panels it is essential that they are neatly finished and sealed with a suitable sealant in an approved colour (usually white/clear).

In general sanitary ware is to be provided in vitreous china finish. Where applicable it may be required or acceptable to look at either stainless steel, fireclay or cast resin materials for sanitary ware.

Sanitary Appliances:
All selected sanitary appliances are to be from approved manufacturers and these should be able to provide the necessary documentation to provide evidence of ceramic industry certification limited and relevant agreement certification where applicable.

WC's to have an effective flush volume of 4.5 Litres or less.

General taps which are not required otherwise for clinical/medical reasons are to have a maximum flow rate of 6 Litres per minute for a water pressure of 0.3MPa and are to be timed automatic shut off (e.g. push taps) or electronic sensor taps.

Cubicles and Vanity units:
Generally it is preferable for all cubicles and vanity units to be selected from a compatible manufactured range of products which allow for manageable maintenance and replacement strategies over the life of the building.

Integrated Plumbing System:

The system is to be a metal framed system with plasterboard facings and removable Trespa access panels, heavy duty rated, suitable for hospital use involving humid condition and frequent exposure to cold and hot water. Panels should be capable of withstanding frequent cleaning, general knocks and abrasion in use. They should be capable of being easily cleaned to aesthetic and clinical standards.

Performance Standards and Tests:
The duct and panel assemblies should comply generally with the requirements of BS 8313:1997 'Code of practice for accommodation of building services in ducts' and BS 1186 1990 parts 1 and 2 'Timber for and Workmanship in Joinery'.

3.14 Finishes

- **References:**
  NA-DC-330-001 Interior Design Strategy Document,
  NA-DC-330-002 Wayfinding Strategy Document
  Architects 331-100, 332-100 & 333-100 series drawings
  NBS M12, M40, M50 & M60

The Finishes proposals have been developed in response to Volume 2/1: Employer's Requirements (Hospitals) - Section 7.9 Finishes, Volume 2.1 Appendix E: ADB Room Data Sheets and to ensure compliance with the appropriate SHTMs. These are performance related finishes types and include options for Art Opportunities. The colours will be developed during the next stage of the project as part of the integrated Interior Design, Wayfinding and Arts Strategy.

3.14 (i) FLOORS FINISHES

- **Reference: NBS M12, M40 & M50 and the Architects 331-150 series drawings**

The Floor Finishes Strategy has been developed in response to Volume 2/1: Employer's Requirements (Hospitals) - Section 7.9 Finishes, Volume 2.1 Appendix E: ADB Room Data Sheets and to ensure compliance with SHTM 61 Flooring. These are performance related finishes types. Colours will be developed during the next stage of the project as part of the integrated Interior Design, Wayfinding and Arts Strategy. A list of the proposed Floor Finishes Types is listed below:

(A) Terrazzo/ceramic tiled flooring with epoxy joints and matching skirting tile (100-150mm high). A range of four standard colours and sizes.

(B) Homogenous vinyl sheet flooring.

(C) Slip resistant vinyl sheet flooring.

(D) Heavy Duty slip resistant vinyl sheet flooring.

(E) Extra slip resistant sheet flooring for bare foot wet areas.

(F) Decorative wood effect vinyl sheet flooring.

(G) Static dissipative vinyl sheet flooring.

All the above vinyl flooring types B, C, D, E, F and G are with coved hot seam welded coved skirting (100mm) and joints. All to achieve a BREEAM Class 'A' certification.

(H) Soft cushioned vinyl sheet flooring for children's play areas with coved hot seam welded skirting and joints. Must be easy to clean and comply with

infection control requirements.

(J) Heavy contract tufted carpet tiles (anti static) with hardwood timber skirting.

(K) Solid hardwood timber flooring with lacquer finish and hardwood timber skirting (public and or feature areas e.g. café's, Medicinema)

(L) Specialist Timber Sprung flooring with hardwood timber skirting (high impact and activity spaces e.g. gymnasiums)

(M) Heavy (Severe Duty) traffic entrance matting for Main Entrances

(N) Heavy (Heavy Duty) traffic entrance matting for General Entrances

(P) Acrylic emulsion dustproof floor sealer

(Q) Heavy duty *epoxy or resin floor for Basement Tunnel & Plantrooms *(See note below)*

(R) Heavy duty seamless *resin floor for AGV turning 'frequent' turning areas within FM Cores and for specialty spaces e.g. Decontamination Unit. *(See note below)*

(T) 'Rompa' type fit out to be designed by specialist for Snoezling Rooms etc.

All safety flooring to be in accordance with the relevant slip resistance standards of the British Pendulum / TRRL Pendulum tests (a subject of BS 7976) or DIN 51097:1992 and DIN 51130:1992.

All level or inclined flooring is required to meet the minimum slip resistant requirements: Rz surface micro-roughness of 20µm and a Slip resistance pendulum value of 36 when dry, wet or contaminated. This is outlined in Volume 2/1: Employer's Requirements [Hospitals] - Section 7.9.7.

Stair nosings to be suitable for heavy resilient flooring and made of mill finished aluminium. Channels to have slip resistant vinyl inserts available to provide contrast to the surrounding tread / riser material as outlined in Approved Document Part M and BS 8300. Fixings to be concealed.

Tread alert panels 2.5mm thick will be positioned at the top and bottom approach to certain stairs. The panels are made of rubber and have a 6mm raised rib at 50mm centres across the full width of the tile. The raised ribs create a tactile surface that allows the visually impaired to recognise when they are approaching stairs as outlined in BS 8300 : 2001 and Guidance on the use of Tactile Paving Surfaces published by DETR (1998).

Certain flooring finishes will be required to achieve a BREEAM Class A certification as outlined in the list below.

3.14 (ii)

FLOOR PATTERNS

Floor patterns have been developed to assist wayfinding and the experience of the interior of the hospitals. Below is a description of the techniques that are to be implemented:

(1) Terrazzo/ceramic Tiles Floor (Type A)
Inset patterns in a variety of colours & tile sizes within the main entrance, feature and atriums spaces in order to assist wayfinding and interior design/aesthetics. Use of separation joint trims between colours to be provided in a range of polished materials including stainless steel and brass.

(2) Vinyl Sheet Floor (Type B)
Demarcation inset patterns within reception areas, staff and touchdown bases.

(3) Vinyl Sheet Floor (Type B)
Tramline strips approximately 500mm wide, inset along both sides of hospital streets and certain main corridors. Strips to continue up the wall as a coved skirting.

(4) Vinyl Sheet Floor (Type B)
Feature inset floor pattern consisting of up to 3 colours and different shapes/patterns in main hospital street corridor linking the Children's to the Adult Hospital on the Ground Floor.

(5) Vinyl Sheet Floor (Type B)
Colour inserts approximately 2000mm at departmental entrances to assist the wayfinding strategy provide identity to the department.

***Epoxy or Resin Floor**
The finish will be heavy duty ('HD') to withstand continuous wheeled trolleys in accord with BS 8204 part 6.

The epoxy finish will be laid flat and gullies will be provided to self contained areas and at a frequency to prevent leakages from plant tracking across pedestrian routes on the floor. The gullies will have a grating level with finished floor.

Synthetic resin to form the binder.

Epoxy floor finish to underground facilities management tunnel to be Class 0 spread of flame.

Epoxy floor finish to all areas to be fire resistant and give off no toxic fumes in a fire situation.

3.14 (iii) **WALL FINISHES**

- **Reference: NBS M60 and the Architects 333-150 series drawings**

The Wall Finishes Strategy has been developed in response to Volume 2/1: Employer's Requirements (Hospitals) - Section 7.9 Finishes, Volume 2.1 Appendix E: ADB Room Data Sheets and to ensure compliance with SHTM 56 Internal Partitions. These are performance related finishes types. The colours will be developed during the next stage of the project as part of the integrated Interior Design, Wayfinding and Arts Strategy. A list of the proposed Wall Finishes Types is listed below and are illustrated wall finishes strategy drawings:

(A) Water based quick drying diamond eggshell emulsion paint with anti-bacterial properties.

(B) Water based acrylic diamond eggshell emulsion paint

(C) Polymeric coating with anti-bacterial properties.

(D) Elastomeric hygiene coating with anti-bacterial properties.

(E) Watertight & impervious coloured wall cladding for wet areas.

(F) Wood Panel Wall Cladding System with acoustic properties

(H) Digitally printed vinyl wall covering or Children's Fabric play wall
Both to be anti-bacterial. Fabric play wall to be further developed at detailed

design stage by the architect

(J) Textured and patterned render finish to concrete walls (including dust sealant if required) within atrium and feature spaces

(K) Dustproof white sealant to plant areas and lift shaft walls

(L) Water based acrylic diamond gloss emulsion paint for atrium bridge feature pods and various other locations within atrium spaces

(M) Feature coloured emulsion walls for department entrance, reception, ceiling bulkheads and waiting areas (as part of the Interior and Wayfinding Strategy)

(N) Watertight PVC Splash-back

(R) Aluminium pre-finished (metallic) panels or GRP panels for feature spaces such as the cladding of the Medicinema.

(S) Fritted vertical glazed cladding to feature spaces such as the Atrium support ward bridge

(T) Specialist wall finish to be soft padded with compressed / dense foam upholstered in wipe clean coated nylon with anti bacterial additive (Rompa or similar approved) for use in specialist spaces e.g. snoezling room. Must be in accordance with required regulations, SHTM's and be approved by fire consultant.

3.15 Wayfinding / Signage

- **Reference: NA-DC-330-002 Wayfinding Strategy Document**

The Wayfinding Strategy has been developed in response to Volume2/1: Employer's Requirements (Hospitals) – Section 7.15.

The design proposal is underpinned by the need for effective wayfinding to facilitate the diverse functions of the new facilities. The design process will tested at each stage to ensure that design decisions support operational demands. Wayfinding refers to the movements around the hospital which will be made by staff, patients, visitors and for servicing and equipment. The goal of the design process is to deliver a high quality healthcare environment which is as user-friendly as possible for people to use, whether for the first time or all the time. This means that journeys to particular parts of the hospital should be as easy to understand as possible and that regular journeys should involve the shortest practical distances for travel. The wayfinding strategy addresses orientation and movement at a variety of scales and ensures that movements can be based upon logical but ultimately intuitive decisions. Clear wayfinding has underpinned the design process in order to make the design as clear and robust as possible.

External signage
This is integral to the Masterplanning and will be subject to approvals in discussion with the planning authorities.

Internal Signage
This includes directories, directional signage, location signage, wall supergraphics and room names/numbers to individual areas as well as the general. Signage to comply with NHSScotland Identity and Signage Guidelines.
Health & Safety signs
Illuminated fire signage and photo luminescent fire signs. To be discussed with M&E Engineering design requirements. Fire signage is to be compliant with BS5499 and BS5378. In addition to this there needs to be an optional provision for the specialist Healthcare dedicated fire signage which is only covered in HTM 52.

General directional signage from main entrance. Combination of ceiling hung and wall mounted. Colour coded to assist in way finding. There are optional compliance requirements with the NHS standards on these. However, this will require significant end user input and discussion to finalise a scheme in keeping with the design proposals.

Aluminium disk signs to bathrooms, WC's etc to be included in the Ironmongery packages to suit particular doors.

3.16 Works of Art

The Art Strategy has been developed in response to Volume2/1: Employer's Requirements (Hospitals) – Section 7.17. This is a crucial part of the scheme which needs both community stakeholders, end users and key Hospital Board Support. There are opportunities to include Artwork within key locations which can form part of the building fabric.

The art strategy falls into two packages: the 'Core Art Strategy' and the 'Board Fundraised Variation Art / Technology Strategy. The two documents must be read together so that a fully coordinated approach to artworks can be achieved.

For full information regarding the art strategies please refer to:

Art Strategy Document by Ginkgo Art Strategists:
'*Working Well: People and Spaces. A therapeutic design and art strategy for New South Glasgow Hospitals*'

Core Art Strategy Plans:
Architects PL-470-100 series drawings

Board Fundraised Variation Art / Technology plans:
Architects PL-470-200 series drawings

Art Strategy Schedule (Core & Fundraising Artworks):
GIN-SZ-XX-SH-470 Art Schedule.pdf

Designer Identification of Hazard/Risk

- Indicates a Residual Risk requiring a Compulsory Action
- Indicates a Residual Risk for Information
- Indicates a Residual Risk requiring a Prohibitive Action
- Indicates a Residual Risk as a Warning

GWS-045 DISCHARGE LOUNGE
GWS-042 WC
GWS-037 WC
GWS-035 PUBLIC DIS WC
GWS-033 PUBLIC DIS WC
GWS-034 ADOLESCENT GROUP ACTIVITY
GWS-055_3 LOBBY
GWS-055_4 ELEC CUPB
GWS-055_5 MEDI CINEMA STORE
GWS-055_6 MEDICINEMA FOH & SPONSORS AREA
GWS-055_1 PROJECTOR ROOM
GWS-055_2 MEDI CINEMA STORE
GWS-055 MEDI CINEMA
GWS-055_7 LOBBY
GWS-055 FLAT ROOF
GWS-056 FLAT ROOF
GWS-070 EN-SUITE
ATRIUM VOID
FLAT ROOF
FLAT ROOF
LIGHTWELL
LIGHTWELL
CC3-025 CORE K STAIRS
CC3-029 CORE K BED/PATIENT LIFT LOBBY
CC3-030 CORE K BED LIFT 30
CC3-031 CORE K BED LIFT 29
CC3-021 RISER M39
CC3-032 HOSPITAL STREET
CC3-048 HV RISER
CC3-024 CORE K FM LIFT LOBBY
CC3-026 1 ELE.CUPB
CC3-022 CORE K FM LIFT 32
CC3-023 CORE K FM LIFT 31
CC3-005 RISER M34
FMC3-006 DINING
FMC3-004 CLEAN HOLD
FMC3-005 DIRTY HOLD
M+E & AGV SENSORS TO BE COORDINATED
GW3-049 SNOOZELUM ROOM
GW3-045 BULK FLUID STORE
GW3-048 STAFF DIS WC
GW3-046 WC
GW3-047 STORE
GW3-074 ELEC CUPB
GW3-050 DISPOSAL HOLD
GW3-051 LOBBY
GW3-052 EN-SUITE
GW3-053 SINGLE BEDROOM
GW3-073 CORRIDOR
GW3-044 WORKSTATIONS (6P)
GW3-043 PLAY/ DINING
GW3-042 SINGLE BEDROOM
GW3-041 EN-SUITE
GW3-039 SINGLE BEDROOM
GW3-040 EN-SUITE
GW3-038 T-D
GW3-037 EN-SUITE
GW2-001 SINGLE BED
GW2-010 EN-SUITE
GW2-011 EN-SUITE
GW2-012 SINGLE BED
GW2-013 EN-SUITE
GW2-014 EN-SUITE
GW2-015 SINGLE BED
GW2-016 EQ. BAY L
GW2-018 PUBLIC WC
GW2-01 PUBLIC WC
GW2-019 MECH RISER M32
GW2-075 MECH RISER M33
GW2-074 CORRIDOR
GW2-031 T-D
GW2-028 ED
GW2-034 EN-SUITE
GW2-032 SINGLE BED
GW2-030 SINGLE BED
GW2-027 SINGLE BED
GW2-029 EN-SUITES
GW2-028 EN-SUITE
GW2-022 ISOLATION SINGLE BED
GW2-020 LOBBY
GW2-023 GEN. ST.
GW2-021 EN-SUITE
GW2-024 EN-SUITE
GW2-025 SINGLE BED
GW2-074 CORRIDOR
GW2-033 UITE
▲NA-ZC-03-PL-252-505▲
▲NA-ZB-03-PL-252-509▲
▲NA-ZC-02-PL-252-507▲
253 491763
665 753662
NA TO CHECK THAT PULL CORDS CAN BE REACHED FROM WC's

Note:
CEILING TYPE
ART-1B
ART-1C
ART-3A
BULKHEAD
CEILING SETTING OUT
CEILING SET OUT FROM CENTRE OF SPACE IN FOUR DIRECTIONS
CEILING SET OUT FORM EDGE OF SPACE IN THREE DIRECTIONS
CEILING SET OUT FROM EDGE OF SPACE OR POINT IN TWO DIRECTIONS
CEILING MOUNTED SERVICES/EQUIPMENT
CEILING FINISHES
MECHANICAL SERVICES
LIGHTING SERVICES
PARTITION PERFORMANCE

REFERENCE DRAWINGS
STRUCTURAL
X-WSP-SZ-03-PL-260-WIP-STRUCTURAL_33
X-WSP-SZ-XX-PL-260-WIP-GRID_05
M+E
X-ME-ZB-03-PL-332-WIP_01
X-ME-ZC-03-PL-332-WIP_01

Rev	Date	Drn	Revision Notes	Chk	App
C	23.10.13	ML	STAIR CORE K FINISHES REVISED FOLLOWING BMC COMMENTS	ML	JL
B	10.10.13	ML	CEILING BULKHEAD & SETTING OUT ADDED TO STAIR CORE K	ML	JL
A	25.09.13	ML	ISSUED FOR PG15 REVIEW (T3)	JL	EW

Client: NHS
Contractor: Brookfield BM MULTIPLEX

NEW SOUTH GLASGOW HOSPITALS - DOCUMENT REVIEW
Representative | Date | Category | Signature
D. HALL | 18.11.13 | B
Comment: No comment on Rev C. See previous comments re pull-cord position in en-suite WC's
1 NO Comment 2 Proceed Subject to Inserted Comments 3 Proceed Subject to Attached Comments 4 Rejected, Amend the Submitted and Resubmit

NIGHTINGALE associates architects
8-10 Newman Street
London
W1T 1EY
Tel: 0207 079 9900
Fax: 0207 079 9901
www.nightingaleassociates.com

0 6 NOV 2013

NEW SOUTH GLASGOW HOSPITALS
(NSGH) PROJECT

Drawing Title
THIRD FLOOR
NCH INPATIENT WARDS & WARD SUPPORT
CEILING & SOFFIT PLAN

Job No	Drawn	Checked	Approved
09080	ML	JL	EW
Status: CONSTRUCTION	Date: 03.09.13		Scale@A0: 1:50

Drawing No: NA SZ 03 PL 332 508 | Rev: C

1:50

A52825963

CRITICAL CARE

Description	Qty	Unit Area m²	Total Area m²	ADB Code	Comment
Entrance/Reception/Administration facilities					
Combined entrance	1		0.0		In circulation allowance
Visitors Foyer	1		0.0		In circulation allowance
Visitors waiting area:	1	15.0	15.0	J1201	
Visitors wc: Disabled/ wheelchair user	1	4.5	4.5	V0904	
Telephone area: single booth; low height	1	2.0	2.0	G0705	
Reception desk/office: 4 places					
Sub-Total			**21.5**		
Family & Friends facilities (adjacent to main entrance)					
Private (single) Family Sitting	2	10.0	20.0	D1405	
Relatives en-suite wc: Disabled/ wheelchair user	1	4.5	4.5	V0904	For 1 of the above rooms
Relatives sitting room: 12 places	1	16.0	16.0	D1403	
Relatives pantry/beverage bay	1	6.0	6.0	P0705	
Sub-Total			**46.5**		
Clinical areas					
Critical care bed area: single room; Isolation (access via gowning lobby)	6	25.5	153.0	B1602	
Gowning lobby: single bedroom	6	7.0	42.0	G0507	
Relatives interview room	2	9.0	18.0	M0704	close to 4 bed areas
Critical care bed area:	16	25.5	408.0	B1602	
Workstation & X-ray Viewing Area	2	12.0	24.0	E0507	
Central Communications / Staff Base + Reception	1	34.0	34.0	T0212A	
Communications "Touch down bases"	11	2.0	22.0	T9999	(as per HBN 04-01) (1 per 2 rooms)
Sub-Total			**701.0**		
Utility/clinical area support facilities					
Clean utility (including blood bank area)	2	17.0	34.0	T0513	
Status laboratory	1	8.5	8.5	L1305	
Dirty utility with urine testing	1	12.0	12.0	Y0311	
Dirty Utility with urine testing/equipment cleaning	1	18.0	18.0	Y0322	
Disposal hold	2	10.0	20.0	Y0614	
Housekeepers (cleaners) room	1	10.0	10.0	Y1501	
Patients pantry	1	6.0	6.0	P0703	
Milk store	1	4.0	4.0	P1004 Reduce quantites to reflect store area only	
Play Leader Base & Toy Store	1	16.0	16.0	M0218	
Medicines Management Room	1	18.0	18.0	T0506	
ECMO Prep Area + Ensuite Store & Office	1	24.0	24.0	W0110A + M0220	
Patients assisted bathroom, wc & wash (Stretcher hoist)	1	16.0	16.0	V1708	
Sub-Total			**186.5**		
Storage/holding facilities					
Bulk supplies store	2	25.0	50.0	W0129	
Clinical equipment store	2	25.0	50.0	W0110	
Equipment service room	1	24.0	24.0	L1803	
Linen bay/store	2	4.0	8.0	G0118	
Furniture / Bed Store	1	20.0	20.0	W1429	
Ready use medical gas cylinders store	2	4.0	8.0	W1306	
Mobile imaging equipment bay (x-ray & Ultrasound) with image intensifiers	2	8.0	16.0	G0143	
Cardiac arrest/emergency trolley bay	2	3.0	6.0	G0103	

Sub-Total			**182.0**		
CRITICAL CARE					
Staff facilities					
Clinical directors office: 1 place	1	12.0	12.0	M0219	
Office: 1 place	2	12.0	24.0	M0221A	
Offices: 2 place	1	13.0	13.0	M0319	
Clinical staff office: 4 places	5	24.0	120.0	M1014	
Hot Desk Room / Library	1	18.0	18.0	H0531	
Meeting room/interview room (8 person)	1	20.0	20.0	M0713	
Staff rest room with dining area	1	30.0	30.0	D0403	
Staff snack/beverage preparation bay	1	8.0	8.0	P0707	
Staff changing facilities 30 places	1	15.0	15.0	V0517	
Staff changing facilities 50 places	1	25.0	25.0	V0515	
Staff shower	5	2.5	12.5	V0801	
Staff wc & wash: Ambulant user	5	2.0	10.0	V1005	
Seminar/training room: 25 places	1	30.0	30.0	H0501	
Staff office/restroom	1	13.0	13.0	M0604	
Staff office/restroom en-suite shower, wc & wash	1	5.0	5.0	V0805	
Sub-Total			**355.5**		

Engineering facilities					
Switchgear cupboard	2	2.0	4.0	N/A	
Battery/UPS room	2	9.0	18.0	N/A	
Sub-Total			**22.0**		

Total Net			**1515.0**
Planning	**5%**		**75.8**
Sub-Total			**1,590.8**
Engineering	**3%**		**47.7**
Circulation	**40.0%**		**636.3**
Total			**2,274.8**

GENERIC WARDS
INPATIENT FLOOR (3 WARDS)

Description	Qty	Unit Area m²	Total Area m²	ADB Code	Comment
Bed Area					
Single bedroom: Children/young people, with relatives overnight stay	20	16.5	330.0	B1802	
Lobby: air lock to bedroom	2	7.0	8.0	G0507	
Shower, WC & wash: accessible, wheelchair assisted	20	4.5	90.0	V1610	As per HBN 00-02
Multi-bed room & day space: Children/young people, 4 beds, with relatives overnight stay	1	68.0	68.0	B2001	
Shower, WC & wash: accessible, wheelchair assisted	1	7.0	7.0	V1612	
Office Area with workstations (x4)	1	18.0	18.0	M0115 Consider work bench in lieu of desks	
Office - clinical - 2 person	1	12.0	12.0	M0319	
Staff & communication base, open 2 staff	1	5.0	5.0	T0109	
Touchdown	2	2.0	4.0	T9999	
Sub Total			**542.0**		

Utility Area					
Bath, WC & wash: treatment, assisted	1	14.0	14.0	V1708	
Clean utility	1	14.0	14.0	T0505	
Cleaners Room	1	7.0	7.0	Y1501	
Parking bay: resuscitation trolley	1	1.0	1.0	G0103	
Dirty utility: bedpan disposal & urine test	1	12.0	12.0	Y0411	
Store: linen & Clothing Back-up	2	2.5	5.0	W1408	
Store: general	1	5.0	5.0	W1218	
Store: equipment	1	5.0	5.0	W0126	
Sub Total			**63.0**		

Patient Support Area					
Treatment room: child	1	16.5	16.5	X0112	
Interview & counselling room: 5 persons	1	9.0	9.0	M0704	
Parking bay:	1	5.0	5.0	G0119	
Pantry: serving ward	1	12.0	12.0	P0607	
Ward Food trolley parking bay	1	1.5	1.5	G0305	
WC & handwash: ambulant - staff	1	2.0	2.0	V1005	
Sub Total			**46.0**		

Recreation, Play & Dining Area					
Dining room & Playroom: 10 - 15 patients	1	25.0	25.0	D0607	
Store Room	1	5.0	5.0	W1218	
WC & handwash: accessible, wheelchair assisted	1	4.5	4.5	V0904	
Sub Total			**34.5**		

Total Net			**685.5**
Planning	**5%**		**34.3**
Sub-Total			**719.8**
Engineering	**3%**		**21.6**
Circulation	**34.0%**		**244.7**
Total			**986.1**

ACUTE RECEIVING UNIT (40 BEDS)

Description	Qty	Unit Area m²	Total Area m²	ADB Code	Comments
Bed Area					
Single bedroom: Children/young people, with relatives overnight stay	32	16.5	528.0	B1802	
Lobby: air lock to bedroom	2	7.0	8.0	G0507	
Shower, WC & wash: accessible, wheelchair assisted	32	4.5	144.0	V1610	As per HBN 00-02
Multi-bed room & day space: Children/young people, 4 beds, with relatives overnight stay	2	68.0	136.0	B2001	
Shower, WC & wash: accessible, wheelchair assisted	2	7.5	15.0	V1612	
Office Area with workstations (x4)	1	18.0	18.0	M0115 Consider work bench in lieu of desks	
Office - clinical - 2 person	1	12.0	12.0	M0319	
Staff & communication base, open 2 staff	2	5.0	10.0	T0109	
Touchdown	3	2.0	6.0	T9999	As per HBN 04-01
Sub Total			**877.0**		
Utility Area					
Bath, WC & wash: treatment, assisted	1	14.0	14.0	V1708	
Clean utility	1	14.0	14.0	T0505	
Cleaners Room	1	7.0	7.0	Y1501	
Parking bay: resuscitation trolley	2	1.0	2.0	G0103	
Dirty utility: bedpan disposal & urine test	1	12.0	12.0	Y0411	
Store: linen & Clothing Back-up	2	2.5	5.0	W1408	
Store: general	1	5.0	5.0	W1218	
Store: equipment	1	5.0	5.0	W0126	
Sub Total			**64.0**		
Patient Support Area					
Treatment room: child	2	16.5	33.0	X0112	
Interview & counselling room: 5 persons	2	9.0	18.0	M0704	
Parking bay:	1	5.0	5.0	G0119	
Pantry: serving ward	1	12.0	12.0	P0607	
Ward Food trolley parking bay	1	1.5	1.5	G0118	
WC & handwash: ambulant - staff	1	2.0	2.0	V1005	
Sub Total			**71.5**		
Younger Children's Play & Dining Area					
Dining room & Playroom: 10 - 15 patients	1	25.0	25.0	D0607	
Store Room	1	5.0	5.0	W1218	
WC & handwash: accessible, wheelchair assisted	1	4.5	4.5	V0904	
Sub Total			**34.5**		

Total Net			**1,047.0**
Planning	**5%**		**52.4**
Sub-Total			**1,099.4**
Engineering	**3%**		**33.0**
Circulation	**34.0%**		**373.8**
Total			**1,506.1**

SCHIEHALLION WARD (22 BEDS)

Description	Qty	Unit Area m²	Total Area m²	ADB CODE	Comments
Bed Area					
Single bedroom: Children/young people, with relatives overnight stay	21	16.5	346.5	B1802	
Lobby: air lock to bedroom	8	7.0	56.0	G0507	
Shower, WC & wash: accessible, wheelchair assisted	21	4.5	94.5	V1610	As per HBN 00-02
Office Area with workstations (x4)	1	18.0	18.0	M0115 Consider work bench in lieu of desks	
Office - clinical - 2 person	1	12.0	12.0	M0319	
Staff & communication base, open 2 staff	1	5.0	5.0	T0109	
Touchdown space	2	2.0	4.0	T9999	
Sub Total			**532.0**		
Utility Area					
Bath, WC & wash: treatment, assisted	1	14.0	14.0	V1708	
Clean utility	1	14.0	14.0	T0505	
Cleaners Room	1	7.0	7.0	Y1501	
Parking bay: resuscitation trolley	1	1.0	1.0	G0103	
Dirty utility: bedpan disposal & urine test	1	12.0	12.0	Y0411	
Store: linen & Clothing Back-up	2	2.5	5.0	W1408	
Store: general	1	5.0	5.0	W1218	
Store: equipment	1	5.0	5.0	W0126	
Sub Total			**63.0**		
Patient Support Area					
Treatment room: child	1	16.5	16.5	X0112	
Chemotherapy Room	1	12.0	12.0	X1501	
School Room	1	18.0	18.0	H0104	
Play Room	1	25.0	25.0	D0815	
Store Room	1	5.0	5.0	W1555	
Interview & counselling room: 5 persons	2	11.0	22.0	M0704	
Parking bay:	1	5.0	5.0	G0119	
Pantry: serving ward	1	12.0	12.0	P0607	
Ward Food trolley parking bay	1	1.5	1.5	G0118	
WC & handwash: ambulant - staff	1	2.0	2.0	V1005	
Sub Total			**119.0**		
Radiotherapy Treatment Suite					
Radiation shielded patient bedroom	1	20.0	20.0	B1802	Part of overall Schiehallion bed complement (22)
Radiation shielded toilet/shower (and drain)	1	4.5	4.5	V1610	
Secure shielded ante-room for storage of radioisotope/radioactive injection rig/radioactive waste	1	10.0	10.0	W0608	
Radiation shielded controlled lobby	1	6.0	6.0	G0507	
Adjoining relatives bed space	1	10.0	10.0	D1302	
Ensuite bathroom for relatives	1	6.0	6.0	V1625	
Sub Total			**56.5**		
External play area including covered area	1		**0.0**	**G0936**	
Sub Total			**0.0**		External Area

Total Net			**770.5**
Planning	**5%**		**38.5**
Sub-Total			**809.0**
Engineering	**3%**		**24.3**
Circulation	**34.0%**		**275.1**
Total			**1,108.4**

DAY CASE UNIT (Incl Treatment) & Staff Base

Description	Qty	Unit Area m²	Total Area m²	ADB CODE	Comments
Day Unit					
Reception	1	5.0	5.0	J0205	
Waiting/Play area	1	20.0	20.0	J1423	
Consult/Exam/Treatment Room	4	16.5	66.0	X0112	Note specific requirements in Operational Policy
Haemophilia Unit Consult/Exam/Treatment Room	1	16.5	16.5	X0112	
Haemophilia Unit Office (2 Person)	1	12.0	12.0	M0207	Co-located with Haemophilia/Consult/Exam/Treatment room
Day Stay Ward	1	68.0	68.0	B2001	
Patient WC	2	2.5	5.0	V1101	Ensuite to Day Stay Ward
Disabled WC	1	4.5	4.5	V0904	
Patient WC	1	2.5	2.5	V1101	
BMT Waiting Area	1	9.0	9.0	J1204	FACT-JACIE requirement
BMT Day Stay Ward	1	36.0	36.0	B0607	
Store: linen & Clothing Back-up	1	2.5	2.5	W1428	
Store: general	1	5.0	5.0	W1587	
Clean Utility	1	14.0	14.0	T0505A	
Dirty utility: bedpan disposal & urine test	1	12.0	12.0	Y0411	
Managers Office	1	9.0	9.0	M0206	
Interview Room	1	9.0	9.0	M0704	
Office Area with workstations (x4)	1	18.0	18.0	M0115	
Sub Total			**314.0**		

Total Net			**314.0**
Planning	**5%**		**15.7**
Sub-Total			**329.7**
Engineering	**3%**		**9.9**
Circulation	**34.0%**		**112.1**
Total			**451.7**

TEENAGE CANCER TRUST

Description	Qty	Unit Area m²	Total Area m²	ADB CODE	Comments
Teenage Cancer Trust Accomodation					Adjacent to Shiehallion Ward
Single bedroom: Children/young people, with relatives overnight stay	4	16.5	66.0	B1802	
Shower, WC & wash: accessible, wheelchair assisted	4	4.5	18.0	V1610	(As per HBN 04-01)
Contingency	1	50.0	50.0		
Sub Total			**134.0**		

Total Net			**134.0**
Planning	**5%**		**6.7**
Sub-Total			**140.7**
Engineering	**3%**		**4.2**
Circulation	**34.0%**		**47.8**
Total			**192.8**

CARDIOLOGY (14 BEDS)

Description	Qty	Unit Area m²	Total Area m²	ADB Code	Comments
Bed Area					
Single bedroom: Children/young people, with relatives overnight stay	10	16.5	165.0	B1802	
Lobby: air lock to bedroom	2	7.0	14.0	G0507	
Shower, WC & wash: accessible, wheelchair assisted	10	4.5	45.0	V1610	As per HBN 00-02
Multi-bed room & day space: Children/young people, 4 beds, with relatives overnight stay	1	68.0	68.0	B2001	
Shower, WC & wash: accessible, wheelchair assisted	1	7.0	7.0	V1612	
Office Area with workstations (x4)	1	18.0	18.0	M0115 Consider work bench in lieu of desks	
Office - clinical - 2 person	1	12.0	12.0	M0319	
Clinical Workstations (x6)					
Staff & communication base, open 2 staff	1	5.0	5.0	T0109	
Touchdown	1	2.0	2.0	T9999	
Sub Total			**336.0**		

Utility Area					
Bath, WC & wash: treatment, assisted	1	14.0	14.0	V1708	
Clean utility	1	14.0	14.0	T0505	
Cleaners Room	1	7.0	7.0	Y1501	
Parking bay: resuscitation trolley	1	1.0	1.0	G0103	
Dirty utility: bedpan disposal & urine test	1	12.0	12.0	Y0411	
Store: linen & Clothing Back-up	1	3.0	3.0	W1408	
Store: general	1	5.0	5.0	W1218	
Store: equipment	1	5.0	5.0	W0126	
Sub Total			**61.0**		

Patient Support Area					
Treatment room: child	1	16.5	16.5	X0112	
Interview & counselling room: 5 persons	1	9.0	9.0	M0704	
Parking bay:	1	5.0	5.0	G0119	
Pantry: serving ward	1	12.0	12.0	P0607	
Ward Food trolley parking bay	1	1.5	1.5	G0118	
WC & handwash: ambulant - staff	2	2.0	4.0	V1005	
Sub Total			**48.0**		

Recreation, Play & Dining Area					
Dining room & Playroom: 10 - 15 patients	1	25.0	25.0	D0607	
Store Room	1	5.0	5.0	W1218	
WC & handwash: accessible, wheelchair assisted	1	4.5	4.5	V0904	
Sub Total			**34.5**		

Total Net			**479.5**
Planning	**5%**		**24.0**
Sub-Total			**503.5**
Engineering	**3%**		**15.1**
Circulation	**34.0%**		**171.2**
Total			**689.8**

ADDITIONAL ACCOMMODATION - Cardiology

Staff Offices, Workstations, Education & Support					
Office - 2 Person	1	12.0	12.0	M1002	
Workstations x 6	1	24.0	24.0	M1013	
Medicines Management	1	8.0	8.0	T0506	
Sub Total			**44.0**		

Shared FM & Other Support					
Cleaners (Housekeeping) room					

Disposal Hold & Recycling Point	1	10.0	10.0	Y0614	
Regen Kitchen & Wash Up Allowance	1	12.0	12.0	P0907	
Clean Equipment & Fluid Store	1	8.0	8.0	W0213	
Sub Total			**30.0**		

Total Net			**74.0**
Planning	**5%**		**3.7**
Sub-Total			**77.7**
Engineering	**3%**		**2.3**
Circulation	**25.0%**		**19.4**
Total			**99.5**

NEW CHILDREN'S HOSPITAL

Clinical Output Specification

AREA	HAEMATOLOGY& ONCOLOGY

1. INTRODUCTION

The department of haematology and oncology provides a tertiary service to the West of Scotland, and for some disorders / procedures a national service, for children with haematological malignancy, non-haematological malignancy and benign haematology.

The department is currently known as the Schiehallion Unit.

This report covers the following areas:

1) General In-patient Ward (high dependency)
2) National Bone Marrow Transplant Unit
3) Teenage Cancer Trust Ward and Day-Care facilities
4) Short-Stay / Day-Care Unit (incorporating the Regional Haemophilia Unit)
5) Clinical Administration Facilities
6) Outpatient Facilities

The National Bone Marrow Transplant Unit (BMT Unit), utilises special facilities incorporated into both the General In-patient Ward and the Day-Care Unit. Where applicable the requirements of the BMT Unit are noted within these sections.

The existing facilities accept new cases up to the patients' 16th birthday but a significant number of children continue treatment to the age of 18 years and over or until education is completed.

a) <u>The Services Provided Include:</u>

- Inpatient, Outpatient and Day Care tertiary services for children with leukaemia, solid tumours and benign haematology
- National Allogeneic Stem Cell Programme
- Regional Haemophilia Centre

b) <u>The Services provided exclude:</u>

The Beatson Oncology Unit at Gartnavel Hospital (NHSGG&C) provides a second 6 bed adolescent unit for patients aged 15 and over (sponsored by the Teenage Cancer Trust). Close working links between the Unit at RHSC and Gartnavel exist, and will be developed with the in-coming appointment of a dedicated Consultant.

2. LOCATION AND LINKS

As mentioned in the introduction, with the exception of Outpatient facilities, co-location of all other Haematology and Oncology is essential in order to maximise our existing resources, without having to rely upon any additional staffing.

<u>External Department Links</u>

Close to	Reason	*Category
Haematology Laboratory	The majority of patients attending Day Care / OPD will require 'bleeding' prior to their attendance. Results are required very quickly	1 / 2
HDU/ICU	• High dependency patients frequently require assessment and urgent transfer to the Paediatric ICU • Schiehallion patients can often be accommodated on ICU, requiring doctors to regularly visit this area.	1
Outpatient Department	Both patients and staff can have multiple visits between the Day-care Unit and OPD on a daily basis.	3
Patient / Family Facilities inc. refreshments ; car-parking; telephone etc.	Given the LOS of some patients, and the frequency of visits, it's essential that good quality facilities are conveniently available for both planned and unplanned visits.	3
Radiology	Patients regularly / frequently attend radiology as part of either their Day-care or In-patient investigations and treatment	2
Theatres	Most patients have several visits to theatre for surgery, biopsies, central lines, bone marrow / trephines, lumbar punctures etc.	2

*1=Essential adjacent *2 = Important 2 minutes walking *3 – Desirable 5 minutes walking

3. ACTIVITY

Activity Summary

Based upon all the above calculations, the summary of activity is given as follows:

Activity	2006/07	2013 projections
Outpatients New	158	174
Outpatients Return	7160	7870
Outpatients New (Benign Haem)	61	61
Outpatients Return (Benign Haem)	1130	1130
Day Surgery	1000	1100
Day Case/Day Care	1258	1384
Inpatients episodes	1238*	1364
Inpatients bed days	7212**	7933

***476** = elective **762** = emergency

****3336** = elective **3876** = emergency

Not included are 600 ward emergency ward attendances out of hours.

4. TRENDS

1) Of note, across all haematology and oncology specialties, greater priority has been given to developing packages of care as opposed to single treatment episodes.
This means that greater numbers of staff are involved in less frequent patient episodes, making the patient pathway much more manageable for the child and their family.

2) There has been, over the past few years, greater emphasis on the quality and quantity of cancer research documentation. Within the existing unit, there is a small, dedicated data management facility, however, it could be anticipated, that based on experience of the past five years, that this will expedentially increase in line with new case activity.

3) There has been a positive drive by the Scottish Executive Health Department, and National Services Division, to provide the necessary resource to improve the quality and quantity of Cancer Services on a local, regional and national basis over the past 18 months. This trend is set to continue over the next 18 months.

4. HOURS OF SERVCE

Current Hours of Service

Day-Care Unit

The day-care facility is open for patient care from 08:30 until 19:30, Monday to Friday. The unit remains open on public holidays, with the exception of Christmas Day and New Years' Day. Patients remaining in the unit after 17:30 are there to complete chemotherapy, blood transfusion, recovery post general anaesthetic etc. Direct emergency admissions (i.e. by-passing the Emergency Department) are accepted into day-care at all times Medical Cover is available.

Outpatient Facilities

Outpatient facilities are provided within the centralised outpatient department (OPD). opening hours are 09:00 – 17:30, Monday to Friday (excluding public holidays).

Clinics take place within these allocated sessions, within dedicated rooms.
There is no proposal to change the timings of these arrangements at present, however, with the introduction of a newly dedicated adolescent cancer service, it may be prudent to investigate early evening clinics for the benefit of our patients.
Following preliminary discussions with the Outpatient Management team, this is viewed as achievable.

6. WORKLOAD INDICATION (weekly)

Area of service	Type of Activity	Current workload	Projected workload
1) General Inpatient Ward	Daily ward rounds / diagnostic testing / patient communications / treatments / monitoring	24 / 7	No change
2a) Teenage Cancer Trust Ward	Daily ward rounds / diagnostic testing / patient communications / treatments / monitoring	24 / 7	No change
2b) Teenage Cancer Trust Day Care	Diagnostic testing / patient treatment / patient observation / unplanned admissions	08:30 – 17:30, medical and nursing cover	No change
3) Day Care Unit	Diagnostic testing / patient treatment / patient observation / unplanned admissions	08:30 – 19:00 (16 medical staff sessions)	There is a potential for an increase in nursing provision, given the move towards more home based / day care treatments, rather than in-patient care (this would equate to approximately 1 wte)
4) Clinical Administration	Patient case notes and general medical administration	All medical staff have existing administration sessions allocated within their job plans	No change
5a) Outpatients	Consultant led clinics	9 sessions	Potential for +1 session (dependent on NSD bid outcome)
5b) Outpatients	Nurse led clinics	0 sessions	Potential for +4 sessions (dependent on NSD bid outcome)
Theatres	Doctor led list	2 sessions	No change
Theatres	Nurse led list	1 session	Potential for +1 session (dependent on NSD bid outcome)

NB: Where sessions have been mentioned, this equates to 4 hours for medical staff and 3.75 hours for nursing and administration staff.

7. KEY OPERATIONAL POLICIES/ISSUES

Accommodation requirements:

1) General In-patient Ward

The ward should be accessed by entry through a double-door barrier system, which allows the entire ward area the benefit of low positive pressure ventilation. Because of the risk of infection to patients, this does mean that no exterior ventilation (opening windows or doors) can be permitted, and therefore, it is an essential requirement to have good quality, adjustable mechanical heating and cooling ventilation. A preference would be to have individual cubicle adjustable thermostats.

2) Teenage Cancer Trust ward and Day-Care Facilities

The preference, and clinical sensibility would be for the teenage cancer trust ward unit to sit alongside (in an adjacent wing or corridor) to the main haematology and oncology unit. This would allow a greater flexibility in the utilisation of specially and specifically trained clinical staff.

3) Day-Care Unit / Short Stay Ward (incorporating the Regional Haemophillia Unit)

It is not necessary to maintain a low level of positive pressure within this area, however, it is important to maintain excellent levels of heating and cooling, as patients are often unable to regulate their own temperatures.

4) BMT Waiting Room

This is a FACT-JACIE accreditation requirement. The room must be physically separated from the standard waiting room, and provide a level of isolation for the patient and their family (up to five people to be accommodated).

5) Standard Day-Stay Ward

There will be 4 bed + 2 chair day-stay ward, which can accommodate up to 6 patients, their families and appropriate staff members. The ward should include the following:

6) BMT Day-Stay Ward

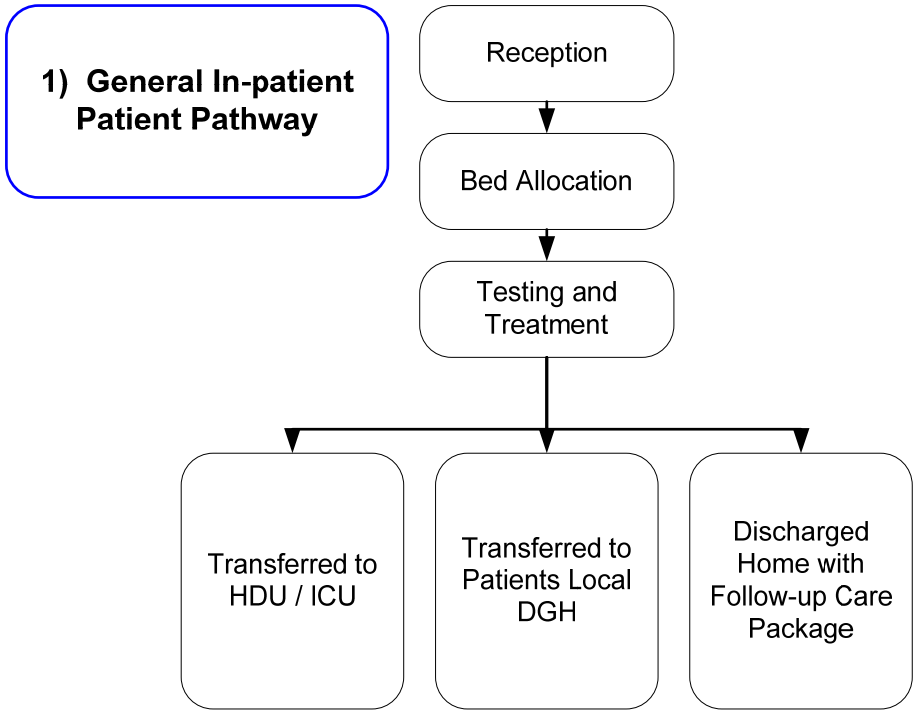
Our BMT Day-Stay Ward is suitable for up to four patients (1 trolley and 3 parker-knoll chairs). The ward should be co-located, but separate from the day-stay ward (to comply with JACIE requirements).

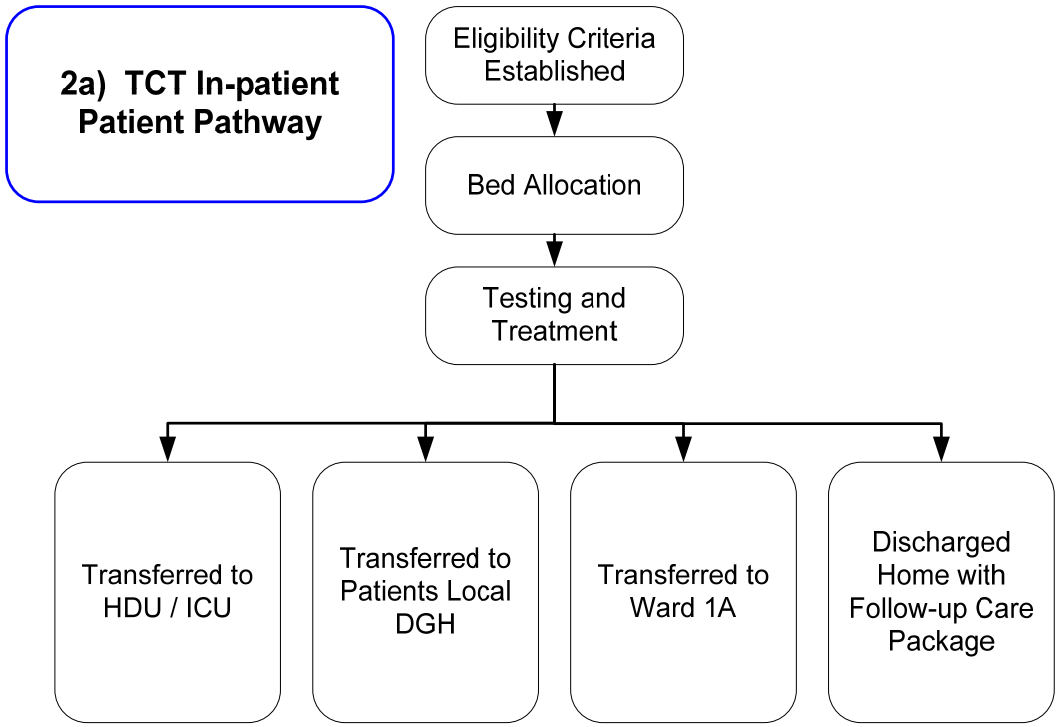
The BMT ward requires exactly the same considerations as the Standard Ward, with the addition of the entry doors being half-glass for observation. No en-suite toilet is required

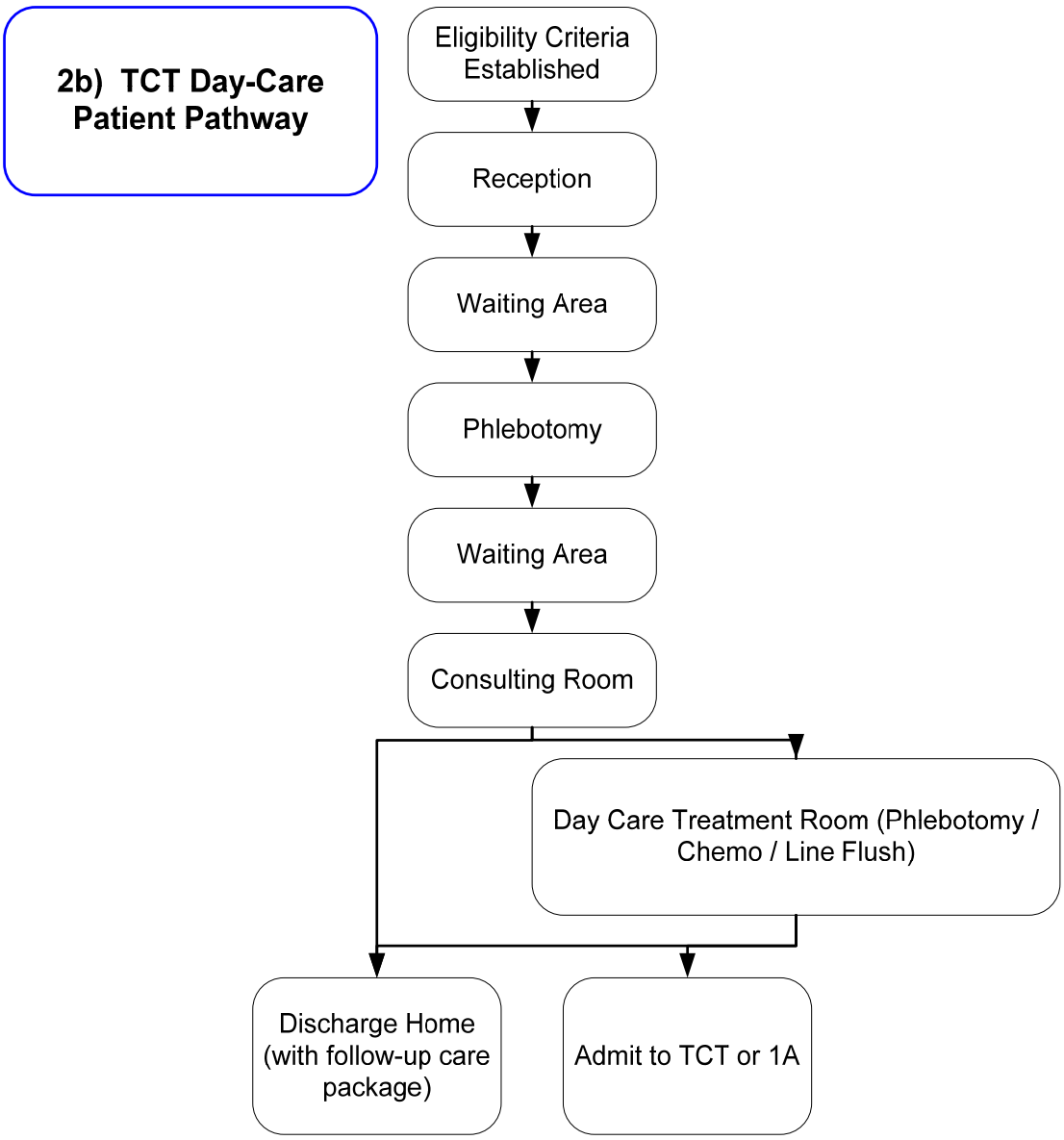
7) OPD

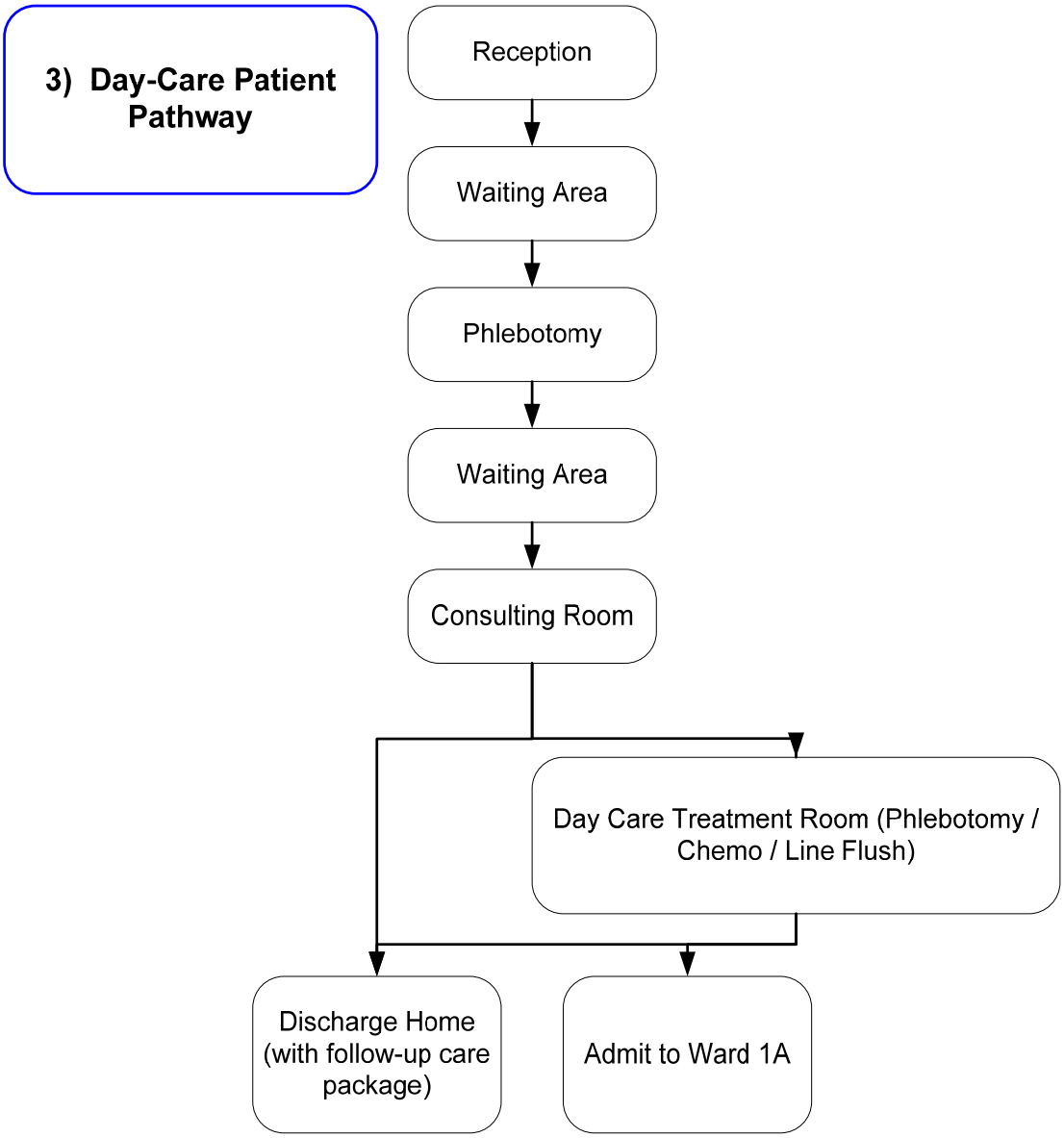
New guidance has been received (PCT – Gateway 10780, Childrens Cancer Measurement Section 08-7B-106) stating that Haematology and Oncology clinics should be spatially and temporally separate from other non-cancer clinics. This should be taken into consideration at design stage. Following these guidelines indicates that 7 rooms would be required for the on-treatment clinics.

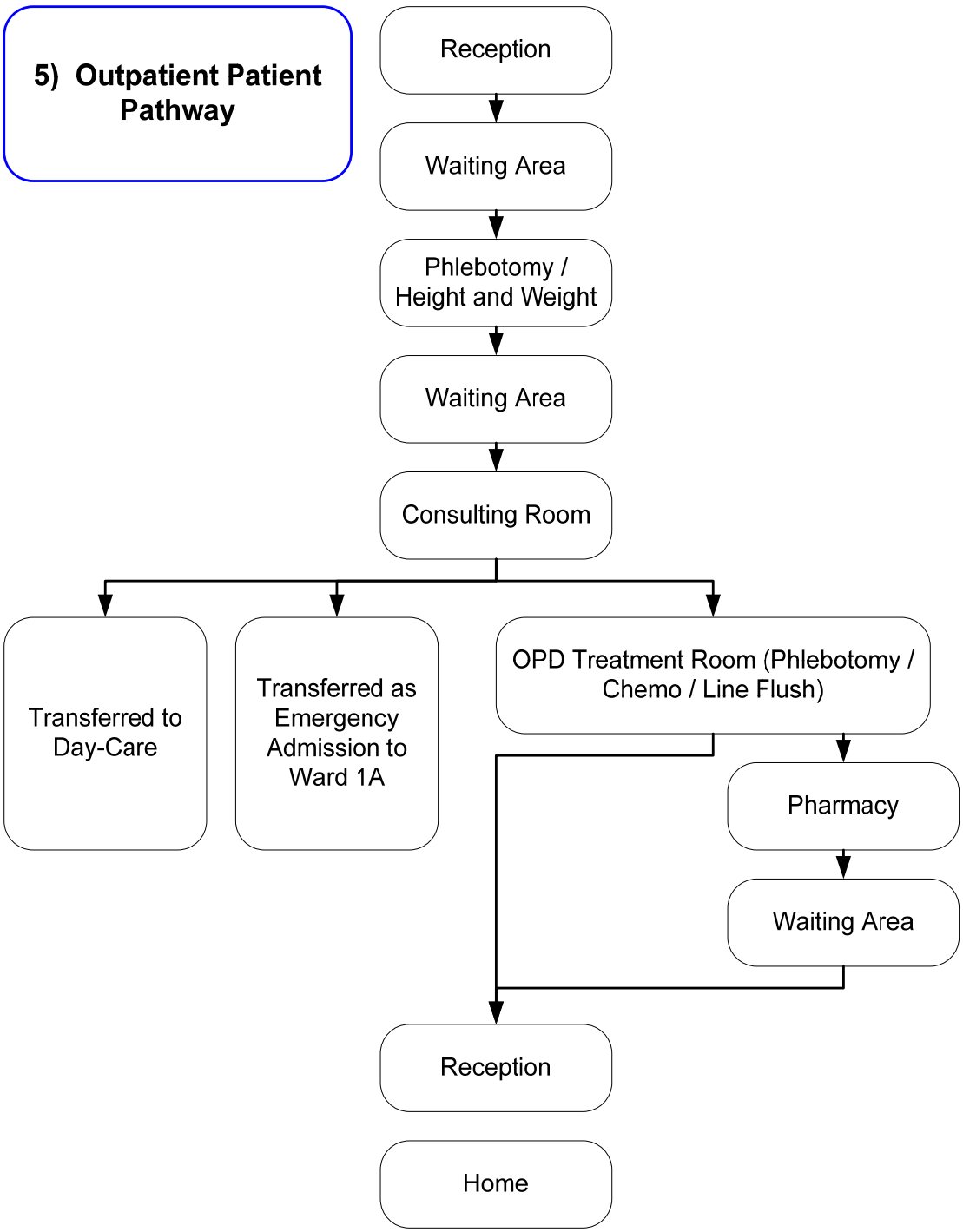
Patient pathways have been presented as representation of a typical patient journey. Due to the condition, patient packages of care will be moderated to fit the individual childs' needs.






2b) TCT Day-Care Patient Pathway
Eligibility Criteria Established
Reception
Waiting Area
Phlebotomy
Waiting Area
Consulting Room
Day Care Treatment Room (Phlebotomy / Chemo / Line Flush)
Discharge Home (with follow-up care package)
Admit to TCT or 1A


3) Day-Care Patient Pathway
Reception
Waiting Area
Phlebotomy
Waiting Area
Consulting Room
Day Care Treatment Room (Phlebotomy / Chemo / Line Flush)
Discharge Home (with follow-up care package)
Admit to Ward 1A


5) Outpatient Patient Pathway
Reception
Waiting Area
Phlebotomy / Height and Weight
Waiting Area
Consulting Room
Transferred to Day-Care
Transferred as Emergency Admission to Ward 1A
OPD Treatment Room (Phlebotomy / Chemo / Line Flush)
Pharmacy
Waiting Area
Reception
Home

There are a number of registration and clinical best practice guidelines available regarding the design and management of both paediatric and adult clinical facilities for patients with Cancer.

Most notably, our accreditation with certain regulatory bodies, dictates that some of our facilities, must be maintained, to allow our registration to continue. Amongst those we include:

- FACT – Jacie
- Human Tissue Authority
- Regional Haemophilia Centre

Recent guidance on Outpatient facilities has been documented within PCT – Gateway 10780, Childrens Cancer Measurement Section 08-7B-(100 – 113).

8. EQUIPMENT

n/a

GREATER GLASGOW AND CLYDE NHS BOARD

NEW SOUTH GLASGOW HOSPITAL PROJECT

USERS GROUP
TERMS OF REFERENCE

1. NAME OF GROUP

The name of the Group shall be the **New South Glasgow Hospital Haemato-Oncology User Group**.

2. AIM

To provide a forum for agreement/sign off of the 1:200 and 1:50 architectural drawings for the Haemato-Oncology Department. Please note that the architectural drawings will be based on the previously signed off Schedules of Accommodation which are now fixed. Sign-off of the drawings will follow a formal procedure and will be recorded on the "Design Acceptance Procedure" Form. This form will record the outcome of each meeting and be signed by the User Group Lead on behalf of the Directorates at the end of each meeting.

3. MEMBERSHIP

- The membership of the group has been approved by the Acute Services Director(s)
- The Group will have an identified Lead
- Members will be responsible for (i) discussing the design with colleagues and in the user meetings (ii) for communicating the priorities and associated work plans agreed by the Group to their colleagues following each meeting

4. GROUP LEAD

- The Lead for the Haemato-Oncology User Group is Gary Jenkins
- The Group Lead will be responsible for the ensuring that Directorate priorities are reflected in the design
- The Group Lead will be responsible for keeping their Director appraised of the status of the design process
- Where differing options regarding the design arise the Project Team will take their instruction from the Group Lead

5. MEETINGS OF THE GROUP

Two to three User Group meetings will be held to agree the 1:200 Departmental layouts and, following this a further 2 to 3 meetings will take place to agree the requirements for each room. The User Group meeting will be facilitated by the Project Team and attended by the Project Team (including FM and Infection Control) and the Contractor Team.

Seven days before each meeting hard copy drawing(s) will be issued by the Project Team to each Group Lead. It will be issued to other members of the User Group electronically.

At the User Group meeting the Design Team (Architect supported by the Health Planner and Project Team members) will provide a detailed update on the User Group Department(s) design progress and take the group through the detailed designs.

6. RECORD OF THE MEETING

Action points will be recorded by the architect on the Design Acceptance Form at the meeting and a copy will be distributed to the Group following the meeting.

Guidance to
ENGINEERING COMMISSIONING

The Institute of
Hospital Engineering

Guidance to

ENGINEERING COMMISSIONING

Published by The Institute of Hospital Engineering, 2 Abingdon House, Cumberland Business Centre, Northumberland Road, Portsmouth PO5 1DS

FOREWORD - COMMISSIONING OF ENGINEERING SERVICES

Many of us recall the problems with new hospital construction and, in particular, engineering services which arose in the late 1970's/1980's. The problems caused delay and expense and led to antagonism with the users.

The Regional Engineers' Association (REA) was naturally concerned with such difficulties and concluded that many resulted from failures to properly commission installations, with a failure to prove the design intent had been achieved prior to handover.

Designs had over the years become standardised with such developments as standard wards, Best Buy and Harness Hospitals and as part of the standardisation the DHSS, Works Department had issued considerable design guidance in the form of HBNs, HENs, HTMs, and Data Sheets. The knowledge of this guidance tended to confirm the need for detailed advice on methods and procedures to be followed to ensure the operational acceptability of services installations were proven. The proving was not confirmed to design but needed to include installation.

The DHSS had provided limited guidance with the publication of HTM No.17 but this guidance had become dated with the rapid advance in medical technology and techniques.

As a result the REA and DHSS agreed to form a Working Party, Working Group No.12, to investigate and publish guidance on all aspects of services commissioning, including procedures to be followed.

The original intention was for DHSS to publish the document via the Stationery Office. However, subsequent changes to the NHS resulted in the reduction or loss of the RHA Works Departments and, finally the Department's Works Department itself. As a consequence the work was never published.

Subsequently it was agreed that the completed comprehensive guidance should be updated, revised and published by the Institute of Hospital Engineering.

The present document is the result of the work by both Working Group No.12 and the Department. The Group took its membership from specialist commissioning engineers from the RHAs and in particular WHCSA, who had been one of the initiators of the use of specialist commissioning teams and who's team was, and is, recognised as a leading authority in this field. I had the pleasure of chairing the Working Group whilst Chief Engineer of WHCSA and undertook the subsequent revisions and editing.

The guidance has been written by practising commissioning engineers as the result of their experience in this specialist field, learnt in most cases, the hard way.

It is hoped it will provide useful guidance to those working for and with NHS and Healthcare Estates (it should however offer advice, particularly Part 1, to non estates staff concerned with contracts, tender appraisal and scheme evaluation).

The work has defined commissioning as the advancement of an installation from static completion to full and satisfactory operation, complying fully with its design intent. The assurance of this definition is the aim of this book.

I trust and hope it has achieved this aim.

R. G. Kensett

SPECIAL ACKNOWLEDGEMENTS

AUTHORITIES AND INDIVIDUALS CONTRIBUTING TO THE PREPARATION OF THE COMMISSIONING DOCUMENTATION

The documents followed as the result of the extensive work carried out by Working Group No.12 which operated under the Department of Health and Social Security, Works Division Euston Tower London. The work was sponsored by the then Regional Engineers Association who considered there was an urgent need to revise and update Hospital Technical Memorandum No.17.

The original chairman of the group was Mr K.Eatwell, then Regional Engineer South West Thames Regional Health Authority.

He was succeeded in 1981 by Mr R.G.Kensett, Chief Engineer, Welsh Health Common Services Authority, who chaired the group to the conclusion of the work.

Members of the Working Group were:

Mr W.Martin	Trent Regional Health Authority (now retired)
Mr C.Collins	Trent Regional Health Authority (deceased)
Mr A.Unitt	Yorkshire Regional Health Authority
Mr I.Bateman	SE Thames Regional Health Authority

Various Occasional Representatives from West Midlands Regional Health Authority

Co-opted Members:-

Mr M.T.Jenkins	ARE - Special Services Department
Mr M.T.Jenkins	Welsh Health Common Services Authority
Mr K.K.Williams	Chief Commissioning Engineer Welsh Health Common Services Agency

Secretaries from DHSS and Department Contributors

Mr R.Tuthill	Superintending Engineer
Mr N.Pierce	
Mr D.Foster	
Mr P.Welford	

Outside Bodies who assisted and contributed

British Gas, CIBSE, BSRIA,

Andrews Weatherfoil Ltd, Crown House Engineering Ltd,

Kyle Stewart Ltd,

Messrs Austen Associates, Consulting Engineers, Croydon

THE INSTITUTE OF HOSPITAL ENGINEERING

ENGINEERING COMMISSIONING

Contents

Contents

1. COMMISSIONING

DEFINITION:-

THE ADVANCEMENT OF AN INSTALLATION FROM ITS STATIC COMPLETION TO FULL AND SATISFACTORY OPERATION, COMPLYING WITH ITS DESIGN INTENT.

ENGINEERING COMMISSIONING

Contents

Part I

PART 1 - INTRODUCTION TO ENGINEERING COMMISSIONING

1. GUIDANCE ON THE COMMISSIONING OF ENGINEERING INSTALLATIONS - IN HEALTH CARE BUILDINGS

INTRODUCTION

The guidance contained within this document has been produced to define and prescribe the responsibilities appropriate to participants to the contract, the responsibilities which devolve onto design engineers to provide the necessary facilities within a design to enable commissioning to be properly completed, and finally to describe the recommended practical procedures for completing the on-site commissioning prior to handover or practical completion of engineering installations provided under main or sub-contracts.

The recommendations are intended to:-

a. Satisfy the principles of the latest guidance issued by the Dept of Health in which commissioning is redefined as "advancing an installation from the stage of static completion to full working order to meet specified requirements".

b. Provide assistance to designers in ensuring the design contains adequate facilities, fittings and such devices and equipment as are necessary to carry out the process of commissioning with the minimum of disruption to a completed installation and to avoid unecessary delay to the programme.

c. Describe the responsibilities of parties to the contract with reference to the Commissioning of Engineering Services.

d. Provide guidance on the commissioning content of "Model Specifications for Building Services in Health Care Buildings".

e. Ensure that Risk Assessments are carried out by the appropriate persons at each stage of the contract and that they are recorded in the project Health and Safety plan.

Compliance with this document does not of itself confer immunity from legal obligations.

2. DEFINITIONS

2.1 Commissioning Engineer

The person(s) appointed by the Contractor to execute the commissioning process in accordance with the contract.

For this purpose "The Contractor" is the building services contractor, whether Main or Sub-Contractor.

2.2 Client's Commissioning Adviser

The person nominated by the Client or the Client Body to advise whether the installation meets the specified requirements.

2.3 Project Engineer

The person nominated by the Client to monitor the installation of the engineering services related to a project.

Where the engineering content is being undertaken by a Consulting Engineer he becomes the Project Engineer.

2.4 Engineering Services Co-Ordinator

The person nominated by the Main Contractor to be responsible for:-

- The co-ordination of the activities of all the engineering nominated and other sub-contractors.

- The co-ordination of the activities of all the Commissioning Engineers as defined in 2.1.

2.5 It should be noted that persons appointed to a contract may hold additional Statutory responsibilities and job titles as defined under the Health and Safety at work etc. Act 1974, Construction (Design and Management) Regulations:

Contractor

Means any person who is under a contract to manage or carry out construction work.

Principal Contractor

Is one appointed by the Client to be responsible for the supervision or execution of the project.

Planning Supervisor

Is a competent person appointed by the Client from among those who are responsible to the Client for the design.

3. ROLES AND RESPONSIBILITIES

3.1 Commissioning Engineer

The Commissioning Engineer shall be responsible for ensuring that all plant, equipment, services and controls are installed in strict accordance with the requirements of the contract documentation made available to his employers.

He shall also carry out checks and preliminary tests on the installations for which he is responsible to satisfy himself that when formally tested and demonstrated in accordance with the specification, all foreseeable difficulties have been overcome, and there is no known reason why the tests should not prove to be entirely satisfactory.

He will be required to co-operate with Commissioning Engineers from other contractors and with the Engineering Services Co-ordinator employed by the Main Contractor to co-ordinate the installation of the engineering services and the respective commissioning activities. He will be expected to participate in the preparation of a co-ordinated programme of work, encompassing all services, under the general direction of the Main Contractor's Co-ordinator.

It will be necessary for a suitable clause to be included in the respective engineering specifications clearly defining the responsibilities attributed to the Commissioning Engineer and including a description of the record documentation required to be prepared by him and submitted to the Project Engineer.

3.2 Client's Commissioning Adviser

The Client's Commissioning Advisor is required to ensure that a project will meet the user's needs and should therefore advise planners, designers and (via the Project Engineer) contractors and site staff on:-

- User aspects of design;
- Health and Safety implications of the design and project
- Technical facilities for maintenance and operation;
- Commissioning including its programming;
- Final acceptability of installations;
- Records, service manual and staff instructions; and
- Feedback of previous operational and maintenance experience.
- Risk Assessment

The Commissioning Advisor must be permitted to witness the commissioning procedures, testing and working demonstrations, and appropriate arrangements will have to be incorporated in the contract to allow him to fulfil this responsibility.

During the design stage the Commissioning Advisor may, without diminishing the responsibility of the Designer or relieving him of any of his duties, bring his specialised knowledge of commissioning to assist the Designer in resolving any difficulties in the interpretation of the employers instructions and relating them to the commissioning and testing of installations.

The Commissioning Advisor will require sufficient information about the design to allow an assessment to be made as to whether the commissioning and acceptance procedures proposed by the Designer are satisfactory and that proper provision has been made in the contract for commissioning and demonstrating the installation.

During the preparation of information by the Designer, relating to pre-handover tests and adjustments, whether at contract preparation stage or later, he should seek the advice of the Commissioning Adviser so as to ensure that the proposals being put forward are acceptable to the client.

The Commissioning Advisor should be sufficiently informed of the basis of the decisions taken in respect of the post handover activities to be able to advise those concerned on the interpretation of results. He should also be able to advise when further tests should be carried out and whether changes to installations are needed.

The Commissioning Advisor should participate in Design in Use studies where these are undertaken.

3.3 Project Engineer

The Project Engineer will be responsible for the design and cost control of all the engineering services content of the scheme. He will provide professional guidance and support to the Architect (as Supervising Officer) throughout the planning, design and construction stages. He may also fulfil the role of designer in respect of his own discipline. (Under certain circumstances the Project Engineer may also be the Supervising Officer for the contract).

He will liaise with the Commissioning Advisor at all stages of design and ensure that the engineering specifications and drawings contain sufficient detailed information for the Commissioning Engineers to carry out all necessary tests and demonstrations together with the preparation of record documentation.

The Project Engineer shall ensure that the Bill of Quantities preliminaries and/or the building specification incorporates an appropriate clause relating to the role and responsibilities of the Engineering Co-ordinator. A requirement that the Engineering Co-ordinator is to be indentified by name should be included.

3.4 Engineering Co-ordinator

The Engineering Co-ordinator will be responsible for fulfilling the Main Contractor's traditional role of overall co-ordination of the activities of the nominated and other engineering sub-contractors, and specifically their appointed Commissioning Engineers.

With regard to the function of co-ordinating the commissioning processes the Co-ordinator's main responsibilities can be summarised as follows:-

- Preparation of a separate and co-ordinated commissioning programme covering all the engineering installations involved in the contract, following detailed discussions with the individual Commissioning Engineers concerned. The 'master' programme should in no way inhibit the production of separate programmes for a specific part of an installation

by the appropriate Commissioning Engineer. These programmes must include adequate time and notice for demonstration to the client's Commissioning Advisor. They should be issued to the Client for distribution.

- Maintain a continous liaison with all the Commissioning Engineers and monitor their progress and conformity to the requirements of the respective specifications.

- In cases of doubt or where clarification of the specification is required, the Co-ordinator should contact the Project Engineer, who will when necessary consult the Commissioning Advisor.

- At an appropriate time, prior to the formal execution of the specified test procedures and demonstrations, ensure that individual Commissioning Engineers have carried out such preliminary tests and checks on the installations for which they are responsible as to eliminate as far as is practicable all problems of failure and malfunctioning of plant and/ or controls.

- Inform all parties concerned with witnessing the tests and demonstrations, of the intention to proceed with these activities, and to give adequate notice thereof.

- Ensure that appropriate records of all tests undertaken are prepared by the respective Commissioning Engineers, cleared with the Project Engineer, and ultimately distributed to all interested parties.

3.5 The Designer's Role

If the commissioning process is to be completed in accordance with established and agreed practice, then it is essential that the Design Engineer shall pay proper attention to this factor when preparing his design and the required sections of the tender documents.

The evolution of a building scheme will pass through successive stages of development which are:

- Brief
- Design
- Construction
- Testing
- Commissioning
- Handover

The brief will form the cornerstone of the project. The brief will define the Client's, (that is the eventual user of the building), requirements and it is essential that these are agreed with the designers, including any special conditions, equipment requirements, etc. prior to the design commencing.

The Designer must provide adequate information to ensure that his intentions are clear to all parties involved. This should include start up procedures, safety, method of operation and control.

The design conditions required in various rooms and departments should be presented in the form of Room Data Sheets and Equipment Schedules, which should then form the basis of the commissioning data. The sheets should always contain such information as temperature, humidity, air change rate, noise levels, personnel and equipment loading, and any special room conditions such as pressure differentials with surrounding areas and filtration levels.

This information is not only essential for the design but also to form the basis on which the Commissioning Engineer must formulate his own test programme and assessment of results.

Special equipment requirements should include such information as gas, air and water services, equipment supplies, any special requirements for non standard gas supplies, ie medical compressed air, entenox, non medical use oxygen, etc. electrical services including lighting levels and special earthing arrangements. Additional information where necessary should be provided for special anti-vibration mounting of equipment and acoustic insulation. An acoustic assessment is also essential information for the Commissioning Engineer as noise tests will form an essential part of the commissioning process.

The Design Engineer must at all stages in the design make special preparations for commissioning by adopting the following principles:

- Ensure the design does not affect the health and safety of persons during construction, maintenance or repair.
- Ensure that the presentation of his information is orientated toward commissioning as well as to construction.
- Include within his design adequate facilities to allow the Commissioning Engineer to carry out his task.
- It must be remembered that the purpose of testing and commissioning is to demonstrate that the installed plant and equipment complies with the requirements of the Design Intention Specification.

4. THE COMMISSIONING SPECIFICATION

The commissioning specification, which should be prepared by the Designer and the Commissioning Advisor, must define the responsibilities of the various sub-contractors and trades and parties to the contract. The general job specification should include the duties and responsibilities of the Main Contractor and the engineering specification those of the engineering sub-contractors.

It must also define the test standards to be observed during commissioning which should be in accordance with the Latest Statutory Requirements eg. Health and Safety at Work etc. Act 1974, its Regulations and Code of Practice, British and EU Standards eg. BS7671; 1992 Requirements for Electrical Installations and other standards, eg. Department of Health and CIBSE, relevant to the project under consideration. Further guidance on the standards to be observed is given in the individual commissioning guidance for the systems making up the completed scheme. (See Part II of this publication).

The specification should either include or make reference to the relevant documentation

The Final Acceptance Record Sheets (FAR) to be used for the recording of information. (See Part II for typical examples recommended for use).

5. THE COMMISSIONING BRIEF

The Commissioning Brief should contain all necessary information to enable the Commissioning Engineer to correctly and properly commission the plant to ensure it meets the design requirements of the engineering specification.

The information should also be used to carry out checks that the installed plant is in accordance with the specification.

The information given in the Commissioning brief should include:

- Room Data Sheets and Equipment Schedules
- System Descriptions and Flow Diagrams
- Design Drawings, in particular System Layouts
- Design Specification
- Programme
- List of Installed Plant
- Functional Schematic Diagrams
- Operating Manuals
- Wiring Diagrams
- Control Schematic Diagrams
- Control Setting Points
- Test Certificates and Performance Curves
- Any special requirements
- Risk Assessment data

Throughout the design the Design Engineer must make provision for the recommended commissioning facilities as defined in Part II of this document. He should also liaise fully with the Commissioning Advisor where appointed throughout the design.

If the commissioning process is to be properly and satisfactorily completed the Design Engineer must realise that he has a significant role in ensuring the work can be carried out without requiring modification to the plant or delays to its completion and handover.

6. COMMISSIONING PROGRAMME

Commissioning should always be completed prior to the issue of a Certificate of Practical Completion. Prior to agreeing a final programme it is strongly recommended that the Commissioning Advisor should be consulted and his assessment of the time scale built into the programme given. It must be realised and accepted that final regulation and adjustment is to be carried out after completion of the work of the trades concerned and when the building is clean. It is not acceptable to endeavour to commission plants whilst tradesmen are working in the area concerned nor whilst it is in the process of being cleaned. It is likely that a period of 3 months could be required to commission properly and to witness a major scheme. This magnitude of time scale must be accepted by all parties. It is essential that the Works Staff of the user authority should be involved in the final witnessing and demonstration as part of the familiarisation process.

7. COMMISSIONING REPORTS

At the conclusion of the commissioning process, commissioning reports should be prepared for record purposes and future reference and possible inclusion in software programs. The preparation of commissioning reports should be the responsibility of either the Project Engineer or the Client's Commissioning Advisor and these reports should form part of the documents handed to the user at the conclusion of the contract. These reports will not only enable the user's Engineer to assess the plant but will provide points of reference for maintenance and any future modification or extensions that may be considered.

Commissioning reports should report factually on the results achieved compared with the design duties. They should identify any particular problems which may require further work to meet user requirements.

It must be appreciated that it is not the responsibility of any of the Contractors to prepare commissioning reports for general issue although it is known that some contractors prepare their own internal reports.

8. COMMISSIONING OF ENGINEERING SERVICES - OUTLINE OF CLAUSES FOR ENGINEERING SUB-CONTRACTS

- The commissioning of engineering services shall be carried out in accordance with the latest guidance issued by the Dept of Health (HTM's, EPL's etc.,) together with the Health Care Engineering Services Commissioning Manual contained within this document.

- The engineering sub-contractors shall be responsible for carrying out the testing, commissioning and demonstrations of their own engineering installation, as described in the specifications and shown on the tender drawings.

- The engineering sub-contractor shall either nominate an approved Engineer from his staff or appoint the services of an independent approved Engineer to be designated the Sub-Contractor's Commissioning Engineer.

- The Sub-Contractor's Commissioning Engineer is to ensure that the installation of his specialist suppliers and installers plant and equipment is satisfactorily tested, commissioned and demonstrated.

- The Sub-Contractor shall note that the Main Contractor is to appoint an approved Engineer to co-ordinate the testing, commissioning and demonstration of all the engineering plant and services in the contract. The Sub-Contractor's Commissioning Engineer shall liaise with the Main Contractor's Engineer to satisfactorily commission the whole of the Sub-Contractor's installation.

- The Sub-Contractor shall complete the works correctly to a pre-arranged programme in a systematic and progressive method such that at time of handover all testing, setting to work, record drawings, commissioning and demonstrations of the works to the Engineer, and the Client's Commissioning Advisor shall have been successfully completed in accordance with specification.

- The Engineer appointed by the Main Contractor shall co-operate with the Sub-Contractor's Commissioning Engineer to produce a programme of activities for the testing, commissioning and demonstration procedures and will notify all interested parties, (the Engineer, and the Client's Commissioning Advisor) and confirm the date and place of each or series of tests, inspections, commissioning and demonstration procedures. Sufficient time shall be allowed in the Main Contractor's overall programme for the works to complete the testing, commissioning, and demonstration process prior to handover of the works. Subject to seasonal influences the works shall not be deemed to be in a state of practical completion until the commissioning process has been satisfactorily carried out.

- As an immediate preliminary to the setting to work of the installations the Sub-Contractor's Commissioning Engineer is expected to carry out a full check and inspection to confirm that the installation and its components are in a safe and satisfactory condition. He should verify that all statutory notices are displayed and that arrangements have been made so that installations may be safely commissioned. When this has been completed the Sub-Contractor's Commissioning Engineer shall proceed to set the installation to work and adjust and regulate them as necessary in accordance with the contract requirements.

- The commissioning will include the energising of electrical installations; the setting of machinery into motion, verifying the operation of controls, safety devices and alarms; the regulating of flow quantities and the setting of controls within the limits specified, and the setting up of gas, steam and electric equipment.

- Regulating valve flow rates, ductwork and grille flow rates are given in the Design Intent Clauses of the Specification or on the Drawings, and the Sub-Contractor shall record and make available all relevant test data to the Engineer in the form of the Final Acceptance Records as shown in this Commissioning Manual.

- When required the Sub-Contractor shall demonstrate to the Engineer or Client's Commissioning Adviser that the test instruments and equipment used are accurate when compared with a recognised standard. The Sub-Contractor or his Commissioning Engineer is to provide all labour, material, apparatus and proper test instruments required for carrying out the testing, commissioning, demonstration and for instructing the Client's Staff.

- The Engineer or his representatives and the Client's Commissioning Adviser will only witness the proceedings,confirm the recorded results and determine whether the specified requirements have been met.

9. DUTIES OF CONSULTING ENGINEERS WITH REFERENCE TO ENGINEERING SERVICES COMMISSIONING (FULL COMMISSION IN ACCORDANCE WITH ACE AGREEMENTS)

A consulting engineer is expected to accept total responsibility for his design. It is now the practice for all Clients to insist that a Consultant signs a certificate to the effect that the design has been checked by responsible members of the Practice, independent of the scheme designer. Even where the Practice has been instructed to follow a certain design philosophy it is none-the-less their responsibility to ensure that the instructed design is completed in full accord with published guidance such as Health Technical Memoranda, Model Specifications, Practice Notes issued by the Client for whom they are working and accepted design procedures.

It must therefore be the responsibility of the Practice to prove that the design and construction meets the design requirements and brief as specified by the Client, that the plant functions in accordance with its specified requirements and to demonstrate to the client that these requirements have been attained in all respects.

For these reasons the Consulting Engineer must accept responsibility for the full commissioning of the system he has designed.

He would be expected to follow established procedures and must carry out the following duties:-

- Instruct the appropriate contractor to set the plant to work ensuring that all items of plant perform the specified duties, that the system is installed as per drawings and that the performance specified by the designer has been achieved.

This must include the balancing of the systems as appropriate and the adjustment of controls, regulating valves, dampers, etc. to achieve the required results.

- Once the contractor has satisfied himself that the requirements outlined have been met he should then offer the plant to the consulting engineer, as designer, to witness that the required results have been realised.

- Dependent upon the policy adopted by the Client concerned, the demonstrations may be witnessed by the Consulting Engineer with the Client's Commissioning Advisor in attendance, or by the Consulting Engineer who, once he is satisfied with the system, may separately demonstrate to the Client's Commissioning Advisor the whole, or selected sections of the plant as instructed.

- At the time of demonstration the Consulting Engineer must make available to the Client's Commissioning Advisor, all test log sheets, completed Final Acceptance Record Sheets and the appropriate calculations necessary to prove the final results.

- The Final Acceptance Record Sheets should be signed by the Consulting Engineers and countersigned by the Client's Commissioning Advisor once he is satisfied with the demonstration and is willing to accept the plant as fit for its intended purpose.

- These sheets then form part of the documents passed to the Client at handover. If the Contractor is unable to bring the plant to a state where it can be shown to meet the required duty he should advise the Consulting Engineer who will then be responsible for making any necessary checks on the installation, must satisfy himself with regard to control settings and investigate any performance deficiencies.

- If the Consulting Engineer is satisfied as regards the installation of the system and that correct plant balancing is achieved, he should advise the Client's Commissioning Advisor that an investigation of the design is required.

- Although it is the sole responsibility of the Consulting Engineer to carry any design investigation required and to issue appropriate instructions as to plant modification, he should keep the Client advised. Some Clients have established the practice of requiring that their Commissioning Advisor is part of the team investigating the performance deficiencies and where this is so then it is the Consulting Engineers' responsibility to arrange for the necessary consultation process.

None the less it must be the Consulting Engineers' responsibility to decide on the design modifcations necessary or to make any essential changes to plant duties. The Commissioning Advisor cannot be party to any such discussions without diminishing the Consulting Engineers' responsibility.

- Where protracted delays to project completion occur through delays in reaching decisions as to design deficiencies or inadequate plant performance, then the Client concerned may decide that it is necessary to instruct the Consulting Engineer as to his future actions. Where this occurs it is still the responsibility of the Consulting Engineer to make any modifications or design changes in accordance with established and accepted design procedures and the fact that he has been instructed as regards the work must not diminish his responsibility for calculations, instructing contractors, etc. or from carrying out the commissioning procedures outlined above.

- The Consulting Engineer must follow the guidance given in the appropriate sections of this document as regards the duties of the various parties concerned in the commissioning process, the required notice of the intention to demonstrate plant and also comply with the procedures given for the commissioning of the appropriate service or item of plant.

- Should the Consulting Engineer be commissioned to carry out certain specified duties only then his responsibility for commissioning must be defined and mutually agreed before any engagement agreement is formally signed.

10. COMMISSIONING PERIOD

It is essential in any contract to ensure that the programme for the construction allows adequate time to properly complete the commissioning of the engineering services.

This generally proves difficult and it is common practice, where contracts are over-running, that the main contractor will endeavour to curtail the commissioning period. It is essential that the engineering sub-contractors, the Project Engineer and the Commissioning Engineer use their best endeavours to resist such proposals.

As a guide to the time required to properly commission the services the attached graph has been prepared.

The graph (Fig.1) is based on some 200 schemes of various values and complexity and is applicable to Health Care projects.

The time shown is based on the Sub-Contractors required period to set the system to work, balance the system and carry out his own tests, together with the time required by the Commissioning Advisor to witness test the system.

Every endeavour should be made, when preparing the construction programme, that the time indicated is included as a minimum period for commissioning.

Figure 1

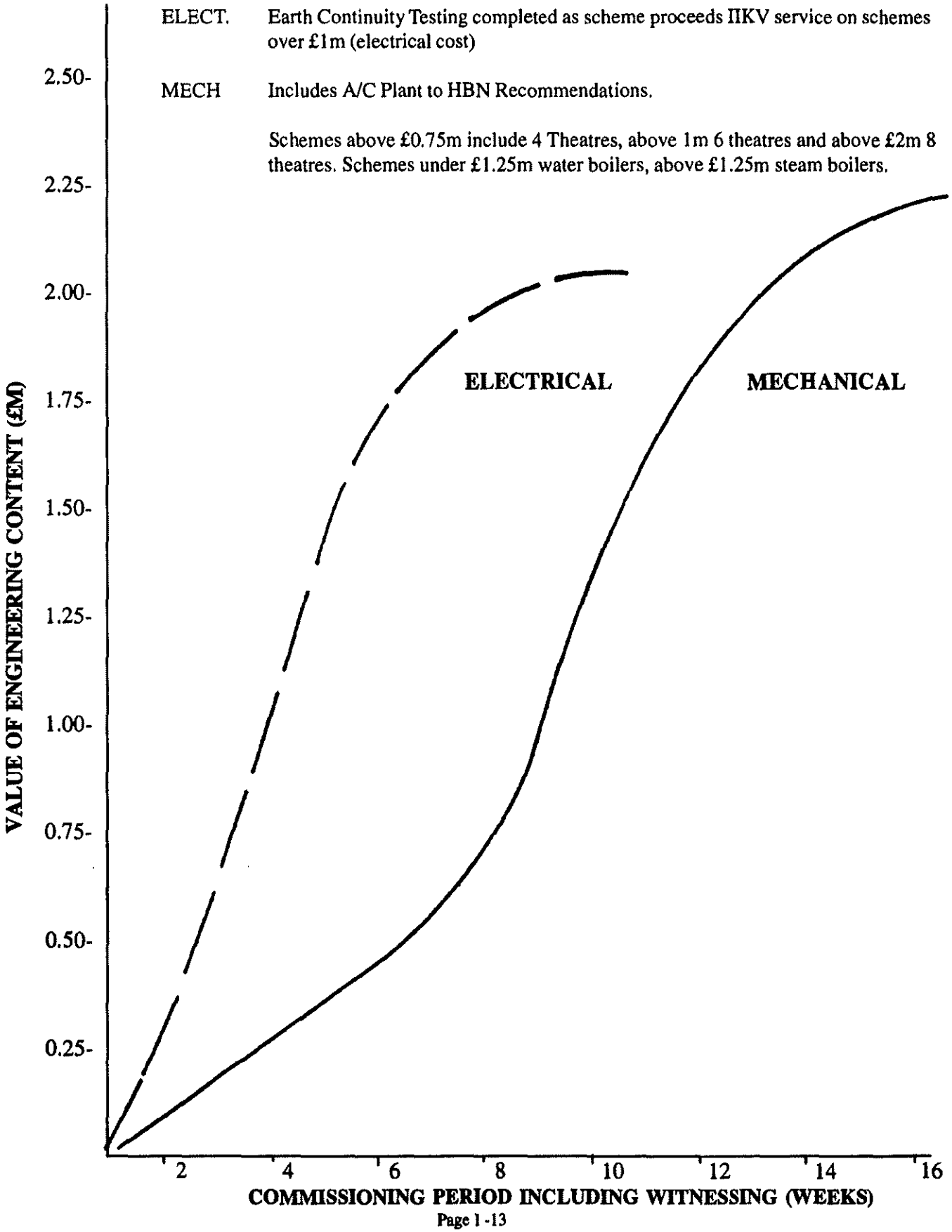
ASSESSMENT OF COMMISSIONING PERIOD REQUIRED FOR VARIABLE VALUE ENGINEERING SCHEMES

Note:- The time quoted is applicable to the service shown (i.e.. more). It assumes no modification and consequential re-testing is required. Where more than one service is involved it assumed their commissioning will proceed coincidentally and the longest period required will govern programme time.

ELECT. Earth Continuity Testing completed as scheme proceeds IIKV service on schemes over £1m (electrical cost)

MECH Includes A/C Plant to HBN Recommendations.

Schemes above £0.75m include 4 Theatres, above 1m 6 theatres and above £2m 8 theatres. Schemes under £1.25m water boilers, above £1.25m steam boilers.



A52825963

11. OPERATING INSTRUCTIONS

Information that should be provided in the various sections of the SERVICE MANUAL is detailed below:-

11.1 Section 1 (Operating Instructions for Technical Staff)

- Name/title/description of equipment to which it applies.
- Index of Contents.
- Procedures for starting up, shutting down, operational testing and emergency.
- Health and Safety measures to be taken, including the use of personal protective equipment.
- On-line conditions.

To be illustrated wherever necessary with simple drawings/sketches/diagrams and emphasis laid on all safety aspects.

11.2 Section 2 (Operating Instructions for Non-Technical Staff)

Relevant instructions extracted from Section 1 in non-technical terminology illustrated by sketches, drawings, photographs, etc generally in accordance with a sample document available for inspection. These instructions shall be separately prepared for **all** plant and equipment used and operated by nursing, medical, janitorial, clerical and other non-engineering staff, ie heating, ventilation, light, power, communications, alarm systems, sterilisers, autoclaves, bed-pan washers/disposers, kitchen and laboratory equipment, refrigerators, lifts, incinerators, lotion cupboards, transportation systems etc., etc., and special emphasis shall be laid upon all aspects of safety.

The instructions shall be on Plastic Sheets (Trafellite) or on robust paper of A5 size in transparent plastic pockets with suitable means of attachment to individual plant and equipment.

11.3 Section 3 (Design Intent - Safety)

11.3.1 Description and relevant details of:-

- Uses that have been made in the engineering works of dangerous, flammable or noxious materials e.g. asbestos, glass fibre, certain plastics, mercury, etc.,
- Provisions made for handling of dangerous, noxious, flammable, etc., materials in the operational processes of the hospital, e.g. transport routes, mixing areas, ventilation, pumping, storage, etc.,
- Provisions made for lifting and handling plant and equipment, e.g. transport routes, access openings, hoists, jacks, ladders, lifts and tackle, etc.,
- Provisions made for fire prevention, containment and control, e.g. details of built in fire prevention measures and general philosophy of alarms and other measures.
- Provisions made for prevention of electric shock and safety in switching electricity supplies with special attention to H.V.
- Any provisions for the prevention of injury to operatives and maintainers not contained in the operating instructions at Sections 1 and 2.

11.3.2 Copies of all safety notices supplied, giving their locations.

11.3.3 A list of the relevant Acts of Parliament, Bye-Laws and Regulations etc., relevant to the Project.

11.4 Section 4 (Design intent - system performance)

To be compiled for each system, sub-system or equipment designated:

- Index of contents.
- Explanation of design intent and general philosophy.
- Line and schematic diagrams to illustrate design intent and provide specific information of design performances required; include manufacturers' performance curves.
- Explanation of agreed methods of testing and details of equipment provided for this purpose in the specifications e.g., orifice plates, venturis, regulating valves, tappings, test holes, measuring stations, recorders, meters, sampling points, etc.
- Schematic control plans giving details of media conditions required, set points, sensor locations, psychormetric charts and schedules of control equipment used. Sufficient information should be provided to enable the Commissioning Engineer to set up according to designer's intent and to ensure that the Commissioning Advisor is able to confirm this.
- Plant/Equipment details, e.g. make, model, type, serial number, capacity, etc., or hospital plant numbers cross referenced to Section 6 (Plant/Equipment Inventory).
- Selected Design and Test Performance Data Sheets (DTPDS) with appropriate details of design performance entered in spaces provided. (Test results will be entered alongside these by the Commissioning Engineer).

11.5 Section 5 (Management Information)

- Index of Contents
- Heated Volumes of buildings
- Installed heating loads in Gj per hour for each category of heating, ventilation and air conditioning plant.
- Estimated daily consumption of domestic hot and cold water in litres/day.
- Installed electrical loads and estimated maximum demands and consumption.
- Estimated gas consumption in therms per year.
- Estimated medical gases consumption in litres per year.
- Numbers of hot and cold water draw off points.

- Numbers of hose/hydrant points.
- Numbers of gas, medical gas, compressed air draw off points.
- Numbers of grilles and diffusers.
- Compressor (air), vacuum pump, refrigeration plant and emergency generator ratings.
- Numbers of electrical power outlets, number of fixed equipment items of 1 h.p. and above, number of fixed equipment items of less than 1 h.p..
    - Number of fluorescent and/or tungsten lamps.
    - Number of beds and Nurses' control points of communications service.
    - Number and rating of electric motors.

Note:

Data used in SECAD, HEVACOMP PROGRAMMES MAY ASSIST IN PROVIDING THE ABOVE.

11.6 Section 6 (Plant/equipment inventory)

- Index of contents
- Contract information
- Inventories of all plant and equipment provided in the contract, showing:-

Manufacturer, model, type, serial number, capacity, year of manufacture, installation date, estimated installed cost, location, drawing and Service Manual references and hospital numbers (if available).

11.7 Section 7 (Lubrication instructions)

- Index of contents
- Hospital plant numbers, make, type, model, etc.
- Minimum Grades of lubricant recommended by all major lubricant manufacturers
- Quantities and packs
- Change/application/top-up periods

11.8 Section 8 (Repair and maintenance instructions

- Index of contents
- Contract information
- Plant/equipment Service Manuals for each individual item comprising the whole works

- Assembly and dismantling instructions - safety aspects
- Lists of special tools required for assembly and dismantling
- Lists of maintenance equipment provided in the contract
- Valve charts and schedules
- Lists of portable test instruments provided in the contract
- Lists of spare plant/equipment assemblies provided in the contract (e.g., electric motors)
- Pipe colour codings
- Copies of all charts and diagrams provided for the works
- Summary of manufacturers' maintenance requirements extracted from item (iii) above.

11.9 Section 9 (Spare parts and stores information)

- Index of contents
- Contract information
- Manufacturers' spare parts catalogues for all plant and equipment
- Ordering instructions giving addresses and telephone numbers of agencies/distributors etc.
- Recommended parts holdings with costs
- Lists of fast moving parts
- Lists of parts provided in the contract

11.10 Section 10 (General Information)

- Index of contents
- Contract information
- The works specification
- List of 'as fitted' drawings provided
- The 'as fitted' drawings listed
- Copies of manufacturers' and insurance companies' Test Certificates
- Copies of local authority, fire officer, factory inspectorate, gas/water/electricity board clearances and inspection reports
- Warranty, defects and liabilities information
- Maintenance contract information (if required)
- Full details of outstanding plant modifications recommended by manufacturers

11.11 Section 11 (Instruction and demonstration log)

A record of training and instruction provided to Client/User staff, containing:-

- Names of instructors and their employers
- Names and grades of those instructed
- Duration and dates of periods of instruction
- Plant/equipment on which instruction was given
- Record of absenteeism
- Supervising Officer's remarks regarding effectiveness of instructions given

Note: It should be noted that the majority of the above information is contained within the Typical Specification Clauses Applicable to Commissioning. However, the outline given is to enable Organisations preparing their own specifications or separate Commissioning Documents to ensure all essential matters are included.

12. SPECIFICATION CLAUSES APPLICABLE TO COMMISSIONING

The attached Clauses (Annex A) have been taken from the Specification for a major scheme which was successfully commissioned and completed to programme.

It will be appreciated that anyone using the Specification will need to review the Clauses and select those applicable to the scheme being undertaken.

Similarly Clients may have specific requirements in their contract procedures which will require the example attached to be reviewed and applicable clauses abstracted.

It is, however, advisable to include the technical clauses in the specification as these have been proved to be satisfactory and acceptable to both Main and Sub Contractors.

Some clauses included are optional and the Project Engineer/Client must decide whether or not these are to be included and if so the form they shall take.

ANNEX A

TYPICAL SPECIFICATION CLAUSES APPLICABLE TO ENGINEERING SERVICES COMMISSIONING

Commissioning

General

This section amplifies the specification clauses and shall complement these sections as specified and the Contractor shall commission all the Works as specified to the approval of the Project Engineer.

The Sub-Contractor shall commission the works in accordance with subsequent clauses of the specification and shall note the roles and responsibilities given in this document and he shall be responsible for carrying out the testing, commissioning and demonstration of the engineering installations, as described in this specification and shown on the tender drawings or shall appoint an independent commissioning engineer to undertake on behalf of the sub-contractor, testing, commissioning and demonstration of the installed plant, equipment and services and ensure that the Sub-Contractors specialist supplier and installers plant and equipment is satisfactorily tested commissioned and demonstrated. The independent firm of commissioning engineers shall be as nominated and/or selected from the list of suitable companies listed in subsequent guidance.

He shall employ methods laid down in the Commissioning Codes, British Standard Codes of Practice, current edition of the Institution of Electrical Engineers guidance and other authoritative nationally accepted codes or standards, where such methods are not in conflict with the requirements of this specification.

It must be noted that the Main Contractor is to appoint an engineering co-ordinator who shall co-ordinate the testing, commissioning and demonstration of engineering plant equipment and services installed under this and all other Sub-Contract works. The Sub-Contractor's commissioning engineer shall liaise with the engineering co-ordinator in all matters relating to sequencing and programming of the commissioning, pre-acceptance and final acceptance testing processes.

He shall provide such additional assistance, competent labour, materials, lubricants, specified by the makers, and such other equipment as may be required, and reasonably demanded, to carry out the tests.

If in any doubt as to the precise manner in which he shall carry out any of the commissioning procedures specified, seek clarification at the time of tender, as no additional costs will be allowed on the grounds of misunderstanding.

The Commissioning Engineer either as a staff member of the Sub-Contractor concerned or as an independent commissioning specialist, shall be responsible for providing all test instrumentation required. The test instrumentation shall be of a type and model approved by the Project Engineer. The Sub-Contractor prior to commencing commissioning shall provide, for examination by the Commissioning Advisor, current calibration certificates for all equipment he proposes to use during the commissioning process.

Commissioning Procedures

The Sub-Contractor shall complete the works correctly to a pre-arranged programme in a systematic and progressive manner so that at the time of handover, all testing, setting to work, commissioning, final acceptance testing, record drawings operating and maintenance manuals and demonstrations of the works to the project engineer, the clients commissioning advisor and the Health Authority representatives shall have been successfully completed in accordance with the appropriate commissioning advice.

The commissioning procedure shall comprise:-

- visual checks and examination by the Project Engineer of the works during construction, including materials, workmanship and network of installations and be subject to continuous examination and review by the Site Engineer(s) appointed to the Contract.

- tests during construction and/or manufacture of sections of the Works and/or items of plant which shall be carried out by the Sub-Contractor and witnessed by the Project Engineer or his representative. These tests include hydraulic pressure tests on pipework as detailed, earth continuity tests and insulation resistance test as detailed in the IEE Wiring Regulations etc.

- energising electrical installations, setting into motion of plant and equipment, verifying the operation of controls, safety devices and alarms, regulating of flow qualities and the setting of controls within specified limits and the setting up of gas, steam and electrical equipment etc as necessary for the operation of installed equipment.

- pre-acceptance testing of the works by the Sub-Contractor when each installation is operated as an integrated whole and is regulated, balanced, set to work, proved and brought to operational status in accordance with design and manufacturer requirements.

- final acceptance testing of the works by the Sub-Contractor when each installation is operated as an integrated whole and is witnessed by the Project Engineer and the Client's Commissioning Advisor in accordance with specified requirements. During this period the Project Engineer will also carry out final acceptance checks and examinations.
- provision of service manuals, documentation and demonstration of the works to the Authority staff.

- As an immediate preliminary to the setting to work of the installations, the Sub-Contractor's Commissioning Engineer shall carry out a full check and inspection to confirm that the installation and its components are in a safe and satisfactory condition. The Commissioning Engineer shall verify that all statutory notices are displayed and that arrangements have been made so that installations may be safely commissioned.

- when this process has been completed the Commissioning Engineer shall proceed to set the installation to work, adjust and regulate these as necessary in accordance with the contract requirements, seeking advice from the Commissioning Advisor should operational problems be indentified which inhibit satisfactory commissioning.

Final Acceptance Tests and Checks

The Sub-Contractor shall:

- note that this section includes a set of Final Acceptance Test sheets which are to be completed in accordance with the Commissioning guidance. He shall provide any additional Final Acceptance Test sheets that are necessary to complete commissioning.

- note that these schedules are based on Commissioning Manuals issued and guidance provided in the appropriate sections of the Commissioning manuals.

- aquaint himself fully with the requirements of the Schedules and return them with this tender and address queries arising from examination of these schedules to the Project Engineer.

- note that the results of the Final Acceptance Tests and Checks will be recorded, initialled and dated in the space provided against each test and checked, by the Commissioning Advisor.

- agree with the Project Engineer and the Commissioning Advisor with regard to the issue of Commissioning Documentation and Final Acceptance Record Sheets.

Test Instruments

The Sub-Contractor shall:

- provide all instruments and test equipment required to commission the Works and properly trained personnel competent in the use of the instruments.

- use correctly calibrated and certified instruments and provide evidence that the instruments have been calibrated by an Approved Authority within three month's prior to being used. The certificates shall be subject to examination by the Commissioning Advisor.

- arrange and pay for any instrument to be re-calibrated by an Authorised Standardising Laboratory if the Commissioning Advisor considers that the instrument is suspected of being out of calibration.

Testing in Sections

The Sub-Contractor shall:-

allow for testing the work in sections to comply with the building programme of work.

provide at least 5 Working Days notice to the Project Engineer prior to the testing of sections.

note that testing in sections does not eliminate the need for tests on completed systems.

Testing on Contractor's Premises

The Sub-Contractor shall:-

where the Contract requires tests on the premises of the Contractor or Specialist Supplier/Installer provide free of charge such assistance, competent labour, materials, electricity, fuel, stores, stationery, lubricants, tools and equipment as may be required and as may be reasonably demanded to carry out the tests efficiently.

notify the Project Engineer of the availability of equipment for examination and testing having assured himself that the equipment is ready and available. He shall give a minimum of 7 days notice to the Project Engineer.

where a visit to a Specialist Supplier proves abortive through a failure by the Sub-Contractor to assure himself that the equipment is ready for test then the Sub-Contractor shall be responsible for expenses incurred by the Project Engineer making the abortive visit(s).

Attendance and Notices

The Sub-Contractor shall:-

note that the Project Engineer shall be entitled at all reasonable times during manufacture to inspect, examine and test on the Contractor's premises, the materials and workmanship of all plant and equipment under the contract if part of the said plant and equipment is being manufactured elsewhere, the Contractor shall obtain permission for the Engineer to inspect, examine and test as if the said plant and equipment were being manufactured on the Contractor's premises.

such inspections examinations or testing, if made, shall not release the Sub-Contractor from any obligation under this Contract.

give the Project Engineer fourteen days notice in writing, of the date after which he will be ready to make the Final Acceptance Tests and the tests shall take place on such day or days as agreed with the Project Engineer and the Commissioning Advisor who will require to attend all final tests, examinations etc.

if after arrangements have been agreed the Sub-Contractor fails to complete such tests for reasons other than design faults which inhibit commissioning, then he shall be responsible for all expenses incurred in making the abortive visit(s).

Penalties, Failure and Rejection

The Sub-contractor shall:-

note that if any test is postponed or abandoned by the Sub-Contractor after obtaining the presence of the Commissioning Advisor on the site, due to failure to provide adequate and proper testing equipment, staff and services, tests of part or all works concerned shall be repeated within a reasonable time upon the same terms and conditions, save that all expense to which the employer may be put, by the repetition of the tests, shall be deducted from the Contract Price.

note that if after inspection, examining or testing the works, the Project Engineer and/or Commissioning Advisor shall decide that such works or any part thereof is defective, or not in accordance with the Contract, he may reject the said Works or part thereof by giving the Contractor notice in writing of such rejection, stating therein the grounds upon which the said decision is based.

Costs of Commissioning

The Sub-Contractor shall:-

allow in his Tender Price for all costs involved in carrying out the pre-commissioning procedures described in this specification and other related documents. The costs arising from carrying out the pre-commissioning and commissioning procedure shall be inclusive in the rates for services, plant and equipment installations in the bills of quantities.

Programme of Commissioning

The Sub-Contractor shall:-

allow for all commissioning procedures to be completed to the Project Engineer's satisfaction within the Commissioning Period and shall note that the commissioning period referred to in this specification is the period in which the engineering systems will be advanced from a state of completion through the commissioning process and final acceptance testing to practical completion.

note that pre-commissioning and testing will commence at the beginning of the contract with the inspections of installations as their installation and construction proceeds.

liaise and co-operate with all other Sub-Contractors, specialist suppliers and installers and the engineering co-ordinator and shall produce a detailed programme for testing, commissioning and demonstrating activities. The programme shall incorporate the requirements of the master programme and the main contractor preliminaries and shall identify key dates for witnessing of final acceptance tests. They shall be submitted at least 6 months prior to the commencement of the commissioning period.

Documentation

General

The project shall be fully documented to record the design intent, commissioning, operation and maintenance information for all engineering services and equipment. This information shall be presented in ten separate sections of a comprehensive "Service Manual" as described.

The Sub-Contractor shall:-

- be responsible for the preparation of the complete document as described.
- prepare a draft document for the approval of the Project Engineer prior to final issue.
- include data provided by the Project Engineer which is only available as part of the design information.
- in producing the documentation use the information made available as part of the Contract.
- provide the manual in accordance with the appropriate instructions contained in the Commissioning guidance documents.

Service Manual

The Sub-Contractor shall:-

- provide the Service Manual covering all services and major items of equipment (Group 1 category).
- make available the Service Manual in draft for use throughout the commissioning periods of the sections within the programme, complete the Service manual during the period of the last section of the programme.
- complete the sections of the Service Manual that depend on commissioning data within four weeks of the completion of the commissioning.

The Service Manual shall be subject to examination by the Client's Operations and Maintenance Manager and if unsatisfactory to him shall be revised and amended as instructed.

Where applicable Record Drawings of the installation as installed and constructed shall be included within the Service Manual.

Unless special circumstances apply or occur Service Manuals shall be made available to the Client at or immediately prior to handover.

It shall be noted that the Service Manual comprises the following sections prepared by the Sub-Contractor:-

- Operating Instructions
- Safety Information
- Design Intent and Performance*
- Management Information
- Plant and Equipment Inventory
- Lubrication Instructions

- Repair and Maintenance Instructions
- Spare Parts and Stores Information
- General Information
- Training and Demonstration Log

* For this section the Engineer will provide information to the Contractor which is not already available as part of the Contract documents.

Operating Instructions - Section 1

The Sub-Contractor shall:-

provide Operating Instructions and allow for this section of the Service Manual to be produced in several volumes, each volume arranged in main sections of works such as (a) Standby Generator Plant, (b) Air Handling Plant, (c) Controls, (d) Medical Gases, (e) Hospital Equipment etc.

Each section of the Service Manual shall include the following information:-

- Name/Title/Description of equipment to which it applies.

- Index of Contents.

- Procedures for starting up, shutting down, operating and testing of the equipment.

- Emergency procedures.

- Health and Safety measures to be taken, including the use of Personal Protective Equipment.

The document shall be complete with schematic line diagrams of the works, sketches and drawings which shall also emphasise all safety aspects.

Where applicable each section of the Instructions shall include a separate sub-section which shall incorporate instructions for non-technical staff. Relevant instructions shall be extracted from the body of Section 1 using non-technical terminology illustrated by sketches, drawings, photographs etc. Instructions shall be separately prepared for all plant and equipment used and operated by nursing, medical, janitorial, clerical and other non-engineering staff, examples of which are: heating, ventilation, lighting, power, communications, alarm systems, sterilizers, bedpan washers, kitchen equipment etc. Special emphasis shall be paid to ensure the safety of non-technical staff who may operate or adjust plant and equipment.

Safety Information - Section 2

The Sub-Contractor shall provide the maximum of safety information and guidance which shall include the following:-

- Description and relevant details of:-

- uses that have been made in the Engineering Works of dangerous, flammable, noxious materials eg. asbestos, glass fibre, certain plastics, mercury, etc.

- provisions made for handling of dangerous, noxious, flammable etc., materials in the operational processes of the Hospital, eg: transport routes, mixing areas, ventilation, pumping, storage etc.

- provisions made for lifting and handling plant and equipment eg. transport routes, access openings, hoists, jacks, ladders, lifts and tackle etc. ensuring all equipment is clearly marked with the maximum loads it can safely handle as agreed with the Insurance Inspectors.

- provisions made for fire prevention, containment and control eg. details of built-in fire prevention measures and general philosophy of alarm and other measures.

- provisions made for prevention of electric shock and safety in switching electricity supplies with special attention to H.V., ensuring that safety posters, life saving instructions etc are clearly installed adjacent to the plant.

- any provisions for the prevention of injury to operatives and maintenance staff not contained in the Operating Instructions - Section 1.

- Copies of all safety notices supplied, giving their locations.

- A list of the relevant Acts of Parliament, Item Regulations and Codes of Practice, Bye-Laws and Regulations etc., applicable to the Project.

Design Intent and Performance - Section 3

The Sub-Contractor shall, following agreement with the Project Engineer, provide and compile the following information for each system, sub-system or equipment:-

- Index of Contents.

- Explanation of design intent and general philosophy.

- Line and schematic diagrams to illustrate design intent and provide specific information of design performance required, including manufacturer's performance curves.

- Explanation of agreed methods of testing and details of equipment provided for this purpose in the specification, eg. orifice plates, venturis, regulating valves, tappings, test holes, measuring stations, recorders, meters, sampling points etc.

- Schematic control plans giving details of environmental conditions required, set points, sensor locations, psychrometric charts and schedules of control equipment used. Sufficient information will be provided to enable the Commissioning Engineer to set up according to design intent and for the Operations and Maintenance Manager to adjust or reset conditions as required.

- Plant/equipment details eg. make, model, type, serial number, capacity etc.

- Selected Design and Test Performance Data Sheets (DTPDS) with appropriate details of design performance entered in spaces provided (test results shall be entered alongside these by the Sub-Contractor/Commissioning Engineer).

- Copies of Final Acceptance Record Sheets recording the witnessed performance accepted during commissioning. (Note this is an optional clause which the Project Engineer shall decide whether it is to be included).

Management Information - Section 4

The Sub-Contractor shall provide a Management Manual which includes the following:-

- Index of Contents.
- Volumes of heated buildings.
- Installed heating loads in Kw for each category of heating, ventilation and air conditioning plant.
- Estimated daily consumptions of domestic hot and cold water in litres/day.
- Installed electrical loads and estimated maximum demands and consumption.
- Estimated medical gases consumption in litres per year.
- Numbers of hot and cold water draw-off points.
- Numbers of hose/hydrant points.
- Numbers of gas, medical gas, compressed air draw-off points.
- Numbers of grilles and diffusers.
- Compressor (air), vacuum pump, refrigeration plant and emergency generator ratings.
- Number of electrical power outlets, number of fixed equipment items of 1 h.p. and above; number of fixed equipment items of less than 1 h.p.
- Number of beds.
- Number and rating of electric motors.
- Numbers of fluorescent, tungsten and other lamps.
- Number of bed and nurse's control panels of communications services.

Plant/Equipment Inventory - Section 5

(Note: This is a further optional clause which the Project Engineer will decide whether it requires inclusion

The Sub-Contractor shall provide the following as the Inventory of Installed Plant and Equipment:-

- Index of Contents
- Contract Information
- Inventories of all plant and equipment provided in the contract, showing:

Manufacturer, model, type, serial number, capacity, year of manufacture, installation date, location, drawing and Service Manual references, hospital numbers.

Lubrication Instructions - Section 6

The Sub-Contractor shall:-

- provide number sets of lubricating instructions which shall be produced pocket size using plastic covers and waterproof paper. This section of the Service Manual shall comprise the following:-
- Index of Contents
- Hospital plant numbers, make, type, model etc.
- Grades of lubricant recommended by all major lubricant manufacturers.
- Quantities
- Change/application/top-up periods

Repair and Maintenance Instructions - Section 7

The Sub-Contractor shall provide a Plant & Equipment Maintenance Manual which includes the following:-

- Index of Contents
- Contract Information
- Plant/Equipment Service Manual for each individual item comprising the whole work.
- Assembly and dismantling instructions - safety aspects.
- Lists of special tools required for (6).
- Lists of maintenance equipment provided under the Contract.
- Valve charts and schedules (including valve set position).
- Lists of portable test instruments provided in the Contract.
- Lists of spare plant/equipment assemblies provided in the Contract.
- Pipe colour codings.
- Copies of all charts and diagrams provided in the works.
- Summary of manufacturer's maintenance requirements extracted from Plant/Equipment Service Manual above.

Spare Parts and Stores Information - Section 8

The Sub-Contractor shall provide the following:-

- Index of Contents

- Contract Information
- Manufacturer's spare parts catalogues
- Ordering instructions giving addresses and telephone numbers of agencies/distributor's etc.
- Recommended parts holding with costs.
- Lists of fast moving parts.

(Note: The Project Engineer is to decide and instruct whether the above information is to be provided by separate manuals or included as part of the Service Manuals for the installation).

- Lists of parts provided in the contract.

General Information - Manual - Section 9

The Sub-Contractor shall provide a General Information Manual covering his installation which shall include the following:-

- Index of Contents
- Contract Information
- The Works specification
- List of "as fitted" drawings provided.
- The "as fitted" drawings listed at (4). Within a separate A3 size binder.
- Copies of manufacturer's and insurance companies' "Test Certificates".
- Copies of Local Authority, Fire Authority, Factory Inspectors, Gas/Water/Electricity Authority clearances and inspection reports.
- Warranty, defects and liabilities information.
- Maintenance contract information (if required).
- Full details of outstanding plant modifications recommended by manufacturers.

Training and Demonstration Log - Section 10

The Sub-Contractor shall provide the following:-

- Name of instructors and their employers
- Names and grades of those instructed
- Duration and dates of periods of instruction
- Plant/Equipment in which instruction was given
- Record of absenteeism

- Instructor's remarks regarding effectiveness of instructions given.

(Note: The above clauses are optional and it must be decided whether these sections are required and if so whether they are to be provided in the form of separate manuals or included in the Service Manual).

Pressure Tests

The Sub-Contractor shall pressure test all equipment/pipework and fittings in accordance with the following requirements:-

- carry out pressure tests in sections as required by the installation and programme of works.
- pressure test the complete system
- refer to schedules of hydraulic and pneumatic test pressures and accompanying notes as given in the specification.

Such tests shall be carried out under the supervision of and to the instructions of the Senior Site Engineer. The Site Engineer shall witness all such tests and sign the appropriate documents required under the contract.

Schedule Notes

When testing installations incorporating expansion joints one of the following procedures shall be followed:-

a) Limit movement of expansion joint flanged by use of tie bolts.

b) Remove expansion joints and replace with temporary pipe.

c) Blank off expansion joint using a temporary slip blank.

If the test pressure is to exceed 1.5 times the working pressure for which the expansion joint is designed, Methods b or c shall be used.

Care shall be taken to ensure that the action a, b, or c taken for test purpose is corrected immediately after test.

All pipework concealed in the building structure, fixed behind partitions or false ceilings, in roof spaces, in trenches or buried shall, in addition to the following applicable tests, be pressure tested and passed as satisfactory before concealment.

All tests shall be carried out and approved before any paint, thermal insulation or similar cladding is applied.

Vacuum systems shall than be dried out by operation of plant and then exhausted to a vacuum of 210 mmHg absolute and, after initial drying out of the pipelines, the pressure should not increase by more than 1 mmHg in one hour. The pressure shall be held for 24 hours and any pressure rise in excess of 1 mmHg per hour indicates need for remedial works and further tests.

Design and Test Pressures

The Sub-Contractor shall test pipe work, fittings etc. to the following Static, Dynamic and Test Pressures as listed and specified by the Design Engineer.

Service	Static Pressure	Dynamic Pressure	Test Pressure
Incoming Mains Cold Water Service			
Hose Reel Main			
Mains C.W.S. (Treated)			
Mains C.W.S. (Untreated)			
Charged Riser			
H.W.S.			
H.T.H.W. Heating Mains			
L.T.H.W. Heating Mains			
Chilled Water Installation			
Steam Mains			
Condense Mains			
Gas Distribution			
Medical Gases			
Compressed Air			
Others			
Vacuum			

Air Leakage Test

The Sub-Contractor shall refer to data given regarding Mechanical Ventilation and Air Conditioning Systems.

The Mechanical Services Sub-Contractor shall include for pressure integrity tests to be carried out in order to determine the air leakage limits for each isolation/containment single bed/airlock cubicles (Number of Rooms). Pressure integrity tests shall be carried out during the commissioning period,

System Tests

The Sub-Contractor shall:

- operate each complete system subjected to the performance tests, regulation, balancing etc. in order to meet the requirements of the Specification.

- set all adjustable equipment to suit the correct balancing of the systems which shall include initial and final adjustment.

Measurements

The Sub-Contractor shall:

- in addition to the measurements called for in the Schedules of Final Acceptance Tests, allow for measuring and recording on suitable instruments during not less than a two day period, the wet and dry bulb temperatures and humidity levels in the rooms listed together with external conditions.

- carry out this work only when the systems are fully commissioned.

- position the recording devices as agreed with the Engineer for:-

- Each Plant Room

- Each Operating Room

  Each isolation/containment room

- Other areas up to a maximum of 10 areas as directed by the Project Engineer.

Test Certificates

The Sub-Contractor shall:

- provide the Project Engineer with Test Certificates to show that equipment, materials and installations have been tested as set out elsewhere in this specification.

- enter on the Authority's standard test certificate forms, site test results eg. pressure tests.

- note that the Sub-Contractor's own form of test certificates shall not be used without prior approval from the Project Engineer or Client in writing.

- provide the Project Engineer during construction with single copies of all test certificates as they are received from manufacturers and/or suppliers, and as tests are completed on site.

- provide further copies of all test certificates for inclusion in the Service Manuals.

Staff Instruction and Demonstration

The Sub-Contractor shall:-

- allow for all necessary visits to site by equipment manufacturer's representatives to ensure satisfactory completion and handover of the works.

- include for all necessary visits to carry out the following separate functions:-

- The initial setting to work and witnessing by the Sub-Contractor's Commissioning Engineer.

- The Commissioning Tests and Examinations specified in the presence of the Commissioning Advisor.

- Special separate visits as necessary to train and instruct the Hospital Staff on the maintenance of the equipment.

- Special separate visits as necessary to train and instruct the Hospital Staff on the operation of the equipment.

THE DATES AND TIMES FOR SUCH VISITS SHALL BE AGREED WITH AND ARRANGED IN CONJUNCTION WITH THE AUTHORITY'S PROJECT MANAGER FOR THE WORKS OR THE APPROPRIATE OFFICER RESPONSIBLE FOR THE DEPARTMENT CONCERNED.

Noise Level Readings

The Sub-Contractor shall:-

- during the Commissioning Period measure and record noise level readings in each octave band in the following areas:-

- All Plant Rooms

- A maximum of other areas as directed by the Project Engineer.

- The ambient at the site boundary.

Note: Outside noise levels shall be taken at positions agreed by the Engineer at times of both normal highest and normal lowest noise levels with the plant on and again with the plant off.

- take readings firstly with the plant off and secondly with the plant under load. Pass all readings to the Project Engineer on completion as a separate report on the noise analysis obtained during the specified tests.

Valve Identification

The Sub-Contractor shall:-

- provide valve identification charts which clearly indicate the position and function of each valve for each service to enable valve operation to be carried out.

- to provide in each plant room a valve chart or charts printed on high quality paper which will not fade or discolour mounted in a glass fronted, hard varnished frame on a wall, position to be agreed with the Project Engineer.

- provide a sample for approval

- provide the charts prior to the commencement of the commissioning

Notes: All double regulating valves, lockshield type globe valves/stop cocks and lockshield type radiator valves shall have the set position recorded against the valve reference in terms of the number of turns open or valve position reference number.

Valves which are covered by ceiling panels or are not visible on completion of the works shall have their position identified by means of ceiling pins, tags or such other methods as may be agreed following discussions with the appropriate officers of the Client.

Pre-Commissioning Cleaning and Final Disinfection

The Sub-Contractor shall comply with the following:-

- tubes and all items of equipment shall be delivered to site, stored and maintained in storage with their open end effectively plugged, capped or sealed.
- store all fittings, valves and sundry items in clean bins, bagged and stowed in suitable racks etc.
- all such stored items shall be maintained under weatherproof cover until they are required for incorporation in the works. Particular care shall be taken to ensure that electrical equipment and components are kept clean and dry etc. and secured under cover.
- before installations are handed over or subjected to the inspection and tests required by this specification, the entire installation shall be thoroughly cleaned both internally and externally.
- during the flushing out or scavenging process provision shall be made to exclude all plant or equipment which could be damaged by the cleaning operation.
- for Chlorination and Sterilising of water systems refer to the appropriate sections of the Specification.
- all ductwork and associated equipment shall be supplied to site with ends and apertures capped to prevent ingress of foreign matter.
- all ductwork shall be free of dust, grease and other foreign matter before and after erection. Failure to comply shall render the Contractor responsible for all costs resulting from part or total removal of the installed works.
- clean all internal ventilation ductwork surfaces once the installed works are complete. This process shall also apply to integral equipment such as heater batteries, mixing boxes, dampers airturners, cooler batteries, fans etc.
- on completion of the commissioning processes and following satisfactory completion of the final acceptance test the Mechanical Ventilation systems interior surfaces shall be disinfected. A minimum of sixty bacteriological tests shall be carried out using exposed culture media in pallets. The pallets shall after exposure be subjected to incubation and the resulting tests and counts recorded.
- if the resulting tests prove that any one or several systems exceed the normal accepted limits or contain dangerous elements, the whole system(s) shall be re-cleaned, and disinfected until satisfactory results are achieved.
- if after re-cleaning the system again fails the sterility tests, the system shall be removed to establish the offending section(s) and re-installed after correction all at Sub-Contractor's expense and the bacteriology tests repeated.
- replace any damaged part of the Works.
- paint equipment if damaged, scratched or tarnished to a standard equal to a new item of equipment.
- specific requirements for the sterilization of water mains pipework etc are given elsewhere in the Services Specification and the Sub-Contractor shall comply fully with all such instructions.

13. ACTIVITIES ASSOCIATED WITH AND ESSENTIAL TO THE PROPER COMMISSIONING OF ENGINEERING SERVICES

The chart attached (Annex B) indicates the essential activities to be completed to allow for the proper commissioning of the services.

The work must be carried out in the sequence shown if it is to proceed smoothly and with the minimum of delays or problems.

The person responsible for the various activities shown is listed. It has been found in practice that if the person indicated accepts the responsibility for the activity shown there will be minimum delay and the work will proceed to programme.

14. KEY MILESTONE DATES

This chart attached (Annex C) gives the information which it is essential to agree with the Main Contractor, the Sub Contractors, and all parties involved with the contract before finalising the programme for the contract.

The agreed dates will then form an essential part of the information required to prepare the commissioning programme.

As will be understood it is usual for the Client to assume maintenance responsibilities as from handover and the dates for Nos 10 and 11 will be coincidental.

There will, of course, be the standard defects liability period when the contractors and suppliers will be responsible for dealing with identified defects and problems identified following handover. However, the Client will of necessity accept responsibility for carrying out general maintenance such as plant lubrication and adjustment.

Care is required during the period between handover and the Client's operational date (ie opening of the facility to patients) to ensure plant is not allowed to deteriorate and that instructions as regards general maintenance requirements are correctly completed at the specified intervals.

With the current financial problems in the NHS it will be understood that this period can be protracted. In many cases it would be necessary to recommission certain items of plant and services prior to their being brought into full use. Items such as sterilizers are particularly likely to require re-commissioning.

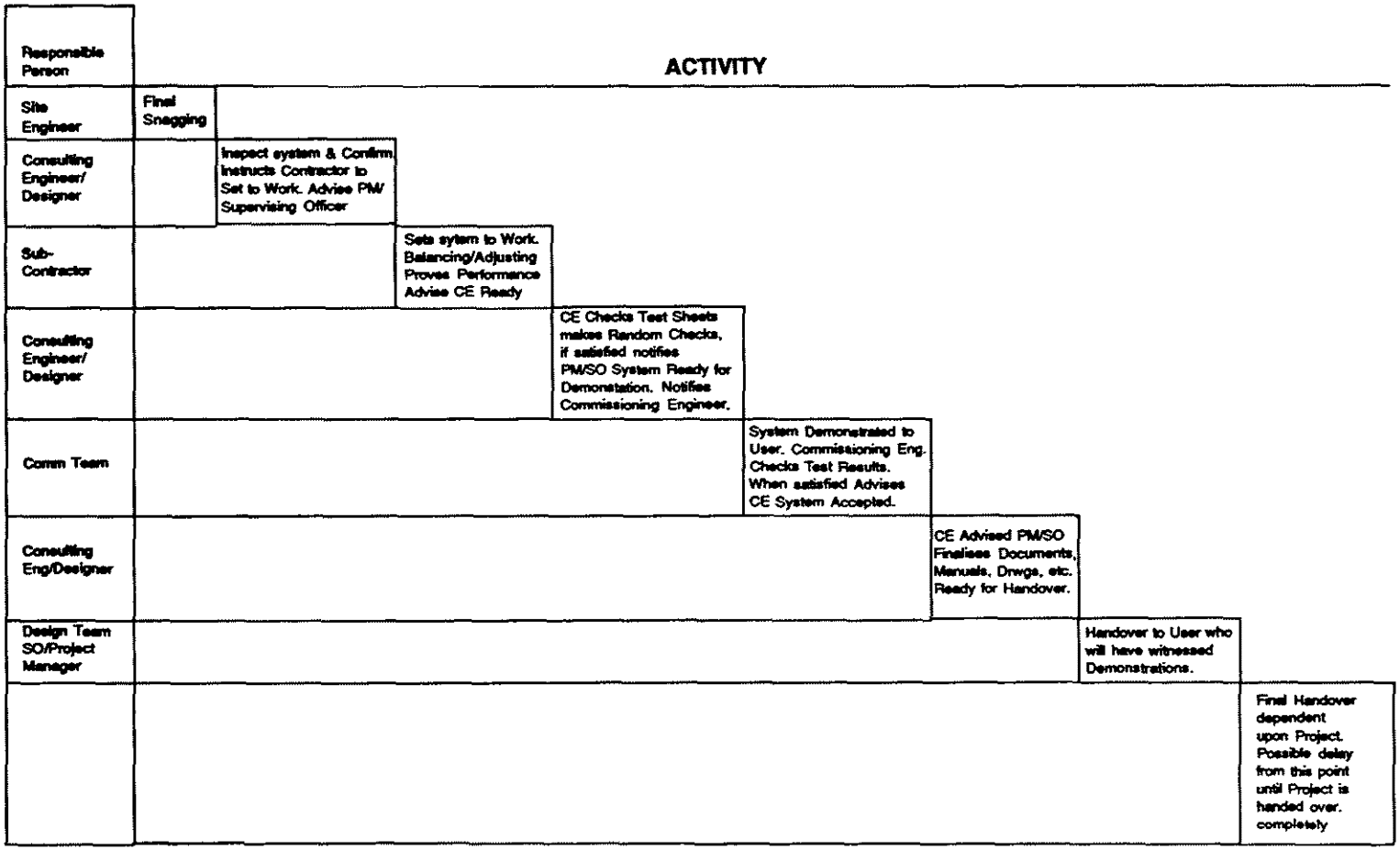
15. STAGES TO SATISFACTORY COMMISSIONING

Annex D shows the essential stages to be undertaken to achieve a satisfactory outcome to the commissioning procedures.

The sequence shown is recommended to be followed as it indicates the natural progression required and ensures all aspects of the work are noted and carried out.

In practice it has been found that Item 3 "A Good Standard of Site Control" is most essential and the Commissioning Adviser will need to maintain a close and regular liaison with the site staff. Site Staff can frequently offer advice as to potential problems and their contribution should never be under-estimated.

SETTING TO WORK/COMMISSIONING ENGINEERING SYSTEM (ASSUMES SATISFACTIORY SYSTEM)



PROGRAMME TIME DEPENDENT UPON SCHEME

Eng Value	Time	
£.5m	6 weeks)	These times indicate the need for adequate allowance to be made in the MCP.
£1.0m	10 weeks)	
£1.2m	16 weeks)	
£2m plus	20 weeks)	

KEY MILESTONE DATES - ESSENTIAL

INFORMATION FOR A COMMISSIONING PROGRAMME

1. BUILDING WORKS COMPLETION
2. M & E INSTALLATION COMPLETION
3. CLEANING COMPLETION
4. FINAL SNAGGING & PRE-COMMISSIONING CHECKS COMPLETION
5. POWER AND HEAT ON
6. PERMIT TO ENTER TO COMMISSIONING TEAM
7. BALANCING AND COMMISSIONING COMPLETION
8. MANUALS, INCLUDING COMMISSIONING RESULTS AND RECORD DRAWINGS CHECKED AND AVAILABLE FOR ISSUE
9. STAFF TRAINING
10. PRE AND FINAL HANDOVER DATES
11. CLIENT ASSUMES MAINTENANCE RESPONSIBILITIES
12. CLIENTS PROPOSED OPERATIONAL DATE

STAGES TO SATISFACTORY COMMISSIONING

1. CORRECT AND PROPERLY PREPARED BRIEF.
   This must state what the system is intended to achieve, and the required method of operation.

2. A DESIGN WHICH INTERPRETS THE BRIEF CORRECTLY AND AS THE USER INTENDED AND WHICH IS TECHNICALLY CORRECT.
   It is always advisable where a complex system is involved to discuss the draft design, and its operation with the user to ensure the designer has interpreted requirements correctly.

3. A GOOD STANDARD OF SITE CONTROL.
   This is essential to ensure the drawings and specification have been properly understood by the contractors and that systems have been installed with a good standard of workmanship in accordance with the design. Also pre-commissioning checks and static tests have been properly completed.

4. SYSTEMS ARE PROPERLY SET TO WORK WITH THE CORRECT SEQUENCING OF OPERATION.
   Guidance is provided in each section of the commissioning documents on the correct method to be used, and the required pre-commissioning checks to be carried out.

5. SYSTEM COMMISSIONING
   In accordance with the preferred methods outlined in each commissioning document

6. COMPLETION OF F.A.R. SHEETS & COMMISSIONING REPORTS
   Each commissioning document includes sample F.A.R. sheets. The completion of these and the issue of the report meets the Badenoch recommendations. These reports should be included with the Operations and Maintenance Manuals at handover

7. EXPLANATION OF RESULTS TO USERS AND TRAINING IN PLANT OPERATION.

THE INSTITUTE OF HOSPITAL ENGINEERING

ENGINEERING COMMISSIONING

Contents

Part II

COMMISSIONING PROCEDURES APPLICABLE TO MECHANICAL SERVICES AND EQUIPMENT

PART II

COMMISSIONING PROCEDURES APPLICABLE TO MECHANICAL SERVICES AND EQUIPMENT

16. INTRODUCTION TO COMMISSIONING PROCEDURES

The purpose of Part II of this manual is to establish, and conform to, a systematic set of procedures which must be followed in the testing, balancing, adjusting and setting to work of all mechanical and electrical services, equipment and systems installed as part of the contract.

The procedures outlined are applicable to the final examination, setting to work and commissioning of all air, hydraulic and electrical services installed.

In general the procedures follow those compiled and prepared by the former NHS Working Group No12 established by the former Regional Engineers Association. However, where applicable or advisable reference is made to the recommendations in use in the Building Services Industry including BSRIA and CIBSE Guides and documentation has been updated and revised to comply with current practice.

The following sections of Part 2 of the manual describe methods and procedures which, when properly executed in the sequence recommended, will ensure that all systems have been correctly balanced and are operating to their design parameters. Provided the test sheets and FAR Sheets are properly completed these will provide a fully documented set of test and commissioning information, which when included as part of the Service Manual for the system will prove of great value to the users in the future particularly where modification or extension of a system is under consideration.

Specialist plant and equipment will require to be commissioned by the manufacturer in accordance with his standard and recommended procedures.

Because of the non-standard design and operation of such plant and equipment it is probable that commissioning procedures and documentation, as described in this Part 2 of the Manual, will not be available.

It is none the less essential that all specialist manufacturer's tests are properly completed and fully documented and also form part of the Service Manuals.

The Commissioning Advisor should discuss with the manufacturer the proposed form the tests are to take and should also agree the documentation to be provided at the conclusion of commissioning.

17. COMMISSIONING DOCUMENTATION

The listing below indicates the essential inclusions to a satisfactory commissioning document.

The document may be included as part of the scheme specification or issued as a separate part of the scheme documentation.

Where the documentation is included as part of the scheme specification it is essential that it be included in both the Main Building Specification and the Engineering Specification.

It is appreciated that the Main Contractor has a positive and essential role to fulfill during commissioning and it is essential that he be aware of the client requirements.

It is also essential to include the documentation within the Engineering Specification particularly where the Engineering Sub-Contractors are nominated.

Typical Commissioning Document Contents

Inclusions with system, including advice to Design Staff.

Procedures

- Prior to commissioning
- Pre-commissioning checks
- Commissioning action

Training of User's Staff

Reports & FAR sheets:- Sample FAR sheets included.

Operations & Maintenance Manuals.

Guidance Material Appropriate to the System

(Useful sources of reference for Designers & Contractors as well as Commissioning Teams) e.g:

NHS Estates Guidance (HTM's, HBN's data sheets etc.)
British Standards
CIBSE Material
Other reports ie. Specialist Working Parties etc.
Journal articles providing useful information ie. Institute of Hospital Engineering's Journal (Health Estate Journal) etc.

18. SAFETY ASPECTS OF ENGINEERING COMMISSIONING

There are two areas of safety to be considered and for which protection is required during engineering commissioning. These are:

- Protection of staff carrying out the commissioning.
- Protection of users where the service to be commissioned forms an extension of an existing service in an operational hospital or where a new hospital or department has been brought into use prior to full commissioning.

Permit to Work System

There are mandatory requirements to operate a Permit to Work system on specified systems within operational hospitals which are fully described in existing guidance such as Health Building Notes and Health Technical Memoranda.

In particular no work is to be carried out (unless properly authorised by a Permit to Work) on:

- Medical Gas Systems which are extensions of an existing service
- High Voltage Installations

In the first case this is to protect patients who may be on life support systems which could be disrupted by the work to be carried out or where contamination of supplies could occur as the result of interference with the service.

In addition to mandatory requirements it is recommended that a Permit to Work system be instituted where testing and commissioning of any service is likely to cause disruption of supplies into an operational department. This will enable medical and nursing staff to take precautions to protect the safety of their patients or to make provision to ensure disruption of a service causes the minimum of problems likely to affect efficient operation of the Department.

It is also advisable to make Unit Works Staff aware that the Commissioning Team will be working on a given system which may involve making certain sections 'dead' for a period. Sudden restoration of service by maintenance staff who may be unaware of the activities could well cause injury to those working on the service. In particular staff working on high temperature installations such as the steam or hot water service and electrical services must be protected at all times.

Typical examples of satisfactory Permits to Work for other than mandatory requirements are attached as Appendix 1.

Where the issue of permits is a mandatory requirement it is recommended that the form of Permit given in the relevant guidance document should be used.

Issue and Withdrawal of Permits to Work

It is recommended that the Commissioning Advisor discusses and agrees with the appropriate Works Officer of the Authority, with Unit representatives and if necessary medical and nursing staff, dates for the work to be carried out and where appropriate the most convenient time to disrupt a given service.

Once there is agreement it is recommended that the Permit to Work should be issued to the Works Officer allowing him to confirm, and to advise users of the systems concerned and his unit works staff.

It will be appreciated that once work is completed and the service is ready to become operational the Permit issued must be withdrawn.

Hospital staff have drawn attention to the problems they face where failure to issue completion of work notices and withdrawal of permits occurs.

It should be the responsibility of the Commissioning Advisor to issue such notices as he will be in the best position to know whether the work has been completed satisfactorily.

19. CERTIFICATES RECOMMENDED AS PART OF SERVICES COMMISSIONING

It is essential that the commissioning of all plant and equipment is formalised and is not allowed to proceed haphazardly. This is particularly important on major contracts where commissioning involves several parties and unless a formal procedure is followed it can be that not all the parties involved are kept fully advised.

In addition some services may be connected into existing hospital services. This can involve disruption of the service and affect occupied areas of the hospital.

Unless prior notice is given problems can arise with regard to the co-operation of nursing and medical staff. In addition work in such areas is likely to require access for the Commissioning Team and again it is essential that the approval of nursing and medical staff is obtained to allow reasonable access, and at the required time.

Similarly it is necessary to advise the staff when the work is complete and no further disruptions are likely to occur.

For these reasons Permits for Access must be used on a formalised basis.

Certificates covering these important areas are attached. These certificates have been used successfully on a number of major schemes and have been found to be satisfactory.

They can, in consequence, be recommended for use. It is, of course, important to give adequate notice to hospital staff of disruptions and the requirement for access. In practice it has been found essential to give a minimum notice of 7 days.

It must be appreciated that the prime objective must be to protect patients and staff at all times whatever the procedures occurring.

Section 16 - 19

Appendix 1

CERTIFICATE OF READINESS TO COMMISSION CERTIFICATE NO

It is confirmed that the following service(s) and/or plant have been satisfactorily installed, set to work and preliminary testing and balancing has been completed.

1 .....

2 .....

3 .....

4 .....

You are hereby notified that in my opinion formal commissioning and witness testing may commence on/after .....

Please advise the date it is intended to witness test the listed services/equipment.

Signed .....

Position .....

Company .....

Date .....

I confirm that I am satisfied that services/equipment listed may be offered for witness testing.

Signed .....

Engineering Services Co-ordinator

For: ..... Main Contractor

Date: .....

I acknowledge the above notification that the listed services/equipment are ready for witness testing.

It is proposed that witness testing will commence on .....

Signed .....

Client's Commissioning Advisor

Date: .....

Circulation List:- Main Contractor, Sub Contractors M & E, Site Engineer, Quantity Surveyor, Architect, Client's Project Manager, Project Engineer.

Section 16 - 19

Appendix 2

PERMIT TO ENTER - COMMISSIONING OF ENGINEERING SERVICES

Hospital: ..... Department: .....

Permission is requested to enter the following areas

.....

.....

.....

for the purposes of commissioning of engineering services and/or plant associated with the following development .....

As a result the services listed are liable to disruption during the time/period of commissioning .....

.....

The proposed date is .....

Work to Commence at ..... Hrs

Estimated Completion Time ..... Hrs

Signed ..... Commissioning Engineer

I confirm the above work is essential to the completion of services commissioning and that the stated time of disruption is fair and reasonable.

Signed ..... Estate Manager

Date of Issue of Request .....

PERMIT TO ENTER - APPROVAL

Hospital ..... Department .....

It is confirmed that the commissioning of the listed services/equipment may take place between the hours of .....

The work may be carried out on .....

It is confirmed that the department/ward staff have been advised of the disruption and/or entry to the department.

Appropriate action has been taken to safeguard patients/service requirements and I have approved entry to the area.

These Approval/Request Forms are to be returned to me on completion of the work.

In event of any delay to completion to the work or extended disruption you are requested to advise and notify the following staff immediately.

.....
.....
.....

Signed ..... Departmental Head/Ward Nursing Officer

Date .....

for .....(Client)

Confirmed as Approved and Satisfactory

Administrator/Senior Nursing Officer .....

Date .....

Section 16 - 19

Appendix 3

NOTICE OF WITHDRAWAL OF ENTRY PERMIT

I confirm that commissioning of the following .....

at ..... Hospital and within .....

Department/Ward has/has not been completed.

The services concerned are/not satisfactory for use.

The following repeat commissioning checks are required for which a further application for Permit to Enter/Work will be made .....
.....

Signed .....Commissioning Engineer

Confirmed by ..... Estates Manager

Date of Issue .....

NB. The person signing this Certificate must complete all sections including a nil return where applicable, deleting non- applicable items.

Circulation: Administrator/Senior Nursing Officer
cc. Departmental Head/Nursing Officer

20. VENTILATION SYSTEMS

Contents List

20. VENTILATION SYSTEMS

NB. This service includes air conditioning systems, mechanical extraction plant, air input plants, simple extraction (with or without filtration), and single air input fans.

20.1 Introduction

Ventilation services are defined further and fully in the commissioning procedures.

However, prior to commencing the setting to work of any system it is essential that the Commissioning Engineer completes a systematic review of the system to ensure it is clear of all obstructions, extraneous material (it is not unknown for tools, overalls, and even in one case a lunchbox, to be left in ducts) and the installation is safe to operate.

This final inspection is frequently carried out by the Site Engineer and it has been found to be advantageous for the Commissioning Engineer to accompany him on this final inspection.

To avoid problems of dirt, building debris and similar material entering the systems during their examination and preliminary run- up it is strongly recommended that whenever possible the examination and commissioning should not commence until after building completion and cleaning.

The check list attached is arranged using the format of a simple tick off form to ensure it causes a minimum of difficulty or delay and it should be impressed upon the person(s) making the check that each item must be ticked off as it is carried out.

Deficiencies or problems should be noted separately and a liaison maintained with both the Main and Sub Contractors to ensure these are actioned with a minimum of delay. The commissioning should not proceed until clearance has been given on all the listed items.

20.2 Checklist - Pre-setting to Work of Ventilation Systems

NB. This checklist must be properly carried out and the checks made initialled in the appropriate section before the service is set to work or commissioned.

It is essential that where deficiencies are noted these are actioned and cleared before setting the service to work.

On completion of the work the Site Engineer or person carrying out the work should sign and date the completed sheets.

20.2 VENTILATION SYSTEMS

CHECKING PROCEDURES - INDICATION OF SATISFACTORY COMPLETION

1. Plant rooms are free of construction debris and clean. ☐
2. All access doors to the plant areas have been fitted and are lockable. ☐
3. Power and water supplies are available, connected to the plant and the required capacities are available at all times. ☐
4. The Main Contractor is operating a security system (usually by means of a Permit to Work) to prevent unauthorised entry to the area under test. ☐
5. Any building work associated with the system is complete and satisfactory and where specified is painted with a dust inhibiting paint. ☐
6. Glazing Work is complete and windows are closed. ☐
7. Any curtain walling, ceiling tiling, and similar building work is completed and areas are closed. Where specifically agreed ceiling tiles and access panels may be open to permit access by the Commissioning Team. ☐
8. All dust generating activities by tradesmen must be completed and areas clean to prevent the ingress of dust and building debris into the plant under test, particularly extraction systems. ☐
9. All pressurised areas must be clean and all building work completed. ☐
10. Integrity testing of any specialist areas, i.e. isolation wards, air locks to specialist departments etc. has been completed and is satisfactory. ☐
11. Air intake louvres, and screens are unobstructed. ☐
12. Fan and equipment chambers clean and free of debris. ☐
13. Floor gulleys and drainage traps are clean and operational. ☐
14. Fan clearances checked and housings are free of foreign objects. ☐
15. Fan impeller clearances are to supplier's recommendation. ☐
16. Heater and cooler batteries have had fins combed and are clean and free from leaks. ☐
17. Dampers operate freely, locking devices are correctly fitted and operational, and position indicators are fitted correctly. ☐
18. All duct work is clean and free of extraneous material, access doors are correctly fitted and where applicable closed, and there is no visible damage, with flange packing correctly fitted and flange bolts tight with lock washers fitted. ☐

19. All associated electrical wiring is complete and has been properly and fully checked and either is, or will be at the time of commissioning, live. ❑

20. Starters and control gear are of the correct type as specified and operational. ❑

21. Electrical panels are clean and free of debris, any safety notices required are in position and panels are operational, have been checked electrically and motor insulation checked. ❑

22. Lighting systems are operational. ❑

23. All equipment checked for: ❑

    a. Equipment rotation.
    b. Lubrication.
    c. Belt/Drive tension.
    d. Motor fixings.
    e. Anti-vibration mounting clearance and operation.
    f. Duct flexible connections correct and operational.
    g. Silencers correctly installed and complete.
    h. Key way and set screw tightness.
    i. Clean condition and ready for use.
    j. Correct overload protection installed.
    k. All safety devices and emergency stop buttons fitted and operational.
    l. All dampers are operational.
    m. Supply systems blown through.
    n. Air terminals, grilles etc correctly fitted.
    o. Manual control valves are pre-set or open as required.
    p. All strainers fitted have been cleaned.
    q. Associated water systems flushed, vented, filled and chemical cleaning, where specified, is complete.
    r. Filters including temporary HEPA filters correctly fitted and air tight.
    s. Duct work cleaning completed.
    t. As required under the Health & Safety Act, plant and plant room access is restricted to authorised personnel.
    u. The installations are under the control of the Commissioning Engineer.

Certified as checked and correct .....for Contractor

Date ..... Checked by ..... Site Engineer

Date .....

I am satisfied that the above procedures are completed properly and that setting to work and commissioning may proceed.

Date .... Commissioning Engineer

20.3 Aspects of Commissioning - Ventilation Systems

Definitions

The Ventilation Services shall include all air moving devices, associated ductwork and fittings (dampers, fire dampers, mixing boxes, etc.) whether required to provide input air or for the purposes of extracting air from any area, device, or item of plant. It shall also be deemed to include all air conditioning plant and equipment whether required to provide a closely controlled and specified environment within a given room, area, or department, or, for the purposes of providing comfort conditions. Chilled Water Systems and Controls are not included with these Commissioning Procedures but are considered separately.

Design Requirements

The Designer's attention is drawn to the requirements of the CIBSE Commissioning Code, Series A, Air Distribution. The data given in the following paragraphs is a summary of the major points of this guide but is not comprehensive; it is intended to provide an aide memoire only. Elucidation of detailed aspects should be obtained from the Commissioning Advisor who will be able to offer comment/guidance on the provision of appropriate points.

Commissioning Information

The following information will be required by the Commissioning Engineer and Commissioning Advisor before commissioning procedures are instituted.

General

A full description of the plant and its intended mode of operation usually by extracts from the relevant sections of the Specification. Drawings showing the layout of the system, positions of dampers and regulating devices, filters and similar devices within the duct runs, together with sizes of ducts and terminal fittings. It is also useful and time saving if these drawings are annotated with the design volumes and static pressures required at each branch and outlet point. Typical examples are given on Sheet No.1 attached to this section of the guidance.

Wiring diagrams for all electrical equipment associated with the air handling systems including motor control circuit details and any interlocking and safety devices such as emergency stop buttons adjacent to the item of plant.

Manufacturers' operating instructions and "setting to work" guidance for all specialist components incorporated in the systems.

Information Required for Pre-commissioning Checks

- Correct clearances for fan impellers
- Design static deflection at anti-vibration mountings
- Any special requirements for tolerances on the alignment and tensioning of drivers

- The recommended grade and type of lubricant for fan and motor bearings
- Fan Motor name plate details
- Fuse ratings for control gear
- Settings for starter overloads and any adjustable thermal overloads and cut outs
- Correct fluid, time setting and levels for dashpots
- Declared supply voltage and freqency
- Design times for staged starting and motor run-up
- Design values for reduced voltage starting or speed control
- Any special requirements as regards correct clearances and tolerances on the alignment of spools and drives of automatic fabric filters
- Correct fluid coating, interlock sequence, safety and alarm settings for electrostatic filters

Information Required for Setting to Work and System Regulations
Ducts and Terminal Fittings

- Design volumes in all ducts and at terminals
- Design static pressures at branches, before and after fittings and components, and at terminal devices
- Design average velocity of air flow at test points for both clean and dirty filter conditions
- Free cross sectional areas, design air volumes and corresponding face velocity for all grilles
- Permissible tolerances for terminal and branch balance and total air flow regulations
- Final setting positions of adjustable louvres and cones on outlets, grilles and diffusers.

Fans, Motors and Starters

- Fan total and static pressure, volume and power characteristics curves
- Fan operating characteristic curves
- Design fan speed and static pressure related to total air volume and filter conditions
- Maximum safe fan speed

- Permissible rise in temperature of bearing coolants
- Anticipated motor starting and running currents at normal and reduced speeds
- Any special requirements in relation to motor bearing temperatures bearing in mind any special or unusual plant locations
- Permitted vibration levels at bearing housings

Filters

- Identification details of filter media
- Design static pressures before and after filters under both clean and dirty conditions for fabric filters
- Any special identification of filter grade and performance
- Permissible tolerance on air velocity distribution across electrostatic filters
- Design HT voltage for electrostatic filters

Notes

Air volumes, velocities and pressures must always be related to a defined Reference Datum Condition.

It is extremely useful and makes for easier working if all the information listed can be given on the system layout drawing.

Heater and Cooler Batteries and Similar Components

- Design static pressure loss across heater batteries (hot and cold conditions), cooler batteries (standard and operating conditions)
- Air washers and silencers
- Static Pressures at constant volume regulations
- Motor design information
- Power factor, efficiency, current, vibration levels, speed and torque characteristics.

20.4 Commissioning Procedures

Commissioning must be conducted in accordance with the appropriate D of H Guidance, Codes of Practice, British Standards, and Commissioning Codes.

It is essential that the performance measured is properly recorded for future reference and as guidance; typical test sheets are attached as an Appendix.

The Contractors Commissioning Engineer should satisfy himself that the systems are operating correctly and meeting performance specifications before offering for witnessing.

It is recommended that at least one week's notice should be given of the intention to offer a system for witnessing enabling all parties essential to the acceptance to be present or represented.

In the event of performance not being met the Commissioning Engineer should satisfy himself that the tests have been conducted properly, that the test equipment is functioning correctly and that the installation conforms to the designer's installation requirements. He should also make a check on the cleanliness of the system (it is not unknown for overalls, tools, etc., to be left in a ductwork system). Ensure that the filters are clean and operating correctly and that dampers and similar regulating devices are operating correctly and have not been locked in the closed position. Having satisfied himself on these points the matter should be dealt with in accordance with the arrangements set out in the contract.

Once the Client's Commissioning Advisor is satisfied that the system meets the design intent then an acceptance sheet should be signed by all parties and inserted in the appropriate section of the documentation.

For guidance a typical example of a system acceptance sheet is attached as Appendix 1.

The Client's Commissioning Advisor or Project Engineer should be responsible for the preparation and circulation of any commissioning reports. It is not the responsibility of the Sub-Contractor to provide such reports.

Instrumentation

Each instrument used must hold a current certificate of calibration, preferably issued by a well known specialist organisation such as BSRIA. Certificates should be examined by the Client's Commissioning Advisor and approved prior to commencement of commissioning.

Design Information

The following information must be obtained from the system designer prior to commissioning:

1. Volumes and Static Pressures of each fan.

2. Manufacturer's fan performance curves.

3. The design pressure loss across all filters, including any HEPA filters fitted, in their dirty condition.

4. Pressure drop across all items fitted to Air Handling Plants such as filters, heater and cooler batteries, silencers, etc together with the pressure drops across any remote mounted re-heat batteries etc.

5. The design flow rates at each grille or terminal.

6. Minimum and maximum static pressure at all constant volume boxes.

7. Any specified pressure differentials in specialist areas such as air locks.

8. A4 size system schematic layouts for each separate system suitable for use as a working reference during commissioning.

20.5 Commissioning Procedures for Constant Volume Supply Air Systems

Temporary filter media of a type which will simulate dirty filter conditions shall be fitted in place of all permanent filters, especially HEPA filters.

Record the volume at each CV box together with the SP across the CV box. Results should be checked with the Designer to ensure these are satisfactory.

Agreement is essential before the CV Box grilles are balanced. Once a satisfactory balance has been achieved carry out a system check of the following:-

1. Final volume check of all grilles installed in the system.

2. Final check of all pitot traverses.

3. Carry out a final check of fan performance specifically of fan volume and static pressure.

4. Adjust grilles as necessary to ensure the correct throw is achieved.

5. Where room pressure differentials are specified the most satisfactory method is to set the supply air volume and then "fine tune" the extract system to attain the required pressure differential.

Once satisfactory results are realised and the system is accepted all duct volume control dampers shall be permanently marked as to the correct setting and any ductwork test holes plugged using rubber grommets or similar.

Replace all temporary filter media using the specified operational filters.

20.6 Commissioning Procedure for Low Velocity Supply and Extract Systems

Temporary filter media are to be fitted satisfactorily to simulate dirty filter conditions.

Carry out an initial check on the system noting volumes and static pressures. Check the results with the designer to ensure commissioning may proceed. Carry out a proportional regulation of the air systems as defined in the CIBSE Codes of Practice, Woods Guide, BSRIA Technical Notes or similar authoritative guidance.

From the initial check establish which branch constitutes the index circuit for the system. The system balance is then made using the index circuit as the reference point.

Each branch duct which incorporates its own volume control damper must be regulated with its index grille terminal fully opened. Use the duct damper to regulate the flow to achieve the best possible results ensuring noise levels are at their minimum.

Once a satisfactory balance has been achieved carry out a final system check as defined for the constant volume systems.

Carry out the concluding procedures as specified for the constant volume systems.

Notes: - Where standby fans are fitted the system must be rechecked using the standby fan.

- Where 2 speed fans are fitted the system must be balanced using the high speed mode and a fan test and grille scan only carried out using the low speed mode.

20.7 General Guidance Material appropriate to the Commissioning of Air Systems

Woods Guide to Fan Engineering

Buffalo Forge Co. Fan Engineering

CIBSE Guide Commissioning Code Series A

BS 5720 Code of Practice for Mechanical Ventilation and Air Conditioning in Buildings

BS 4718 Methods of Tests for Silencers in Air Distribution Systems

BS 4979 Testing and rating of Air Control Devices

BS 2831 Testing of Air Filters for Ventilation and Air Conditioning

BS 5491 Testing and Rating of Air Conditioners

BS 848 }
} Testing of Fans
BS 5285 }

This list is not intended to be fully comprehensive but to advise on some of the more applicable information available.

NOTE:

The commissioning procedures outlined are to establish that the systems are capable of providing the performance specified. The system will be required to be checked in conjunction with other items of plant such as the chilled water service and LPHW heating system which for the purposes of commissioning are treated separately, if appropriate.

In addition it will be necessary to co-ordinate plant operation in conjunction with any control systems specified. The commissioning of the control system is discussed in other sections of this document.

Section 20

Appendix 1

FINAL ACCEPTANCE RECORD SHEETS for

VENTILATION AND AIR CONDITIONING SYSTEMS

This section contains examples of FAR Sheets and Cover Sheet for typical systems.

Suggested FAR Sheets for Mechanical Specialist Contractors' work such as that listed below, which may be relevant, will normally be issued with the corresponding standardised sections of Part C of the Model Specification.

Thermal Insulation	Section	CO2
Welding and Brazing	"	CO3
Low Velocity and Low Pressure Ductwork System	"	CO4
High Velocity and High Pressure Ductwork System	"	CO5
Hot Water Service Equipment	"	CO6
Cold Water System Equipment	"	CO8
Refrigeration	"	C10
Steam Generators	"	C16

In some instances provision for signature by Commissioning and Witnessing Engineers may need to be made by a simple covering certificate.

Section 20

Appendix 1.1

COVER SHEET V

ENGINEERING COMMISSIONING OF HEALTH CARE INSTALLATIONS

FINAL ACCEPTANCE RECORDS

VENTILATION AND AIR CONDITIONING

Client's name and Address .....

.....

.....

Project .....

Engineering Specification .....

Engineering Contractor .....

Notes

1. These Final Acceptance Record Sheets have been prepared for use on this project in accordance with *"Guidance on Commissioning of Health Care Engineering Installations"*.

2. Standard contractual clauses on commissioning are in Part B of the Engineering Specification.

3. Standard check/test methods are laid down in Part C of the Engineering Specification.

4. Particular commissioning requirements are in Part D of the Engineering Specification

Section 20

Appendix 1.1

FINAL ACCEPTANCE RECORD SHEET

CLIENT :- .....

HOSPITAL :- .....

DEPARTMENT :- .....

CONTRACT:- .....

FAR SHEET NO:- .....

REFERENCE:- .....

Copies to:- Project Manager
Project Engineer
Quantity Surveyor
Client
Main Contractor
Mech/Elec Sub Contractor

FINAL ACCEPTANCE TEST ON:-

SYSTEM:- .....

DATE:- .....

The following related documents are enclosed for retention/comment

1) .....

2) .....

3) .....

4) .....

All required and specified commissioning procedures have been completed on the above system and the system is confirmed as satisfactory and available for use.

Signed ..... Commissioning Engineer
(The nominee of the Designer)

Date .....

Signed ..... Main Contractor's Engineering Services Co-Ordinator

Date .....

I confirm having witnessed the specified tests on the above system which have proved satisfactory and accept the system for use on behalf of the Client.

Signed .....Client's Commissioning Advisor

Date .....

Note The attached FAR Sheets relating to sections of the system must be completed, signed and attached to this System FAR Sheet

FINAL ACCEPTANCE RECORD

CODE: V1 FOR:
Schematic Diagram for
Ventilation Systems

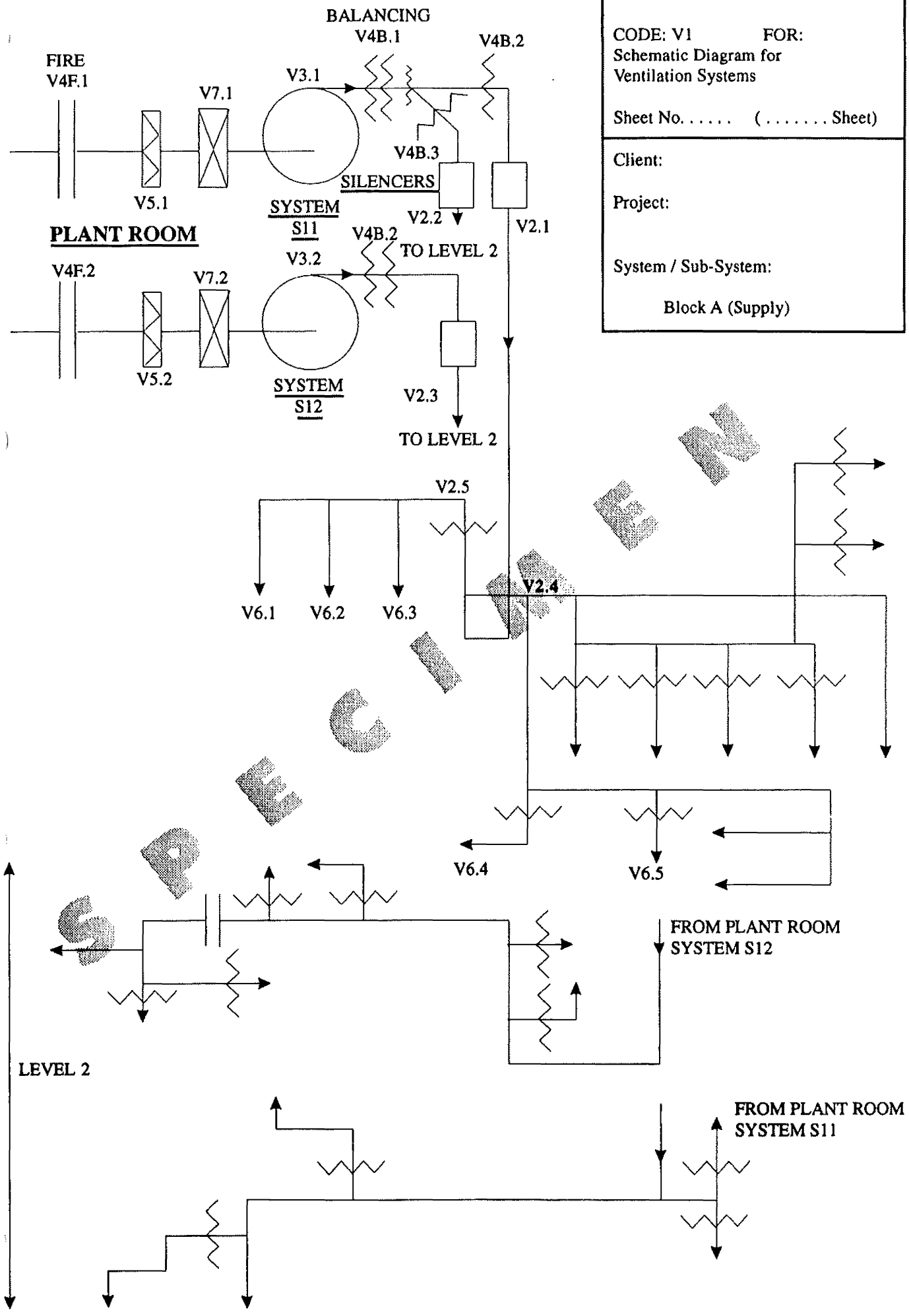
Sheet No. . . . . (. . . . . Sheet)

Client:

Project:

System / Sub-System:

Block A (Supply)



FINAL ACCEPTANCE RECORD

CODE: V1 / 1 FOR:
Schematic Diagram for
Ventilation Systems

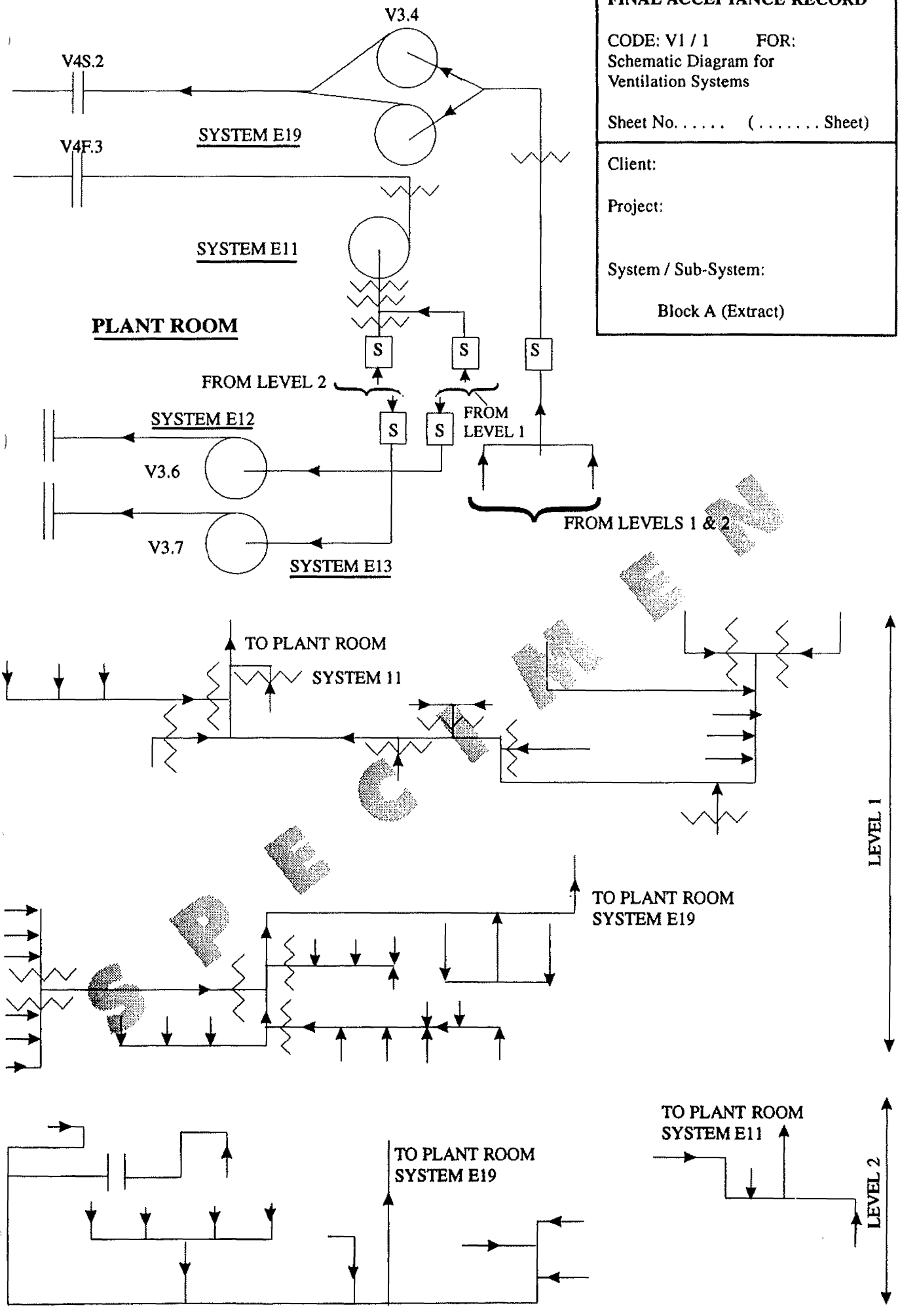
Sheet No. . . . . (. . . . . Sheet)

Client:

Project:

System / Sub-System:

Block A (Extract)



NATIONAL HEALTH SERVICE - ENGINEERING COMMISSIONING

FINAL ACCEPTANCE RECORD

CODE: V2 FOR: Air Flow and Pressure (For Air Ducts or Fan Outlets) Supply to V3

Sheet No. . . . . (. . . . . Sheet)

Client:

Project:

System / Sub-System:

Commissioned on: / /19

(Signed) . . . . . .

Commissioning Engineer
for Messrs

Witnessed by

(Signed) . . . . . .

Commissioning Engineer

STANDARD CHECKS / TESTS (Test Methods to Part C, Section of Specification)

ITEM/TEST POSITION REFERENCE	Air Velocity m / Sec — Test Grid Position	Design	Actual	Design	Actual	Design	Actual
	Aver. Vel. (V) m / Sec						
	Flow (AxV) m³ / Sec						
	Vel. Pressure (V^2 / 1.7) Pa						
	Static Press Pa						
	Total Press Pa						
	Cross section of Duct or Fan Outlet showing the Test Grid positions						
	Notes						

ADDITIONAL CHECKS / TESTS (To Part D of Specification)
e.g. Duct Leakage Tests to DW / 141 HVCA 1977

Continued overleaf

NATIONAL HEALTH SERVICE - ENGINEERING COMMISSIONING

STANDARD CHECKS / TESTS (Test Methods to Part C, Section of Specification)

		Air Flow (from V2 sheet m^3 / sec	Static Pressure N / m^2			Motor					Ambient °C	Air Temp @ Test Position	Plant Room Noise Level dBA		Notes
			Inlet	Outlet	Increase	Start Current	Full Load Current	Full Load r.p.s.	Ins. Res.	O/L Setting			Background	Fan Running	
Fan	Design														e. g. temporary damper settings and filter condition
	Actual														
Fan	Design														
	Actual														
Fan	Design														
	Actual														
Fan	Design														
	Actual														

ADDITIONAL CHECKS / TESTS (To Part D of Specification)

Continued overleaf

FINAL ACCEPTANCE RECORD

CODE: V3 FOR:

Fans

Sheet No. . . . . (. . . . . Sheet)

Client:

Project:

System / Sub-System:

Commissioned on: / /19

(Signed) . . . . . .

Commissioning Engineer for Messrs

Witnessed by

(Signed) . . . . . .

Commissioning Engineer

NATIONAL HEALTH SERVICE - ENGINEERING COMMISSIONING

STANDARD CHECKS / TESTS (Test Methods to Part C, Section of Specification) *Tick if correct

Item / Test Position Reference	Final setting	Damper Ref.	Final setting	Damper Ref.	Final setting	Fire Damper				Notes
						Ref.	Setting		Ref.	Setting		
							Open *	Temp		Open *	Temp	
Damper												
Damper												
Damper												
Damper												
Damper												

ADDITIONAL CHECKS / TESTS (To Part D of Specification)

FINAL ACCEPTANCE RECORD

CODE: V4 FOR: Dampers (Balancing & Fire)

Sheet No. ..... (..... Sheet)

Client:

Project:

System / Sub-System:

Commissioned on: / /19

(Signed) .....

Commissioning Engineer for Messrs

Witnessed by

(Signed) .....

Commissioning Engineer

Continued overleaf

NATIONAL HEALTH SERVICE - ENGINEERING COMMISSIONING

STANDARD CHECKS / TESTS (Test Methods to Part C, Section of Specification)

*Tick if correct

Item / Test Position Reference	Dirtiness of Filter Material	Visual Check (edges, seals etc.) *	Air Flow m³/sec (From v2 Sheet)		Inlet Static Pressure Pa	Outlet Static Pressure Pa	Pressure Drop Pa	Manometer Reading	Pressure Switch Operation		Notes
									Closing Pa	Opening Pa	
Filter				Design							
				Actual							
Filter				Design							
				Actual							
Filter				Design							
				Actual							
Filter				Design							
				Actual							

ADDITIONAL CHECKS / TESTS (To Part D of Specification)

Continued overleaf

FINAL ACCEPTANCE RECORD
CODE: V5 FOR: Filters
Sheet No. . . . . (. . . . . Sheet)
Client:
Project:
System / Sub-System:
Commissioned on: / /19
(Signed) . . . . .
Commissioning Engineer for Messrs
Witnessed by
(Signed) . . . . .
Commissioning Engineer

NATIONAL HEALTH SERVICE - ENGINEERING COMMISSIONING

STANDARD CHECKS / TESTS (Test Methods to Part C, Section of Specification)

Item / Test Position Reference		Average Vel m / sec	Flow m^3/ sec	Notes	Item / Test Position Reference		Average Vel m / sec	Flow m^3/ sec	Notes
Diffuser	Design				Diffuser	Design			
	Actual					Actual			
Diffuser	Design				Diffuser	Design			
	Actual					Actual			
Diffuser	Design				Diffuser	Design			
	Actual					Actual			
Diffuser	Design				Diffuser	Design			
	Actual					Actual			

ADDITIONAL CHECKS / TESTS (To Part D of Specification)

FINAL ACCEPTANCE RECORD

CODE: V6 FOR:

Diffusers

Sheet No. . . . . (. . . . . Sheet)

Client:

Project:

System / Sub-System:

Commissioned on: / /19

(Signed) . . . . . .

Commissioning Engineer
for Messrs

Witnessed by

(Signed) . . . . . .

Commissioning Engineer

Continued overleaf

NATIONAL HEALTH SERVICE - ENGINEERING COMMISSIONING

STANDARD CHECKS / TESTS (Test Methods to Part C, Section of Specification)

*Tick if correct

Item / Test Position Reference	Type	Input			Air				Visual Check *	Notes
		Pressure / Temp. Drop or Voltage	Flow or Current	Heat transfer Rate kW	Flow m^3/sec	Temp. In	Temp. Out	Heat Emission kW		
Battery										
Battery										
Battery										
Battery										
Battery										
Battery										
Battery										

ADDITIONAL CHECKS / TESTS (To Part D of Specification)

FINAL ACCEPTANCE RECORD

CODE: V7 FOR:

Heater & Cooler Batteries

Sheet No. . . . . (. . . . . Sheet)

Client:

Project:

System / Sub-System:

Commissioned on: / /19

(Signed) . . . . . .

Commissioning Engineer
for Messrs

Witnessed by

(Signed) . . . . . .

Commissioning Engineer

Continued overleaf

NATIONAL HEALTH SERVICE - ENGINEERING COMMISSIONING

STANDARD CHECKS / TESTS (Test Methods to Part C, Section of Specification)

Item / Test Position Reference	Air Temp In		Air Temp Out		Air Flow m^3 / sec (from V2 Sheet)	Calc. Heat Transfer Rate W	Water Temp		Notes
	DB	WB	WB	DB			Flow °C	Return °C	
Humidifier or Washer									
Humidifier or Washer									
Humidifier or Washer									
Humidifier or Washer									
Humidifier or Washer									
Humidifier or Washer									
Humidifier or Washer									

ADDITIONAL CHECKS / TESTS (To Part D of Specification)

FINAL ACCEPTANCE RECORD

CODE: V8 FOR:

Humidifiers & Air Washers

Sheet No. . . . . (. . . . . Sheet)

Client:

Project:

System / Sub-System:

Commissioned on: / /19

(Signed) . . . . . .

Commissioning Engineer
for Messrs

Witnessed by

(Signed) . . . . . .

Commissioning Engineer

Continued overleaf

NATIONAL HEALTH SERVICE - ENGINEERING COMMISSIONING

STANDARD CHECKS / TESTS (Test Methods to Part C, Section of Specification)

Item / Test Position Reference	Date and Time	Outdoor Temp °C	Average Room Temp		Surface ?	Ventilation Rate		Overall Noise Level dBA	Notes
			Dry Bulb Temp °C	Wet Bulb Temp °C		Mechanical	Natural		
Room No.									
Room No.									
Room No.									
Room no.									
Room No.									
Room no.									

ADDITIONAL CHECKS / TESTS (To Part D of Specification)

FINAL ACCEPTANCE RECORD

CODE: V9 FOR:
Environmental Tests in Selected Rooms

Sheet No. ..... (..... Sheet)

Client:

Project:

System / Sub-System:

Commissioned on: / /19

(Signed) .....

Commissioning Engineer
for Messrs

Witnessed by

(Signed) .....

Commissioning Engineer

Continued overleaf

Contents

21. THE COMMISSIONING OF HOT AND COLD WATER SERVICES

21.1 Commissioning Procedures - Water Systems - General

- Determine that all preliminary procedures, equipment and system checks have been carried out as defined in Part 1 of this document.

- With the pump off observe and record the static pressure at the pump.

- Check the system has been vented. Run the pump and ensure all air has been removed then allow flow conditions to stabilize.

- Record Pump Speed.

  With pump running, slowly close the discharge isolating valve and record pump suction and discharge pressures under the closed discharge head condition. The pump suction connection must be fully open to system circuits.

- Use the closed discharge head to determine the pressure at the no-flow condition and compare this measured pressure against the certified pump operating curve.

  If the no-flow condition measured pressure does not fall on the published pump operating curve, mark the point and draw a pump curve parallel to the published curve from zero to maximum flow from the closed head point measured and marked.

  This will show the actual pump operating curve.

NB: Important

- One gauge should be used to read the differential pressure.

- Double check all test readings before drawing the new curve.

- Gauge readings must be corrected to the centre line of the pump impeller.

- Ensure the pump suction connection remains open.

- Using the measured pump head in conjunction with the new operating curve prepared; read the water flow rate.

- A pump head higher than the design figure indicates a lower than design flow rate, whilst conversely a measured pump head lower than design indicates a higher than design flow rate.

  If a higher flow rate is found, close pump discharge valve until the true flow rate is approximately 110% of design.

- Run any secondary system pumps and re-adjust the valve on the primary circuit pump as necessary.

- Record discharge and suction pressures and pump heads.

- Check flow distribution in the system before making any further re-adjustments to valve settings.

- Open fully all the 3-way valves in the system and check pressure drop readings across all items of equipment fitted to the system eg. boilers, chillers, air handling units etc. and ensure these comply with design statements.

- Establish which circuit forms the system index circuit in the operational mode (Note: the circuit which theoretically forms the system index circuit may not prove to be so in practice).

  Commencing with the end point of the index circuit and working through to the pump, proportionally balance all flow rates to that of the index point.

- Re-check the main pump readings. If the flow rate has fallen to below design, open the pump discharge valve until the measured pump flow is within 100% - 105% of the design requirement. If the pump capacity is inadequate to allow the required design flow to be achieved re-check the system to ensure there are no blockages occurring or valves have not been accidentally partially closed. If the flow rate cannot be realised consult with the system designer.

- Where 3-way control valves are fitted, set the by-pass line setting valves to restrict the by-pass flow to 90% of the maximum flow through the equipment it serves.

- After completion of balancing as described, and the Commissioning Engineer is satisfied that the system is operating within acceptable tolerances ie. 10%-15% of the design flow rates, carry out a final check on pump and equipment pressures ensuring these remain within acceptable tolerances of design figures and record the data.

- Note and record control valve and other appropriate pressure drops.

- Note and record the position of all balancing valves and gauges (Note: discussion should be held with the operations and maintenance staff to check whether it would be of advantage to mark these points in a permanent manner).

- Finally check the operation of all safety shut-down controls fitted to the system.

- Record data on the appropriate FAR sheets and sign off the system(s) as acceptable.

- In the event of problems occurring which cannot be resolved during the commissioning period, shut down the system(s) and discuss the position with the system designers before taking any further action.

- Advise the Project Engineer and Project Manager that the system is not to an acceptable standard and that a delay to the commissioning process will occur.

21.2 Supplementary Commissioning Procedures for Specific Types of Water Systems.

The basic procedures described will be applicable to all water systems. However additional procedures are required for specific distribution systems.

Low Temperature Hot Water Systems

- Flow rates through specific items of equipment eg. coils, calorifiers and heat exchangers should be checked against manufacturer's certified pressure drop v.flow charts.

- Open all control valves, measure water flow at each orifice or metering point and determine the index flow rates.

- Carry out a proportional balance of the system working from the index point back towards the pump.
- With the system operating at its design temperature balance radiator circuits and then re-check flow rates.
- *Record flow and return water temperatures.
- Record the position of DRVs (the flow rate at each measuring point).
- Check and record pressure drops across all items of equipment fitted.
- Re-check and record main pump duties. The final flow rate measured at the pump should be - 0% + 15%.
- Where 3 way valves are fitted adjust the by-pass flow rate to approximately 90% of the design flow rates.
- Check and record both air and water temperatures at the inlet and outlet of each heat emitting device.
- Operate the system under control ie. automatic or via the BMS and re-check water flow rates and temperatures.
- Note that correct air venting operation is satisfactory.
- Finally check all safety shut down controls for correct placement and operation.

Chilled Water Systems

- Check and record water flows through coils, heat exchanges and chiller plants against certified pressure drop v.flow rate charts.
- Ensure that the manufacturer has carried out a correct pre-commissioning check and has certified the plants are correctly adjusted for correct and safe operation, and that he has checked, adjusted, and correctly set all operating and safety devices fitted to the plant.
- Check that the manufacturer has issued signed and certified commissioning sheets for his supply.
- Measure and record flow rates at each item of equipment as previously described and establish the index circuit.
- carry out a proportional balance working from the index point and toward the pump as previously described.
- Measure and record or note the details described in the paragraph above marked *.
- Ensure the final pump flow is - 0 + 10% of the design flow, and adjust by-pass flow at each 3-way valve as described.
- Operate the refrigeration equipment under the specific control system and re-check water flow and return temperatures and flows. Check air inlet and outlet temperatures where necessary.

Check air vents operate correctly.

- Check the operation and positioning of all safety shutdown controls.

High Temperature Hot Water Systems

Important Before commencing commissioning of the system reduce the system water temperatures to the safe working level. Alternatively if the system is to be commissioned at its design temperature ensure safe working procedures and a Permit to Work system are in being.

- Check Water flows through items of equipment and measure flow rates etc as previously described, and then establish the index circuit and complete the proportional system balance as described.

- Note and record all items as described in the Water System - General Guidance.

- A typical arrangement of High Temperature Hot Water system is shown on the attached sketch - Appendix 3. Commissioning of the pressurising system should be completed by the specialist supplier.

- Once pressurising is satisfactory the distribution system can be treated as, and commissioned as, a standard heating system.

- With High Temperature Hot Water systems it is particularly important to ensure the correct operation of all safety devices fitted before commencing system commissioning.

Hot Water Services Systems (HWS)

- Carry out the procedures and record the data required as previously described for all hot water systems.

- On completion of the flow rate checks and the completion of system balancing, set the calorifier controls and ensure HWS temperatures are achieved.

- Carry out the following system checks and record the measured data as necessary:

- Check volumes flowing and water temperature and determine any circuits with below design flow rate.

- Regulate the DRV on each circuit to ensure even temperature distribution throughout the system.

- Note and record the positional setting of each DRV.

- Complete a check at each tap or outlet point to ensure adequate pressure and water flow at the correct temperature is obtained. Carry out measurement of the conditions and record the data for a specified percentage of the taps etc (usually 20-25% is adequate, but ensure the index point is included).

- At each fitment and mixing point measure and record static pressure, flow rate and hot, cold and blended water temperatures.

- Check the correct and safe operation of any infra-red taps fitted.

- At each calorifier or water heater check and record primary and secondary flow rates and water temperatures particularly the system return water temperature. Measure and record the time taken by each device to reach its design temperature.

Where calorifiers and water heaters are steam operated it is essential to properly commission, the steam mains, as described under this heading, before commissioning the HWS system.

21.3 The Commissioning of Hot and Cold Water Services

Definitions

Hot water services shall include all pipework and plant, including heat exchangers, water treatment and pressurisation units, but excluding boiler plant, which is considered separately, to provide cold and domestic hot water to all outlets and appliances.

Commissioning Procedures

Prior to commencing commissioning the designer must ensure the following information is available to the Commissioning Personnel and the facilities stated are available.

- Provision of adequate regulating valves and flow measuring valves.
- Schematics showing size and location of all regulating valves and flow measuring valves.
- For accurate flow measurement the pipework must be designed to allow a certain minimum length of straight pipe both preceding and following the measuring valves.

Commissioning Information

The following information will be required by the Commissioning Engineer before commissioning procedures are instituted.

- A full description of the plant and its intended mode of operation, usually by extracts from the relevant sections of the specification.
- Wiring diagrams for all electrical equipment associated with the system, including motor control circuit details and interlock arrangements.

Information Required for Setting to Work and System Regulation

- Water flow quantities at all plant items, regulating valves and flow measuring valves.
- Pump duties.
- Water treatment plant duties.
- Heat exchanger duties and pressure drop at the stated design flow.
- Water pressurisation duties.
- Manufacturers' setting to work, operating and maintenance instructions for all system components and associated electrical equipment.

Commissioning

Commissioning must be conducted in accordance with the appropriate Codes of Practice, British Standards and Commissioning Codes.

It is essential that the performance measured is properly recorded for future reference and guidance: typical FAR test sheets are attached as Appendix 1.

The Commissioning Engineer should satisfy himself that the systems are operating correctly and meeting performance specifications before offering these for witnessing.

It is recommended that at least two weeks notice of the intention to offer a system for witnessing should be given to enable all parties essential to the acceptance to be present.

In the event of performance not being met the Commissioning Engineer should satisfy himself that the tests have been conducted properly, the the test equipment is functioning correctly and that the installation conforms to the designer's installation requirements. Having satisfied himself on these points the designer should be advised and his guidance as to future action sought.

Once the client's commissioning adviser is satisfied that the system meets the design intent then an acceptance sheet should be signed by all parties and inserted in the appropriate section of the documentation.

For guidance a typical example of a FAR system acceptance sheet is attached as Appendix 1.

The Client's commissioning adviser should be responsible for the preparation and circulation of any commissioning reports. It is not the responsibility of the Sub-Contractor to provide such reports.

General Guidance material appropriate to the Commissioning of Water Systems

CIBSE	Commissioning Code series W, "Water Distribution Systems".
BSRIA	Application Guide 1/79 "Manual for Regulating Water Systems".
Codes of Practice	CP310, 1965 (Amended December 1970) "Water Practice Supply".

Water Authority Bylaws

This list is not intended to be fully comprehensive, but to advise on some of the more applicable information available.

Note:

The commissioning procedures outlined are to establish that the systems are capable of providing the performance specified.

The system will be required to be checked in conjunction with other items of plant such as boilers and controls which, for the purposes of commissioning, are treated separately.

21.4 The Commissioning of Low Pressure Hot Water Heating Systems

Definitions

Low pressure hot water heating systems shall include all pipework and equipment including primary heat exhangers, but excluding boiler plant which is considered separately. The system can serve a variety of heat emitters (radiators, unit heaters, convectors, floor and ceiling heating) and should be designed and installed in accordance with British Standard Code of Practice CP.341.300-307: 1956 or if related to domestic premises CP.3006 Part 1: 1969 or any later editions of these standards.

Procedures Prior to Commissioning

Prior to the commencement of the commissioning activity all preliminary checks, setting to work and regulations as described in the CIBSE Commissioning Code Series W - Water Distribution Systems shall have been carried out by the engineering contractor who should also ensure that:

- systems have been provided and installed in accordance with the specification and drawings.
- pre-acceptance tests have been satisfactorily completed.
- all system components function.
- the electrical final acceptance tests have been completed.
- the control plan is available and understood.
- feed and expansion tanks operate satisfactorily regarding leaks, the overflow runs clear and there is no flooding in discharge areas.
- any coils from the heat exchangers can be easily withdrawn.

All the above checks and the test checks, etc outlined in the Commissioning Code have been witnessed by a member of the Authority's site engineering staff.

The Commissioning Record Sheets outlined in the CIBSE Commissioning Code shall be produced by the Design Engineer complete with the relevant Design Information - samples of sheets acceptable to N.H.S. contracts are as Appendix 1 (ie. FAR sheets H1 to H8 as appropriate). All test results shall be entered onto the appropriate sheet by the Contractor's Commissioning Engineer.

Commissioning Procedures

The following procedures shall be undertaken by the Contractor, witnessed by the Commissioning Advisor or his nominated representative and entered on to the appropriate record sheet produced by the Engineering Designer:

- **Pumps** - with the system cold check operation
- **Tanks** - measure the depth of water when the ball valve is fully closed. When the system is at the working temperature measure the distance from the water level to the lowest part of the overflow. Turn on the circulating pump and note any discharge from the open vent.

- **Water Distribution** - the cold balancing system described in the Commissioning Code should always be used but this involves the use of regulating valves with built-in pressure tappings or orifice plates with the appropriate manometer tappings, hence an alternative section has been included on the appropriate F.A.R. sheet.

- **Cold Balancing** - with the system cold and the circulating pump running, connect a suitable manometer to each orifice plate or regulating valve with built-in pressure tappings in turn and measure the pressure drop.

  From the manufacturer's data read off the volume rate of flow in the circuit.

- **Hot Balancing** - with the system operating at the design temperature and the circulating pump running measure the temperature at all circuit branches: determine the temperature drop.

- **Calorifier Control Valve** - with the system cold set the control thermostat to a minimum setting, after a reasonable period measure the water flow temperature, repeat at suitable intervals. At various increments throughout the range of the thermostat repeat. When the setting is at maximum, record the flow temperature at frequent intervals until satisfied that the design maximum is not exceeded.

  With the valve fully open measure the pressure drop (inlet to outlet).

- **Steam to Water Calorifier** - with the system at the design temperature measure the steam flow to the calorifier, also the steam pressure: establish the latent heat of evaporation and calculate the heat input rate.

  Measure the rate of flow on the water side, the flow and return temperatures and calculate the output rate.

  Compare the figures and repeat for other calorifiers.

  For water to water calorifiers, calculate the heat input rate by measuring the primary flow and return temperatures and the primary rate of flow.

- **Compensate Control of Room Temperature** - with the system set to operate at a condition appropriate to ambient, measure and determine the average inside temperature over 10% of rooms which are not subjected to solar gains, calculate the actual heat loss.

  Measure the system volume flow and the temperature drop and calculate the circuit emission. Compare the two results.

  Repeat on other different occasions.

- **Heat Emitters** - with the system set to operate at a condition appropriate to ambient:-

- **Radiators, Natural Convectors and Continous Perimeter Heaters**
  determine the mean heat emitter temperature from manufacturer's data. Calculate total heat emission of each device.

  Measure the inside/outside air temperatures and by proportion establish the actual heat loss.

- **Radiant Panels and Strips** - determine the mean radiant temperature of the space using a globe thermometer, compare with the air temperature and the design mean radiant. Calculate the heat emission and compare with the actual heat loss based on the inside/outside air temperatures.

- **Ceiling and Under-Floor Heating** - determine the heat emission by measuring the mean floor/ceiling temperature and the water flow rate to the particular circuit. Measure inside/ outside air temperatures and by proportion establish the actual heat loss and compare with the emission.

  For ceiling heating compare the mean radiant temperature at head level with the actual air temperature and the design mean radiant.

  For floor heating compare the floor temperature with the design.

  Repeat for all other heat emitters or rooms served by other circuits supplying floor, ceiling or radiant panels or strips, and compare with the emission.

- **Mechanical Convectors and Unit Heaters** - determine the mean emitter temperature and via the pressure drop across the battery establish the water flow rate and the heat input.

  Measure the air volume flow rate and the inlet and outlet temperatures, calculate the heat and the heat emitted and compare.

  Repeat for all fan speeds.

- **Noise Levels** - check and compare with the design noise ratings all moving equipment, (pumps, fans etc.) over all frequency bands.

21.5 Commissioning of Medium and High Pressure Heating Systems

The concept of both systems is similar and both are frequently referred to as closed heating systems.

There is much to commend the use of medium pressure as with this type of system it is possible to use standard pipework and fittings as are available for LPHW systems. High pressure systems have an advantage for use with tower blocks and highrise developments in general but require special jointing methods and the use of special fittings and components. Their use is normally confined to systems above 2000Kw.

As either system is not in general use within the NHS general notes are given which outline the systems and a sketch is attached (Appendix 3), which notates the major components.

Systems in Use - Designers' Notes

In any heating system provision has to be made to allow for the expansion of the water content which inevitably occurs when the system is brought up to temperature.

The standard designs for LPHW systems include an open type feed and expansion tank placed at or above the highest point of the system.

With higher pressure systems closed expansion tanks are used which incorporate an air or nitrogen cushion to absorb expansion within the system.

With the diaphragm expansion tank, using an inert gas as the cushion, the diaphragm prevents the system water content coming into direct contact with the cushioning agent and thus absorbing the gas.

The choice of the gas to form the cushion is very much a designer's choice and manufacturers offer both systems. With a nitrogen cushion the pressures are normally preset and generally fixed at 0.5, 1.0 or 1.5 atmospheres.

Where air is used the cushion pressure can be either preset or adjusted at site to suit the exact static head of the system. It therefore offers greater flexibility in use.

The closed system with a diaphragm expansion tank offers many advantages. These will include smaller distribution mains with corresponding reductions in the sizes of valves and other components, it provides a permanent cushion for system expansion and a reduction in air and corrosion problems by eliminating air entry into the system. The diaphragm tank is compact, simple to install and because the system is pressurised can be installed in any suitable position thus eliminating the need for mounting the F & E tank at high level. It also eliminates problems at freezing of the F & E tank and vent pipes and reduces maintenance as there are no ball valves to service. It will be understood that because of the high temperatures used it is essential to make proper provision for expansion and mains should be treated similar to steam mains.

Operating Temperatures

Because of the higher pressures in use both MPHW and HPHW systems operate at increased temperatures. It will be understood that the temperature is dependent upon system pressures but it is possible to design on flow temperatures of 110°C - 116° (230°-240°F) and a temperature drop in the system of 17° - 18°C (say 40°F).

These temperatures are applicable to MPHW systems. Those used for HP systems are of course correspondingly higher 150°C - 180°C being typical with a corresponding temperature drop of up to 65°.

Control of Heating Temperatures. Where it is necessary to reduce the heating surface temperatures to comply with specific guidance temperature control is best achieved by mixing. This is best effected by using mixing valves and pumps each serving its own circuit.

Pre-Commissioning Checks

The system requires careful visual examination particularly as regards joints and fittings, prior to filling.

The pressurising unit should in all cases be purpose built and supplied by a specialist contractor. Because of the higher pressures and temperatures and also the danger that any leaks will flash to live steam it is recommended that pressure tests on major components be properly certified and can with advantage be witness tested at works.

System Flushing

Prior to filling, the system must be properly flushed out as dirty systems can cause problems far greater than those experienced with LPHW systems.

The system should initially be flushed through with cold water having first removed any filters, strainers etc. fitted. The system must be drained, filters etc. replaced and a further flush be given using a commercial boiling out agent. This is essential to remove any grease or oil which may be present. A further filling with a cleaning agent such as trisodium phosphate, sodium carbonate or sodium hydroxide is then recommended to remove all traces of the boiling out chemical which may be detrimental to pumping equipment.

Standard solutions which have been found satisfactory are 1lb of cleaning powder to every 40 gallons of water.

The system should be filled and vented using the cleaning solution and then brought up to operating temperature if possible. After circulating for 3-4 hours the system must be drained and refilled with clean water. It will be found that sufficient cleaning solution will adhere to inner surfaces to give a slightly alkaline solution. The recommended pH should be between 7 - 8 but must not exceed 8.5.

It is recommended that the cleaning procedure outlined be witnessed by the Site Engineer who should also satisfy himself as to the final pH of the system after filling.

Water Treatment

Properly designed closed systems do not normally require extensive water treatment. The size and type of system will influence the requirements for treatment and advice should be sought from the specialist supplier of the pressurising units. It should be borne in mind that excessive water treatment can cause operating problems with automatic air vents, mechanical seals on pumps and the heating units.

Controls and Safety Measures

Closed heating systems can be controlled in the same manner as standard LPHW systems. As

a safety measure it is recommended that an overriding high limit stat should be fitted in addition to the operating stat which shuts down the boiler in the event of the control stat failing.

It is also recommended that where the system is disconnected from a continous make-up water supply a low pressure cut out switch be fitted and wired in series with the boiler control so that in the event of a system water leak there is adequate protection.

Discussions with boiler insurers indicate that provided the systems are properly installed there is no increase in premium over and above that of standard LPHW systems.

Commissioning

Subject to tests being satisfactory on the specialist components such as the pressurising unit, systems will be commissioned in a similar manner to standard LPHW systems and the Final

Acceptance Record Sheet recommended for use in commissioning such systems may be applied to MP & HP systems. Because of the specialist nature of the pressurising unit and its matched sealed expansion tank these units should be commissioned by the supplier.

Section 21

Appendix 1 .1

FINAL ACCEPTANCE RECORD SHEETS FOR HOT AND COLD WATER SUPPLY SYSTEMS

This section contains examples of FAR Sheets (and Cover Sheet) for typical systems.

Suggested FAR Sheets for Mechanical Specialist Contractors' work such as that listed below, which may be relevant, will normally be issued with the corresponding standardised sections of Part C of the Model Specifications.

Thermal Insulation	Section CO2
Cold Water System Equipment	Section CO7
Hot Water Boilers	Section CO9
Boilers and Firing Appliances	Section C16
Oil Firing and Dual Firing, Equipment, Handling and Storage	Section C17
Steel Chimneys	Section C22

In some instances provision for signature by Commissioning and Witnessing Engineers may need to be made by a simple covering certificate.

Section 21

Appendix 1.2

ENGINEERING COMMISSIONING

FINAL ACCEPTANCE RECORDS
(W) HOT AND COLD WATER SERVICE

Client and Address .....

Project .....

Engineering Specification .....

Engineering Contractor .....

Notes

1. These Final Acceptance Record Sheets have been prepared for use on this project in accordance with "Guidance on Commissioning of NHS Engineering Installations.
2. Standard contractual clauses on commissioning are in Part B of the Engineering Specification.
3. Standard check/test methods are laid down in Part C of the Engineering Specification.
4. Particular commissioning requirements are in Part D of the Engineering Specification.

FINAL ACCEPTANCE RECORD

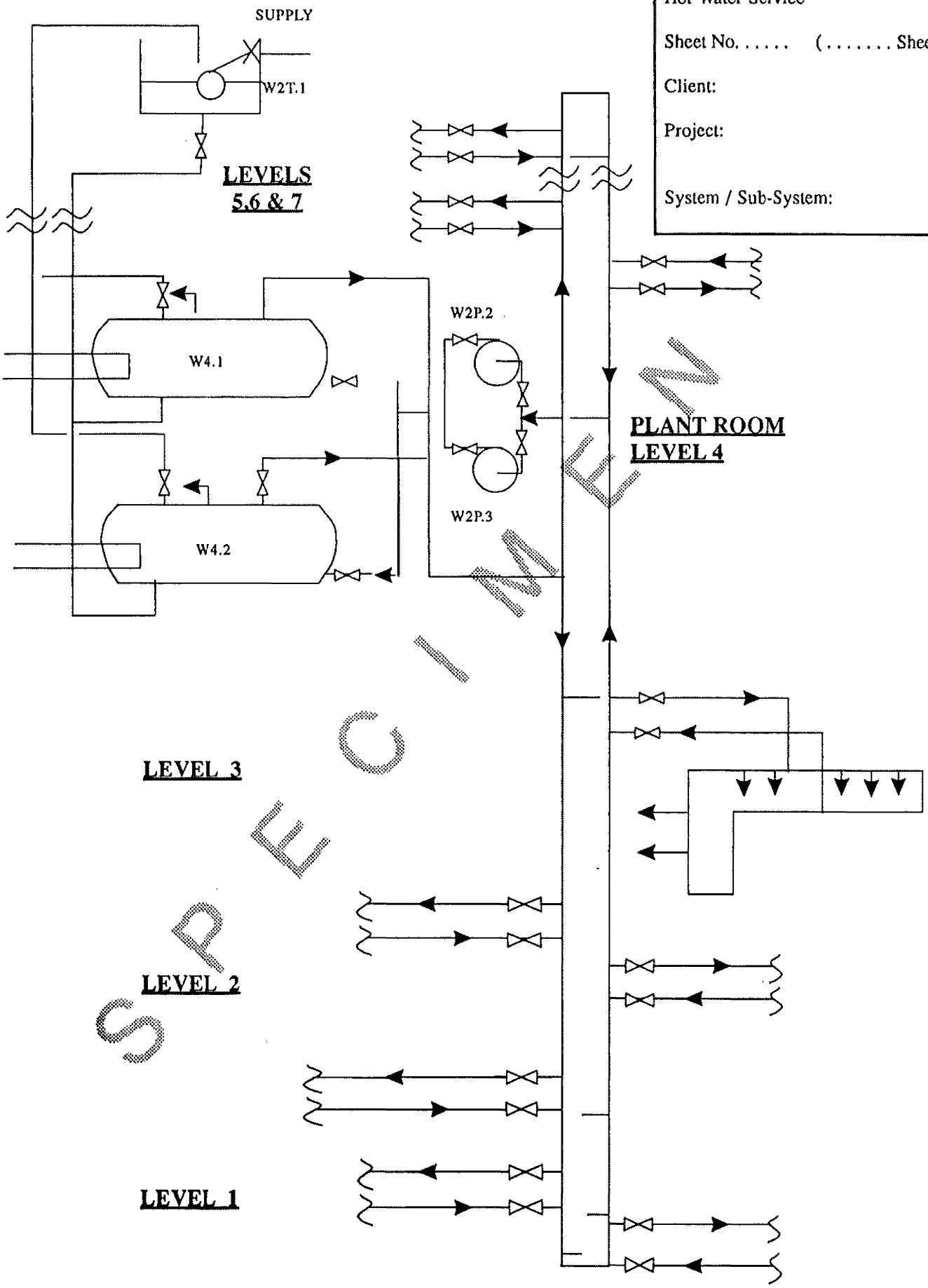
CODE: W1 FOR:
Schematic Diagram for
Hot Water Service

Sheet No. . . . . (. . . . . Sheet)

Client:

Project:

System / Sub-System:



NATIONAL HEALTH SERVICE - ENGINEERING COMMISSIONING

STANDARD CHECKS / TESTS (Test Methods to Part C, Section of Specification)

Item / Test Position Reference		Rating	Pressure		Flow	Motor			Notes	Tank Ref.	Inlet Flow Rate	Time to Fill	Notes
			Suction	Deliv-ery		F/L Current A	Ins. Res M (ohm)						
Pump	Design												
	Actual												
Pump	Design												
	Actual												
Pump	Design												
	Actual												
Pump	Design												
	Actual												

ADDITIONAL CHECKS / TESTS (To Part D of Specification)

FINAL ACCEPTANCE RECORD

CODE: W2 FOR:

CWS or HWS Pumps / Tanks

Sheet No. . . . . (. . . . . Sheet)

Client:

Project:

System / Sub-System:

Commissioned on: / /19

(Signed) . . . . . .

Commissioning Engineer
for Messrs

Witnessed by

(Signed) . . . . . .

Commissioning Engineer

Continued overleaf

NATIONAL HEALTH SERVICE - ENGINEERING COMMISSIONING

STANDARD CHECKS / TESTS (Test Methods to Part C, Section of Specification)

Item / Test Position Reference	Static Head (No flow)		Available Head (at Design Flow)		Fitment Flow (At Design Pressure)		Notes
		Design		Design		Design	
		Actual		Actual		Actual	
		Design		Design		Design	
		Actual		Actual		Actual	
		Design		Design		Design	
		Actual		Actual		Actual	
		Design		Design		Design	
		Actual		Actual		Actual	

ADDITIONAL CHECKS / TESTS (To Part D of Specification)

Item / Test Position Reference	Static Head (No flow)		Available Head (at Design Flow)		Fitment Flow (At Design Pressure)		Notes
		Design		Design		Design	
		Actual		Actual		Actual	
		Design		Design		Design	
		Actual		Actual		Actual	
		Design		Design		Design	
		Actual		Actual		Actual	
		Design		Design		Design	
		Actual		Actual		Actual	

Continued overleaf

FINAL ACCEPTANCE RECORD

CODE: W3 FOR:
Distribution CWS or HWS
(Cold conditions)

Sheet No. . . . . (. . . . . Sheet)

Client:

Project:

System / Sub-System:

Commissioned on: / /19

(Signed) . . . . . .

Commissioning Engineer
for Messrs

Witnessed by

(Signed) . . . . . .

Commissioning Engineer

NATIONAL HEALTH SERVICE - ENGINEERING COMMISSIONING

STANDARD CHECKS / TESTS (Test Methods to Part C, Section of Specification)

(Secondary Circulation on - No Draw Off)

*Tick if correct

Item / Test Position Reference	Heat up		Test from cold					Thermostat Tests					Notes
			Secondary				Primary	Min		Max			
	Normal Stat Setting °C		Initial Flow °C	Steady Flow Temp °C	Steady Return Temp °C	Time taken (minutes)	Supply Temp °C	Control Stat Setting °C	Steady Flow Temp °C	Control Stat Setting °C	Limit Stat Setting °C	Steady Flow Temp °C	
Calorifier		Design											
		Actual											
Calorifier		Design											
		Actual											
Califorier		Design											
		Actual											
Califorier		Design											
		Actual											

ADDITIONAL CHECKS / TESTS (To Part D of Specification)

Continued overleaf

FINAL ACCEPTANCE RECORD

CODE: W4 FOR:

Calorifier (HWS Storage)

Sheet No. ..... (..... Sheet)

Client:

Project:

System / Sub-System:

Commissioned on: / /19

(Signed) .....

Commissioning Engineer for Messrs

Witnessed by

(Signed) .....

Commissioning Engineer

NATIONAL HEALTH SERVICE - ENGINEERING COMMISSIONING

STANDARD CHECKS / TESTS (Test Methods to Part C, Section of Specification)

Normal Settings of Calorifier Control Stat and Fitment Mixer Stats

Item / Test Position Reference		Hot Water Supply °C	Mixed Outlet Temps: Normal °C	Mixed Outlet Temps: Cold Off °C (Initial)	Notes	Item / Test Position Reference		Hot Water Supply °C	Mixed Outlet Temps: Normal °C	Mixed Outlet Temps: Cold Off °C (Initial)	Notes
Fitment	Design					Fitment	Design				
	Actual						Actual				
Fitment	Design					Fitment	Design				
	Actual						Actual				
Fitment	Design					Fitment	Design				
	Actual						Actual				
Fitment	Design					Fitment	Design				
	Actual						Actual				

ADDITIONAL CHECKS / TESTS (To Part D of Specification)

FINAL ACCEPTANCE RECORD

CODE: W5 FOR:

HWS Temperature at fitments

Sheet No. ..... (..... Sheet)

Client:

Project:

System / Sub-System:

Commissioned on: / /19

(Signed) .....

Commissioning Engineer

for Messrs

Witnessed by

(Signed) .....

Commissioning Engineer

Continued overleaf

Section 21

Appendix 2 .1

FINAL ACCEPTANCE RECORD SHEETS

FOR LTHW HEATING SYSTEM

This section contains examples of FAR Sheets (and Cover Sheet) for a typical heating system from calorifier onwards.

Suggested FAR Sheets for Mechanical Specialist Contractors' work such as that listed below, which may be relevant, will normally be issued with the corresponding standardised sections of Part C of the Model Specification.

Thermal Insulation	Section CO2
Low Temperature Heating Equipment	Section CO7 & CO9
Boilers and Firing Appliances	Section C16
Oil and Dual Firing Equipment, Handling and Storage	Section C17
Steel Chimneys	Section C22

In some instances provision for signature by Commissioning and Witnessing Engineers may need to be made by a simple covering certificate.

Section 21

Appendix 2 .2

ENGINEERING COMMISSIONING

FINAL ACCEPTANCE RECORDS (H) HEATING, L.T.H.W.

Client and Address .....

Project .....

Engineering Specification .....

Engineering Contractor .....

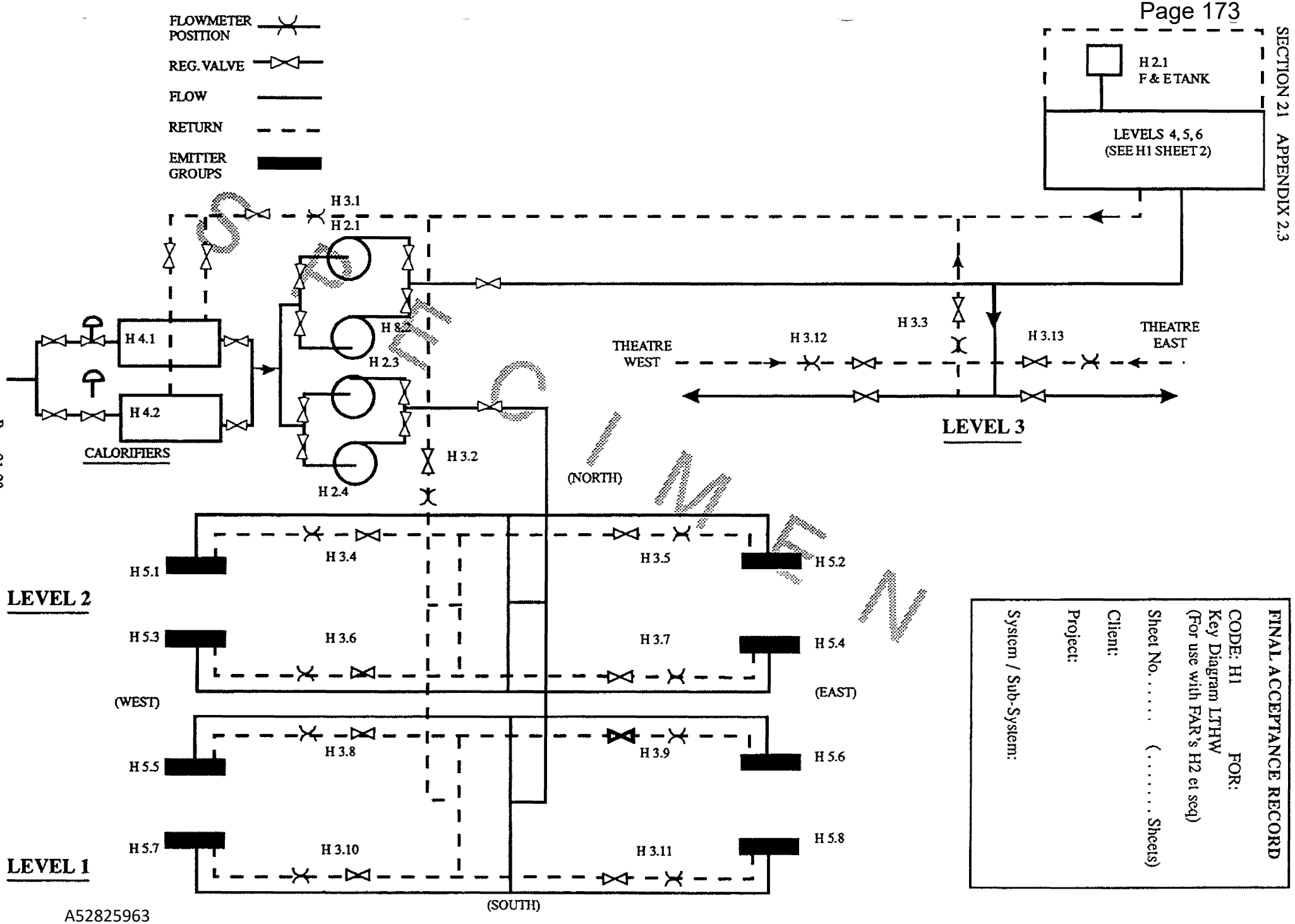
Notes

1. These Final Acceptance Record Sheets have been prepared for use on this project in accordance with "Guidance on Commissioning of NHS Engineering Installations, August 1980".

2. Standard contractual clauses on commissioning are in Part B of the Engineering Specification.

3. Standard check/test methods are laid down in Part C of the Engineering Specification.

4. Particular commissioning requirements are in Part D of the Engineering Specification.



FINAL ACCEPTANCE RECORD

CODE: H1 FOR:
Key Diagram LTHW
(For use with FAR's H2 et seq)

Sheet No. ..... (..... Sheets)

Client:

Project:

System / Sub-System:

NATIONAL HEALTH SERVICE - ENGINEERING COMMISSIONING

STANDARD CHECKS / TESTS (Test Methods to Part C, Section of Specification)

* Yes / No

Item / Test Position Reference		Rating	Pressure		Flow	Motor			Notes	Tank Ref.	Water Depth (Pump Off)		Vent Disch. (Pump on) *
			Suction	Delivery		F/L Current	Ins. Res	O/L Setting			Cold	At Wkng Temp	
Pump 1	Actual									1			
	Design												
Pump 2	Actual									2			
	Design												
Pump 3	Actual									3			
	Design												
Pump 4	Actual									4			
	Design												

ADDITIONAL CHECKS / TESTS (To Part D of Specification)

Continued overleaf

FINAL ACCEPTANCE RECORD

CODE: H2 FOR:

Pumps And Tanks

Sheet No. . . . . (. . . . . Sheet)

Client:

Project:

System / Sub-System:

Commissioned on: / /19

(Signed) . . . . . .

Commissioning Engineer
for Messrs

Witnessed by

(Signed) . . . . . .

Commissioning Engineer

NATIONAL HEALTH SERVICE - ENGINEERING COMMISSIONING

STANDARD CHECKS / TESTS (Test Methods to Part C, Section of Specification)

Item / Test Position Reference		Cold Balance		OR	Hot Balance (If no Calibrated Reg. Valves or Flow Meters)			Notes
		Reg. Valve Press Drop	Flow Volume		Flow Temp	Return Temp	Temp Drop	
Branch 1	Design							
	Actual							
Branch 2	Design							
	Actual							
Branch 3	Design							
	Actual							
Branch 4	Design							
	Actual							

ADDITIONAL CHECKS / TESTS (To Part D of Specification)

Continued overleaf

FINAL ACCEPTANCE RECORD

CODE: H3 FOR:

Distribution L.T.H.W.

Sheet No. . . . . (. . . . . Sheet)

Client:

Project:

System / Sub-System:

Commissioned on: / /19

(Signed) . . . . . .

Commissioning Engineer
for Messrs

Witnessed by

(Signed) . . . . . .

Commissioning Engineer

NATIONAL HEALTH SERVICE - ENGINEERING COMMISSIONING

STANDARD CHECKS / TESTS (Test Methods to Part C, Section of Specification)

Ø Omit for mixing valve control

Item / Test Position Reference		Control Stat Min				Control Stat. on Normal										Max Output				Notes
		Setting Temp	Water			Setting Temp °C	Water						Steam			Water Ø		Steam		
			Initial Flow Temp	Steady			Initial Flow Temp	Steady								Flow Temp °C	After (Mins)	Press In	Press Out	
				Flow Temp	After (Mins)			Flow Temp	After (Mins)	Return Temp	Flow Rate	Heat output rate	Press	Flow Rate	Heat Input Rate					
Calorifier 1	Design																			
	Actual																			
Calorifier 2	Design																			
	Actual																			
Calorifier 3	Design																			
	Actual																			
Calorifier 4	Design																			
	Actual																			

ADDITIONAL CHECKS / TESTS (To Part D of Specification)

Continued overleaf

FINAL ACCEPTANCE RECORD

CODE: H4 FOR:

Calorifiers (Steam / L.T.H.W.)

Sheet No. . . . . (. . . . . Sheet)

Client:

Project:

System / Sub-System:

Commissioned on: / /19

(Signed) . . . . . .

Commissioning Engineer for Messrs

Witnessed by

(Signed) . . . . . .

Commissioning Engineer

NATIONAL HEALTH SERVICE - ENGINEERING COMMISSIONING

STANDARD CHECKS / TESTS (Test Methods to Part C, Section of Specification)

Item / Test Position Reference	Test No. & Date	Air				Water					Weather	Occupancy	Notes
		Outdoor °C	Mean Indoor °C	Heat Loss (Design Loss x Act Temp Diff) / Design Temp Diff		Temp Flow °C	Temp Return °C	Flow Rate	Heat Emission				
Design Condition													

SPECIMEN

ADDITIONAL CHECKS / TESTS (To Part D of Specification)

Environmental Test Results have been recorded on V9

FINAL ACCEPTANCE RECORD

CODE: H5 FOR:
Compensator Control of Room temperature.

Sheet No. . . . . (. . . . . Sheet)

Client:

Project:

System / Sub-System:

Commissioned on: / /19

(Signed) . . . . . .

Commissioning Engineer
for Messrs

Witnessed by

(Signed) . . . . . .

Commissioning Engineer

Continued overleaf

NATIONAL HEALTH SERVICE - ENGINEERING COMMISSIONING

STANDARD CHECKS / TESTS (Test Methods to Part C, Section of Specification)

Item / Test Position Reference			Air			Water					Notes
			Temp		Heat Loss = (Design Loss x Act Temp Diff) / Design Temp Diff	Temp			Rad. Surface or Convector Data	Emission	
			Outdoor °C	Indoor °C		In °C	Out °C	Mean °C			
Emitter Group	Design										
Room	Actual										
Emitter Group	Design										
Room	Actual										
Emitter Group	Design										
Room	Actual										
Emitter Group	Design										
Room	Actual										

ADDITIONAL CHECKS / TESTS (To Part D of Specification)

Environmental Test Results have been recorded on V9

Continued overleaf

FINAL ACCEPTANCE RECORD

CODE: H6 FOR:
Heat Emitters
(Rads or Nat. Convectors

Sheet No. ..... (..... Sheet)

Client:

Project:

System / Sub-System:

Commissioned on: / /19

(Signed) .....

Commissioning Engineer
for Messrs

Witnessed by

(Signed) .....

Commissioning Engineer

NATIONAL HEALTH SERVICE - ENGINEERING COMMISSIONING

STANDARD CHECKS / TESTS (Test Methods to Part C, Section of Specification)

*Tick if correct

Item / Test Position Reference		Air					Water				Electrical			Notes
		Fan Speed Low, Med and High	Temp In	Temp Out	Flow Rate	Heat Emission	Mean Temp	Press Drop	Flow Rate	Heat Input	FL Current	O/L Prot *		
Emitter Group	Design													
	Actual													
	Design													
	Actual													
	Design													
	Actual													
Emitter Group	Design													
	Actual													
	Design													
	Actual													
	Design													
	Actual													
Emitter Group	Design													
	Actual													
	Design													
	Actual													
	Design													
	Actual													

ADDITIONAL CHECKS / TESTS (To Part D of Specification)

FINAL ACCEPTANCE RECORD

CODE: H7 FOR:

Heat Emitters (Fan Convectors)

Sheet No. . . . . . (. . . . . . . Sheet)

Client:

Project:

System / Sub-System:

Commissioned on: / /19

(Signed) . . . .

Commissioning Engineer
for Messrs

Witnessed by

(Signed) . . . .

Commissioning Engineer

Continued overleaf

NATIONAL HEALTH SERVICE - ENGINEERING COMMISSIONING

STANDARD CHECKS / TESTS (Test Methods to Part C, Section of Specification)

Item / Test Position Reference	Air			Water					Notes
	Temp		Heat Loss (Design Loss x Act Temp Diff / Design Temp Diff)	Temp		Flow Rate	Heat Input		
	Outdoor	Indoor		In	Out				
Circuit									
Circuit									
Circuit									
Circuit									

ADDITIONAL CHECKS / TESTS (To Part D of Specification)

Continued overleaf

FINAL ACCEPTANCE RECORD

CODE: H8 FOR:

Heat Emitters (Floor or Ceiling)

Sheet No. . . . . (. . . . . Sheet)

Client:

Project:

System / Sub-System:

Commissioned on: / /19

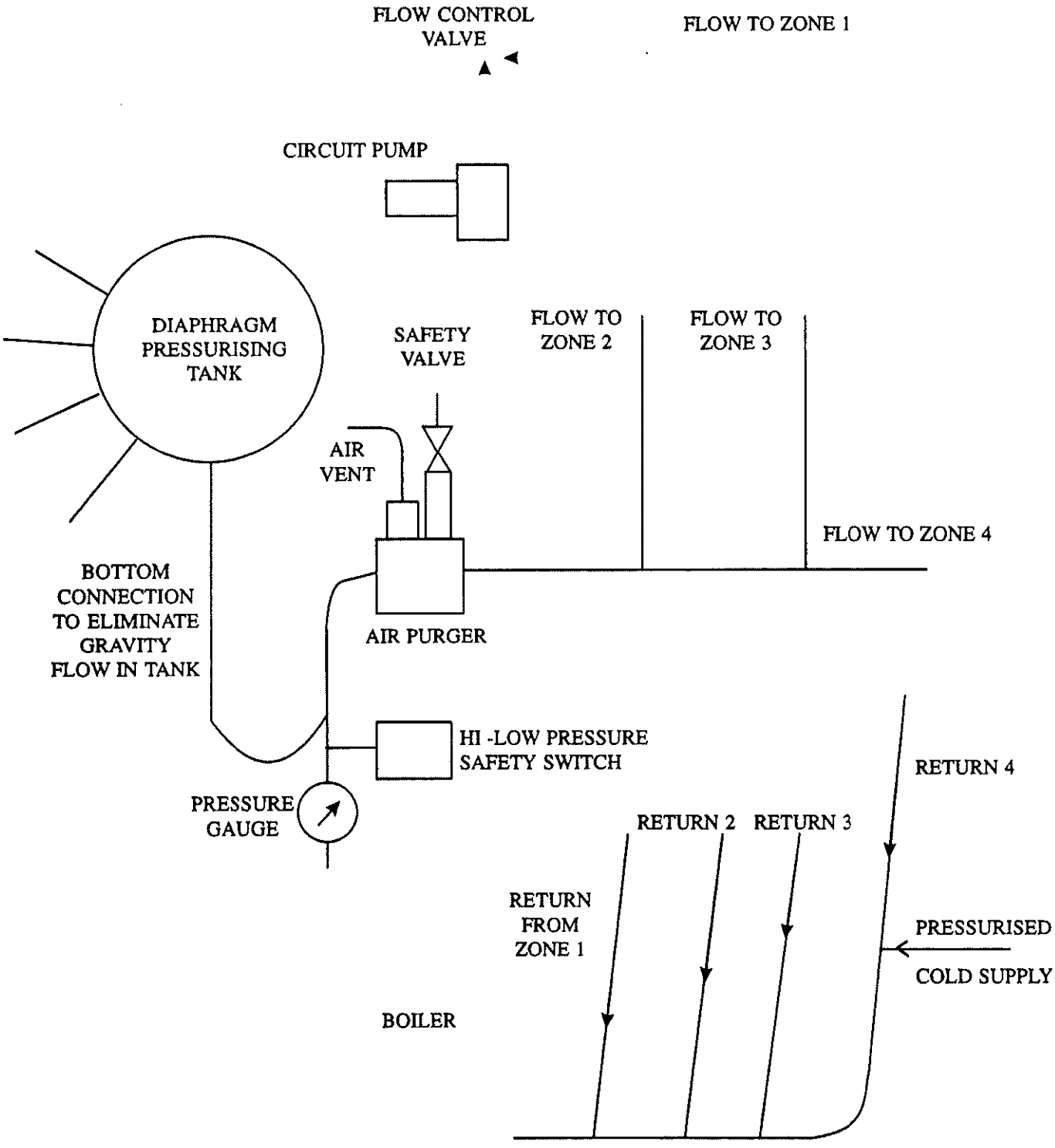
(Signed) . . . . . .

Commissioning Engineer for Messrs

Witnessed by

(Signed) . . . . . .

Commissioning Engineer



TYPICAL ARRANGEMENT OF SEALED SYSTEM HTW HEATING SYSTEM

Contents

22. Commissioning and Precautions Required for the Bringing in to Use of Flues and Chimneys for Boiler Plant.

22. COMMISSIONING AND PRECAUTIONS REQUIRED FOR THE BRINGING INTO USE OF FLUES AND CHIMNEYS FOR BOILER PLANT

One of the major causes of damage to flues and chimneys results from a failure to take proper precautions when bringing this equipment into use.

This is particularly applicable to brick and concrete constructions where the mass of the material can be considerable.

Initial Examinations

Prior to lighting up boilers a full examination of the flue and chimney system should be carried out. Because of the difficulties in completing a physical examination it is recommended that installations serving major plants should be surveyed by a TV camera and a record of the examination retained for future reference. To ensure the plant is completely satisfactory the examination should be completed whatever the construction used.

It will be understood that to complete a satisfactory examination the chimney will require to be rigged, either with scaffolding or laddered. This can be an expensive process, typical prices being £2000 - £3000 for a 50m stack. For this reason it is strongly recommended that the requirement should form part of the specification. The price will thus form part of the tender sum and be considerably reduced from that which would result from a post contract examination. In the case of materials other than steel particular attention should be given when making an examination of the video film, to the condition of the joints if a segmented construction is used, for the presence of incipient cracks or damage. Such areas are susceptible to subsequent acidic attack when the stack is in use and can also form a lodgement for particulate matter. Particular attention should also be given to the presence of excessive jointing material which can also form an area liable to subsequent attack, or a lodgement.

A visual examination of the exterior should also be completed to ensure there is no physical damage, tapes forming part of the lightning protection system are properly laid, are continous and are correctly secured. Any external treatment specified requires examination to ensure it is correctly applied and affords the maximum protection to weather attack.

Particular attention should be given to any warning lights fitted to stacks. It is essential that these can be lowered for examination and lamp replacement without a requirement to rig the chimney. Guiding is essential otherwise physical damage to the lightning fittings can result particularly on exposed sites.

All access doors, soot doors and the jointing of flues into the stack require a thorough check to ensure these are correctly fitted and are gas tight. It is particularly important to ensure there can be no ingress of cold air. Adequate and correctly fitted drain points are a further essential and it is advisable to ensure these are clear of obstructions by rodding through.

It will be appreciated that because of the particular circumstances of chimney construction it is doubtful whether a Clerk of Works inspection during construction can be achieved or relied upon if it is carried out. This is particularly so on the upper sections of main chimneys. In consequence the initial examination detailed is an essential requirement prior to lighting up.

Finally, if a chimney has provision made for future hospital extension and contains spare flues, these must be correctly and properly capped.

Warming Through

Prior to bringing any flue system or chimney into use it must be warmed through gradually

over several days. This is important to avoid thermal shock, particularly on constructions other than steel.

The recommended method is to use either propane or similar gas burners. A burner should be applied to each flue and it is essential to avoid flame impingement particularly during the early stages. The rate of rise of temperature should be strictly controlled and where possible should not exceed 5°C/hour. If a high mass is involved the temperature rise should preferably be limited to 3°C/hour. The heat should be applied evenly to allflues and care must be taken to ensure that the differential between flues is minimised. During the warming through process all access doors, soot doors etc. must be in place and be properly secured. It will be understood that the process will create a thermally induced natural draught and encourage the ingress of cold air. During the warming through process a physical examination of areas where cold air ingress is possible should be made to ensure this is not occurring. If any major leaks are found the process should be abandoned until these are properly repaired.

NOTE **Under no circumstances should Contractors be permitted to fire up the boiler plant to warm through the stack and/or fluesystem. The use of the fans whether forced or induced draught should not be permitted during this period.**

The warming through process should take place immediately prior to firing the boilers and it is essential that the stack and flues are not allowed to cool down once the process is in progress.

Once the temperature within the flues and stack reach 150° - 200°C and no visible damage is apparent, the boiler plant may be brought into use.

Once the boiler plant is fired the firing rate should be gradually increased until the specified operating temperatures are reached. Under no circumstances should maximum heat be applied suddenly or immediately, irrespective of the fuel used.

The stack should be allowed to reach its approximate operating temperature and be thoroughly heated through before the incinerator, if its flue forms part of the stack, is commissioned. It is recommended that the stack be used, with the boiler plant operating, for 7 days prior to firing the incinerator.

This is necessary because the stack temperature using the boiler plant is unlikely to exceed 300°C whereas temperatures in the order of 800°C plus can be quickly reached with the incinerator in use and thermal shock may result.

Future Examination and Maintenance

Because of numerous problems experienced with chimneys it is recommended that a further TV camera examination should be made after 12 months use. This film should be compared with the initial film taken and any areas of deterioration or damage attended to immediately. By these means it is possible to extend the life of the stack and avoid the high incidence of early failures which is occurring.

It is recommended that the TV camera survey should continue at regular intervals throughout the life of the plant. In all cases the original film should be used as the bench mark for comparison. A 3 year interval for examination is suggested but this is dependent upon the use of the plant, the type of fuel burnt and the method of operation. It should be noted that heavy oil firing is likely to give rise to most problems because of its high sulphur content. Again a stop-start operation is also likely to cause difficulties rather than continuously operating plant producing steady load conditions.

These recommendations should form part of the maintenance schedule for the plant which is included with documentation passed to the user Authority at handover.

Contents

23. THE COMMISSIONING OF BOILER PLANTS INCLUDING OPERATIONAL EFFICIENCY TESTS

Commissioning Tests for Shell Boiler Installations other than Efficiency and Acceptance Tests

Pre-Commissioning Inspection

Examine all mechanical and electrical controls and fittings to ensure that these are correctly installed and connected in accordance with the manufacturer's design drawings and specification before any attempt is made to energise the system.

Firing equipment shall be tested initially by a "dry" run that is with main and pilot fuel supplies isolated, or with no coal in the hoppers or oil fuel supplies available to the burner. All tests shall be repeated until all faults are rectified and a correct "dry" run is obtained consecutively of three complete operational cycles.

Timers, relays, fuses etc. in the control circuitry shall be checked during the "dry" run for accuracy and stability for the particular fuel and each sequence checked for compliance with the set standards. Note each and record.

Following the completion of satisfactory "dry" runs each safety device in the system shall be actuated to demonstrate that the systems fail safe on each fault sequence. Check that bridging out or interruption of electrical circuits is not being offered as the correct operation of safety devices. If there is any doubt of a component being defective ensure that it is replaced and that the replacement enables the systems to operate correctly and fail safe. Record by description each system tested satisfactorily.

If necessary (ie. gas fired) check using a portable gas detector that the boiler flue gas exit is adequately purged during the initial commissioning of the boilers.

Ensure that a Certificate of Compliance with the Clean Air Act is available at all specified local conditions to the turn down ratios.

Ensure that copies of the "Factories Act" and "Electric Shock" notices glazed and framed are mounted at a convenient position in the boiler house.

23.1 Coal Storage and Distribution Pneumatic Compressor

Check the rotation and operation of the compressor units at the design operating pressure.

Using an orifice plate and pressure gauges measure the flow rate and check against the design capacity. Record the operating pressures also the sequence of the duty and standby units. Remove the orifice plates.

Measure and record the oil pressure and temperature and compare with the manufacturer's specification.

Measure and record the flow rate of the cooling water, the flow and return temperatures, after a period of peak demand, compare with the design data. Ensure the capacity of the drain is sufficient to cater for the cooling water to waste if not the recirculation type.

An octave band spectrum shall be taken at an agreed distance from the compressor. Compare the noise criteria level with the design.

Record the operation of each electric motor, speed, horse power, number of phases, starting and running currents, insulation resistance and overload protection.

Check that any vibration transmitted to the structure is acceptable to the Design Engineer.

Bunkers/Hoppers

Check that probes, pressure plates in the overhead hoppers and the ground level receiving bunker are reproduced on a mimic diagram if specified and/or otherwise carry out their prescribed function.

Check that ground level bunker grid is in position and secured.

Check that there are facilities to discharge the contents of overhead hoppers onto the firing floor in the event of a fire "blow back" or the need to hand fire the stokers. If not satisfactory inform the Design Engineer.

Conveying Equipment

Check that any coal screw conveyors can be readily withdrawn in the event of a blockage also shear pins are accessible.

Check that mechanical coal handling plant is lubricated to the manufacturer's instructions, which should be readily available preferably framed and wall mounted. Ensure any wear plates are in position.

Check pneumatic conveyors for sharp bends, excessive noise, vibration.

Measure the time taken to fill overhead hoppers and calculate the capacity flow rate of handling plant compared with design requirement.

Ensure that any dampers designed either for motorised operation or chain and rack and pinion gearing will operate easily particularly under hopper full condition.

Check that the speed of mechanical elevators or conveyors correspond with the speed of subsequent conveyors such that the fuel is transferred with no spillage.

Note and record the firing rate using the coal meter at M.C.R. also the frequency of stop/start. Repeat at 50% M.C.R. Check against the design data.

23.2 Oil Storage and Distribution

Test Certificates should be available to show that the oil storage tanks have been hydraulically tested.

Prior to delivery of the oil check that sand and trays have been provided at the fill point, the viscosity of the oil has been clearly painted onto the tank and is visible from the fill point.

Check the operation of the outflow heater and sludge coil, note and record temperature also operation of steam trapping arrangements. Check for leaks.

Check the operation of the tank high level alarm, by moving the float also by the test button. Fit new oil filters.

At the initial oil fill ensure that the oil dipstick and the oil level/contents gauge are correctly calibrated and agree.

With the boilers operating at M.C.R. check and record temperatures of the oil in the tank, after the outflow heater, before and after line heaters with tracer cables operating.

Note and record the oil pressure at the pump suction and delivery, identify and record from manufacturer's data the rate of flow. Check against the flow obtained from the oil meter and a specific interval of time, record.

Note and record pressure drop over the oil filter. Record the pressure drop when the oil filter requires changing.

Check the operation of the pressure control valves.

Check fire sensing devices to energise the solenoid of the fire valves. Check the action of quick closing fire valves by de-energizing the solenoid.

Note and record the oil temperature at the farthest burner.

Check the operation of the burner and controls also safety features.

An octave band spectrum shall be taken at an agreed distance from the burner, any silencing equipment to be in position. The noise criteria level to be compared with the design data.

Check that any vibration transmitted to the supporting structure is acceptable to the Design Engineer.

Check that there is no gas/oil leakage at casing joints, flexible couplings, shaft seals etc.

Induced/Forced Draught Fans

Unless specifically stated by the Designer the fan shall be activated with the main damper shut. The damper shall be gradually opened until the design volume rate of flow (corrected to the boiler house temperature) has been achieved. The motor current to be noted and recorded. The maximum as given by the manufacturer shall not be exceeded.

The volume rate of flow to be measured in the manner described in the CIBSE Commissioning Code for ventilation ductwork and each reading recorded.

The pressure drop across the boiler, through the fire tubes and grit arrestor to be noted and recorded. Due allowance to be made for the pressure drop through the fire bed at maximum thickness, and a comparison made with the design data.

Any out of balance forces shall be noted and corrected.

An octave band spectrum shall be taken at an agreed distance from the fan, any silencing equipment to be in position. The noise criteria level to be compared with the design data.

Check that any vibration transmitted to the supporting structure is acceptable to the Design Engineer.

Check that there is no air leakage at casing joints, flexible couplings, shaft seals etc.

Identify on the quadrant of the balancing damper the position used for running the fan under the boiler house air conditions.

Check the temperature of the fan bearings and record. If the bearings are water cooled, measure the flow and return temperatures of the cooling water. Ensure that the drain can handle the amount of water if not of the re-circulation type.

Record the operation of each electric motor, speed, horse power, number of phases, starting and running currents, insulation resistance and overload protection.

Water Treatment

Check the amount and extent of treatment required. It depends on the analysis of the water supplied to the site and may range from simple dosing applied by a drip feed into the boiler feed tank to the provision of distilled or demineralised water. For hospitals using shell boilers it would not be economic to install plant producing purer water than de-alkalisation combined with base exchange softening. The cost of fuel has made this type of plant more economical in terms of reducing the amount of blow down.

These commissioning procedures are based on this type of treatment plant, but should also apply to a lesser extent with less sophisticated methods.

Ensure that framed and glazed notices are fixed in the appropriate positions outlining:

- The dangers of using acid.
- Precautions to take in the event of an accident.

Check the availability of first aid equipment.

Obtain in writing from the Design Engineer any particular hazards associated with filling vessels, starting up etc. also full instructions on the operation of all systems.

Check that the drench shower is operating and instruction on its use is available.

Ensure that all test certificates for pressure vessels carried out by the Insurance Inspector off site are available.

Check the continuity of any protective coatings used on surfaces of water softening, de-alkalisation vessels, de-gassing towers, acid or brine storage and measuring tanks using a high frequency spark tester or direct current probe tester.

Obtain an analysis of a recently taken raw water sample and compare with the analysis given in the specification. Identify to the Design Engineer any differences.

With the boiler plant operating at maximum continuous rating divert sufficient of the condensate return to drain such that the water meter to the water treatment plant shows the design capacity.

Check that the ball valve to the water break tank serving the water treatment plant is set in accordance with the design.

Check that high/low level probes in the de-gassing tower sump and the boiler feed tank stop and start the raw water pumps and the de-gassed water pumps accordingly.

Check the operation of the chemical dosing pump and the pH meter controlling the amount of acid to the de-alkalisation unit.

Check the operation of the fan in the de-gassing tower. Measure and record the amount of air flow in the tower. Using pilot tubes transversing the tower in the manner described in the CIBSE Commissioning Code for ventilation ductwork. Record the speed of the fan also the total pressure developed and compare with the manufacturer's specification. Note any out of balance and correct accordingly.

Check that any vibration transmitted to the supporting structure is acceptable to the Design Engineer.

An octave band spectrum shall be taken and the results compared with the design noise criteria level.

Check the operation of the air compressor, if fitted separately, running at the design operating pressure. Measure the flow rate, compare with the design capacity also record the operating pressures and the sequence of duty and standby units if the unit is duplex.

Measure and record the oil pressure and temperature and compare with the manufacturer's specification.

Ensure that the air is of a quality acceptable to the control manufacturer.

Check the noise criteria rating for acceptability.

Ensure that all plant pipework etc., in particular the acid, and salt saturation storage and measuring tanks and pipework, has been hydraulically tested by the installation engineer, by receipt of the appropriate certificates, duly witnessed.

Agree to the delivery of the bulk acid and brine, ensure that high level control/alarms operate satisfactorily.

When sufficient brine and acid have been mixed to the correct quantities allow the plant to be activated.

Check and record the operation of all pumps, ensure correct operation of the changeover from duty to standby.

Check that the controls etc. are set to enable the water to the boiler feed tank to be at zero commercial hardness.

Check all pipework glands etc. for leakage also all overflows.

When satisfied switch over to regeneration; note if all plant is then isolated. Check that the effluent discharging into the drainage system is not in excess of the maximum requirements of the Local Authority in respect of temperature, pH and sulphate content.

Measure and record the time taken for regeneration to occur, and check that the cycle is automatically recommenced.

With the system operating on normal running re-check the hardness of the water entering the boiler feed tank for commercial zero.

Measure the level of non-condensable gases in the boiler feed water also in the steam supply particularly if the steam is to be used for sterilization purposes. A figure of less than two parts per million is acceptable.

Boiler Treatment

Check the operation of the dosing pump also that the low level float switch in the dosing tank operates the warning light and stops the pump.

Add chemicals to the dosing tank to the specialist's recommendations, record quantities when the Design Engineer is satisfied with the quality of the water available from inspections test cock on the boiler.

Condensate Return and Boiler Feed Water

Check the availability of certificates covering the accuracy of the water meters also a chart indicating correction factors from the set point.

Obtain from the Design Engineer written instructions on the operation of the systems also indentifying any hazards.

Check location of sparge pipes in the boiler feed tank which may cover make-up water, condensate return, recovered flash stream, steam injection and spill-back pipes from the boiler feed pumps.

Arrange for the system to be filled using commercially zero water from the treatment plant.

Check settings and operation of pumps, alarms etc. of the probes sited within the boiler as the water level is increased. The probes may cover:- extra high level: normal operating: high and low level; and extra low level.

In addition to controlling alarms, indicating lamps, the same probes may stop/start the boiler feed pumps or open/close auxiliary feed water control valves (depending on the design) also cut off the fuel and air supply to the firing appliances. Check each operation as specified and record level against function.

Check any boiler feed tank level indicators for correct operation, recall the set positions.

Note the operation of steam pressure reducing sets, record the set pressures, test the operation of safety valves.

Check that the steam injectors raise the contents of the boiler feed tank within the specified temperatures and time.

Check the operation of the condense pumping system. Record the pressure differential across the pumps, record the flow rate from manufacturer's data and compare with the steam and water meter readings aggregated accordingly.

Repeat the above for the boiler feed pumps. If the level control is direct to the pumps then check that the pump can start against the boiler pressure.

Check the operation of the automatic standby facilities on the condense pumps and boiler feed pumps.

Record the operation of each electric motor-speed, horse power, number of phases, starting and running currents, insulation resistance and overload protection.

Check the operation of the continuous blow down by the conductivity electrodes and the automatic total dissolved solids controls by manual testing - note and record the levels also the frequency.

By measurement of a boiler water sample establish the frequency and amount of blow down required to keep the T.D.S. within the levels specified by the manufacturer - note and record.

Check the operation of the flash steam vessel-record operating conditions.

Instrument Panel

Check the availability of certificates covering the accuracy of each instrument, also correction factors. Test each instrument for a correct zero.

Check the availability of all wiring diagrams, including interior panel wiring and to external point of contact.

During the period of testing the boilers for efficiency, portable draught, CO2, O2, temperature instruments should be used. These instruments should be checked for accuracy before and after the acceptance tests. Adjacent to each permanent sampling point should be a test point for the portable instruments to enable the same conditions to be used when comparing the readings.

Check pipework for leaks and correct connections, also that any vibration from moving plant is not transmitted to the panel or any individual instrument.

Check that all pens on recording instruments register correctly and that the linking systems are correctly filled and that chart makings are clear and distinguishable from each other on multi-pen recorders.

Check all visual indication and audible alarms are functioning correctly, clocks are maintaining the correct time and lights are functioning as designed. On smoke density meters ensure that the projector/lamp and light receivers are clean and indicate correctly on the instruments. Measure and record the temperature within the panel.

Note and record at 15 minute intervals, through the MCR and 50% MCR tests, the readings on the panel instruments with those given on the portable instruments. Compare with the details specified. Instrumentation given in the model specifications C16 are for each boiler:

- All fuels

Exit gas temperature recorder
Flue gas temperature recorder in the reversal chamber
Oxygen recorder
Feed Water meter - checked during the commissioning of the boiler feed systems
Fuel meter - checked at efficiency testing against manual firing of weighed loads.

- Additional for coal firing

Overfire draught relative to atmosphere
Differential draught indicator to measure draught losses over the boiler passes.
Differential draught indicator to measure draught losses over the grit arrestor.
Smoke obscuration recorder with audible and visual alarm calibrated to Ringelmann Number and percentage obscuration.

- Additional for oil firing

Smoke obscuration recorder with audible and visual alarm calibrated in Bacherach smoke number and percentage obscuration.

Differential draught indicator to measure draught loss over boiler passes.

Note and record any other specified instrument in a similar manner to those recommended in the model specification.

Check and record that indicating instruments and recorders show the same reading, similarly with flow indicators and recorders.

23.3 The Commissioning of Boiler Plant

Steam Boiler Trials for Hospitals

Object

The object of the trials is to ensure that:-

a) The boiler meets its requirements for output
b) The boiler meets its requirements for thermal efficiency
c) All boiler house systems and controls function correctly

Test Methods

Trials can be carried out by two methods:-

a) Direct method
b) Indirect method

Direct Method

As the name implies this method of testing entails the direct measurement of fuel burned and the water consumed/steam produced.

Trials by the direct method should be conducted over a period of at least four hours at high fire followed by one hour at mid fire and one hour at low fire. Readings should be obtained at 15 minute intervals but should commence only when stable conditions have been attained.

Blow down should not take place during test periods. To enable tests to be carried out by the direct method provision should be made to enable water and fuel meters to be fitted to each

boiler. The water meter should be positioned between the feed pump and the boiler shell. (In view of energy conservation and management, water and fuel meters should be considered as a permanent feature of each steam boiler).

Indirect Method

The indirect method is carried out by analysis of the flue gases. From the analysis, the percentage of heat lost in the flue gases can be calculated and by difference the percentage of heat transferred to the boiler shell, and hence the thermal efficiency obtained. The indirect method of testing can not give any indication that priming or carry over is taking place.

Readings should be obtained over a period of at least one hour but for new boiler installations it is recommended that tests be carried out for the same duration as the direct method. Ideally, both direct and indirect test methods should be carried out simultaneously.

Reporting

On completion of the trials a fully detailed report should be produced which contains a specimen set of calculations. A copy of the report should be issued to the Estates Manager.

NOTE

It is important that the T.D.S. levels are maintained within the boiler manufacturers limits in order to prevent priming or carry over. An abnormally high water meter reading could be an indication that carry over is taking place, hence the importance of carrying out tests by the direct method.

Details of boiler trials are given in BS 845 1972.

If boiler trials are to be carried out in accordance with BS 845 then it should be stated in the specification which method (Preferably both) is to be employed.

Section 23.3

Annex A.1

BOILER EFFICIENCY - DIRECT METHOD

OIL

Thermal efficiency $\eta th = \frac{A + B}{C}$

where A = Evaporation Factor

= Feed Water Used (Kg) / Fuel Used (Kg)

= Litres Water x RD / Litres Fuel x RD

RD = Relative density
= 4.2 for Water at 80°C

= 0.835 for gas oil, 0.97 for Heavy Fuel Oil at 15.6°C

RD @ T °C = RD at 15.6 - 0.00063 (T-15.6)

B = heat added to feed water

= total heat hg - (Sp. heat x feed water temp)

= hg - (4.2 x feed water temp)

C = heat in fuel

= Calorific value - Sensible heat in fuel

= CV + 0.5* (fuel temp - Air inlet temperature) Kj/Kg

CV = 44656 KJ/Kg - gas oil

= 41865 KJ/Kg - H F O

* Specific heat.

Correction to F and A 100°C

Evaporation = Actual Evaporation x B / 2257.6 (hg at 100°C)

Section 23.3

Annex A.2

BOILER EFFICIENCY - DIRECT METHOD

NATURAL GAS

Thermal efficiency $\eta th = \frac{\text{feed water used (kg)}}{\text{m}^3 \text{ gas}} \times \frac{B}{C}$

$\underline{C}$ = heat in fuel

= 39330* + 1.455 (fuel temp at burner - fuel temp at meter)

* Calorific value of gas Kj/m^3

GAS FLOW CORRECTION

Vol. ft^3 @ S T P $= \frac{P + 407}{T + 460} \times \frac{520}{407} \times$ measured vol. ft^3

P = ins w g

T = ^{0}F

STP = 760 mm hg = 407 ins w g @ 60^0 F (520^0 F.Absolute)

Section 23.3

Annex B

BOILER TRIALS

Specimen Calculation

Boiler rating 6000lb/h (2724 kg/h) F and A 100°C

Operating pressure 100 lb/in² (6.9 bar)

Fuel: Heavy fuel oil. CV = 41865 Kj/Kg (18,000 Btu/lb) gross

Observations:-

Fuel:	Consumption	194 l/h
	temperature at burner	88°C
	Wt. fuel used	179 Kg/h at 88°C
Feed Water:	Consumption	2,567 Kg/h
	temperature	78°C
Flue Gases:	CO_2	13.5%
	temperature	234°C
Boiler house air temperature		26°C
Average steam pressure		6.9 bar (gauge)

Calculations - direct method Steam assumed to be 0.97 dry

A. Evaporation factor * = $\frac{\text{feed water consumption (Kg)}}{\text{fuel consumption (Kg)}}$

= $\frac{2567}{179}$

= 14.34

B. Heat added to feed water = hg - sens. heat in feed water

= 2,700.8 - (4.2 x 78)

= 2,373.2 Kj/Kg

C. Heat in fuel = CV - sens.heat in fuel

= 41865 - 0.5 (88 - 26)

Section 23.3

Annex B continued.....

= 41865 - 31

= 41834 Kj/Kg

ηth Thermal efficiency = $\frac{A \times B}{C}$

= $\frac{14.34 \times 2373.2}{41834}$

= 81.4%

Correction to F & A 100°C

Evaporation = $\frac{\text{Actual Evaporation} \times B}{hg @ 100^{0}C}$

= $\frac{2567 \times 2373.2}{2257.6}$

= 2699 kg/h (5945 lb/h)

Losses on indirect method

Dry gas loss % = 0.56 x 0.944 (FGT - AIT) / % CO_2

= 0.56 x 0.944 (234 - 26) / 13.5

= 8.15%

Moisture and Hydrogen Loss % = $\frac{9 \times 13.75 [\, 2460 - (4.2 \times AIT) + (2.1 \times FGT)\,]}{\text{Heat in fuel}}$

= $\frac{9 \times 13.75 [\, 2460 - (4.2 \times 26) + 2.1 \times 234)\,]}{41865 + 0.5\,(88 - 26)}$

= 8.40%

Radiation loss by difference = 100 - 8.15 - 8.40 - 81.4

= 2.05%

Assuming radiation loss is 2.0% at M C R

then Thermal efficiency = 81.5%

Section 23.3

Annex C

BOILER EFFICIENCY - INDIRECT LOSSES METHOD

OIL

Dry Gas Loss % $= \frac{0.56 \times (FGT - AIT)}{\%\ CO_2} \times 0.938$ (GAS OIL) - [or 0.944 (H F O)]

Moisture + Hydrogen $= \frac{9 \times 13.75 [\ 2460 - (4.2 \times AIT) + (2.1 \times FGT)\ ]}{44656^{*} + (\text{fuel temp} - AIT)\ 0.5}$

* 44656 Gas Oil - Calorific Value - typical
41865 H F O - Calorific Value - typical

NATURAL GAS

Dry Gas Loss $= \frac{0.387 \times 0.898\ (FGT - AIT)}{\%\ CO_2}$

Moisture + Hydrogen $= \frac{2460 - (4.2 \times AIT) + (2.1 \times FGT)}{241.8}$

BLOW DOWN CALCULATION

Required blowdown Kg/h $= \frac{\text{Steam raised Kg/h} \times \text{Actual TDS in Feedwater}}{\text{Desired TDS in boiler water.}}$

Legend

AIT - Air Inlet Temperature °C

FGT - Flue Gas Temperature °C

TDS - Total Disolved Solids

Section 23.3

Annex C continued.....

Blowdown Calculations

Assume boiler feed water is made up of 60% condensate return and 40% make up.

Suppose condensate return contains zero TDS

Make up contains 350 PPM TDS

Then TDS in feed water = 350 x 0.4

= 140 PPM TDS

Suppose max. allowable TDS in boiler is 2500 PPM TDS

then blowdown required $= \frac{6000 \times 140}{2500}$

= 336 lb/h

= 5.6%

Therefore total feed water supplied = 6336 lb/h = 2874 kg/h

Suppose water surface in the boiler is 5ft x 9ft

1 inch^3 of water = 0.036 lbs

then 5' x 9' x 1" contains 233 lbs of water

then blowdown rate $= \frac{336}{233}$

= 1.44 inches per hour

≃ 1.5" /h

23.4. FINAL ACCEPTANCE TESTS - MECHANICAL SYSTEMS - BOILER PLANT.

23.4.1 FINAL ACCEPTANCE TESTS MECHANICAL SYSTEMS - BOILER PLANT PRELIMINARIES

	No. Checks and Tests to be applied	Check/Test Applied	Remarks
.1.1	Systems have been provided and installed in accordance with specifications and drawings.	[ ]	
.1.2	Pre-Acceptance Tests have been satisfactorily completed by Sub-Contractor	[ ]	
.1.3	Final Acceptance Tests of all associated plant have been carried out before commencement of Thermal Efficiency and Maximum Continuous Rating Tests.	[ ]	
.1.4	Sub-Contractor has arranged for competent staff from the boiler manufacturer's works to carry out and supervise Thermal Efficiency and Maximum Continous Rating Tests in accordance with BS845 except that the Maximum Continuous Rating Test may be carried out at the boiler manufacturer's works, at the discretion of the Engineer.	[ ]	
.1.5	Sub-Contractor has provided tools, instruments, loads, labour, access and service required for all tests and inspections required in this section.	[ ]	
.1.6	Documentation is complete and satisfactory including, drawings, specifications, control plans, design intent, manufacturer's instructions, fuel and water analysis certificates, fire service, local authority and factory inspectorate reports, insurance certificates, permit to work system (if any).	[ ]	
.1.7	Boiler house is in a generally fit condition to carry out tests, ie. windows, doors, partitions completed, surfaces finished and Contractor's labour out of the area.	[ ]	
.1.8	Sub-Contractor has boiled out and filled boilers in accordance with BS 2486.	[ ]	
.1.9	Safety valves have been tested and certified by insurance company.	[ ]	

NOTE: Final Acceptance Tests for boiler plant shall be carried out in the following order:

.9.1 PRELIMINARIES.

.9.2 ELECTRICAL SUPPLY.

.9.3 MAIN CONTROL

.9.4 FUEL

.9.5 EQUIPMENT

.9.6 EFFICIENCY AND MCR TESTS

except that, at discretion of the engineer, testing of fuel burning equipment may be held concurrently with efficiency and MCR tests.

COMMISSIONED BY .....

DATE .....

SUB-CONTRACTOR'S REPRESENTATIVE .....

23.4.2 FINAL ACCEPTANCE TESTS - MECHANICAL SYSTEMS - BOILER PLANT - ELECTRICITY SUPPLY

	Checks and Tests to be applied	Check/Test Applied	Remarks
.1.1	The System has been provided and installed in accordance with specifications and drawings.	[ ]	
.1.2	Pre-Acceptance Tests have been satisfactorily completed by the Sub-Contractor.	[ ]	
.1.3	Preceding Final Acceptance Tests, as approved, satisfactorily completed.	[ ]	
.2.2	Phasing phase colours and phase rotation correct.	[ ]	
.2.3	Insulation Resistance satisfactory.	[ ]	
.2.4	Earthing and bonding satisfactory.	[ ]	
.2.5	Identification labels correctly engraved and fitted at cable termination ends and switch-gear.	[ ]	
.2.6	Switches fitted with correctly rated fuse(s) and/or link(s).	[ ]	
.2.7	Switches operate satisfactorily by hand, including any interlocking facility, with no overheating.	[ ]	
.2.8	Distribution board(s) fitted with correctly rated fuse(s).	[ ]	
.2.9	Distribution board(s) fitted with circuit schedule(s) and labels.	[ ]	

COMMISSIONED BY .....

DATE .....

SUB-CONTRACTOR'S REPRESENTATIVE .....

CONFIRMED AS CHECKED AND SATISFACTORY

..... CLIENT'S COMMISSIONING ADVISOR

DATE .....

23.4.3 FINAL ACCEPTANCE TESTS - MECHANICAL SYSTEMS - BOILER PLANT MAIN CONTROL/INSTRUMENT PANELS

	Checks and Tests to be applied	Check/Test Applied	Remarks
.3.1	**GENERAL**		
.1.1	Systems have been provided and installed in accordance with specifications and drawings.	[ ]	
.1.2	Pre-Acceptance Tests have been satisfactorily completed by the Sub-Contractor.	[ ]	
.1.3	Preceding tests have been satisfactorily completed.	[ ]	
.1.4	Vibration from plant or boiler does not affect panel or instruments.	[ ]	
.1.5	All visual and audible alarms function correctly.	[ ]	
.1.6	All clocks are maintaining correct time.	[ ]	
.3.2	**INSTRUMENTS**		
.2.1	Operate and ensure response to change in conditions is satisfactory.	[ ]	
.2.2	Chart markings are clear, in agreement with indicator and instruments rotation where multi-recording.	[ ]	
.2.3	Response is sharp from control adjustments and changes in condition at point of measurement.	[ ]	
.2.4	Indicating or recording sensible value.	[ ]	
.2.5	Joints and pipes free from leaks at full range of pressure and temperature.	[ ]	
.2.6	Where integrators are fitted, they register correctly when compared with the recorder chart over period of steady readings.	[ ]	
.2.7	Chart pen and inking system correctly filled.	[ ]	
.2.8	Projector/lamp and light receiver lenses are clean.	[ ]	

23.4.3 MAIN CONTROL/INSTRUMENT PANELS

	Checks and Tests to be applied	Check/Test Applied	Remarks
.3.1	Temperature of panel.	[ ]	
.3.2	Clear of water or spillage from plant.	[ ]	
.3.3	Reaction on mains failure.	[ ]	
.3.4	Lamps, including remote lamps, functioning correctly.	[ ]	
.3.5	Lamps and fuses not overheating.	[ ]	
.3.6	Relays and contactors quiet in operation.	[ ]	
.3.7	Tests of switchgear and fuseboards. (Refer to preceding test).	[ ]	

COMMISSIONED BY .....

DATE .....

SUB-CONTRACTOR'S REPRESENTATIVE .....

CONFIRMED AS CHECKED AND SATISFACTORY

..... CLIENT'S COMMISSIONING ADVISOR

DATE .....

23.4.4 FINAL ACCEPTANCE TESTS - MECHANICAL SYSTEMS - BOILER PLANT - FUEL

	Checks and Tests to be applied	Remarks
1.	**GENERAL**	
1.1	Systems have been provided and installed in accordance with specifications and drawings.	
1.2	Pre-Acceptance Tests have been satisfactorily completed by the Sub-Contractor.	
1.3	Preceding Final Acceptance Tests, as appropriate, satisfactorily completed.	
2.	**TANKS, PIPING, VALVES AND FITTINGS**	
2.1	Freedom from leaks over operating range of pressure and temperature.	
2.2	All supports, bases and fixings are secure and rigid.	
2.3	Freedom from distortion at all levels of liquid stored.	
2.4	Overflows run clear of tank at higher rate than inlet flow.	
2.5	Correct operation of safety devices including fire valves.	
2.6	Operation and tightness of valves when fully loaded.	
2.7	Where heating cables are fitted 'loops' are left at joints to provide slack.	
2.8	Oil filling points and panel numbering are identical.	
2.9	Tank compound drains towards sump. Valved drain or semi-rotary pump provided. Ensure valve padlocked externally to bond.	
2.10	Adequate space for removal of sludge coils and heaters.	
2.11	Tanks slope to drain points.	

2.12 Tanks cradle packing provided.

Checks and Tests to be applied	Remarks

2.13 Catch pit oil proof rendered.

2.14 Dip sticks and content gauges correctly calibrated at initial filling of each tank.

2.15 Interlocks provided for tanks supplied from common filling point.

2.16 Sand and trays provided at filling caps.

2.17 Viscosity of contents clearly marked on each tank.

2.18 Correct operation and control of heater battery/immersion heater. Check outflow liquid temperature under operating conditions with tank full.

2.19 Piping for tightness, security of anchors, movement, effectiveness of expansion pieces, freedom of rollers, and hangers.

3. FUEL BURNING EQUIPMENT (GAS/LIQUID FUEL)

3.1 Operation of all controls, including ignition are correct and fail SAFE.

3.2 Oil temperatures and pressures are correct at Maximum Continous Rating and when filters are 'loaded: record readings.

3.3 Noise level does not exceed that laid down in Specification.

3.4 Record combustion conditions, flame angle and soot ring formation under all conditions of load.

3.5 System of oil tightness.

3.6 Damper controls for freedom and conformity with scales provided.

3.7 Chimney exit for smuts and smoke.

3.8 Correct operation of gas meters and/or governors.

3.9 Correct operation of gas safety cut-off valves.

3.10 Correct operation of gas jet and controls.

NOTES: - See NOTE in Section 23.4.1 - Preliminaries.
- Test Record form at Appendix 3.

COMMISSIONED BY .....

DATE .....

SUB-CONTRACTOR'S REPRESENTATIVE .....

CONFIRMED AS CHECKED AND SATISFACTORY

..... CLIENT'S COMMISSIONING ADVISOR

DATE .....

23.4.5 FINAL ACCEPTANCE TESTS - MECHANICAL SYSTEMS - BOILER PLANT - EQUIPMENT

	Checks and Tests to be applied	Remarks
1.	**GENERAL**	
1.1	Systems have been provided and installed in accordance with specifications and drawings.	
1.2	Pre-Acceptance Tests have been satisfactorily completed by the Sub-Contractor.	
1.3	Preceding tests have been satisfactorily completed.	
1.4	Direction of rotation correct and freedom of rotation by hand.	
1.5	Freedom from noise and vibration.	
1.6	Satisfactory alignments of drives.	
1.7	Belts and chains for excessive slackness.	
1.8	Freedom from leaks over operating ranges of temperature and pressure.	
1.9	Controls satisfactory and in accordance with specification for manual, automatic, fail to 'SAFE' interlocks, indicators and signals.	
1.10	Operating temperatures satisfactory for gearboxes, glands, bearings, cooling water outlets.	
1.11	Lubricant levels and grades according to specification.	
1.12	Operating instructions are clear and concise.	
1.13	Stability at all loads.	
1.14	Switches and contacts free from sparking and over-heating.	

	Checks and Tests to be applied	Remarks
2.	**PUMPS**	
2.1	Free from strain from piping.	
2.2	Gauges, strainers and drip trays in accordance with specification.	
2.3	Packing glands in alignment, clean and in adjustment.	
2.4	Special seals correctly fitted, clean and of correct type.	
2.5	Air vents clear.	
2.6	Free from 'chatter', 'baning' or cavitation at all loads.	
2.7	Under correct control from any external source and responding correctly to signals.	
2.8	Where multi-stage pumps are provided - maker's instructions are complied with; that delivery valve is closed and suction valve open on start-up, unless otherwise specified.	
3.	**WATER TREATMENT PLANT**	
3.1	Tests to be carried out by competent staff from manufacturer's works.	
3.2	Installation in accordance with specification regarding materials used for filter, mixing gear, instruments, drives, valves, tanks fittings and paintwork.	
3.3	Operation of plant in accordance with specification regarding maximum flow rate, water analysis at maximum flow rate, condition of softened water, control (automatic) or hardness and regeneration, condition of backwash water, quantity of salt required for regeneration and loading of drive units.	
4.	**AIR COMPRESSORS**	
4.1	Lubricant of specified grade at correct level.	
4.2	Fusible plugs in good condition.	
4.3	Automatic controls, pressure gauges, frost heaters and safety valves in accordance with specification.	

	Checks and Tests to be applied	Remarks
4.4	Freedom of rotation by hand.	
4.5	With machine up to full speed, oil pressure is to maker's specification, relief devices function correctly, drive unit within rated capacity, instruments operate correctly and no flooding of drains with maximum cooling water.	
4.6	With plant at maximum load, ensure capacity is sufficient and compressors start and stop at specified frequency and in specified sequence.	
4.7	Ensure that unloaders are correctly interconnected.	
4.8	On completion of test check and record condition of blow down from receiver, filters, crankcase lubricant and contactor faces.	
5.	**FANS**	
5.1	Freedom from noise and vibration.	
5.2	Bearing temperatures are correct.	
5.3	Freedom from air leakage at casings, joints, shaft seals etc.	
5.4	At full load measure and record volume, suction and discharge pressures, fan static pressure, speed, motor amps, volts and speed and bearing temperatures. Enter readings on Fan Test Result Sheets (Appendix 4) attached.	
6.	**ELECTRIC MOTORS, STARTERS AND MOTOR CONTROLS**	
6.1	Alignment of motor and plant served.	
6.2	After one hour's operation on load ensure bearing and winding temperatures are correct and check current, speed and voltage during test.	
6.3	Relays and contacts free from 'chatter' and safety devices including 'no-volt' trips operate correctly.	
7.	**PRESSURISATION PLANT**	
7.1	Components, ie. pumps, electric motors, pressure vessels, compressors, controls etc., have been satisfactorily tested.	

	Checks and Tests to be applied	Remarks
7.2	System performs satisfactorily and according to specification under all conditions of loading, including maximum output of associated boiler plant and responds rapidly and accurately to control signals.	

COMMISSIONED BY .....

DATE .....

SUB-CONTRACTOR'S REPRESENTATIVE .....

CONFIRMED AS CHECKED AND SATISFACTORY

..... CLIENT'S COMMISSIONING ADVISOR

DATE .....

23.4.6 FINAL ACCEPTANCE - MECHANICAL SYSTEMS - BOILER THERMAL EFFICIENCY & MCR TESTS

	Checks and Tests to be applied	Remarks
1.	**GENERAL**	
1.1	Systems have been provided and installed in accordance with specifications and drawings.	
1.2	Pre-Acceptance Tests have been satisfactorily completed by Sub-Contractor.	
1.3	Preceding Final Acceptance Tests, as appropriate, satisfactorily completed.	
1.4	Pipe-lines and vessels for water hammer.	
1.5	Operation of condensate removal system.	
1.6	Insulated surfaces by hand, probe thickness where temperature appears excessive.	
1.7	General cleanliness, paintwork according to specification.	
1.8	Boiler plate correctly entered with duty, number and maker. Insurance test stamp.	
1.9	All electric wiring clear of hot surfaces.	
1.10	Air supply adequate with all doors and windows closed under all combustion conditions.	
1.11	Emergency devices including high and low level alarms pressure stats etc. operate correctly and fail 'SAFE'.	
1.12	Blow-down system operates correctly. Pit venting, accuracy and continuous blow-down, control settings, guarding and siting of pit.	
1.13	Soot blowers correctly directed and operate effectively.	
1.14	Access for maintenance and safety of gantries and walkways.	
1.15	Fuel for Tests is that specified for which certified analyst's report has been approved in the 'Preliminaries' Section of Boiler Plant Final Acceptance Test.	

	Checks and Tests to be applied	Remarks
2.	**BOILER TEST**	
2.1	With manometer that dampers operate correctly. Note draught readings at various settings including fully closed.	
2.2	Brickwork tightness, by quick adjustment of damper and observation for gas leaks.	
2.3	Tightness of brickwork tie-rods.	
2.4	At maximum load for priming and foaming, ensure that wetness of steam to steam atomised oil burners is not affected by this.	
2.5	Tightness of manhole securing nuts on other access covers to pressure spaces.	
2.6	Accuracy of automatic feed water controls.	
2.7	Operation of gauge glass cocks and safety of blow down points.	
2.8	Visibility and illumination of gauge glasses.	
3.	**THERMAL EFFICIENCY TESTS**	
3.1	Boiler manufacturers to carry out Thermal Efficiency Tests of six hours duration in accordance with BS 845 and record test readings on Log Sheets (Appendix 6).	
3.2	Average readings recorded to be entered on Heat Account Sheets Nos.1 - 3 for Steam Boilers, Nos. 4 - 6 for Hot Water Boilers (Appendix 6).	
3.3	Take sample of boiler water for analysis.	
4.	**MAXIMUM CONTINUOUS RATING TEST (MCR)**	
4.1	Boiler manufacturer to carry out Maximum Continous Rating Test for two hours duration and record evaporation flow rate of boiler, fuel fired, flue gas composition and temperature of gases leaving boiler, at 15 minute intervals. Enter readings on Log Sheets.	
4.2	On completion of test, note condition of furnace and take sample of boiler water for analysis.	

NOTE: At the discretion of the Engineer, this test may be carried out by the manufacturer at his works and witnessed by the Engineer.

	Checks and Tests to be applied	Remarks

5. CONCLUSIONS

5.1 Complete Heat Account sheets.

5.2 Inspect condition of furnace after completion of tests.

5.3 Ensure information available for final settings of automatic combustion controls by specialist.

COMMISSIONED BY .....

DATE .....

SUB-CONTRACTOR'S REPRESENTATIVE .....

CONFIRMED AS CHECKED AND SATISFACTORY

..... CLIENT'S COMMISSIONING ADVISOR

DATE .....

23.4.7 FINAL ACCEPTANCE - MECHANICAL SYSTEMS - BOILER PLANT - DOCUMENTATION, TRAINING AND HAND-OVER

Checks and Tests to be applied	Check/Test Applied	Remarks
Check that:		
Sub-Contractor has arranged with boiler and other plant manufacturers for training of operation and maintenance staff for a minimum of 5 working days.		
Boiler log sheets, heat account sheets, and recorder charts from preceding tests completed.		
Fuel and water analysis reports properly certified by an approved authority.		
Commissioning check lists completed.		
Performance report from information above completed.		
All test certificates provided.		
Insurance reports provided.		
Guarantee certificates provided.		
Any relevant correspondence from suppliers of electricity, fuel, water, fire service, telephones, T.V. and radio (Suppression Certificates).		
Design-in-use arrangements provided.		
Receipted list of tools, keys and other equipment (including specified spare parts) handed over to user.		
Service manuals have been provided.		
(Refer to main Commissioning Clause in the Specification for Details)		
Specified quantity of "as installed" record drawings and 1/2 plate negatives received.		
Permit to work (if any) issued.		
Hand over/take over certificate issued.		

COMMISSIONED BY.....

DATE .....

SUB-CONTRACTOR'S REPRESENTATIVE .....

WITNESSED AND CONFIRMED AS SATISFACTORY FOR USE

..... CLIENT'S COMMISSIONING ADVISOR

FOR .....CLIENT'S ORGANISATION

MECHANICAL SYSTEMS
BOILER PLANT MAIN CONTROL / INSTRUMENT PANELS

No.	Description	Location	Checks & Tests to be supplied			Remarks
			.3.1	.3.2	.3.3	
1	INSTRUMENTS					
2	CONTROL PANELS					

COMMISSIONED BY _____ DATE _____ SUB-CONTRACTOR'S REPRESENTATIVE _____

FINAL ACCEPTANCE TESTS - MECHANICAL SYSTEMS
MAIN
SUB-MAIN AND SENSING CABLES

Item No.	Size & Type	From	To	Checks & Tests to be applied							Remarks
				2.1	2.2	2.3	2.4	2.5	2.6	2.7	

COMMISSIONED BY _____ DATE _____ SUB-CONTRACTOR'S REPRESENTATIVE _____

FINAL ACCEPTANCE TESTS - MECHANICAL SYSTEMS
BOILER PLANT
FUEL

No.	Description	Location	Checks & Tests to be supplied			Remarks
			1	2	3 (3.1 to 3.10)	
1	TANKS, PIPING, ETC.					
2	FUEL BURNING EQUIPMENT (LIQUID FUEL)					

COMMISSIONED BY _____ DATE _____ SUB-CONTRACTOR'S REPRESENTATIVE _____

FINAL ACCEPTANCE TESTS - MECHANICAL SYSTEMS
BOILER PLANT
EQUIPMENT

No.	Description	Location	Checks & Tests to be supplied							Remarks
			1	2	3	4	5	6	7	
1	PUMPS									
2	WATER TREATMENT PLANT									
3	AIR COMPRESSORS									
4	FANS									
5	ELECTRIC MOTORS									

COMMISSIONED BY _____ DATE _____ SUB-CONTRACTOR'S REPRESENTATIVE _____

FINAL ACCEPTANCE TESTS - MECHANICAL SYSTEMS
BOILER PLANT
EQUIPMENT

Item No.	Description	Location	Checks & Tests to be applied							Remarks
			1	2	3	4	5	6	7	
6	PRESSURISATION PLANT (WIRING)									
7.	WIRING TO FANS AND AUXILIARY PLANT									

COMMISSIONED BY _____ DATE _____ SUB-CONTRACTOR'S REPRESENTATIVE _____

FINAL ACCEPTANCE TESTS - MECHANICAL SYSTEMS
BOILER PLANT
EQUIPMENT FAN TEST RESULTS

Pressures Measured by: ..... Date: .....

Volumes Measured by: .....

	Type & size of Fan	M^3 / Sec or C.F.M.	Suction Static Head M. Bar or In. W.G.	Discharge Static Head M. Bar or In. W.G.	Fan Static Head M. Bar or In. W.G.	Supply Volts	Supply Amps	Motor KW and Rev / Sec or H.P. & R.P.M.	Fan Speed Rev / Sec or R.P.M.	Remarks
DESIGN										
ACTUAL										
DESIGN										
ACTUAL										
DESIGN										
ACTUAL										
DESIGN										
ACTUAL										

FINAL ACCEPTANCE TESTS - MECHANICAL SYSTEMS
BOILER PLANT
BOILER, THERMAL EFFICIENCY AND M.C.R. TESTS

Item No.	Description	Location	Checks & Tests to be applied					Remarks
			1	2	3	4	5	

COMMISSIONED BY _____ DATE _____ SUB-CONTRACTOR'S REPRESENTATIVE _____

Section 23

Appendix 6

FINAL ACCEPTANCE MECHANICAL SYSTEMS BOILER PLANT
BOILER, THERMAL EFFICIENCY AND M.C.R. TESTS
HEAT ACCOUNT SHEET NO.1 - STEAM BOILERS

REPORT FORM

Test of .....

At .....

Date of Test .....

1.	**SPECIFIED CONDITIONS AND PERFORMANCE**			
1.1	Rated evaporation	Kg/s or lb/hr		
1.2	Pressure of steam	bar g or/ psig (lb/in^2 g)		
1.3	Final steam temperature	^{0}C or ^{0}F		
1.4	Initial temperature of feed water	^{0}C or ^{0}F		
1.5	Description of fuel to be used			
1.6	Overall thermal efficiency on net calorific value	%		
	* overall thermal efficiency on gross calorific value	%		
2.	**PARTICULARS OF PLANT**			
2.1	Boiler	1.1 1.2	type heating surface	 m^2 or ft^2
2.2	Superheater	2.1 .2.2	type heating surface	 m^2 or ft^2

Section 23

Appendix 6

2.3	Economiser			
2.4	Air heater	4.1	type	
		4.2	heating surface	m^2 or ft^2
2.5	Method of Firing			
2.6	Details of grate or burner			
2.7	Draught producing plant			

* Omit whichever not required.

Section 23

Appendix 6

FINAL ACCEPTANCE MECHANICAL SYSTEMS BOILER PLANT
BOILER, THERMAL EFFICIENCY AND M.C.R. TESTS
HEAT ACCOUNT SHEET NO.2 - STEAM BOILERS

REPORT FORM (continued)

3.	**DATA FROM OBSERVATION, ANALYSIS, ETC**	
3.1	Duration of test	hours
3.2	Water	
3.2.1	Temperature entering economiser	°C or °F
3.2.2	Temperature entering boiler	°C or °F
3.2.3	Evaporation per hour	Kg or lb
3.2.4	Evaporation per kilogram or pound of fuel as weighed	
3.2.4.1	or per cubic metre or cubic foot of gas	Kg or lb
	Evaporation per kilogram or pound of fuel as weighed	
3.2.4.2	or per cubic metre or cubic foot of gas (from 100°C or 212 °F).	Kg or lb
3.3	STEAM	
3.1	Gauge pressure	bar g/ p.s.i.g (lb/in^2 g)
3.2	Final temperature	°C or °F
3.4	FLUE GASES	
3.4.1	Temperature leaving - Boiler, Economiser or Air heater	°C or °F
3.4.2	Analysis	
3.4.2.1	CO_2	% *
3.4.2.2	O_2	% *
.3.4.2.3	CO	% *

*Omit whichever not required.

Section 23

Appendix 6

FINAL ACCEPTANCE MECHANICAL SYSTEMS BOILER PLANT
BOILER, THERMAL EFFICIENCY AND M.C.R. TESTS
HEAT ACCOUNT SHEET NO.3 - STEAM BOILER

REPORT FORM (continued)

3.5	DRAUGHT	m.bar or In.h H_20
3.5.1	Furnace front	" " " "
3.5.2	Boiler exit	" " " "
3.5.3	Economiser exit	" " " "
3.5.4	Air Heater exit	" " " "
3.5.5	Base of chimney	" " " "
3.6	AIR	
3.6.1	Temperature of air entering air intake	°C or °F
3.6.2	Temperature of air supply to furnace	°C or °F

4. HEAT ACCOUNT

		on nett calorific value - %	on gross calorific value - %
4.1	Overall thermal efficiency		
4.2	Losses due to flue gases		
4.3	Losses due to combustible in ash		
4.4	Losses due to combustible in riddlings		
4.5	Balance of account, including radiation and other unmeasured losses.		
		100	100

Section 23

Appendix 6

FINAL ACCEPTANCE MECHANICAL SYSTEMS
BOILER PLANT
BOILER THERMAL EFFICIENCY AND M.C.R. TESTS
HEAT ACCOUNT SHEET NO.4 - STEAM BOILERS

REPORT FORM

Test of .....

At .....

Date of test .....

1.	**SPECIFIED CONDITIONS AND PERFORMANCE**		
1.1	Rated output		MW or BTU/hr.
1.2	Boiler static pressure		bar g or/ * psig
1.3	Boiler differential head pressure		" " *
1.4	Boiler differential temperature		°C or °F
1.5	Water temperature leaving boiler		°C or °F
1.6	Description of fuel to be used		
1.7	Overall thermal efficiency		gross %
			nett %
2.	**PARTICULARS OF PLANT**		
2.1	Boiler	1.1 type 1.2 heating surface	m^2 or ft^2
2.2	Superheater	2.1 type 2.2 heating surface	m^2 or ft^2
2.3	Economiser	3.1 type 3.2 heating surface	m^2 or ft^2
2.4	Air heater	4.1 type 4.2 heating surface	m^2 or ft^2
2.5	Method of firing		
2.6	Details of grate or burner		
2.7	Draught producing plant		

* Omit whichever not required.

Section 23

Appendix 6

FINAL ACCEPTANCE MECHANICAL SYSTEMS
BOILER PLANT
BOILER, THERMAL EFFICIENCY AND M.C.R. TESTS
HEAT ACCOUNT SHEET NO.5 - STEAM BOILER

REPORT FORM (continued)

3.	**DATA FROM OBSERVATION, ANALYSIS, ETC**	
3.1	DURATION OF TESTS	hours
3.2	WATER	
	Temperature leaving boiler	^{0}C or ^{0}F
	Rate of flow from boiler	Kg/hr or lb/hr
	Heat output per litre of pound of water	W or BTU
	Heat output per litre of pound of fuel per second or hour	W or BTU
	Heat output per litre of pound above make-up water temperature	W or BTU
3.3	FLUE GASES	^{0}C or ^{0}F
3.1	Temperature of gases leaving boiler	^{0}C or ^{0}F
3.2	Analysis leaving boiler	
		CO_2 % *
		O_2 % *
		CO % *
3.4	DRAUGHT	m.bar or In.H_20
	Furnace front	
	Boiler exit	m.bar or In.H_20
3.5	AIR	^{0}C or ^{0}F
	Temperature air entering air intake	^{0}C or ^{0}F
	Temperature air supply to furnace	^{0}C or ^{0}F

* Omit whichever not required.

Section 23

Appendix 6

FINAL ACCEPTANCE MECHANICAL SYSTEMS
BOILER PLANT
BOILER, THERMAL EFFICIENCY AND M.C.R. TESTS
HEAT ACCOUNT SHEET NO.6 - STEAM BOILER

REPORT FORM (continued)

4. HEAT ACCOUNT

		on nett calorific value - %	on gross calorific value - %
4.1	Overall thermal efficiency		
4.2	Losses due to flue gases		
4.3	Losses due to combustible in ash		
4.4	Losses due to combustible in riddlings		
4.5	Balance of account, including radiation and other unmeasured losses.		
		100	100

Contents

24. Commissioning of Steam Mains and Steam Distribution Systems.

24. COMMISSIONING OF STEAM MAINS AND STEAM DISTRIBUTION SYSTEMS

24.1 General

It is the Design Engineer's responsibility to ensure that the installation complies with all statutory requirements and is safe to operate up to its design pressure.

The Site Engineer is responsible for inspecting the installation prior to its being set to work. He should ensure that the correct type and grade of pipe has been used (this is of importance bearing in mind the operating pressures likely) that the jointing of pipework complies with either the Model Specification or the Client's particular instructions. He should also ensure that all valves operate satisfactorily, that steam trap sets comply with standard guidance and include:

1) Strainer (which should be checked for cleanliness)
2) Trap of the Specified Type
3) Sight Glass
4) Valves before and after each trap set

All drain points should be checked to ensure they are clean and operate satisfactorily. Anchor points and expansion joints should be installed as designed and operate freely and supports be fitted to the design requirements. Subject to the inspection indicating these points are correct, steam may be admitted. The admission of steam will follow proper commissioning of either the boiler plant or steam generator.

Many of the particular points regarding the installation which are commented upon in subsequent clauses form part of the system design. Because of their importance it is recommended that the Client's Commissioning Advisor be given the opportunity of discussing the design and making comment prior to tender invitation.

Prior to commissioning the system, the Commissioning Advisor should ensure the Site Engineer has properly examined the system(s) and completed final snagging with outstanding work or advised defects properly attended to by the Contractor.

The importance of correct installation cannot be stressed too highly. It is also essential that the design be correct. Fatalities have occurred on commissioning steam installations through failure to ensure that both the design and installation are correct and conform to established practice. Part of this document comments upon and advises on established practice.

24.2 Steam Velocity

Many problems occur as the result of incorrect steam velocities. The velocity should normally be within the range 24 m/s to 35 m/s for all major distribution pipework. Whilst a velocity within this range offers a reasonable compromise between installation cost, pressure drop and noise considerations, it must of course be subject to maximum permissible pressure drop bearing in mind the required minimum operating pressure at the point of use.

24.3 Drainage of Condensate

A sufficient number of drain points must be provided to prevent the accumulation of condensate within the system. These should be sited at intervals along distribution mains. Mains should be installed with a fall of 12mm/3m length in the direction of steam flow and

to ensure proper drainage this rate of fall should be checked. Particular care should be taken to ensure the pipework is properly supported and that there is no sag between supports which forms a pocket where condensate can collect.

Where duplicate or ring main systems are installed particular care must be taken to ensure the system is adequately drained with any part of the system isolated.

Reducing fittings should be of the eccentric reducing type with the taper uppermost.

Drain pockets must be formed from pipe of equal diameter to the main being drained and be approximately 300mm in length. Each drain point must include a trap set connected into the drain point at approximately mid point.

The trap set must be designed to discharge the maximum rate of condensate produced which will normally occur on cold start up. As an example a 100mm steam line, well insulated and 30m long carrying steam at 100 psig (7.0 bar) and with the surrounding air at 14 C will produce approximately 16 litres of condensate per hour.

24.4 Thermal Expansion

Systems must be designed and installed to minimise stress placed on valves and components. In no case should the imposed stress exceed the maximum permitted working stress of any such components. As far as possible the installation of anchors, guides and support brackets should be so positioned as to avoid stress being placed on components.

It is preferable to allow the natural flexibility of the pipework to take up expansion. Where expansion compensation is essential articulated bellows are preferred as these avoid the higher stresses caused by axial bellows.

Anchor points must be checked to ensure construction is satisfactory and that proper account has been taken of the magnitude and direction of the imposed thrust loads.

Pipe brackets must be checked to ensure that whilst they restrain movement to prevent lifting they also allow expansion movement. In addition guiding adjacent to bellows must be fitted as if this is inadequate it will lead to premature failure of bellows.

To provide protection it is recommended that designers should insert a clause within the Specification requiring the Bellows Supplier to ensure that the installation conforms to their requirement. Where this clause has been inserted commissioning staff should check this to ensure agreement has been reached.

24.5 Checks Prior to Commissioning

The above constitute essential checks which must be completed prior to steam admission. Where doubt exists discussion should be held with the designer to agree whether design modifications are necessary for safety and general protection of staff. Modifications must be completed before steam admission.

24.6 Commissioning

On initial start up there should be a gradual admission of steam by 'cracking' the main stop valve. This will enable the steam lines and their components to heat up gradually and avoid sudden thermal stress. The admission of steam can be gradually increased up to its

normal loading once it is established that the system has been warmed through and any leaks attended to.

Once steam has been admitted the Commissioning staff should check that all condensate drains and trap sets with their components are operating correctly. Expansion joints and bellows should be checked to ensure that movement is correctly restrained without undue stress being placed on components.

Subject to satisfactory operation of the system and its components it is essential to establish that required pressures and flow rates are obtained at the point of use. The required rates and pressures should be tabulated from design intent documents and individually checked. It is preferable for equipment served to either have its individual pressure gauge or, in the case of major departments such as laundries, CSSDs or kitchens, to have measurement devices which should include both a pressure gauge and steam meter fitted at that inlet to the department. Where this is so and it is found that inadequate flow or pressure is apparent, experience dictates that the measuring devices fitted should be checked against standard instruments before any action is taken.

It is preferred to bring steam distribution systems into use prior to fitting insulation. Once checks are completed insulation may be applied. If possible it is recommended that the system be maintained live for 7 days following bringing into use and prior to its insulation. Incipient leaks, joint failures etc often take some while to manifest themselves and it will be appreciated that stripping of insulation once fitted should be avoided.

Section 24

Appendix 1

FINAL ACCEPTANCE RECORD SHEET - STEAM DISTRIBUTION SYSTEMS

Commissioning Advisor to indicate whether satisfactory or not.

System Drawing Nos .....

Precommissioning Checks

Has installation been completed in accordance with the above drawings?	[ ]
It is confirmed that the specified grade of pipe has been used and components are all as specified	[ ]
Installation has been properly cleaned and is free from scale	[ ]
Components operate freely	[ ]
Trap Sets comply with standards	[ ]
Drain points are clean and run freely	[ ]
Expansion bellows are correctly installed to manufacturer's recommendations	[ ]
Anchor points are secure and properly constructed	[ ]

Commissioning

Installation is free from leaks	[ ]
Pressures at points of use comply with design intent	[ ]
Flow rates are adequate and satisfactory	[ ]
Noise level is satisfactory and there is no excessive noise generated by steam flows	[ ]

It is confirmed that insulation of the system may proceed.

Signed .....Contractor's Commissioning Officer

I confirm that the system as installed is satisfactory and is fit for use.

Signed ..... Commissioning Advisor for and on behalf of .....(Client)

Date .....

Contents

25. The Commissioning of Gas Pipelines, Fittings and Appliances.

25. THE COMMISSIONING OF NATURAL GAS PIPELINES, FITTINGS AND APPLIANCES TO BRITISH GAS MANDATORY REQUIREMENTS

General

Although pipelines and associated equipment may be specified for installation by the engineering sub-contractor, British Gas have drawn attention to the need to ensure that properly equipped and qualified staff carry out work associated with gas installations, their commissioning and maintenance. Such staff should either be employed by British Gas or have been authorised by them to carry out the work.

This recommendation should be borne in mind when specifying gas installations and naming contractors to carry out the work.

Commissioning Guidance

Attention is drawn to the following documents which are available from British Gas. The recommendations given which constitute good practice and compliance with safety codes should be followed on all installations:

Guidance Note for Architects, Builders and Consultants on the Gas Safety (Installation and Use) Regulations 1984 - applicable in all cases where British Gas are the fuel suppliers.	Ref: DM4
Guidance Notes on the Installation of Gas Pipework, Boosters and Compressors in Customers' Premises. (excludes domestic installations of 25mm and below)	Ref: 1M/16
Codes of practice for the Use of Gas in Low Temperature Installations (includes aspects of gas and fuel burners).	Ref: 1M/18
Purging procedures for Non Domestic Gas Installations.	Ref: 1M/2
Soundness Testing Procedures for Industrial and Commercial Gas Installations.	Ref: 1M/5

As additional guidance a copy of a British Gas Test Record Form is attached to this document for further information (Appendix 1).

Design Guidance

The following points should be noted which are based on British Gas recommendations. For Low Pressure gas supplies the pressure drop between the primary meter and any booster for the plant manual isolating valve, at maximum flow, should not normally exceed 1m bar (0.4" In. H_20).

Low pressure gas supplies are generally metered at 21m bar (8.4 In. H_20). Where gas supply pressure at the outlet of the primary meter is greater than 21m bar, the pressure drop between the primary meter and the plant manual isolating valve at maximum flow should not exceed 10% of that pressure.

Where gas is supplied at high pressure from boosters or a compressor the pressure loss at

maximum flow should not exceed 10% of the outlet pressure from the booster or compressor. Gas velocity in pipes should not exceed the following unless special requirements apply. In special cases due note must be taken of the likely effects of noise in the system and pipe erosion.

Where supplies are filtered down to 250 micrometers the velocity should not exceed 45m/s (148 ft/sec).

If unfiltered supplies have to be used the velocity should not exceed 20m/s (65.6ft/sec).

The maximum pipe velocity whatever the circumstances should never exceed 75m/s (245ft/ sec).

Pipe Materials

Where buried pipes or ducted gas distribution mains are used the following materials are recommended.

British Gas place the stated maximum work pressure limitations on the materials used.

Material	Pipe Pressure	Fittings Pressure	Valve Pressure
Steel	5 bar	5 bar	5 bar
Ductile Iron	2 bar	2 bar	5 bar
Polyethylene	2 bar	2 bar	2 bar
Copper	75m bar	75m bar	Not to be used
Brass	Not to be used	Not to be used	Not to be used
Bronze	Not to be used	75m bar	5 bar
Malleable Iron	Not to be used	5 bar	5 bar
Grey Cast Iron	Not to be used	2 bar	5 bar
Grade 17 min	Not to be used	2 bar	5 bar

It is essential to take the usual measures used when burying pipes to ensure there is no damage from rocks, sharp materials or traffic flow. The pipes should also be protected against chemical action caused by corrosive soils and high tension cables. Fittings, valves etc. as specified in the NHS Model Specifications are confirmed as satisfactory. All pipework must be indicated in accordance with BS 1710.

Where gas installations occur in high rise developments the type of pipe material and the British Gas stated maximum working pressures applicable are as follows:

Materials	Pipe Pressure	Fittings Pressure	Valve Pressure
Steel	5 bar	5 bar	5 bar
Ductile Iron	Not to be used	Not to be used	5 bar
Brass	Not to be used	Not to be used	75m bar
Bronze	Not to be used	Not to be used	5 bar
Malleable Iron	Not to be used	5 bar	5 bar
Grey Cast Iron	Not to be used	Not to be used	5 bar

Grade 17 min.

It should be noted that the requirements apply to risers in excess of 15m (50 ft), and which are above 20m (66 ft) from ground floor level to the ceiling level of roof top plant rooms and boiler houses.

Pipe Supports

British Gas advise that pipe support spacing should not exceed the figures given in the table for steel with other than welded fittings, ductile iron and copper pipe.

Size	Vertical Runs Steel & Ductile Iron	Copper	Horizontal Runs Steel & Ductile Iron	Copper
15mm	2.5m	2.0m	2.0m	1.2m
20mm	3.0m	2.5m	2.5m	1.8m
25mm	3.0m	2.5m	2.5m	1.8m
32mm	3.0m	3.0m	2.7m	2.5m
40mm	3.5m	3.0m	3.0m	2.5m
50mm	3.5m	3.0m	3.0m	2.5m
67mm	3.5m	3.0m	3.0m	2.5m
80mm	3.5m	Not to be used	3.0m	Not to be used
100mm	3.5m	Not to be used	3.0m	Not to be used

Above 100mm I/D, only welded/flanged steel pipe should be used. Reference is also made to the need to allow for thermal expansion, vibration and general movement of pipework. Where possible purpose made fitments should be used and not flexible pipework.

Purging of Pipework and Fittings

Prior to final inspection and commissioning all pipelines must be purged in accordance with the recommendations given in the British Gas publication 1M/2 "Purging Procedures for Non Domestic Gas Installations". The procedures should be witnessed by the site engineer/clerk of works.

The procedures will apply to all sizes of pipework commencing downstream of the meter inlet valve through to the position of gas use at the inlet to appliances or the termination of the supply pipe.

The procedures will apply irrespective of the gas pressure used, and are essential to comply with Regulations 33b and 43c of the Gas Safety Regulations 1972. It is also essential that the procedures be carried out by properly trained and authorised personnel.

A leakage test of the pipework must be completed immediately prior to purging using an inert gas.

The purging of primary gas meters must only be carried out under the supervision of a responsible person nominated by British Gas. For all but the most simple purge operations a written procedure appropriate to the installation must be prepared and followed. It is also recommended that where the installation to be purged is an extension to a system in use, a Permit to Work system should be enforced.

Particular attention is required to ensure that where an inert gas is used for purging it is prevented from entering British Gas mains (Gas Act 1972 Schedule 4 Clause 18 applies).

The purging procedures to be followed are explained and described in the British Gas publication referenced above.

Pre Commissioning Examinations and Checks

The installation should be purged in accordance with the recommendations given previously.

The following checks should be instituted prior to commissioning:

Ensure the necessary installation drawings have been prepared and are displayed adjacent to the main meter.

Check supporting of pipework with particular reference to dips where moisture may collect.

Check that operating handles are fitted to all valves and are clearly marked as to direction of operation and the 'open' and 'shut' positions.

Ensure that the installation is correctly cross bonded in accordance with IEE Regulations 17th Edition.

Check that the necessary test and purge points are provided especially at the ends of pipe runs.

Ensure that all joints on underground pipework which remain exposed are securely anchored, if appropriate, and that due care is taken with regard to personnel in the vicinity of excavations.

Ensure that all pipe ends are spaded, plugged or capped and that the meter and other sensitive equipment are properly protected.

Check the pipework is correctly wrapped or painted and is colour coded in accordance with BS1710.

Ensure that all ancillary equipment has been installed and commissioned in accordance with manufacturers' requirements.

Make final usual inspection of installation.

Complete purging of the installation in accordance with British Gas Document Purging Procedures for Non Domestic Installations (Ref 1M/2).

Check final connections of appliances to all distribution pipework, if necessary applying specified leak test compounds to the joints.

Commissioning of the Installation

The document summarises testing procedures for Industrial and Commercial Gas Installations, British Gas Publication 1M/5 is primarily concerned with testing of the installation for leakage. It specifically relates to installations which include a meter of badged capacity U16 and above. Domestic/residential accommodation with individual boilers rarely include badged capacity meters of above 6m3.

The procedures apply to all sizes of pipework installation commencing downstream of the meter through to the appliances or to the termination of the supply pipe.

The listed procedures apply to installations designed to operate at pressures up to 6 bar (72 psig). For higher pressures reference should be made to British Gas before commissioning. Soundness testing procedures specifically apply to:

1) New installations of pipework or appliances.

2) The alteration or replacement of existing pipework in which case it is recommended the whole installation be re-tested.

3) In cases of known or suspected gas leaks.

Attention must be drawn to the Gas Safety (Installations and Use) Regulations 1984 which prescribe circumstances in which a prescribed soundness test is required by law.

It should be noted that the prescribed tests include calculation of flow volumes, calculated permitted leak rates based on British Gas requirements and specified test periods. For these reasons it is recommended that the tests be completed by Authorised Personnel only, but should be witnessed by a nominee of the client and the user. Appliances should be tested, preferably by the suppliers' specialist officers, in accordance with their recommended procedures. All tests should, however, be witnessed by the Commissioning Team, the Commissioning Advisor and, if required, by a representative of the User.

TEST RECORD FORM

SOUNDNESS TESTING PROCEDURES FOR NEW NON-DOMESTIC GAS INSTALLATIONS

Customer's Name ..... Address .....

....

Job Reference ..... Fitter ..... Supervisor .....

Contractor .....

Working Pressure ..... mbar (If this exceeds 32 mbar contact supervisor)

Conditions for the test must be steady, therefore the answers to the next two questions must be 'Yes' or 'Not applicable'. If the answer is 'No' contact the Supervisor.

If part of the pipework is in the open, are the weather conditions stable (note steady sun is unacceptable)? Yes / No / Not applicable

Is the Building temperature steady? Yes / No / Not applicable

Tests which are to include a primary meter, may only be carried out with the permission of the local Region of British Gas.

PROCEDURE

1 Estimate total volume of the installation to be tested from the Tables 1 and 2. (If this is in excess of 1400dm^3 consult the supervisor). Pipe Volume ..... dm^3.
2 Determine the test period from the Table 3. Test Period ..... min.
3 Spade off, plug or cap the valves to and from the section under test and bypass any governor or non-return valve upstream of the pressure gauge.
4 Raise the installation pressure to 50 mbar with air or inert gas.
5 Allow the temperature to stabilise for 15 minutes maintaining the pressure.
6 Isolate the source of pressure and observe the water gauge for the test period.
7 If there is any perceptible gauge movement there is an unacceptable leak and it must be dealt with.
8 When a test has been carried out with no perceptible gauge movement, the installation can be regarded as safe, provided that all pipe joints in unventilated areas have been tested with leak detection fluid and any leaks dealt with. Checked? Yes / No / Not applicable.
9 Put the installation into service (See Purging Procedures for Non-Domestic Gas Installations).
10 Joints in unventilated or unoccupied areas and ducts should be checked with a suitable gas detector. No perceptible movement from 0% LEL on the LEL scale. Checked Yes / No / Not applicable.
11 Provided this test is successful and that there is no smell of gas anywhere the installation can be regarded as sound (subject to 12). Is there a smell of gas. Yes / No.
12 Three to four days after commissioning, repeat 10. Checked Yes / No / Not applicable.

Note: For a successful test the answers to 8, 10 and 12 must be 'Yes' or 'Not applicable'; the answer to 11 must be 'No'. If this is not the case, contact the Supervisor.

SUPERVISING ENGINEERS NOTES

In item 3, governors etc. are temporarily bypassed, for example using pressure points to avoid 'trapping' pressure. Meter governors should only be bypassed with the agreement of British Gas; if this is not practical the meter governor should be checked separately, for example using leak detector fluid.

TABLE 1 PIPE VOLUME (dm^3)

Length (m) \ Pipe Size (mm)	15	20	25	32	40	50	80	100	150	200	250	300
½	0.10	0.18	0.30	0.55	0.68	1.1	2.5	4.3	10	17	27	37
1	0.20	0.36	0.60	1.1	1.4	2.2	5.0	8.6	20	34	54	74
2	0.40	0.72	1.2	2.2	2.8	4.4	10	17	40	68	110	150
3	0.60	1.1	1.8	3.3	4.2	6.6	15	26	60	100	160	220
4	0.80	1.4	2.4	4.4	5.6	8.8	20	34	80	140	220	300
5	1.0	1.8	3.0	5.5	7.0	11	25	43	100	170	270	370
6	1.2	2.2	3.6	6.6	8.4	13	30	52	120	200	320	440
7	1.4	2.5	4.2	7.7	9.8	15	35	60	140	240	380	520
8	1.6	2.9	4.8	8.8	11	18	40	69	160	270	430	590
9	1.8	3.2	5.4	9.9	13	20	45	77	180	310	490	670
10	2.0	3.6	6.0	11	14	22	50	86	200	340	540	740
15	3.0	5.4	9.0	16	21	33	75	129	300	510	810	1100
20	4.0	7.2	12	22	28	44	100	170	400	680	1100	1500
30	6.0	11	18	33	42	66	150	260	600	1000	1600	2200
40	8.0	14	24	44	56	88	200	340	800	1400	2200	3000
50	10	18	30	55	70	110	250	430	1000	1700	2700	3700
60	12	22	36	66	84	130	300	520	1200	2000	3200	4400
70	14	25	42	77	98	150	350	600	1400	2400	3800	5200
80	16	29	48	88	110	180	400	690	1600	2700	4300	5900
90	18	32	54	99	130	200	450	770	1800	3100	4900	6700
100	20	36	60	110	140	220	500	860	2000	3400	5400	7400

Table 2 Meter Volumes

The table gives approximate volumes of diaphragm meter cases; if the meter volume exceeds 1/3 of the installation the case volume should be ascertained by measuring the case.

Meter Size ft^3	100 P1 or D1	200 P2 or D2	212 U6	400 P4 or D4	525 U16	700 P7	1200 P12	1800 P18	3000 P30	6000 P60	9000
Volume dm^3	11	22	16	42	28	99	130	190	310	570	1100
Meter Size ft^3	12000	15000									
Volume dm^3	1700	1900									

Note: (i) BM meters – measure the case volume (deduct oil volume)
(ii) Other meters assume as length of pipe.

Table 3 Test Period

Pipe Volume (dm^3)	0 – 200	200 – 280	280 – 360	For each additional 80 dm^3 or part of 80 dm^3
Test Period (Min)	2	3	4	Add 1 minute

This form is an extract from Soundness Testing Procedures for Non-Domestic Gas Installations – British Gas Report No. IM/5.

Section 25

Appendix 2

COMMISSIONING OF NATURAL GAS PIPELINES, FITTINGS AND APPLIANCES.

Client ..... Hospital .....

Scheme ..... Reference .....

Commissioning Advisor .....

Gas Engineer .....

1) Soundness Tests Completed in Accordance with British Gas Procedures 1M/5.

2) System Purged in Accordance with British Gas Document 1M/2

3) Gas Admitted and System Satisfactory.

4) All Appliances tested and set to work in accordance with Manufacturers' Instructions and Requirements.

5) Systems and appliances confirmed as satisfactory and available for use.

I confirm that all tests have been completed in accordance with British Gas requirements and Gas Safety Regulations have been complied with.

Signed .....

Position .....

Company .....

The tests have been properly witnessed and are satisfactory, all record drawings, operating manuals and maintenance instructions are completed and available.

The system is confirmed as ready for use.

Signed .....

Commissioning Advisor .....

For ..... Client .....

Contents

26. The Commissioning of Incinerator Plants and Ancillary Equipment Essential to Comply with Anti-Pollution Legislation.

26. THE COMMISSIONING OF INCINERATOR PLANTS AND ANCILLARY EQUIPMENT ESSENTIAL TO COMPLY WITH ANTI-POLLUTION LEGISLATION

The incinerator plant shall be deemed to include the actual incinerator, auxiliary burners including after burners, anti pollution equipment, mechanical loading equipment, flue connections and dampers, electrical services to the incinerator and its auxiliaries and any mechanical handling equipment included within the incinerator house. It is probable that the plant will include toilet and mess room facilities for the operators and where warranted, shower facilities. Whilst the staff amenities are an essential part of larger incinerator installations in particular, their commissioning does not form part of the incinerator commissioning process and incorporated services such as hot and cold points should be commissioned as part of the appropriate hospital service.

Larger installations may incorporate heat recovery equipment and where this is included it should form an integral section of the plant and will require to be commissioned as part of the installation.

Commissioning Procedures

Prior to Commissioning

It should be appreciated that incinerator plant is specialist equipment and its setting to work, commissioning and demonstration should form part of the brief given to the specialist supplier. Unless exceptional circumstances arise the commissioning of this plant should not form part of the general commissioning activity of the mechanical engineering sub-contractor.

Where plant is to be installed as either replacement or an addition to an existing hospital the designer is recommended to establish the loading from a whole hospital survey. Where plant forms part of a new hospital scheme, then the required loading should be established by reference to HSE Data Sheet No.MW2.1/39 - the Disposal of Hospital Waste. It should be assumed that plant will operate for a maximum of 30 hours per week to allow time within the normal working day for cleaning the plant, de-ashing, disposal of non-combustibles, etc. and the loading advised to the manufacturer of an hourly throughput should be based on this time scale.

Designers and those specifying plant should note that problems have been experienced through the bulk density of refuse being lower than anticipated and hence the machine throughput being reduced from the manufacturer's published data. This problem arises through the placing of such items as plastic containers, cardboard boxes etc. within refuse bags. These articles should be compressed where possible. Designers are recommended to discuss this point with tenderers otherwise the required throughput is unlikely to be achieved on commissioning.

Pre-Commissioning Checks

The following examination should be made to ensure the plant will comply with Health and Safety requirements:

Charging Openings

Irrespective of the type of loading employed the minimum size of opening must allow easy passage, without likelihood of tearing of the bag, of typical bags of waste. The average size of bag will be 500mm diameter x 750mm long. There should be adequate space to allow the operator to stand to one side of the incinerator when charging the unit.

For larger units, under recent legislation the incinerator must incorporate automatic loading.

Charging Door

The door must be designed so that when it is in the open position the operator is not exposed to possible injury from hot surfaces. The operator should also be able to load the incinerator without being exposed to possible injury in the event of blow back or the explosion of any cans, aerosols, etc. which have inadvertently been included with the waste. The door should also be linked to the burner to prevent its operation when the door is in the open position. The burner should not be able to be re-ignited until the door is in the fully closed position.

Where bulk charging is in use the system of charging adopted by the manufacturer and the method of mechanical handling incorporated should be so designed that the operator does not incur hardship or be liable to physical strain. There should be no possibility of dangerous conditions pertaining to any staff engaged in operating the plant.

The charging door, whether mechanical or manual loading is incorporated, should be 10% larger on plan dimensions than the maximum size of charge to ensure there is no damage to bags during loading.

The door should be automatically locked and remain locked when the combustion cycle is operating and until the temperature has fallen to a safe level.

Instrumention

For the safe operation of the plant the following level of instrumentation is considered to be the minimum acceptable.

- Primary and secondary combustion chamber temperature indication.
- Smoke density meter and alarm.
- Chimney gas temperature and alarm to be fitted when the stack is not an integral part of the incinerator
- Oxygen %
- Carbon Monoxide %
- Carbon Dioxide %

All instruments must be clearly and correctly labelled.

Burners

Whilst any fuel is acceptable and the designer will have specified the type of fuel to be used, it is essential to ensure the burners comply with the relevant British Standards and Codes of Practice, safety regulations and supply authorities requirements. Where appropriate, burners should be fitted with flame failure devices and pilot jets. There should be adequate valving to permit easy removal of burners for cleaning and maintenance. Burners should be protected to prevent nozzle blockage by refuse or ash.

Operation and Control

The plant should be fitted with safety controls for standard operation and have back-up equipment to ensure it is brought to a safe condition in the event of failure of normal operation. It should only be possible to restart the plant by following the manufacturer's recommended method of lighting up. Generally it must be borne in mind that it is essential the method of operation is such that it can be safely carried out bearing in mind the training and skills of the staff who will usually operate the plant.

General

Manufacturers' operating and maintenance instructions should be available and displayed by means of a permanently mounted display. Safety notices, warning notices and notices drawing attention to hygiene needs should also be prominently displayed within the incinerator house. The current Certificate of Approval to Operate issued either by the Local Authority or HM Pollution Inspectorate should also be displayed.

Wiring diagrams, plant layout diagrams, servicing instructions and details of burners, grades of fuel etc. should also be available for handover to the user following commissioning.

Commissioning

The actual initial setting to work and proving in operation should form part of the specified duties of the supplier of the equipment. The client commissioning activity should be limited to an examination of the plant to ensure the items referred to in the Pre-Commissioning Checks have been included, and the witnessing of a demonstration to prove the required duties have been achieved.

Adequate quantities of typical waste which is to be expected from the hospital must be available both for the supplier's tests and for the witnessed demonstrations. It will not be the responsibility of the manufacturer to provide this material and it is recommended that arrangements be concluded with the users to provide a minimum of 8 hours throughput of refuse. This should be contained in typical refuse bags of the size and type which will be used in the hospital during its normal operation. Where applicable any special refuse which was specified as forming part of the usual day-to-day load, such as theatre waste, laboratory waste, etc. should be available in the advised ratio.

Where a unit has been specified to burn a given weight of plastic or plastic derivatives as part of the charge, then the Commissioning Advisor should ensure that as part of the demonstration this requirement is achieved. It will be appreciated that one of the major complaints regarding incinerator operation is the emission of smoke when burning plastics. If the unit is to comply fully with Environmental Health Officers' requirements then the unit must be proven by practical demonstration.

Dependent upon plant location and previous liaison with either the local Environmental Health Officer or Her Majesty's Pollution Inspectorate (HMPI), it may be advantageous to invite one of their representatives to witness at least part of the demonstration. Experience has shown such an involvement to be of advantage in the event of future complaints by local residents.

When witnessing the demonstration of the plant the Commissioning Advisor should satisfy himself on the following points:

There is correct operation and movement of all controls including valve position in accordance with indication fan rotation and particular emphasis should be given to any fail safe devices.

The refractory lining is in good condition and no cracks have occurred as the result of the supplier's operation of the plant.

Controls have been properly set using samples of the typical waste provided by the user.

The plant should be operated for the specified period at the full design rate of incineration for the typical waste to ensure all aspects of operation are checked.

After operation the residue contained within the incinerator should be examined to ensure that total combustion has occurred. In particular, where specified as part of the incinerator duty, attention should be given to ensuring any animal or human tissue has been totally disposed of during the process.

Any final checks and ajustments to controls should be made prior to handover.

In the event of any dispute as regards throughput, correct disposal of waste etc. the supplier must re-examine and adjust the plant and provide a further demonstration.

Any mechanical loading devices, hoists etc. should be checked during the operation of the plant to ensure that their operation is in accordance with the specification.

Training of User's Staff

Because of the specialist nature of the plant it is recommended that a training period for the user's staff be included.

This training should occur following satisfactory commissioning and demonstration of the plant.

Test Record (FAR) Sheets

The test results and checks made during commissioning should be recorded in the manner adopted for similar plant. Typical examples are attached to these notes and on completion copies should be signed by the manufacturer's Commissioning Engineer and the Commissioning Advisor or the engineer witnessing the demonstration on behalf of the client and included with the documentation passed to the user on handover.

Anti Pollution Devices

Following recent anti pollution legislation all new incinerator plants must be supplied complete with anti pollution equipment of an approved type.

This equipment must form part of the incinerator installation and must be to the approval of either the Local Environmental Health Officer (for plants below 1 tonne/hr capacity) or to the approval of Her Majesty's Pollution Inspectorate.

The equipment installed may operate on the dry principle ie. multi tubular collector, bag filter or electro static precipitator, or be of the wet scrubber design, ie. scrubbing tower, spray washer etc. Whichever type is supplied it must be integral to the design and because of its specialist nature should be commissioned by its supplier.

The commissioning should include measurement of dust loading in grains cu. in. at the inlet to the gas cleaning device, and at its final discharge, immediately prior to discharge to the atmosphere.

Dust sampling is a specialist task which requires to be carried out isokinetically using specialist sampling equipment. It is unlikely that mechanical sub contractors will hold the correct equipment or have the experience to carry out this work.

Organisations such as N.I.F.E.S. or B.S.R.I.A. should be used where doubt over performance arises.

Certification

Following commissioning application to the appropriate Authority must be made for approval to operate the plant. This Certificate To Operate which must be prominently displayed in the incinerator house and must form part of the handover documentation is essential to permit the user to operate the plant.

Guidance Material Appropriate to the Commissioning:

- British Standard BS 3316 Large Hospital Incinerators (This specification was completely revised in 1983 and reference should be made to the latest edition only).

- The Working Party Final Report - Disposal of Clinical Wastes in the London Area. April 1983.

- DHSS Data Sheets MW2/1 - 2/39. Disposal of Hospital Waste
  Modern Approaches to Incinerator Practice.
  Dr C.Chamberlain, Institute of Hospital Engineering Journal.November 1983.

Department of the Environment
Waste Management paper No.25 - The Disposal of Clinical Waste.

Appropriate recent legislation governing the installation and operation of incinerators.

Section 26

Appendix 1

COMMISSIONING RECORD SHEET

INCINERATOR PLANT

Scheme Title: Job No.

Hospital:

Details of Plant:

Manufacturer:

Type and Model of Unit(s) Supplied:

No. of Units Installed:

Specified Hourly Throughput:

Type of Auxiliary Firing:

After Burner:

Heat Recovery System:

Mechanical Loading Devices

Pre Commissioning Checks

Door Size:

Door Operation:

Loading Devices:

Hoists and Mechanical Handling:

Stack to Clean Air Act Requirements:

Damper Operation:

Valve Operation:

Electrical Services:

Smoke and Emission Monitoring Equipment:

Operation of Fail Safe Devices:

Gas Temperature Alarms Where Fitted:

Instrumentation to Comply With Latest Legislation:

Section 26

Appendix 1

Commissioning

Specified Kg/hr Achieved Kg/hr

Period of Test:

Weight of Refuse Fired:

Hourly Rate of Burning:

Temperature of Exposed Surfaces:

Noise Level:

Smoke Emission:

Dust and Grit Emission:

Auxiliary Fuel Consumption:

Where appropriate, what % of plastic included

Typical Analysis of Load:

Temperatures:

1) Primary Combustion Chamber:
2) Secondary Combustion Chamber:
3) Stack if applicable:

Plant Operation: (Tick if Satisfactory)

Plant Alarms:

Operation of Fail Safe Devices:

Control Operation:

Safety Features:

Door Operation:

Operation Loading Position:

Handling of Loads:

Section 26

Appendix 1

Post Commissioning and Handover

Instruction of User's Staff:

Documents:

Layout Drawings:

Wiring Diagrams:

Manufacturer's Instruction Manual:

Manufacturer's Maintenance Manual:

Specialist Equipment Instruction Manuals:

Specialist Equipment Maintenance Manuals:

Statutory Notices

Safety Notices:

Emergency Instructions:

Hazard Warning Notices:

Hygiene Notices:

Certificate of Approval to operate plant:-

General Comments:

Following completion of the above tests and checks, the installation is:

1) Satisfactory 2) Unsatisfactory is considered
a) safe to operate b) unsafe to operate

It is/is not recommended as satisfactory for handover to the Client.

Signed 1) .....Manufacturer's Commissioning Engineer

2) ..... Client's Commissioning Advisor

on behalf of .....

Date .....

Contents

27. The Commissioning of Refrigeration Plant including Sealed Units, Storage Cabinets, Body Stores, Deep Freeze Units, Cook -Freeze Cabinets, Chilled Water - Chiller Plants, Cold Rooms. Essential Safety Precautions (are also included).

27. THE COMMISSIONING OF REFRIGERATION PLANT INCLUDING SEALED UNITS, STORAGE CABINETS, BODY STORES, DEEP FREEZE UNITS, COOK -FREEZE CABINETS, CHILLED WATER - CHILLER PLANTS, COLD ROOMS. ESSENTIAL SAFETY PRECAUTIONS (ARE ALSO INCLUDED).

Categories.

The plant will fall into the following categories and the refrigeration process may be provided by alternative methods of energy transfer.

- Free Standing Self Contained Refrigerators operated by a sealed unit refrigeration system. Such refrigerators are usually limited in capacity to a maximum of 10 - 12 cu.ft and provide refrigerated storage for food stuffs, drugs or are used in Pathology Departments.

- Standard food and drug storage refrigerators, frequently walk-in cold rooms.

- Blood Bank Refrigeration

- Body Stores associated with Pathology Departments.

- Plant to operate in conjunction with air conditioning systems and air cooling. Such plants may provide for direct air cooling or chilled water for circulation to one or more conditioning units.

Types of Refrigeration systems.

These will include:

- Sealed hermetic units specifically for free standing cabinet refrigerators based on the typical design of household kitchen refrigerators.

- Vapour compression plants which entail the compression from dry saturated vapour to superheated vapour at condensing pressure.

- The type of plant can include all types of compressor plant or hermetic units similar to those supplied for self-contained cabinet refrigerators.

- Absorption plant, this type of refrigeration unit is most commonly used to provide chilled water for air cooling. This process is essentially a chemical change of state of the absorbent, usually lithium bromide. The heating medium to effect the chemical change is frequently steam at low pressure but units are available which operate using hot water or which are direct gas heated.

- Because of the complexity of the plants and the necessity for special gauges to record vapour pressures at intermediate points of the cycles the setting to work and full commissioning is better left to the specialist supplier of the equipment who will employ specialist engineers to balance intermediate pressures etc. For detailed information reference should be made to the CIBSE Commissioning Code Services R - Refrigerating Systems. The principal requirement for the Commissioning Engineer and the Client's Commissioning Advisor will be to ensure that recommended safety features are included and that the required service performance can be proved in accordance with the specified plant duties.

Information to be made available to the Commissioning Engineer and Advisor.

A full description of the plant including the intended mode of operation. This must also include the designer's specification from the plant, including the duties it is to perform.

Information including drawings to relate the refrigeration plant to air and/or water systems where applicable.

Design capacities of all major components of the system including driving motor details, switchgear and connected electrical loads.

Wiring diagrams for all electrical equipment associated with the plant(s).

Manufacturer's plant diagrams, setting to work instructions and plant operating instructions.

Maintenance instructions for day to day maintenance by non- specialist hospital engineering staff. Details of call out service available including 'out of hours' contacts for immediate breakdown service.

Name and number of the refrigerant for each plant and details of compressor lubricant where applicable.

Weight of refrigerant charge required to fully charge the machine (spare cylinders of refrigerant to be supplied capable of providing double the full charge).

Where water cooled condensers are bottled details of any requirement to 'blow down' condenser water. Details of recommended treatment of condenser water including frequency of treatment recommended. Make up water details and design 'bleed off' of condenser water where applicable.

Design temperatures, pressures and mass flow rates at all measuring points which are fitted with indicating gauges which require regular surveillance by maintenance staff.

Declared Supply voltage amd frequency.

Details of all motors and starters associated with the plant(s).

Standard motor starting and running currents.

Details of protective devices for motors in particular those directly coupled to hermetically sealed and semi-hermetically sealed units.

Fuse ratings applicable to motor control gear.

Design settings for starter overloads and any adjustable thermal cutouts, the correct fluids and levels for dashpots.

Once the commissioning, setting to work and witness testing is complete the items listed above should form part of the commissioning manual and plant details passed to the user at handover.

Design Provisions to be checked by the Commissioning Engineer and Advisor.

The following design provisions should be incorporated within the plant which are essential for proper and safe operation. Because of the specialised nature of the plant it is probable that in many instances the designer will have specified duties required and will have invited package quotations from specialist companies relying on their experience to provide the required equipment, fully automated and complete. For this reason it is essential that the provisions made are fully checked when the plant is offered.

Manual valves to shut off the plant or sections of the plant including a compressor suction valve, and compressor discharge valve, and a liquid line (the pipe running from the liquid gas receiver to the compressor) shut off valve.

An emergency push button to cut off electrical supply to the compressor motor, which should be as close as possible to the compressor assembly.

A liquid charging valve, preferably on the HP side of the compressor, for reciprocating compressor plants.

Pressure gauges to indicate suction pressures, compressor oil pressure and discharge pressure.

Pressure relief valve (this is essentially a safety valve for the gas side of the plant) to prevent explosions. It is preferably mounted on the liquid receiver and may, for small plants, take the form of a fusible plug.

Sight glasses and gauge glasses. Sight glasses are required to provide a visual indication of refrigerant condition in any part of the system. The essential sight glasses should be mounted on the liquid gas line immediately prior to their connection to the evaporator which is immediately prior to the expansion valve. A further sight glass is essential adjacent to the liquid line shut-off valve on the receiver to indicate whether the system is fully charged. A gauge glass is also recommended on the compressor to check oil levels. A gauge glass to indicate the liquid level in the gas receiver is also recommended and this should be clearly marked to indicate normal running level required.

Strainers, easily removable for regular cleaning, should be fitted to any expansion or solenoid valves to minimise risk of dirt blockage.

Provision should be made to fit dryers (frequently silica gel) particularly during commissioning or after gas recharging to remove residual moisture in the system.

Each compressor should be fitted with an oil drain cock.

Purge valves should be fitted to the highest point of the condenser and liquid gas receiver.

Reference Documents

In addition to manufacturers' manuals, etc. the following documents are recommended as providing useful additional information.

BS 1584 Glossary of Terms used in Refrigeration

BS 1586 Methods used for the Testing of Refrigerant Condenser Units

BS 1608 Electrically Driven Refrigerant Condenser Units

BS 3122 Rating and Testing of Refrigeration Compressors

BS 4434 Requirements for Refrigeration Safety

BS 4580 Number Designation of Organic Refrigerants

CP 406 Mechanical Refrigeration

Cold Rooms

The standard of insulation and method of construction of cold rooms should form part of the specification for the plant and it is unlikely that detailed checks will be possible. However the Commissioning Engineer/Advisor is strongly recommended to check the safety precautions, in particular those associated with the accidental locking-in of personnel in walk-in coldrooms. Both visual and audible alarms are recommended in addition to facilities for emergency opening of cold room doors.

Commissioning Procedures to be Adopted by Specialist Suppliers

As advised the setting to work must be completed by the specialist suppliers of the plant who will be in possession of the required equipment to measure and adjust intermediate pressures in the system.

The efficiency of the system in operation and its performance will rely on an adequate plant specification. Reference should be made to Model Specification No.C10 for guidance on the manner in which plant duties should be specified.

Plant Duties:-

- Standard procedure is to state the following -
- Operating Temperature Range in a stated ambient temperature.
- Loading of the Cold Room.
- Average specific heat of materials to be refrigerated.

Example for a Meat Cold Store:-

The equipment must be designed to maintain an operating temperature of -2°/0°C (28°/32°F) in an ambient condition of 32°C (90°F). The duty calculation shall allow for a loading of 3lbs/cu.ft. per 24 hours assuming an average specific heat of 0.8 Btu/lb.

Because of the problems of simulating the required conditions the specialist supplier should prior to handover demonstrate the functioning of the plant, the provision of and correct operation of all safety features and should balance the plant as regards the correct setting of intermediate system pressures. These intermediate pressures cannot be specified and are unlikely to be known to the designer because there are likely to be variations dependent upon the specialist design. Reliance has to be placed on the specialist supplier of the equipment to correctly interpret requirements and to properly adjust the system accordingly.
Final proving of the plant and demonstration of the attainment of the required duties frequently takes place after handover, following occupation and loading of the plant by the

User in accordance with 'in service' conditions. For these reasons it is preferable for the Commissioning Advisor to liaise with the User in completing a 'design in use' study following a period of use. The specialist supplier of the equipment should attend and make final adjustments to the plant as may be required. It is recommended that final plant acceptance should be conditional upon the completion of such an exercise and the User's satisfaction as regards operation of the equipment.

Client Commissioning

For the purposes of commissioning, plant may be considered under the following categories:-

1) Free standing limited capacity cabinets.
2) Material storage, ie. meat, fish, vegetable, storage.
3) Body Stores.
4) Deep Freeze Cabinets/Refrigerators.
5) Plant to provide air cooling.

Commissioning Guidance

a) Free standing limited capacity cabinets normally operate satisfactorily or fail to run. Connections are limited to an electrical connection, frequently a connection to a 13 amp socket outlet although larger units may require a fused switch connection and be direct wired.

The usual demonstration is limited to proving the plant to be operational and in the event of failure the complete cabinet is changed. Because of methods of manufacture, on site adjustment and/or modification other than the checking of electrical connections (fusing arrangements) is not possible. The completion of FAR Sheets and the recording of duties is not essential for such units.

b) Material storage plants should be examined as regards safety features with particular attention being given to release of staff who may be accidentally shut into 'walk-in' cold rooms. The essential features as regards safety and operation are given in this document. Final commissioning should be completed in accordance with the recommendations given in the appropriate clauses of this document. FAR Sheets should be completed at the time of final commissioning.

c) Body Stores. Because of the unpleasant nature of the use of such equipment and the reluctance of specialist suppliers staff to work in the conditions which will prevail under 'in service' conditions, commissioning is frequently completed using a simulated load with final adjustments to the refrigeration plant being made after handover. Simulated testing may be completed by using plastic bags or containers of water at 94° F (34°C) each weighing approximately 140 lbs (63.5kg) and ensuring the plant reduces the temperature within the specified time scale to the required conditions. Where simulated tests are carried out this should be recorded on the FAR Sheets.

d) Deep Freeze Cabinets/Refrigerators should be commissioned as recommended.

e) Plant to provide air cooling should be demonstrated as regards satisfactory operation, the inclusion of required safety features etc., but final proving of attainment of duties should take place with the commissioning and proving of specified output of the air conditioning unit it serves. Although such refrigeration equipment may be a specialist supply it is common practice for it to form part of a packaged air conditioning unit

under the responsibility of a particular manufacturer and it must be commissioned and have its duty proven as part of the output tests of the complete assembly. Recording of commissioning information should form a part of the FAR Sheets appropriate to the unit it serves.

It will be appreciated that refrigeration equipment is highly specialised and it is comparatively rare to find design and/or commissioning engineers who have detailed knowledge of its operation and performance. For this reason greater than usual reliance has to be placed on the equipment supplier who will have experience of commissioning of his plants. It will be understood that for these reasons it is essential to properly specify the plant and the duty it is required to perform.

Section 27

Appendix 1

FINAL ACCEPTANCE TESTS
MECHANICAL SYSTEMS
AIR CONDITIONING REFRIGERATION

No. Checks and Tests to be applied	Check/Test Applied	Remarks
PRELIMINARIES:		
Systems have been provided and installed in accordance with specifications and drawings.	[ ]	
Pre-Acceptance Tests have been satisfactorily completed by Sub-Contractor	[ ]	
All main components eg. compressors, evaporators, condensers, pumps, cooling towers etc. function correctly.	[ ]	
Control plan available and understood.	[ ]	
Controls have been set up by Sub-Contractor.	[ ]	
Interlocks operate satisfactorily (Condenser and chilled water).	[ ]	
Electrical commissioning checks have been completed.	[ ]	
Electric immersion heater in compressor not under control of compressor isolator.	[ ]	
Dummy heating load provided by sub-contractor ready on site.	[ ]	
WITH PLANT ON LOAD ENSURE THAT THE FOLLOWING 'BUILT IN' SAFETY CONTROLS FUNCTION CORRECTLY:		
High gas pressure.	[ ]	
Low gas pressure.	[ ]	
Oil pressure.	[ ]	
Chiller Front Thermostat.	[ ]	

Section 27

Appendix 1

WITH PLANT ON LOAD ENSURE THAT ANTI-VIBRATION DEVICES ARE SATISFACTORY.

No. Checks and Tests to be applied	Check/Test Applied	Remarks
There is no carry-over of oil or liquid.	[ ]	
There is temperature control of:		
Chilled Water.	[ ]	
Condenser Water.	[ ]	

CAPACITY CONTROLLER OPERATES SATISFACTORILY OVER FULL RANGE.

WITH PLANT ON FULL LOAD, MEASURE AND RECORD THE FOLLOWINGOVER A PERIOD OF NOT LESS THAN 4 HOURS DURATION:

Compressor

Speed
Suction and discharge temperatures
Suction and discharge temperatures
} Record on separate sheets

Condenser

Refrigerant inlet and outlet temperatures
Refrigerant inlet and outlet pressures
Coolant inlet and outlet temperatures
Coolant flow rate
} Record on separate sheets

Evaporator/Chiller

Refrigerant inlet and outlet temperatures
Refrigerant inlet and outlet pressures
Water inlet and outlet temperatures
Water flow rates
Ambient temperature
} Record on separate sheets

With plant on load measure and record noise level readings in each octave band in adjacent occupied rooms
} Record on separate sheets

COMMISSIONED BY .....

DATE .....

SUB-CONTRACTOR'S REPRESENTATIVE .....

Section 27.

Appendix 2

FINAL ACCEPTANCE TESTS
MECHANICAL SYSTEMS
REFRIGERATION PLANT FOR KITCHENS AND MORTUARIES

No.	Checks and tests to be applied	Remarks
	PRELIMINARIES:	
1.	Systems have been provided and installed in accordance with specifications and drawings.	
2.	Pre-Acceptance Tests have been satisfactorily completed by Sub-Contractor.	
3.	All main components eg. compressors, evaporators, condensers, etc. function correctly.	
4.	Controls have been set up by Sub-Contractor in accordance with specification.	
5.	Interlocks operate correctly (if provided).	
6.	Electrical commissioning checks have been completed.	
7.	'Dummy' loads are ready in site for pull-down tests etc.	
	WITH PLANT ON LOAD ENSURE THAT:	
8.	Controls provided are in accordance with specification and operate correctly.	
9.	Anti-vibration devices are satisfactory.	
10.	There is no carry over of oil or liquid.	
11.	Load refrigeration compartment with 'dummy' loads equivalent to maximum specified capacity and ensure that pull-down meets the specified requirements or, where this is not required, the plant is capable of maintaining the maximum load at specified temperature.	Record on separate sheets
12.	Record magnitude and time of pull-down, weight and specific heat of load.	

Section 27.

Appendix 2

No.	Checks and tests to be applied	Remarks
13.	Fittings and furniture in refrigerated compartments are in accordance with specification.	
14.	Alarm systems, door locks, and de-icing equipment operate correctly.	
15.	Instrumentation (eg. temperature recorders) operates satisfactorily and provides sensible readings.	
16.	With plant on load measure and record noise level readings in each octave band in adjacent occupied rooms.	Record on separate sheet

Section 27.

Appendix 3

COLD ROOMS
ALARMS AND RECORDERS

1. COLD ROOMS SHOULD BE FITTED WITH THE FOLLOWING SAFETY DEVICES AND METERS:

(a) All door catches must have a system of operating from the inside of the room even when locked externally.

(b) All cold rooms must have personal alarms which are operated by a press switch from inside the room to be audible in the catering department during working hours and in the telephone exchange at all other times. This switch must also shut off the evaporator fan which must be manually reset. A visual sign outside the cold room should also be operated from this switch.

(c) A high/low temperature alarm may also be required depending on the usage of the room to be audible as in (b) above.

(d) A remote reading thermometer is required indicating internal room temperature.

2. DEEP FREEZE STORES SHOULD ALSO HAVE THE FOLLOWING ADDITIONAL FEATURES:

(a) A door frame heater is required to prevent the door freezing in the closed position.

(b) An anti-heave mat is normally required below freezing temperatures if the area of the room is above 16 m^2.

3. PRE-COOKED CHILLED FOOD STORES SHOULD HAVE THE FOLLOWING FEATURES IN ADDITION TO THOSE IN PARA (1):

(a) A temperature recorder sensing the internal room temperature and readable from outside the room. The record should be on a removeable chart and be for a minimum of 7 days operation. It should preferably be operated from the main electrical supply with a battery back-up.

(b) Cold rooms operating at above freezing and which are on a solid ground base do not normally require an insulated floor, but walls should be sealed to the floor to prevent the ingress of warm ambient air.

Section 27.

Appendix 4

FINAL ACCEPTANCE RECORD SHEET FOR REFRIGERATION PLANT

CLIENT .....

.....

DEPT

.....

PLANT DUTY .....

The equipment supplied to carry out the duty stated, in the department specified has been properly commissioned and witness tested.

All required safety devices have been installed and operate to specification requirements.

The plant (and where appropriate the cold room) are satisfactory and safe to operate.

Signed ..... Commissioning Engineer

For .....(Company)

Date .....

I confirm that the above equipment has been properly commissioned and is satisfactory for use. The required performance has been witnessed and completed in accordance with specified requirements.

Signed .....Client's Commissioning Advisor

For .....(Client)

Date .....

Contents

28. The Commissioning of Piped Medical Gas Installations.

28. THE COMMISSIONING OF PIPED MEDICAL GASES AND VACUUM SYSTEMS

The procedures to be adopted, safety practices to be instituted and the Permit to Work system to be used are described in Health Technical Memorandum No.2022 It is essential that any person, whether employed by the Contractors, Consultants where appointed, or by the Client, is fully conversant with HTM No.2022 and is aware of the mandatory requirements it contains before attempting to work on any aspect of the medical gas system.

It must be fully appreciated that should there be a failure to comply fully with mandatory requirements or to observe the recommendations and procedures given in the HTM No.2022 it could result in most serious consequences including loss of life.

Members of the Commissioning Team working on this service must be experienced in the work and where indicated, an Authorised Person (usually a specialist engineer carrying out the function for a specified area or a number of Trusts, Districts or Group of Hospitals) must be used to commission the service to comply with mandatory requirements.

It cannot be emphasised too strongly that commissioning procedures must follow HTM No.2022 guidance and be carried out under the overall control of an Authorised Person (as defined in the HTM).

Appendix 'A' of HTM 2022 is strongly recommended for use as examples of the Test Sheets and Forms to be completed during commissioning are included. These Test Sheets and Forms comply with NHS Estates recommendations and preferred practice and ensure a common standard, which is compatible throughout the NHS, is used. In the event of any future problems arising it will be easier for any specialist officer to check commissioning performance against 'in service' results from such Tests Sheets.

Appendix 1 shows the Final Acceptance Sheet/Certificate which is in accordance with HTM 2022 and which is recommended for completion by the Authorised Person following successful commissioning.

The test procedures to be followed are given in Appendix 2 Sheet 1. Appendix 2 also illustrates, in diagrammatic form, the standard test procedure recommended in HTM 2022 which must be followed to ensure satisfactory commissioning. The sequencing of tests must be adhered to, to ensure acceptance.

Section 28

Appendix 1

MEDICAL GASES INSTALLATION
CERTIFICATE OF ACCEPTANCE
(Complete in triplicate)

Client .....

Hospital ..... Dept .....

1. I accept on behalf of the Management Team the medical gas installation at the above site in accordance with the Final Acceptance and other Test Certificates attached.

2. I declare that I am satisfied that the appropriate pressure, anti-confusion, flow rate and alarm tests and the purging of each system has been carried out and that the systems are ready for medical commissioning and training of hospital staff in their use.

3. I am fully conversant with the management principle technique of 'Permit to Work Systems' to safeguard and maintain the fixed services installation being handed over to prevent unauthorised interference at hand-over. I propose notifying the appropriate management officer within the hospital of fixed services installation all in accordance with current guidance documentation.

   I am aware that any equipment and services provided through the appropriate Scientific Officer and/or Supplies Officer organisation and structure at Authority or Trusts levels or any other source of equipment is not covered by this Acceptance Certificate for the fixed services installation which has been installed, demonstrated and fully commissioned by the appropriate Staff.

   I understand that no gas purity tests have been carried out as the purchase of the medical gases is not covered by the fixed services installation contract. If required, this will be dealt with by disciplines other than 'Works' who will carry out the final Client Interest commissioning of the complete hospital installation before patient occupancy.

4. This Acceptance Certificate does not cover medical compressed air installation.

Acceptance Representative Signature	**Printed Name**	**Designation**	**Date**
Witnessing Representative Signature	**Printed Name**	**Designation**	**Date**

DISTRIBUTION: **Original - Representative of .....Client**
Duplicate - Commissioning Engineer
Triplicate - Main Job File

FINAL ACCEPTANCE TESTS
MECHANICAL SYSTEMS
MEDICAL GASES, COMPRESSED AIR & VACUUM
INSTALLATIONS

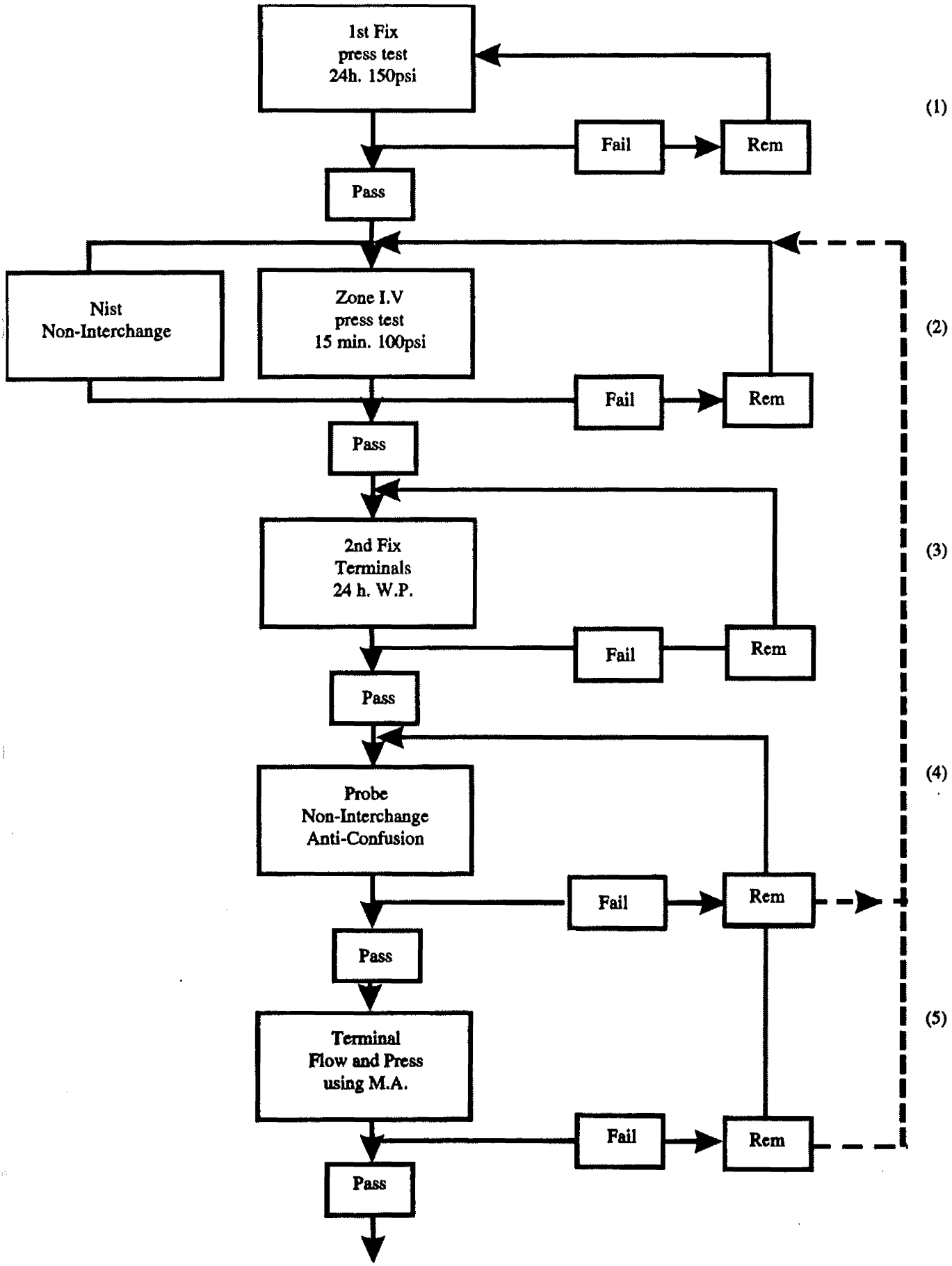
No.	Checks and Test to be applied	Check/. Test Applied				Remark
		O	N_2	MA	MV	
9.1	PRELIMINARIES:					
.1.1	Systems have been provided and installed in accordance with specification and drawings.					
.1.2	Pre-Acceptance Tests have been satisfactorily completed by Sub-Contractor.					
.1.3	Representative of Client's Management Team is available to witness tests and checks.					
.1.4	Relevant pressure test certificates have been completed and checked.					
9.2	Electrical test and checks have been applied (See Final Acceptance Test - ELECTRICAL SYSTEMS).					
9.3	The following tests shall be applied in accordance with H.T.M. No.2022 Piped Medical Gases, Medical Compressed Air and Medical Vacuum, Installations - Procedure for Validation and Verification of Medical Gas Pipeline Systems - issued by H.M.S.O.:-					
.3.1	Pressure tests for leakage in pipelines only					
.3.2	Valve tightness tests					
.3.3	Relief valve tests					
.3.4	Pressure tests for leakage on complete systems					
.3.5	Satisfactory mechanical operation and non-interchangeability of each terminal outlet by test probes					
.3.6	Correct connections tests (anti-confusion tests).					
.3.7	Flow rate tests at each terminal outlet					
.3.8	Total flow rates and delivery pressure tests					

No.	Checks and Test to be applied	Check/. Test Applied				Remark
		O	N_2	MA	MV	
.3.9	Manifold changeover valves tests					
.3.10	Plant operation tests as applicable on:					
3.10.1	Liquid Oxygen Plant:					
3.10.2	Compressed Air Plant:					
3.10.3	Vacuum Plant:					
3.10.4	Manifolds:					
3.10.5	Service Point Panels:					
.3.11	Signalling system tests					
.3.12	Purging of each medical gas system with working gas on completion of all other tests on the systems.					
.3.13	Gas identification and air purity checks in conjunction with medical officers					
9.4	Satisfactory operation of Booms, Crane or Flexibles as applicable.					
9.5	Complete Certificate of Acceptance (in triplicate) and obtain signature of Client's representative.					

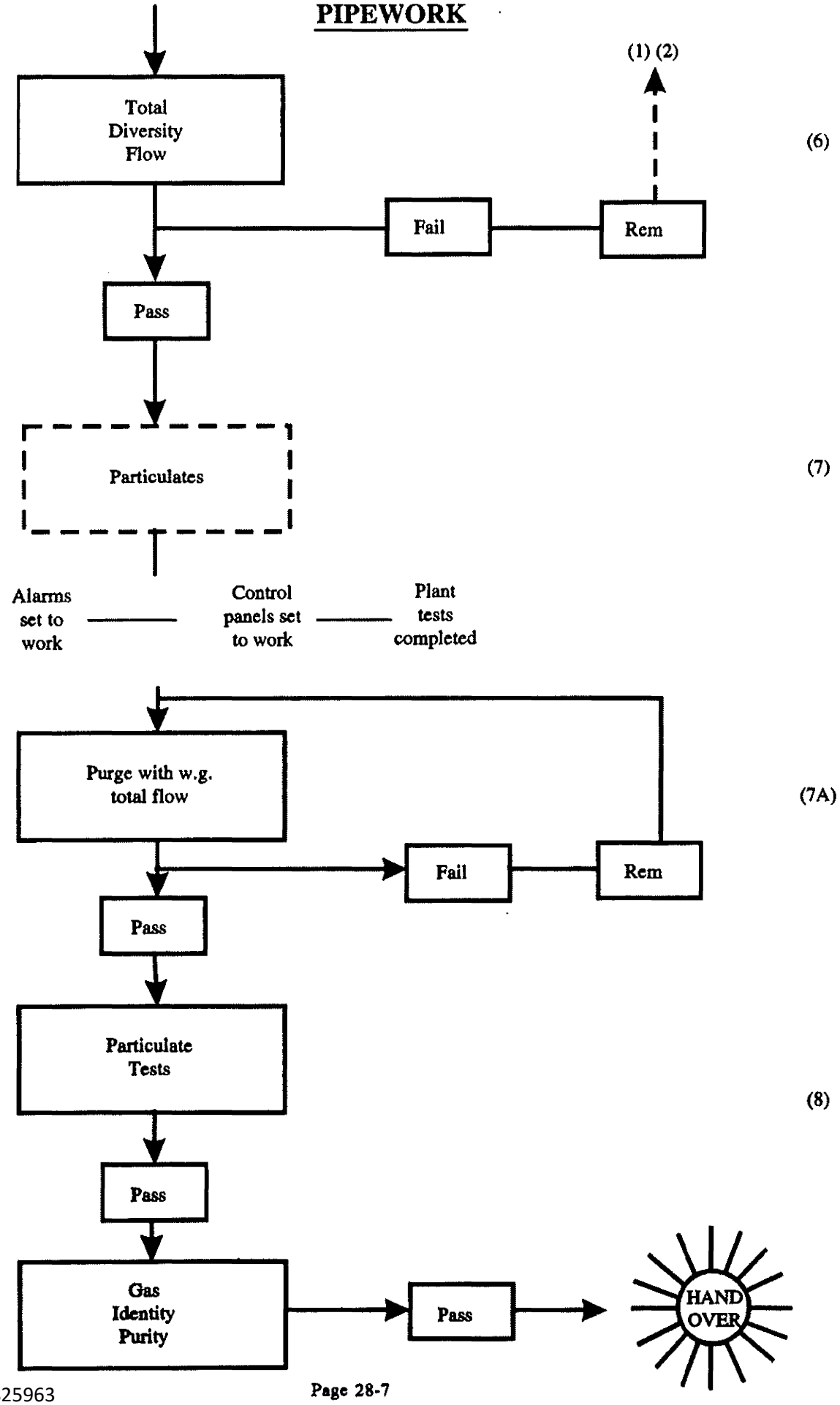
COMMISSIONED BY _____ **DATE** _____

SUB-CONTRACTOR'S REPRESENTATIVE _____

PIPEWORK


1st Fix
press test
24h. 150psi
Fail
Rem
(1)
Pass
Nist
Non-Interchange
Zone I.V
press test
15 min. 100psi
Fail
Rem
(2)
Pass
2nd Fix
Terminals
24 h. W.P.
Fail
Rem
(3)
Pass
Probe
Non-Interchange
Anti-Confusion
Fail
Rem
(4)
Pass
Terminal
Flow and Press
using M.A.
Fail
Rem
(5)
Pass

PIPEWORK


(1) (2)
Total Diversity Flow
(6)
Fail
Rem
Pass
Particulates
(7)
Alarms set to work
Control panels set to work
Plant tests completed
Purge with w.g. total flow
(7A)
Fail
Rem
Pass
Particulate Tests
(8)
Pass
Gas Identity Purity
Pass
HAND OVER

Contents

29. The Commissioning of Sterilizer Plants

29. THE COMMISSIONING OF STERILIZER PLANTS

General

Sterilizers should be installed, checked and commissioned in accordance with the procedures given in Health Technical Memorandum No.2010.
Commissioning should be carried out by the Supplier's specialist engineer and witnessed by either the Authority's Sterilizing Engineer or the Client's Commissioning Advisor. The Engineer concerned should be conversant with the HTM No.2010 requirements and familiarise himself with the supplier's literature, including the Operating and Maintenance Instructions applicable to the make and model of the machine to be commissioned, before a commencing setting to work procedures.

Pre-Commissioning Procedures

Pre-Commissioning procedures must be carried out by the Supplier's Engineer and by a suitably trained Officer (see above) representing the Client.

1. Ensure the unit has been provided and installed in accordance with the specification and that all connected services (steam, water and electrical supplies which should have already been separately commissioned in accordance with the appropriate sections of this Commissioning Manual) are satisfactory and provide the conditions specified by the supplier. Particular attention should be given to ensuring that after connection to the electrical supply earth bonding to the supplies and the sterilizer has been properly tested and is acceptable.

2. Ensure that all services are leak free at all temperatures and pressures within the operating range of the machine.

3. Check that the sterilizer is securely mounted and that all supports, bases and other fixings are secure and that there is no imposed strain on either the machine or pipework.

4. Check that the sterilizer functions correctly and there is no indication of interference with the performance of other apparatus and equipment connected to the same service. Check particularly any steam pressure drop at such machines as washers in the same department.

5. Ensure that where a heat exchanger is fitted there are no leaks evidenced which may bring the coolant into contact with the primary container causing it to become non-sterile.

6. Check that the sterilizer chamber is clean and free from staining.

7. Once satisfied that the sterilizer is correctly installed and safe to operate run through a single cycle and ensure that during any part of the cycle the steam, water, air and sterilant gas pressures (ethylene oxide or formaldehyde) are within he limits and tolerances specified by the supplier. Check that drains effectively remove any effluent generated when all plants in the area including the sterilizer are connected and operating.

8. Check that any vents connected to the sterilizer effectively remove all vapour/gases and that ductwork is leak free.

Functional Performance Tests

1. Check that during any part of the cycle the door(s) is locked before the admission of steam or sterilizing gas.

2. Ensure that the door(s) cannot be unlocked when the pressure within the chamber is 0.2 bar gauge or greater.

3. Simulate a failure of the power supply and check that the steam to chamber and/or cylinder gas valve (where Ethylene Oxide or Low Temperature Steam Formaldehyde Mixture cycles are in use) close fully.

4. Except when overridden for maintenance purposes the interlock between manual and auto-control permits one mode of operation only.

5. Check that the auto-controller operates to the specification requirements.

6. The door remains securely closed and cannot be released until the sterilizer chamber has been fully vented to atmospheric pressure.

7. Check that the surface of door seals which are visible to the operator can be cleaned without the need to dismantle any part of the sterilizer.

8. With the auto-controller in its manual mode, its operation is in accordance with the specification.

9. Check that the door interlock mechanism is fitted with a minimum of 2 interlocks (independent of each other) and that failure of either interlock or of any of the services to the machine does not allow the door to be opened when the cycle condition is such that conditions within the chamber constitute a hazard, ie. high pressure or temperature, high level of sterilant gases or danger from sealed containers within the chamber.

10. Check that during all stages of the cycle the controls react correctly and safely under the following conditions:

    - Low Steam Pressure.
    - High Steam Pressure.
    - Low Water Pressure.
    - Low Air Pressure.
    - Incorrect Vacuum.
    - Simulated Power Failure.
    - Boiling Dry (where appropriate).
    - Insufficient Sterilant Gas (where appropriate).
    - Inadequate aeration (gas sterilizing).

11. Check the operation and readings of all instruments, carrying out thermo-couple checks where appropriate, and ensure there is correct return to zero reading on all indicators.

12. Ensure the calibration of all instrumentation and controllers is correct and certificates of calibration are available where appropriate.

13. Check that the temperature of all exposed surfaces normally handled by users does not exceed 55°C.

14. Any loading trolleys supplied are of the correct type, couple correctly to the chamber, and are safe in use.

15. The security and settings of all door safety switches and locking devices operate in accordance with manufacturers' specifications.

Note: each sterilizer must be supplied with its own log book. (Plant History Record).

The log book should include the following, and must be completed by the suppliers specialist (witnessed by the Clients Representative) at commissioning:

- Machine details.
- Record of pre-commissioning and commissioning procedures.
- Valid calibration certificates for all test instruments and instruments fitted to the machine.
- Insurance Surveyor's report including details of pressure tests of the chamber, welds etc. completed at works.
- Maintenance Contract where appropriate.
- Maintenance and Test Certificates.
- Operations and Maintenance Instructions.

It is essential that a day-to-day Log Book and Plant History Record be examined for correct completion by the Client's Representative before acceptance of the sterilizer and that the documents form part of the handover documentation.

Commissioning Sterilizer Performance Tests

Details of the manner in which the listed tests are to be completed are contained in HTM No.2010 and the instructions given in this document must be followed correctly. Bearing in mind the dangers that result from incorrect cycle operation and performance of the sterilizer, including potential life threatening situations for patients, it is recommended that the tests be completed by Specialist Engineers and be witnessed by the Commissioning Advisor unless he is experienced in this field. Final test results should be submitted to the Authorised Person for agreement before bringing the sterilizer into regular use.

Tests Essential on Commissioning

- Steam quality tests.
- Warm up cycle (for jacketted vessels only).
- Leak rate test.
- Leak rate test with temperature sensors and test gauges connected.
- Instrument calibration.
- Temperature and automatic control tests.
- Air detector test for a small load.
- Air detector test for a full load.
- Sound pressure test.
- Thermometric test for a full load.
- Thermometric test for a part load.
- Repeat thermometric test for a partload condition.
- Leak rate test with temperature sensors and test gauges removed.
- Hospital full load test.
- Air detector function test.
- Bowie Dick test.

Section 29

Appendix 1

FINAL ACCEPTANCE RECORD SHEET FOR COMMISSIONING TESTS STERILIZERS

Client ..... Hospital: .....

Department: ..... Date: .....

Sterilizer Reference No. & Model .....

Sterilization Timer Setting ..... Seconds/Minutes

Sterilizer Temperature Setting .....°C

Minimum Sterilizer Temperature .....°C

Sterilizer Holding Time .....

Sensor No & Location	Start		Mid			End		Hold*
	p	t	T	p	t	p	t	t
No..... Chamber								
No..... Cold Curve								
No..... Hot Curve								

Legend:

t = time in seconds/minutes.

p = chamber pressure bar. Sensor No.....

T = Temperature °C.

* = time at or above the minimum sterilizing temperature.

Total cycle time .....seconds/minutes.

At the conclusion of the test, ensure test packages and their temperature measurement systems are satisfactory.

Test instruments used have current calibration certificates and verification of instruments and sensors satisfactory before and after tests.

Calibration of instruments supplied and fitted to the sterilizer have been verified.

Data is within limits specified for the commissioning tests.
The load is sensibly dry.
All basic performance tests have been recorded as PASS.

Performance Tests valid until .....

Test Engineer .....

Company..... ..... Date .....

Client's Sterilizing Engineer ..... Date .....

Client's Commissioning Advisor ..... Date .....

I confirm the sterilizer is satisfactory and fit for use until..... (Date)

Authorised Person (Sterilizers) .....

A Registered Authorised Person (Sterilizers) will be the appropriate specialist engineer to carry out this work. A list of registered Authorised Persons can be obtained from the Registrar, c/o The Institute of Hospital Engineering (Tel: 01705 823186)

Contents List

PART III

ELECTRICAL SERVICES

30 THE COMMISSIONING OF CONTROL SYSTEMS

Contents List **Page**

30. THE COMMISSIONING OF CONTROL SYSTEMS

General Controls

The commissioning of controls and control systems may need to cover a wide range of equipment from the simplest of controls such as an on-off thermostats through to a complex Building Management system. Controls are installed in any item of plant or equipment either to command a function to happen [ie. switching or regulating a function (Control Valve)], to indicate a plant state, to supply information for analysis (Metering data logging), or to protect the plant and personnel.

Control may be accomplished using a variety of systems, pneumatic, electro-mechanical, optical, electronic or a mixture of these; each has its own advantages and disadvantages. It is the duty of the Design Engineer to have selected the correct control for the item that is to be used. The Commissioning Engineer is to carry out the performance tests to ensure that: (a) the design is correct; (b) the manufacturer's claimed performance on which the Design Engineer would have based his design can in fact be proved.

When the commissioning of any new plant is to take place then the controls and control systems that are an integral part of that equipment must be fully tested and commissioned. The commissioning will need to be duly planned to encompass the full design parameters of the plant and its associated controls: (a) within the normal operating range; (b) design requirements for operation at extremes of range. Within the commissioning programme it is important that all testing should include the requirements and functions of controls to be examined and proved satisfactory.

The parties to the commissioning activity should fully examine the design to determine the parameters that are to be examined during the trials to ensure that the proposed testing programme validates all the controls and control points and that the interactions between controls and control systems are in accordance with the design intent.

If the plant to be commissioned has a multiplicity of separate controls, then the pre-commissioning testing should ensure that each individual control is tested prior to the full system test. This information should be made available to the Commissioning Engineer prior to the full commissioning.

Controls and control systems are invariably of an on-off facility or proportional/modulating circuitry any of which may also contain elements of a data feedback to a central control system, possibly a Building Management System.

Centralised Control Systems

These can either be a hard wired or Time Division Multiplexing (TDM) system or more unusally could be of a pneumatic nature. When these systems are being commissioned it is important to ensure that they are capable of meeting their design criteria, especially insofar as receiving and acting upon information being relayed from base stations back to a Central Processing Unit. It must be demonstrated that the unit is capable of holding and then acting upon and displaying information in accordance with its priority coding. It should also be demonstrated that in the event of a Central Processing Unit failure the base/relay stations are capable of continuing their design functions.

Alarms

Incorporated in nearly all controls and monitoring systems are methods of displaying faults; these may be visual or could be audible. During the commissioning it is important that these are checked and that they carry out their design function.

Safety

All control and control systems incorporate safety features and during the commissioning they should be demonstrated to act within their specified limits to ensure full compliance with the design intent safety assessment.

The main controls that are encountered in today's modern hospital environment are many and varied but normally fall into the following categories:

CONTROLS	TESTS
(1) TEMPERATURE INDICATION AND CONTROL	Tests should be comprehensive and carried out to ensure that the control and the systems are capable of carrying out their function. The tests should include accuracy checks throughout their range; they should also test all the safety features including overloads and the data feedback system, if fitted, should be proved to be accurate.
(2) PRESSURE/VACUUM INDICATION AND CONTROL	
(3) FLOW INDICATION AND CONTROL	
(4) HUMIDITY INDICATION AND CONTROL	
(5) LEVEL INDICATION AND CONTROL	
(6) GAS ANALYSIS AND CONTROL	
(7) QUALITY INDICATORS AND CONTROL	
(8) OPTICAL CONTROLS DENSITY	
(9) MOTOR CONTROL	
(10) LOAD CONTROL	
(11) TIME CONTROL	
(12) SPEED CONTROL	

The Commissioning of Building Management Systems BMS

The Commissioning will comprise 3 separate stages:

Stage 1

A static test of the equipment ensuring:

- The correct equipment as specified has been supplied and is correctly fitted.

- The location of the equipment is as shown on the specialist supplier's installation drawings.

- The installation is correctly completed with the specified grade of cabling, shielded where specified or required, any hydraulic lines are properly installed and leak free, any compressed airlines are correctly installed and leak free.

  (**Stage 1** will include checking continuity of wiring, equipment location and correct connection to its specific control valve or device).

Stage 2

Pre-commissioning installation check together with a check to establish the correct functioning of each control item. This will require power to be available to all panels and to the system. This comprises:

- Check power supply availability to all components as specified.

- For each controlled system install CPU and boards, enter data file and the minimum programme.

- Check integrity and operation of environmental inputs using a local test for each controlled system.

- Check all digital inputs for integrity including starter connections, flow pressure switches, alarms, any specified interface with the fire alarm system, zone interfacing and temperature controls.

- Check operation of digital outputs using signals generated by local tests with motor control gear set in "Auto" mode.

- Using the local test mode check integrity and operation of all analogue outputs and final control elements.

- On remote position panels check operation including interfacing with main control consol.

- Check operation of dampers and key operated control functions.

- Check local filter alarm indicators.

- Verify operation of resets on set point operations.

- Check and ensure correct operation of variable speed fans selection.

- Ensure correct and legible indications on LED display panels.

Stage 3

Final commissioning including setting of controls to meet required specified conditions, comprising:

- Check the off site testing of software control programmes has been correctly completed and results verified and certified.
- Check the correct insertion of software into system and control response parameters.
- Check calibration of limit and frost stats adjusting these as required.
- Modify software data file for any errors on a point-by-point basis. Check of all analogue readings of pressure, relative humidity and temperature.
- With each system under full automatic control by the BMS check all hardware interlocks and/or overrides are fully implemented and operational, paying particular attention to smoke/firezone interconnections.
- Modify control parameters in sequence and verify operation of BMS control including operation of induced alarm functions, emergency shut downs etc.
- Check and verify controller programmes and printed outputs against modified control parameters.
- Operate system under close supervision for a minimum period of 48hrs for each controlled system or zone.
- Carry out periodic manual instrument checks in environmentally controlled zones and ensure compatibility with BMS print outs.

Once BMS is operational and is giving the required level of correct control, if possible it should be maintained in an operational condition.

Note

The above functional tests and checks described are general but each system is likely to operate in a different design mode and the procedures outlined may require modification to suit the system design. It will be appreciated that the setting to work and commissioning of complex BM systems is a specialist function which should be carried out by the Supplier's Engineers. On no account should Commissioning Engineers attempt to modify supplier's software or carry out modification or adjustments of the system except under the supervision and instruction of the Supplier's Specialist Engineers.

The procedures outlined are given to enable Commissioning Engineers to appreciate the sequence necessary to set to work systems and the checks essential to ensure correct operation of the BMS.

Section 30

Appendix 1 (BMS)

FINAL ACCEPTANCE RECORD SHEET FOR BUILDING MANAGEMENT SYSTEMS

Client: .....

Hospital: .....

Zone Controlled: .....

Period of Test: .....

The system has been installed as specified and controls all parameters given in the system specification.

The installation is correct to the supplier's installation drawings and specification.

All components operate as specified.

Software has been authenticated and correctly fed into the system and is operational.

Printouts taken correctly indicate system status and environmental conditions in each department/control zone. The system has operated under auto-control for a minimum period of 48hrs and its operation, alarm action and interface with other alarm circuits is satisfactory.

The system is now fully operational in its intended control mode and is satisfactory for use.

Signed ..... Commissioning Engineer

..... Company

..... Date

I confirm witnessing the prescribed tests on the system and have verified its operation against manual condition status checks and confirm the system to be satisfactory for use.

Signed ..... Client's Commissioning Advisor

For .....Client

Date .....

31. COMMISSIONING OF COMMUNICATIONS SYSTEMS, FIRE ALARM SYSTEMS AND GENERAL SECURITY ALARMS

Contents List **Page**

31. COMMISSIONING OF COMMUNICATIONS SYSTEMS, FIRE ALARM SYSTEMS AND GENERAL SECURITY ALARMS

General

Communications systems will include the following:

- Telephone System - British Telecom network
  Telephone System - Private/Commercial Installation
- Radio/TV Systems
- Bell and Call Systems
- General
- Patient/Nurse Call
- Staff Location
- Visual and/or audible
- Radio Paging
- Alarm Systems to include:
- Fire Alarms
- Alarms associated wth a specific service ie. Oxygen failure or Cardiac Arrest.
- Special Alarm/Monitoring Systems
  ie. Gas detection equipment fitted in subways, ducts, etc.
- Security Alarms

Designer's Guidance

The Design Engineer must make available to the Commissioning Team in advance of commencement of commissioning, drawings showing the layout of the system, the areas served, accommodation for major items of equipment and details including manufacturers' design drawings for specialist equipment. Details should also be available of the electrical supply including the provision of a 'clean' supply for SPC computer controlled exchanges, the layout of cables to serve the specific systems showing details ofseparation from standard HV and MV cabling, method of containment eg. conduit, cable trays or specially insulated cables and connection to distribution boards etc.

The Design Engineer must also indicate services which require to be on the essential circuits and those requiring stand-by battery supply to ensure continued function in the event of total mains failure. Design Engineers will appreciate that unless special circumstances apply to specified circuits it would be expected that all communications and alarm systems would be included on the essential supply circuit and the majority, particularly those involving patient or staff safety, would require battery back up to ensure operation in the event of total mains supply failure. It is recommended that this requirement should be discussed with the users prior to design to ensure the District operational policy is agreed.

The Design Engineer will need, prior to commissioning, to ensure that any outstanding queries regarding wayleaves and the use of tie lines or private wires have been settled. It will be understood that such questions require to be dealt with at an early stage but it is known that some public utilities are lax in clearing these items.

The Design Engineer should also advise the Commissioning Advisor of any adjacent noise sources such as items of plant and whenever possible advise of the anticipated noise criteria of the plant. This is of particular importance as such external noise may affect satisfactory functioning of the communications systems and may also require acoustic shielding to be provided. TheCommissioning Advisor will from past experience be able to advise on such requirements. For this reason, as well as to ensure the systems will operate without problems, it is recommended that scheme proposals be discussed with the Commissioning Advisor and Communications Engineer at as earlier stage of the design as possible.

Pre-Commissioning Checks - General

The Site Engineer should check the installation(s) as these proceed, paying particular attention to the following points:

- Cable holes through internal partitions, floors and ceilings are cleaned and free from sharp edges which cause eventual damage to cables.

- Cable holes through external walls are properly sleeved and sealed with a waterproof compound which will not have an adverse effect on the cable sheath.

- Cable trays are constructed and installed to specification and are free of dirt, dust, etc and dry before cables are installed.

- The segregation of wires and cables is to specification ensuring clear minimum separation distances of 600mm from HV cables and 50mm from all other cables is achieved.

- Where any communications or alarm wiring requires to run within lift shafts it is clear of interference from other trailing wires, lift ropes, etc.

- Earthing is to IEE Regulations latest edition and no communications or alarm system earth is connected to the HV sub Station earthing system.

- Manufacturers' instructions as regards earthing of the chassis of specialist equipment must be followed.

Commissioning

Telephone Systems

As advised by British Telecom or specialist supplier.
Radio/TV Systems

Final Pre-Commissioning Check

The aerial array is to be checked for installation ensuring orientation is in accordance with manufacturers recommendations, the mechanical fixings are satisfactory and firm and that electrical bonding and connections are to specification.

Prior to setting to work the provision of the following in accordance with specification requirements, must be checked andthat their installation is satisfactory, the location is correct and to the Suppliers' recommendations:

- TV Sets
- Loud Speakers
- Microphones associated with in-house radio broadcasts
- Radio Receivers
- Bedhead Units

The power supplies to receivers and amplifiers must be provided via a commissioned and approved socket outlet (See Electrical Services General) and the plug connected to the apparatus must be fitted with a fuse of the recommended type.

Final Commissioning

It will be appreciated that the primary tests must be for the operation and reception offered by the equipment. Whilst each receiver needs to be individually checked for operation, tests should be made with normal ward or department equipment operating and with a number of receivers in simultaneous operation to ensure there is no interference; and reception, particularly of TV receivers, will be acceptable to users. Adjustment of aerial arrays may be required to ensure reception is at its best for all locations. The adjustment to aerial arrays should always be carried out by its supplier and installer. Tests should be made to ensure that the volume of sound is satisfactory for the particular location and is without distortion, particularly for music.

Bell and Call Systems including:

- Patient/Nurse Call Systems
- Staff Location (Audible and/or Visual)

Pre-Commissioning Checks

Ensure all equipment is to specification and installed in its correct location. Check for visibility of all luminous indicators, patients' re-assurance lights, controls, indicator boards and panels and that bedhead units are accessible to patients. Check for colour of luminous indicators. Ensure that marking and labelling is correct and that disconnection devices for sounders sited in sensitive areas (eg.ITU) are operating correctly and performing their design function.

Checks should also be made to ensure that transformers and/or power supply points are to specification and that their location is correct and they conform to BS974. Ensure appliances and apparatus are supplied from a socket outlet of the correct rating; where this is of a specified low voltage type it is clearly indicated as such and that the appliances are fitted with a plug incorporating a fuse of the specified rating.

Secondary stand-by battery system must be correctly located and ensure that these have easy access with the area correctly ventilated.

Final Commissioning

During final commissioning which should be conducted in co-operation with the specialist suppliers, test personnel ensure that the following are satisfactory:

- Ease of recognition of visual indicators.
- Volume of sound and ease of distinguishing the particular service are satisfactory.
- Where fitted combined microphone/loud speaker units operate satisfactorily and the correct balance of sound achieved.

At commissioning the Commissioning Advisor should also ensure the satisfactory operation of operating keys, switches and pushes and signal cancelling arrangements, switches can be re-set as required and priority switching can be realised on all services particularly those affecting patient safety and used in conjunction with emergency procedures (eg. Cardiac Arrest). Monitoring facilities must be included and be operationally satisfactory and facilities for the disconnection of sounders particularly in sensitive areas, operate as specified.

Staff Location Systems - Radio Paging

Pre-Commissioning Checks

Checks should be made to ensure the satisfactory installation and operation of the control unit and the transmitters.

The VHF aerials must be correctly sited and the installation checked paying particular attention to the method of securing the aerials and the security of the connections.Loop aerials must also be correctly sited and the installation must be to the Specification requirements. The aerials must be so sited that they are not liable to damage from any external source, the method and materials used for fixing are correct and satisfactory and protective arrangements are in accordance with specification requirements.

Where cables are buried under screeds or contained within partition walls their condition should be checked to ensure there is no damage during installation and that screeds are free from cracks. Where cables are installed in areas of high ambient temperatures (where temperatures are likely to exceed 45°C) the cables used are of a type suitable for installation in such areas giving particular attention to the insulation provided. If considered advisable advice should be sought from the specialist supplier on the need for additional cable protection.

Receiver racks for storage must be supplied and installed according to Specification requirements. In particular inspections should ensure the type of racking is correct, the mounting height is satisfactory to enable staff to use these as intended, illumination of the area of installation is adequate bearing in mind future maintenance and that instructions regarding use are properly sited and clearly visible.

Transformers and power supply must be to Specification, be located correctly and be to the requirements of BS794. All power supplies must be via a socket outlet installed in accordance with IEE Regulations and supplies to individual components must be via the correct and as specified plug fitted with a fuse rated according to the specialist supplier's recommendations. The fuse rating can be of major importance and it is strongly recommended that each plug be individually checked to ensure the fuse is correctly rated.

All wiring systems particularly signal wires must be so installed that they are not liable to signal interference from adjacent telephone systems or TV and radio wiring. Under no circumstances must signal wires be installed in parallel with such installations.

One of the major sources of problems in radio paging systems can be interference from other and similar signals. It is strongly recommended that pre-commissioning checks give particular attention to the installation of signal wires. If there is any doubt regarding the standard of installation advice should be sought from a specialist communications engineer.

Final Commissioning

It will be appreciated that satisfactory final commissioning of the system will largely be dependent upon trial in use. However at Commissioning and prior to handover the following system operations should be checked:

- Ease of signal recognition.
- Clear siting from all positions.
- Automatic cancellation after the specified time lapse.
- Cancellation via a telephone signal.
- Correct signal is given at each operation.
- Operation of repeater stations is satisfactory.
- Cancellation of loud sounders is possible, particularly in sensitive areas.
- The control station is fully accessible for all locations

All indicator lights operate in the correct sequence and are cancelled, on cancellation of a call, and that the installation is correct to specification.

Fire Alarms

General Notes for Designers

It will be appreciated that the fire alarms system is vital to patient and staff safety. It is therefore essential that the installation is to the approval of the fire officers, both those specifically employed by the Client and the Local Authority Fire Brigade, is in accord with the Client's operational policy and any specific Client's requirements.

Initially it is recommended that the proposed design, including the selection of detectors (smoke or heat), and their location be discussed and agreed with the Client's Fire Officer. Because of his experience and liaison with the Local Authority Fire Officers there are many advantages in this officer being the principal point of contact with the local brigade. Approval to the design from both should be obtained in writing before finalising layouts and selecting equipment. Once such written approval is given designers will appreciate that no alterations to the system, without discussion and further approval, should be made.

It is particularly important that the location of the main indicator board be agreed, the siting of the alarms (sounders) and the zoning of the system receive full approval before installation.

Pre Commissioning Checks

Check the following:

- Main Indicator Board and any sub board specified are as specified and sited in accordance with the agreements reached.

- The siting of alarm bells or buzzers is correct and that unless otherwise agreed these are not positioned at greater than 30m (100ft) centres.

- 'Break glass' alarms are correctly sited and so positioned that they are readily accessible to staff and fitted with a break glass device of an approved type.

- Where specified, key operated alarms are positioned correctly and can be operated satisfactorily. Generally these special alarms are confined to specific locations and their siting is recommended by the Fire Officers.

- All circuits are fitted with test facilities.

- The zoning of alarm circuits is in accordance with specified and agreed requirements.

- There is automatic operation of the alarm system by telephone.

- This operation may include either the total system or by zones according to the size of the installation and the agreement reached with the Fire Officers.

- The direct telephone link to the local Fire Brigade location is installed and operates to specification requirements.

- Any special facilities for automatic warning to nominated personnel are correctly installed and operational.

- The fault signalling system is correctly installed to specification and provides indication of:

  Indicator light failure

  Failure of battery charging circuit

  Low battery voltage

  Earth fault

The power supply, which it is absolutely vital, be on the essential supply circuit, is installed to IEE Regulations (latest edition) and that connection to system components is via approved socket outlets which have been properly commissioned with final connections via an approved plug fitted with a fuse of the specified rating. All fuse ratings should be individually checked prior to final commissioning. Particular attention should be given to checking system earthing as this can frequently be the cause of false alarms.

Final Commissioning

At final commissioning of the system in addition to the Client's Works Officers responsible for witnessing engineering commissioning generally, there are advantages in extending the invitation to witness to the Client's Fire Officer. Subject to his advice, on major installations particularly those associated with new District General Hospitals, experience indicates that there are many advantages in also extending the invitation to the Local Authority Fire Brigade. This often assists in obtaining their co-operation where post comissioning problems arise, particularly any incidence of false alarms.

At final commissioning the following should be checked for satisfactory operation:

- Diversion relay operation and operation of the supervisory buzzer.
- Alarm circuits are automatically restored after replacement of keys or glass on break glass alarms.
- Indicator board signals are correct in accordance with the agreed zoning and are easily visible.
- Each fire alarm contact should be operated in turn to ensure correct and sequenced operation of the sounder and the indicator.
- Operation of selected smoke and heat detectors must be checked.
- Link with staff location system operates correctly.
- Link with local fire station is operational (NB warning should be given to the local fire station that commissioning is in progress).
- Sounders in remote locations such as isolated stores, workshops, etc operate correctly and the sound level is satisfactory bearing in mind the probability of locally generated noise.
- A full investigatory check should be made of the fault signalling system ensuring that it gives immediate and correct indication of the faults listed under Pre-Commissioning checks.

There are also advantages, following satisfactory commissioning, in arranging a seminar in conjunction with the Client's Fire Officer to explain to local staff, in particular senior nursing staff, the operation of the systems, the type of indication of alarm given and seeking their views on the tone and sound level of audible alarms. This can often eliminate post commissioning complaints and comment.

Alarms Specific to a Given Service

Alarms are required to operate in conjunction with failures of medical gas systems, cardiac arrest and other specified facilities according to agreed operational policies.

It is helpful that alarms associated with a specific service, ie failure of medical gas systems, be specified and designed as a partof the particular service. Pre-Commissioning checks on the alarm system should be carried out in conjunction with checks on the system and final commissioning must form an essential part of the commissioning of the particular system.

Cardiac arrest alarms form part of the internal telephone service and reference should be made to the data on that service for advice and recommendations to be followed to ensure the system operates correctly in service. Many such alarms are associated with patient life support systems and their correct function and commissioning is essential.

Special Alarm/Monitoring Systems

Monitoring/Alarm systems are frequently fitted to monitor conditions in underground subways, ducts and areas where maintenance staff may be required to work in isolation. Such alarms and monitoring systems are an essential feature of staff safety.

Their installation may result from the intervention of officers from the Health & Safety Executive and it will be appreciated that such recommendations will then form a mandatory feature of the design.

Generally these systems require to be designed, installed and commissioned by specialist companies and it is recommended that tenders be sought from such specialists who will undertake full responsibility for the system. Because of the specialist nature of the systems they should also be the subject of a maintenance and service agreement. It will be understood that failure of any component may jeopardise operation of the entire system. The designer must however include within his brief to the specialists information on likely gases which will be encountered, any chemicals or chemical solutions which will be present and details of where alarm indicators are to be sited. Advice should be sought from specialist medical officers on acceptable levels of contaminants and the levels at which alarms are required to operate. The site engineer will be required to oversee the installations by the specialist companies and the commissioning advisor should witness their commissioning noting in particular procedures adopted and general operation of the system, the operation of alarm indicators and that these function at the specified level of contamination.

Where the system has been installed as the result of intervention by the Health & Safety Executive there will be advantages in inviting their attendance at commissioning.

Security Alarms

General Advice to Designers

Security alarms are becoming increasingly important following increases in vandalism of hospital premises, attacks on staff and for the protection of Pharmacies and Drug Storage Areas. Prior to commencing design advice should be sought from the Client's Security Officer and local Crime Prevention Officer as to their views on the recommended security policy, the approved type of system recommended and the areas to be covered. Certain high security areas may require special systems with limited circulation of information on system design and key issue to specifically registered holders only.

High security alarms will also require a direct link to the nearest continuously manned police station and advice should be sought from the Crime Prevention Officer as to these needs. The location of alarm indicators and the need for audible warning should also be discussed and agreed.

It is also known that some Clients particularly those with major hospitals sited within city areas are proposing the incorporation of light rays as added protection and advice should be sought from the Client as to its present and future operational policy.

It will be appreciated that such installations as those outlined above are of specialised design and their design, installation and commissioning should be carried out by a specialist company who accept overall responsibility for the scheme. Similarly because of the specialist nature of the installations it is recommended that the Client be urged to place the system on a maintenance and service agreement with its suppliers.

Installation and Pre-Commissioning Checks

The Site Engineer will be required to oversee the installation by the specialist company but it is essential that he be instructed as to the confidentiality of the design and its operation. In particular the need to maintain this requirement for high security areas must be emphasised.

The divulgence of information on the system should be made a disciplinary offence and it is recommended that an instruction to this effect be issued to staff concerned with the scheme.

During the course of the installation the Site Engineer should ensure that the system is installed in accordance with Standard Specifications, the electrical installation is in accordance with IEE Regulations and that all connections to apparatus are via properly installed and commissioned fused spur permanent connections. This is necessary to ensure plugs cannot be removed by intruders. Similarly all wiring should be concealed and where necessary provided with protection to prevent interference. Particular attention should be given to ensuring earth connections are properly made as faulty earthing can frequently be the cause of mal-operation and the raising of false alarms.

Final Commissioning

Commissioning should be carried out by the specialist company supplying the equipment but be witnessed by the Commissioning Advisor. There are advantages in inviting the User's Security Officer and subject to advice, the Crime Prevention Officer, to witness final commissioning and system proving.

Where direct links to the police are in use they must be advised that commissioning of the system is in progress. During commissioning particular attention should be given to the operation of indicator lights and any audible alarms fitted. Fault indication should be checked and the re-instatement of the system following clearance of faults.

It is necessary to ensure the system operates from the essential supply circuits and that battery back up is provided particularly for high security areas.

The direct link to the police should be checked and assurance obtained that this operates immediately an intruder is sensed, also that the link is satisfactory to the Crime Prevention Officer.

Care should be taken to ensure that advice on the system and its operation is only given to those officers nominated by the User Authority on a 'need to know' basis.

Final Completion and Handover of All Systems

General

Ensure all FAR Sheets and Test Sheets are completed and included within Manuals and documents for handover.

Arrangements are made or have been completed for the instruction of Clients in system operation.

Discuss with Works Staff recommendations for system maintenance in particular those systems which it is specifically recommended be placed on Maintenance Contracts.

Commissioning Reports are completed with any defects noted properly attended to and final reports are included in documents for handover.

Documents Required at Handover

Two copies of all Service Manuals covering all items of plant included within a system together with any ancilliary equipment supplied.

The Service Manual should include the following:

- Index of Contents
- Description of Purpose of System and its Design Intent
- Commissioning Information including copies of final commissioning reports and where appropriate copies of FAR Sheets
- Manufacturers' Service Manuals
- Line Diagrams of both Mechanical and Electrical Services including connection into hospital systems
- List of Recommended Spares including ordering advice
- Operational Instructions including guidance to Users
- Schedules of Mechanical and Electrical Equipment and Fittings
- Planned Maintenance Procedures and/or copies Service Agreements
- Vocabulary
- Emergency Measures and any Fault Tracing Advice
- Users' Handbooks
- Copy of System Specification
- Final as Fitted Drawings for the System

In addition the following must be available at or before handover:

- Lists of tools, Keys and special equipment provided to the User including signed receipts.

- Any Insurance or Inspection Authority (ie Fire Brigade/Police) reports or certificates of satisfaction.

- Plant and Equipment Guarantee Certificates where appropriate.

Confirmation from Statutory Undertakings of agreements covering shared use of masts or aerial arrays, wayleaves, use of tie lines and TV/Radio supervision certificates.

Any schedule of exceptions to handover or final inspections which require to be delayed until the systems are in regular use.

When preparing handover documents senior officers of the Client should be advised on the installation of high security systems where nominated officers only are to receive advice on system design and operation, and their instruction sought as regards handover documentation.

Section 31

Appendix 1

FINAL ACCEPTANCE RECORD SHEETS - ALARM AND COMMUNICATION SYSTEMS

Scheme: Job No:

Client: Hospital:

System:

Specialist Engineer | Commissioning Advisor

Pre-commissioning Checks completed to Instructions

System installed in accordance with Specification and installation confirmed as satisfactory

System Set to Work and properly Commissioned

System confirmed as fully satisfactory and ready for use

Where appropriate Operation of the following has been checked and is satisfactory:

1) Standard of Reception for TV/Radio Installations and Location of Receivers
2) Operation of Indicator Panel including correct sequencing of Indicator Lights
3) Repeater Panels where fitted Satisfactory
4) Fault Indicators Operate according to Specification and reset on rectification is satisfactory
5) Audible Alarms satisfactory in all locations
6) Electrical Back-up facilities are to specification and operate correctly
7) All circuits are connected to essential supplies

The system has been properly commissioned, operates in accordance with design intent and User requirements and is satisfactory to Specialist Advisors.

I confirm that the above system has been set to work, fully commissioned, meets with the Design Intent and is ready for use in all respects.

Signed .....Specialist Test Engineer

Witnessed by ..... Commissioning Advisor for

..... (Client)

Accepted by ..... for and on behalf of

..... (Client)

32. THE COMMISSIONING OF LIFT INSTALLATIONS (ELECTRICAL OR HYDRAULIC)

Contents List:

32. THE COMMISSIONING OF LIFT INSTALLATIONS (ELECTRICAL OR HYDRAULIC)

Definitions

Lifts shall include passenger, bed/passenger, goods and hoists. The term 'lift' shall incorporate the complete installation of mechanical and electrical equipment necessary to provide a working installation. Lifts in the majority of cases will be driven by electric motors, but may also include hydraulically operated installations. Specialist lifts such as Paternoster types may be required on certain specific schemes.

Commissioning Procedure

Design Requirements

Because of the specialist nature of the supply it is usually for the design engineer to specify a lift installation of the form required stating the type of drive required, and in some instances providing a very limited specification, relying on manufacturers to include essential features.

For this reason it is essential to make a thorough pre-commissioning check to ensure all necessary safety features are included.

The designer, in his specification, must ensure that the requirements of BS 5655 current edition, the Code of Practice CP407.101 current edition and the Health and Safety at Work Act 1974 with latest amendments, are complied with in all respects.

Many Health Authorities have a specialist in lift engineering on their staff and where such an appointment has been made designers should always seek his advice, particularly as regards any specialist installation.

Commissioning Information

The following information will be required by the Commissioning Engineer and Commissioning Advisor before commissioning procedures are instituted.

General

A full description of the plant, its specific duty, ie. passenger only, bed/passenger, etc. and mode of operation, generally from the relevant sections of the specification. Drawings showing the layout of the plant, schematic line diagrams indicating the main features of the plant, the inter-connections between various items, drawing attention to the method of setting controls switchgear, etc.

Electrical drawings showing the various relays and semi conductor modules and interconnections between these components together with wiring diagrams showing sub circuits and printed circuits. Manufacturers' service manuals, operating instructions, and 'setting to work' instructions must also be available.

Precommissioning Checks of the Lift Installation

Type of Lift	ie. bed/passenger
Contract Load	eg. 8 passengers - 630Kg.
Contract Speed	0.75m/sec is an acceptable figure
Travel	Distance between floors. mm.
Floors Served	eg. 5 floors, single entrance on each floor
Method of Control	eg. Directional Collector control - variable speed A.C.
Indicators	normally luminous 'Direction' and 'Position' type installed at each level
Drive	
Size of Car Platform (internal dimensions of lift car)	
Position of Counterweight	
Car Construction and Finish	
Car Entrance	
Car Lighting	
Landing Entrances	
Levelling Accuracy	Automatic self levelling to give an accuracy of + 6mm is typical
Electricity Supply	usually 415v 3ph. and 240v single phase is required
Depth of Pit	depth of car plus 25% is usual
Guides and method of fixing	steel brackets are usually preferred - rag bolts are not acceptable

Safety Features

The following essential safety features should be fitted (if omitted, the omission may invalidate the insurance inspection and/or render the installation unacceptable to the Health & Safety Executive):

- Emergency alarm push button within the car which operates a battery powered alarm bell at Ground Floor Level. The batteries should preferably be mounted in the lift motor room.

- Telephone link between the lift car and motor room with the telephone within a labelled emergency panel visible to the lift occupants.

- Lifts cars should be suspended by a minimum of 4 steel wire ropes independent of each other with rope equalising gear fitted to equalise the tension in the suspension ropes.

- Lift motors to be properly labelled showing manufacturers name, output power, voltage, speed, etc. and the direction of rotation indicating UP and DOWN.

- Excess Current protection for lift motors.

- Kilometer Recorder to record total distance travelled by each car.

- Conductors to be colour coded or fitted with identification ferrules in accordance with IEE Regulations.

- Test Certificates for the Controller and the suspension ropes.

- Valid Certificate of Insurance provided by the Company nominated by the Health Authority (the plant user).

  NOTE:- particular attention should be given to ensuring any reservations indicated by the Inspector, have been properly cleared prior to commissioning.

- Guarding of Top of Lift Car. Wherever a gap exists between the car and the lift shaft wall which exceeds 150mm x 400mm guarding must be provided to close the gap.

Lifting Beams within Motor Room. Test Certificates for any such beams should be provided and the beam have clearly stencilled on to it its safe working load. The factor of safety of such beams must be at least 5. (Insurance company inspectors have, in two recent cases, refused to accept the installation where this has been omitted).

Commissioning Tests

Tests are to be demonstrated to BS5655 Part I, plus the following additional tests:

Tests to determine the plumbness, accuracy of alignment and gauge of the guides.

Tests to determine the required levelling accuracy has been achieved.

Tests to establish noise levels in operation.

Tests to determine the doors open and close at the correct speed.

An up and down run at full load, of one hour duration to determine the reliability of all semi conductor devices, relay and solenoid coils, and circuit components in general.

It is also essential that seven days notice in writing be given of the intention to demonstrate the equipment.

In addition a demonstration to hospital personnel is essential to demonstrate plant operation and to show the approved method of operation for the emergency lowering of the car and release of passengers.

It is usual practice to include in the Specification for all lift equipment to be fitted with Radio and TV Interference Suppression Components, as required by BS 800 latest edition.

Tests for interference may be required by British Telecom, the manufacturer of the in-house communications systems and the Insurance Company Engineer. The Design Engineer/ Commissioning Advisor should enquire as to the necessity for such tests and if required should arrange for these to be completed during the demonstrations.

For guidance a typical system acceptance sheet is attached as Appendix 1.

Electrical Commissioning

Panels are to be fitted with adjustable magnetic overload protection for the pump motor, under voltage relays and phase failure/reversal relays. The operation of these devices must be checked during commissioning tests. Such devices should be incapable of automatic resetting.

The electrical installation complete is to be subjected to the Tests given in the IEE Regulations 16th Edition including earth continuity, earth loop impedance, polarity and phase sequencing.

General Commissioning

Once the installation has been satisfactorily set to work and is also acceptable following Insurance Company inspection it should be witnessed tested for the following:

- Push Button Operation
- Automatic Levelling
- Door Operation
- Operation of Anti Creep Devices (this can be a source of problems on hydraulic lifts).
- Landing Indication Operation
- Coding and Identification of all circuitry and hydraulic lines.
- Safety Devices including occupant re-assurance devices
- Hand Operation
- Fitting of Operating Instructions including procedures to be undertaken for hand lowering.
- Speed of Travel.
- Operating Sound Levels

A visual inspection of the complete installation should be made prior to signing of acceptance certificates with particular emphasis on the integrity of all pipework and hydraulic equipment particularly as regards the absence of oil leaks. As is common with all lift installations the issue of a certificate of satisfaction by the Insurance Company Inspector is indicative of an acceptable installation.

Items to be Available at or Before Acceptance and Handover

The following are essential to the user/client and must be available at or before handover.

- Test Certificates
- Properly completed and bound Maintenance Manuals containing:
- Description of the Installation itemising main components of the plant.
- Description of Plant Operation with full design details together with a description

of the emergency action to be taken in the event of breakdown.

- Complete schematic line diagrams indicating the main features of the plant, the interconnections between various items, drawing attention to the method of setting controls, switchgear etc.

- The method of adjusting components, typical fault finding, routing and a complete set of wiring diagrams showing the various relays, semi conductor modules, and inter connections between those items. Wiring diagrams of all sub circuits and printed circuits must be included.

- Service manuals for all specialised plant giving details as listed above, including spares and general mechanical maintenance stating recommended oils and greases.

- Two sets of complete Record Drawings showing the 'as installed' plant.

- Twelve Months Maintenance and Service Agreement giving details of emergency call out procedures.

General Guidance Material Appropriate to the Commissioning of Lifts

Code of Practice: CP 407.01
BS 5655 Part I
BS 800

Useful guidance is also available from the following publications:

C.G.Morley - Architects' Journal July 1962 - Installation, Lifts,Escalators

R.S.Phillips - Pitman 1966 (5th Ed.) - Electric Lifts

W.J.Pinfold - BRS Symposium 1966 - Lift Design & User Requirements

DHSS Data Sheets - Vertical Transportation

G.R.Strakosch - J.Willey & Sons 1967 - Vertical Transportation

Section 32

Appendix 1

COMMISSIONING OF LIFTS (ELECTRIC)

Proposed Final Acceptance Record Sheet

HOSPITAL: SCHEME: JOB NO:

MANUFACTURERS REFERENCE:

TYPE OF LIFT(S):

SIZE OF CAR:

TRAVEL SPECIFIED mm

FLOORS SERVED:

(Where a bed/passenger lift is specified it is essential to ensure the car is adequate to take the largest bed with attachments in use by the hospital)

Item to be Checked/Demonstrated			Satisfactory	Unsatisfactory
Contract Load	1) Specified	2) Test Load		
Contract Speed	1) Specified	2) Test Speed		
Indicators		1) In Car		
		2) At Floor Level(s)		
Electrical Installation & Circuitry				
Door Opening & Closing Speed				
Levelling Accuracy				
Emergency Alarm				
In-Car Telephone				
Operating Instructions Properly displayed				
Kilometer Recorder				
Guarding of Car Top				
Test Certificate for		1) Ropes		
		2) Controller		
Certificate of Insurance:				

Have any reservations by Inspector been cleared?

Lifting Beam in Motor Room
Is safe load stencilled on Beam?

Certificate of Test Inspected

Labelling of Lift Motors

Depth of Pit

Commissioning Tests

Tests to BS5655 Part I
Tests on Guides
Noise Level in Operation
One Hour Run at Full Load

Demonstration to Client's Personnel of All emergency Procedures.

Documents checked for Handover;-

1) Plant Layout Drawings & Schematics
2) Wiring Diagrams
3) Test Certificates As Specified
4) Certificate of Insurance Cleared of All Reservations
5) Manufacturers' Service Manuals
6) Operating Instructions
7) Emergency Procedures
8) Setting to Work Instructions
9) Clearance by H&SE Inspector

I have examined all documents, instruction manuals and installation diagram/drawings which are correct. The installation has been tested in accordance with BS5655 Part I together with any supplementary test requirements as specified by the .....
.....(Client)

The installation has been demonstrated to the Client's Commissioning Advisor and is satisfactory for Handover and use.

Signed: .....

Status: .....

For and on behalf of: ..... Co.Ltd.

Date: .....

I have examined all documentation listed and would confirm having witnessed all required tests and demonstrations and am satisfied the installation may be safely handed over to .....(Client) ready for use.

Signed: .....

Status: .....

For and on behalf of: .....(Client)

Date: .....

Section 32

Appendix 2

INDEX TO TESTS TO BE COMPLETED (HYDRAULIC LIFTS)

Section 32

Appendix 3

SCHEME:

JOB NO: FILE NO:

JOB/REF:

SITE TEST REPORT **HYDRAULIC LIFT INSTALLATIONS**

CONTRACT NUMBER: DATE OF TEST:

ADDRESS ON INSTALLATION:

A GENERAL DESCRIPTION

Manufacturer

Type of Lift:
Supply:
Contract Load:
Contract Speed:
Travel: No. of Stops:
Number of Landing Entrances:
Number of Car Entrances:
Control Type:
Controller Works Number:
Source of Hydraulic Supply:

Contract Power

Oil System Pressure:
Diameter of Ram:
Position of Ram:
Door System:
Drive Details:
No.of Ropes:
Governor Rope:
Type of Valve:

OTHER DETAILS

A1 HYDRAULIC PUMP MOTOR DRIVE DETAILS

Manufacturer:

Type	Serial No.	KW/BHP	Volts
Current	Amps Rating		Insulation Class
RPM	Windings		No. of Phases
Frequency			Date of Manufacture

Are Thermistors fitted in motor windings?
Other Information

A2 HYDRAULIC PUMP DETAILS

Manufacturer
Type Pump
Maximum Pressure Bar oil viscosity
Works No. Date of Manufacture

Appendix 3

SCHEME .....

DEMONSTRATION OF LIFTS .....

DATE .....

PRESENT REPRESENTING

OBJECT OF DEMONSTRATION

CLIENT .....

HOSPITAL .....

SCHEME .....

Section 32

Appendix 4

CLIENT .....

HOSPITAL .....

SCHEME .....

TEST CERTIFICATE
ELECTRO-HYDRAULIC LIFTS

Section 32

Appendix 4

BS 5655 LIFT SPECIFICATION

NOTES FOR REFERENCE

Gap between door and well not exceed .15m

Lighting of well

Angle of acccess ladder 70° & 76° to horizontal

Non-slip floor

Access ways

Room ventilation

Room lighting level

Safe work load to be indicated on beam

Stop watch

Fire doors close automatically

Mechanical door strength 300N area 5cm2 to exceed 5mm

Door force 150N & 10j

Door guides top & bottom

Pulley 40 x dia of rope

Rope fixing at least 3

Rope fixing drum 2 clamps

Not possible to raise car with counterweight on stops

Trip safety gear shall not operate electrical etc.

Safety gear fully laden

Tripping of over speed 115%

Test of over speed governor

Rotation of guide attachment

Normal & final limit switches

Breaking contractors under load

Incorporate device cause lift to stop. If machine does not rotate

Distance between sills 35mm

Brake capable of 25% over load. See also D2 APP.D

Section 32

Appendix 4

BS 5655 LIFT SPECIFICATION

NOTES FOR REFERENCE continued.....

Two independent contractors for brake

Two independent contractors in series in the supply circuit (motor)

Two independent contractors in series in the supply to motor

Protection of machinery (painted yellow for hand winding) .5 meg power .25 meg other

Contractors AC-3 DC-2 for DC Power

Main switch machine room capable of interrupting highest current

Earth of electrical safety circuit

Distance between separation of contacts 2mm

Electrical safety device act directly on equt. controlling machine

Roof top controls

Direction of movement for hand winding

Date plate of settings of governor speed

D2 test car movement with counterweight on stops (Empty Car).

Section 32

Appendix 4

F1 GENERAL TESTS

1. Is a load indication plate fitted in the car?
2. Does the fireman's control function correctly?
3. Can syphoning take place?
4. Has the operation of the emergency lowering device been demonstrated?

   Has the operation of the emergency audible and indication been provided?
5. Do the stop switches in the pit and at the top function correctly?
6. Is the lift car stop vibration on mains failure acceptable?
7. Does the rupture valve function correctly or governor control (under free fall conditions)?
8. Has a bund wall been provided?
9. Has the Machine Room adequate artificial lighting for all maintenance purposes?
10. Have guards been provided for lifting machinery?
11. Is a fire extinguisher provided in the machine room?
12. Is fire detection provided?
13. Is the Machine Room ventilation in accordance with Part 1 of BS 5655?

    Is heating provided?

    What type of lift car ventilation?
14. Have warning notices been displayed?
15. Have warning notice prohibiting entry to Machine Room been provided?
16. State the means of main isolation of lift and have lock off facilities been provided?
17. Does the emergency lighting in the car function correctly?
18. Does the alarm system in the car function correctly?
19. Does the low oil level alarm system function correctly?
20. Does the low oil pressure alarm system function correctly?
21. Is the S W L painted on the lifting beam kg?
22. Dimensions of beam MMx MMx M LENGTH?
23. Has a pit stop been provided?
24. Does the slack rope switch operate?

    Has a permanent ladder been provided for pit inspection?

Section 32

Appendix 4

F1 ADDITIONAL TESTS AS REQUIRED

1

2

3

4

5

6

Section 32

Appendix 4

B ELECTRICAL INFORMATION

B1 CIRCUIT BREAKER MANUFACTURER

Type Ratings Amps Fuse Value
Recorded Mains Voltage Volts

B2 LIFT CONTROL PANEL

Manufacturer
3 Phase Circuit Breaker
Overloads in each phase setting amps
Time Relay seconds
Full load motor with pump S C amps. Tripping time seconds
Does phase failure device operate satisfactorily?
Does phase reversal device operate satisfactorily?

B3 CONTROL CIRCUIT TESTS

CONTROL CIRCUIT CONDITION	CONTROL CIRCUIT VOLTAGE (VOLTS)	CONTROL CIRCUIT CURRENT (AMPS)
NO - LOAD		
FULL - LOAD		

Control Circuit rectifier type

B4 DOOR PROTECTION TESTS

Operating current A Fuse/circuit breaker rating A

DOOR CONDITION	MEASURED CURRENT (AMPS)	MEASURED TIME (SECS)	NO. PHASE
DOORS RUNNING			
DOORS STALLED			
MOTOR PHASES SINGLE PHASE TEST			

Time Delays

Car hold delay seconds

Section 32

Appendix 4

B5 INSULATION AND CONDUCTIVITY

1. Insulation Resistance Test of Motor M ohms
2. Insulation Resistance Tests of Power Wiring Minimum M ohms
3. Insulation Resistance Tests of Control Wiring Minimum M ohms
4. Is the lift car connected to earth via separate conductor?
5. Is the minimum continuity resistance to earth of the following less than 0.5 ohms?

Architraves	Ladder .....
Push Buttons	Doors .....
Control Station.....	PITSW .....
Guides.....	TOPSW .....
Ropes	Hydraulic ram/s .....
Buffers	Is PITSW adjacent to Ladder? .....

C HYDRAULIC PUMP MOTOR TESTS

LIFT CAR LOADING	STARTING CURRENT (AMPS)	RUNNING CURRENT AT MID-TRAVEL (AMPS)	RUNNING SPEED M/SEC	OIL PRESSURE (WHERE APPLICABLE)
FULL LOAD UP				
FULL LOAD DOWN				
NO LOAD UP				
NO LOAD DOWN				
FL + 10% UP				
FL + 10% DOWN				

Section 32

Appendix 4

ORIGINAL COMMISSIONING DETAILS						
CAR LOAD	STATIC PRESSURE BAR	UP		DYNAMIC CURRENT AMPS	DOWN	
		Pressure Bar	Speed m/sec		Pressure Bar	Speed m/sec
NO LOAD CAR AT BTM.						
NO LOAD CAR AT TOP						
FULL LOAD CAR AT BTM.						
FULL LOAD CAR AT TOP						
10% OVERLOAD CAR AT BTM.						
ELEC O/L SWITCH PRESSURE						
MECH RELIEF VALVE PRESSURE						

C1 LOAD TESTS

1. Half/hour run at contract load, full travel with intermediate stops to give a rate of starts at least equal to the contract number of starts/hour.

   a) Number of Starts/hour

   b) Machine Room ambient temperature Start °C Finish °C

   c) Motor Start °C Finish °C

   d) Oil System Temperature Start °C Finish °C

   e) Control Panel Temperature Start °C Finish °C

   f) Does the anti creep device function correctly?

   g) Other observations

Section 32

Appendix 4

C2 FLOOR LEVELLING

Floor Level Accuracy

LOAD/DIRECTION	GROUND	1	2	3	4	5	6	7
EMPTY UP								
EMPTY DOWN								
HALF LOAD UP								
HALF LOAD DOWN								
FULL LOAD UP								
FULL LOAD DOWN								
FULL LOAD & 10% UP								
FULL LOAD & 10% DOWN								

C3 OVERLOAD

The lift car to complete round trip with Contract Load plus 10% stops only.

Observations

C4 GOVERNOR AND SAFETY GEAR TESTS

Governor Manufacturer Type

Operation Trip Speed Electrical M/Sec MECH M/Sec

Distance travelled after trip

/safety gear manufacturer

Type

Guide marks Inspected Operating mechanism under car

Section 32

Appendix 4

D DOOR TEST

D1 LANDING AND LIFT CAR DOOR OPERATION

Type of Door Drive Manufacturer

DOOR DESIGNATION	DOOR WEIGHT	MAXIMUM FORCE AT MID-POINT OF TRAVEL	DOOR CLOSING SPEED	TOTAL KINETIC ENERGY

Does the maximum force and kinetic energy comply with Part 1 of BS 5655 Car door pressure switch tested?

D2 DOOR TYPE, LOCKS AND LIFT CAR INTERNAL DIMENSIONS

	Length	Width	Height
Car Door			
Landing Doors			
Clear Opening Dimensions			
Lift Car Dimensions			

Does the door equipment comply with the Specification?

Does the circuit breaker (or fuse) protecting the car door lock circuit trip (or blow) if the car door lock circuit is earthed when tested at the top and bottom landings and at the car door?

Position

Does the car door operate lock equipment comply with Part 1 of BS 5655?

Has the landing door interlock been inspected?

Section 32

Appendix 4

GUIDE TO OPERATING DOOR PRESSURES

G1 The kinetic energy can be calculated from the knowledge of the door weights and speed.

The formula for kinetic energy is:

$KE = 1/2\ Mv^2$

or, in the units of the table below:

KE = 1/2 (Weight of door (Kg) x Velocity (M/S)² Joules

$KE = \frac{1/2\ (\text{Weight of door (Kg)} \times (\text{Velocity M/S})^2}{9.81}$ Kgfm

$KE = \frac{1/2\ (\text{Weight of door lbs)} \times (\text{Velocity of door (ft/sec)}^2}{32.2}$ ft lbf

The combined kinetic energy of a two speed trailing type landing door then would be 2.5 KE of leading door.

MAXIMUM OPERATING DOOR PRESSURE LAID DOWN IN BRITISH STANDARD

DOORS	COMBINED KINETIC ENERGY LESS THAN	FORCE TO PREVENT DOOR CLOSING LESS THAN
WITH PROTECTIVE DEVICE	9.8j 1.0 Kgfm 7 ft lbsf	147N 15 Kgf 33 lbf
WITHOUT PROTECTIVE DEVICE	3j 0.35 Kgfm 2.5 ft lbs	49N 5 Kgf 11 lbf
WITHOUT PROTECTIVE DEVICE OR AUDIBLE WARNING OF CLOSURE	1.8j 0.18 Kgfm 1.25 ftlbf	29N 3 Kgf 6.6 lbf

Section 32

Appendix 4

E MECHANICAL INFORMATION

Buffer Type	Pit Depth	
Buffer Compression Bottom	mm Top	mm Other Details
Buffer Test Certificate		
Setting of relief valve Mechanical	Bar Electrical	Bar

Is the relief valve secured against unauthorised interference?

E1 PERMANENT STOPS

Have permanent stops been fitted to prevent the car over-travelling?

1) Distance run past top floor level to permanent stop

2) Distance run past bottom floor level to the solid buffer

3) Limit switch setting at top of shaft beyond normal floor level

Limit switch setting at bottom of shaft beyond normal floor level

E2 BUFFER TESTS

Do the buffers stop the car with contract load when travelling at contract speed without permanent deformation of the car?

E3 CLEARANCE AND RUN-BYS

1) Will the car and, if fitted, the counterweight clear all obstructions when driven at slow speed? .....

a) When driven at slow speed with the car compressing the buffer? .....

b) With the car at the extreme top position? .....

2) Distance to first striking point above car when in extreme top position .....

3) Estimated distance to first striking point above counterweight (if fitted) with car on compressed buffer. .....

4) Bottom Run-by of Car .....

5) Bottom Run-by of Counterweight (if fitted) .....

Section 32

Appendix 4

E4 CAR TOP CONTROL STATION

1.	Speed Speed up	M/SEC	FULL LOAD	M/S
2.	Speed Down	M/SEC	FULL LOAD	M/S

3. Does the operation of the car top control station comply with Part 1 of BS 5655?

4. Does the car stop with its roof not less than 1.8m from the top of the well?

32A. COMMISSIONING OF HYDRAULIC LIFTS

Contents List **Page**

32A COMMISSIONING OF HYDRAULIC LIFTS

General

Hydraulic lifts are frequently used where limited travel only is required or where limited head room is available for lift motors and associated equipment.

In general hydraulic lifts operate at a slower speed than electric lifts - 1.5m/second being a typical maximum speed.

This type of lift is also noisier in operation than an electric lift and for this reason it is essential to state in the Specification the maximum acceptable noise level for the installation. As is usual with lift installations the specification should also include for an initial maintenance agreement to be included with the tender price. A 12 month agreement is an acceptable period. The maintenance agreement must also include emergency call out during its period of operation.

The standard design of hydraulic lifts is normally for side ram operation.

The lift car should be specified as for a standard electric lift and must include the features specified for the electric lift car including requirements for emergency lighting, escape panels, emergency telephone and finishes. Although the lift is termed hydraulic, the basic pump drive and other features are electrically operated. It will be understood that the electrical equipment including cabling, terminations, control panel etc. must be in accordance with the requirements of the Institution of Electrical Engineers Regulations 16th Edition or any subsequent revisions to this document. Similarly all electrical equipment supplied with the lift and its components must be fitted with interference suppression for Radio and Television as required in British Standard No.800. It is also advisable to include a sum within the tender price for interference tests to be completed by British Telecom engineers.

Specification Requirements

The specification must include details of the type of installation required. A typical example being "Bed/Passenger Lift", direct acting two side Ram type Electro-Hydraulic lift with direct to floor levelling and anti creep re-levelling ". Such a specification is satisfactory to enable the specialist supplier to appreciate the requirements.

It is also essential to state the following (a typical requirement is given):

Load -	eg 20 person/1500 Kg Speed:0.5m/sec. Travel:3500mm (Ground Floor FFL to 1st Floor FFL)
Serving -	2 Floors Ground and First with single entrance on each floor
Oil Pump -	To be fitted with anti vibration mountings
Noise Level of Motor Room -	Not to exceed 80 db.
Method of Control -	Automatic Direct to floor self levelling push button control with dual purpose pushes on each floor served. Car is to park with doors closed.

Motor (Hydraulic Pack) Room	Adjacent to Liftshaft Basement
Size of Lift Well -	Width - 1920mm Depth - 3140mm (note Chamfered Corners)
Internal Size - of Lift Car -	Width - 1400mm Depth - 2400mm Height - 2200mm
Height of Top - Landing to Shaft Roof	3040mm
Depth of Pit -	1803mm
Car Entrance -	Open at Front Only

Details will also be required for the lift car, car doors, landing entrance and landing door generally as for an electric lift.

The above information will be adequate to enable specialist suppliers to put forward tenders for the equipment.

Pre Commissioning Inspections and Certificates Required

The installation of the lift must be undertaken by its supplier and cannot be left to general contractors.

The site construction must be supervised throughout by a competent Engineering Clerk of Works. Because of the specialist nature of the equipment it is also advisable to carry out a works inspection of the equipment and for the Health Authority representative to arrange to attend works tests on specified items of equipment.

Particular care should be given during site erection to the inspection of lift shaft components which will be heavier than those installed for an electric lift. It is particularly important to ensure that framing and supports are attached to the shaft by purpose made heavy steel brackets with metal inserts. Rag bolts are not acceptable.

The power unit should consist of an electric motor driven pump and hydraulic controller complete with control and relief valves mounted as one assembly. The completed assembly should be works tested prior to despatch and is an item which it is recommended be witness tested if possible.

Considerable vibration can be generated during operation and all drives should be via a service flexible coupling. Similarly all components likely to give rise to vibration must be mounted on anti vibration mountings.

It is preferable for the pump motor to have star-delta start, or for large installations, auto transformer. Super silent operation is essential and components should be checked to ensure they are of this type.

The unit must be provided with its first fill of oil and it is essential that only high grade hydraulic oil is used. It is recommended that the site engineer should witness the filling of the installation paying particular attention to ensuring no oil leaks are present.

Some designs utilize a pump which is totally submerged in an oil bath. Where this is so it is essential that protective devices be fitted to prevent loss of the oil in which the pump is submerged. It will be understood that the pump motor is strictly dependent on the oil for lubrication and cooling. An oil level switch should be fitted which is activated by the oil level falling below its pre-determined level. This switch should be checked for operation prior to commissioning. Hydraulic pipework must be solid and fitted with anti vibration couplings. All pipework must be checked for compliance with the appropriate Codes of Practice and British Standards. The use of flexible pipework should not be permitted and where essential its use must be kept to an absolute minimum. It will be appreciated that satisfactory operation is dependent upon the integrity of the pipework and this must be properly checked prior to commissioning.

Cylinders and Rams need to be carefully checked during installation. Cylinder heads with pipe connections must be fitted with an adjustable gland to ensure a constant tight fit and thus prevent oil leakage.

Rams must be fitted with a solid steel stop at the limit of the stroke or some other acceptable method to prevent the ram travelling beyond the limit of the cylinder. The positioning and adjustment of this device must be checked prior to commissioning. It is also essential to ensure a flow restriction valve is fitted, and is operating correctly, to limit the speed of descent in the event of supply pipe fracture.

Other safety devices and requirements should be checked for operation as part of the commissioning tests.

The following certificates of test should be provided by the supplier:

- Compliance with IEE Regulations 16th Edition including test certificates for all major components and special items of equipment.
- Certificates for Hydraulic Test on Appropriate Components.
- Compliance with all Statutory Regulations.
- Insurance Company's Lift Inspectors Certificate of Acceptance.
- Generally as Appendix 'B' of BS 2655 Part 7.
- Test Certificates for all motors and control panels.

Commissioning

The installation should be set to work, checked and commissioned by the supplier's specialist engineers.

All installations require to be checked, tested and confirmed as satisfactory by the appropriate Insurance Company's Lift Inspector.

Electrical Commissioning

Panels are to be fitted with adjustable magnetic overload protection for the pump motor, under voltage relays and phase failure/reversal relays. The operation of these devices must be checked during commissioning tests. Such devices should be incapable of automatic resetting.

The electrical installation complete is to be subjected to the Tests given in the IEE Regulations 16th Edition including earth continuity, earth loop impedance, polarity and phase sequencing.

General Commissioning

Once the installation has been satisfactorily set to work and is also acceptable following Insurance Company inspection it should be witnessed tested for the following:

- Push Button Operation
- Automatic Levelling
- Door Operation
- Operation of Anti Creep Devices (this can be a source of problems on hydraulic lifts).
- Landing Indication Operation
- Coding and Identification of all circuitry and hydraulic lines.
- Safety Devices including occupant re-assurance devices
- Hand Operation
- Fitting of Operating Instructions including procedures to be undertaken for hand lowering.
- Speed of Travel.
- Operating Sound Levels

A visual inspection of the complete installation should be made prior to signing of acceptance certificates with particular emphasis on the integrity of all pipework and hydraulic equipment particularly as regards the absence of oil leaks. As is common with all lift installations the issue of a certificate of satisfaction by the Insurance Company Inspector is indicative of an acceptable installation.

Items to be Available at or Before Acceptance and Handover

The following are essential to the user/client and must be available at or before handover.

- Test Certificates
- Properly completed and bound Maintenance Manuals containing:
- Description of the Installation itemising main components of the plant.
- Description of Plant Operation with full design details together with a description

of the emergency action to be taken in the event of breakdown.

- Complete schematic line diagrams indicating the main features of the plant, the interconnections between various items, drawing attention to the method of setting controls, switchgear etc.

- The method of adjusting components, typical fault finding, routing and a complete set of wiring diagrams showing the various relays, semi conductor modules, and inter connections between those items. Wiring diagrams of all sub circuits and printed circuits must be included.

- Service manuals for all specialised plant giving details as listed above, including spares and general mechanical maintenance stating recommended oils and greases.

- Two sets of complete Record Drawings showing the 'as installed' plant.

- Twelve Months Maintenance and Service Agreement giving details of emergency call out procedures.

Section 32A

Appendix 1

FINAL ACCEPTANCE RECORD SHEET - HYDRAULIC LIFT INSTALLATION

Scheme : ..... Commissioning Advisor | Manufacturers Test Engineer

Client .....

Hospital: .....

Test Certificates Available and Checked	❑
Insurance Company Inspection Carried Out and Satisfactory.	❑
Visual Inspection of Installation Satisfactory	❑
Compliance with Specification Satisfactory	❑
Electrical Components and Installation Complies with IEE Regulations and Test Requirements.	❑
Lift Car to Specification including Fitting of Safety Devices and Occupants' Re-assurance Equipment	❑
Hydraulic Installation includes required safety devices and is free from leaks	❑
Sound Level of Operational Installation Specified: db Attained on Test db	❑
Speed of Travel Specified: m/s.	❑
Attained on Test m/s.	❑
Radio and TV Interference Tests Satisfactory	❑
Hand Operation Satisfactory	❑
Control Operation Satisfactory	❑
Indicators as specified fitted	❑
General Tests in Accordance with BS 2655 Completed	❑

I certify that the installation has been set to work, all tests are completed and that the Insurance Company's Inspector has passed the installation as fit for use.

Signed ..... Test Engineer

for .....

I am satisfied that the lift(s) have been properly commissioned and tested, that performance is satisfactory and the installation is fit for use. Documents for handover are complete and satisfactory.

Signed ....Commissioning Advisor

for ..... Client

33. THE COMMISSIONING AND TESTING OF LIGHTNING PROTECTION SYSTEMS

Contents List **Page**

33. THE COMMISSIONING AND TESTING OF LIGHTNING PROTECTION SYSTEMS

General

In many cases Clients treat this provision as a specialist service and appoint contractors to complete the design, installation and commissioning of the system as a package, whereas some Clients carry out their own design and commissioning via a liaison with the specialist. In either case commissioning tests should be completed.

Guidance on the design and commissioning is given in detail in Code of Practice CP 326 - The Protection of Structures Against Lightning. The Code is published by the British Standards Institution. Similarly reference is made to the BS document Code of Practice CP1013 - Earthing. This document references the main points to be noted from both Codes of Practice and draws attention to matters of particular relevance to the commissioning of installations. This is to provide a source of immediate reference to commissioning engineers in particular and engineers generally who may not have ready access to the Codes of Practice.

Nonetheless an examination of both Codes is recommended. The guidance given should be complied with to offer a satisfactory installation.

It should also be noted that whilst the Code of Practice CP 326 recommends that the complete system should have a combined resistance to earth not exceeding 10 ohms before bonding to metal surfaces or to below ground services, this is a 'working' figure to be maintained following commissioning. To allow for possible deterioration in service it is strongly recommended that at the commissioning of a new installation the combined resistance should not exceed 7 ohms.

The principal effects of a lightning discharge to a structure are electrical, thermal and mechanical. These effects are determined by the currents which are discharged into the structure. The currents are undirectional and can vary in amplitude from 2-300 Amps up to a maximum of 200 000 Amps. The average lightning discharge has a current value of 20 000 Amps.

The discharge is momentary and will reach its maximum value in microseconds and similarly decays to zero in a time generally between 10 - 750 microseconds.

The electrical effect of a lightning discharge is two-fold.

a) As the current is discharged through the earth electrode of the protection system it produces a resistive volt drop which can raise momentarily the potential of the system with respect to true earth to a high value.

b) It can also produce, around the earthing electrode, a high potential gradient which is likely to prove fatal to people and livestock.

The thermal effect is usually confined to a temperature rise of the conductor through which the lightning strike is discharged. This does not constitute a serious fire hazard.

The mechanical effect can arise when a high current is discharged through parallel conductors in close proximity. The conductors are then subjected to considerable mechanical force and if

ruptured and subjected to the thermal effect described can fuse or weld. If there is a stray end of the conductor caused by mechanical rupture there is a risk of 'flashover' to adjoining metal fixtures. The purpose of the lightning protection system is to artificially increase the range of attraction and provide a safe passage to earth.

Definitions

Lightning Protective System is the total system of conductors used to protect a structure from the effects of lightning.

Air Termination or Air Termination Network - that section of the system which is intended to intercept lightning discharges.

Down Conductor. The conductor(s) which connects an air termination and earth termination.

Bond: A conductor which provides an electrical connection between the protective system and other metal work and also between sections of metal work.

Joint: A mechanical and electrical junction between two or more sections of the system.

Testing Joint: A joint specifically constructed to enable continuity and resistance measurements to be made.

Earth Termination: The section of the system which is used to discharge currents generated into the true earth.

All sections below the lowest Testing Joint in a down conductor constitute the earth termination.

Earth Electrode: That portion of the earth termination which makes a direct electrical connection with the true earth. It may consist of an earthing rod sunk into the ground or an earth mat. The selection is dependent upon ground conditions. Ground conditions particularly susceptible to drying out ie. above flues, subways containing steam/hot water mains, should be avoided and if necessary the earth electrode should be placed some distance from the structure it protects to avoid such conditions.

Zone of Protection: The space within which a lightning conductor provides protection against a direct strike by diverting the stroke to the lightning protection system.

The preamble and definitions are provided as information to engineers who may not be familiar with terminology used.

It should be noted that it is standard practice for the design and installation of lightning protection systems to be completed by specialist contractors. Design engineers should not attempt to design their own protective systems.

Pre-test Checks

Prior to testing the systems a general inspection should be made to ensure the materials used are in accordance with the recommendations of the British Standard Code of Practice CP326 Table No.1. Similarly the minimum dimensions of the component parts are given in Table No.2 of the Code. The security of fixing should also be examined.

The following points should also be examined:

- **Air Terminations**

For spires or towers	- single vertical conductor
Small dwellings (Residential Accommodation)	- single horizontal conductor along the ridge
Large Pitched Roofs	- System of horizontal conductors
Flat Roofs	- Conductor along the outer perimeter of the roof. Where a roof has large horizontal dimensions involved then a network of parallel horizontal conductors is required.

No part of the roof should be more than 9m from the nearest horizontal conductor except that an additional 300mm may be allowed for each 300mm by which the part to be protected is below the nearest protective conductor.

All metalic projections such as chimneys, ducts, vent pipes, railings, etc. on or above the main roof structure surface should be bonded to or form part of the air termination network.

If sections of a structure vary in height any lower sections should in addition to their individual down conductors, be bonded to the down conductors of the taller portions.

Down Conductors

A structure having a base area not exceeding 100m² should have at least one down conductor.

Where the base area exceeds 100m² the number of down conductors should equal the smaller of the following:

a) one plus one for every 300m² or proportion of in excess of the first 100m²

b) one for every 30m of perimeter

Lift shafts must not be used for fixing down conductors.

Seals at each floor may be necessary for internally fixed conductors but the Fire Officer's advice should be sought.

If the conductor is housed in a separate duct then access is essential.

The route of the down conductor(s) should follow the most direct path possible between the air termination and earth termination.

Any structure built on bare rock should be provided with a minimum of two down conductors equally spaced.

Joints & Bonds

External metal should have a bond to the protective system of not less in cross sectional area than the main conductor. The system should include as few joints as possible. Where joints do occur these should be mechanically and electrically effective eg. clamped, screwed, bolted, crimped, rivetted or welded. With overlapping joints the overlap should be a minimum of 19mm.

Testing Joints

Each down conductor should be provided with its individual test joint. Care is necessary in the siting of these because whilst they need to be accessible they should not be subject to damage from passing traffic or invite interference.

Earth Terminations

An earth termination must be connected to each down conductor. Earth terminations should be capable of isolation for testing.

Earth Electrode

Earth electrodes should consist of metal rods or strips or a combination of both.

Where rods are used these should be driven into the ground beneath or as close as practical to the structure it protects. Wherever possible the connection between the down conductor and the rod should be accessible above ground. If it is buried then it must be contained within an inspection box. In this case this connector may substitute for a test joint.

Where strips are used these should be buried beneath the structure or in trenches at a suitable depth to avoid damage. Strips should preferably radiate in two or more directions from their point of connection . Where strips are fitted in either a grid formation or are parallel then the separation between parallels should not be less than 2.4m.

Testing

It is usual for specialist suppliers to conduct their own tests. The following is given for guidance:

- Earth terminations should have a resistance to earth of not exceeding the product of 10ohms x the number of terminations provided.

- The whole of the protective system should have a combined resistance to earth not exceeding 10 ohms before any bonding to metal surfaces or to below ground services.

- Inspections must be carried out by a competent person after completion, alteration or extension and reference should be made to the points of concern noted in this document. If on test the resistance to earth of the system exceeds 10ohms the value must be reduced.

- On completion of an installation, or any modification to it, the resistance to earth of the whole installation and of each earth termination should be measured and the electrical continuity of all conductors, bonds and joints and their mechanical condition examined and verified as satisfactory.

The methods of testing should be in accordance with the BS Code of Practice 1013 - Earthing.

System Records

The following should be made available to building user at handover:

1) scale drawings showing the complete installation and the nature and position of all component parts of the system.

2) details of the nature of the soil and any special earthing arrangements.

3) dates recommended and particulars of any salting required

4) test conditions and results.

Reference Manuals

Particular reference should be made to the following Codes of Practice:-

CP 326 - The Protection of Structures against Lightning

CP1013 - Earthing

Section 33

Appendix 1

FINAL ACCEPTANCE TESTS

ELECTRICAL SYSTEMS

LIGHTNING PROTECTION

No. Test Applied	Checks and test to be applied	Check	Remarks
PRELIMINARIES:			
1	The system has been provided and installed in accordance with specification and drawings.		
2	Pre-Acceptance Tests have been satisfactorily completed by Sub-Contractor.		
3	All connections and bondings secure.		
4	Tests of each down lead, including roof conductor system, each earth termination. Notes: Resistance to earth to whole system should not exceed 10 ohms. Where there is more than one down lead, the resistance of each earth termination should not exceed 10 times the number of earth terminations. See also Code of Practice C.P. 325:101.		
	Results of Tests:		

COMMISSIONED BY .....

DATE .....

SUB-CONTRACTOR'S REPRESENTATIVE .....

CLIENT'S COMMISSIONING ADVISOR .....

NATIONAL HEALTH SERVICE - ENGINEERING COMMISSIONING

STANDARD CHECKS / TESTS (To BSCP 326 Sections 207, 302, and 303)

*tick if correct

ITEM	Checked *	Checked No. of items	Tested for Continuity *	Notes	ITEM	Checked *	Tested for Resistance to Earth (BSCP 1013 Section 901) ohm	Notes
					Earth Termination:- 1 2 3 4 Whole Installation			

SPECIMEN

ADDITIONAL CHECKS / TESTS (To Part D of Specification)

e.g. record of details of electrodes and other concealed equipment

FINAL ACCEPTANCE RECORD

CODE: E4 FOR:

Lightning Protection

Sheet No. ..... (..... Sheet)

Client:

Project:

System / Sub-System:

Commissioned on: / /19

(Signed) .....

Commissioning Engineer
for Messrs

Witnessed by

(Signed) .....

Commissioning Engineer

34. GUIDANCE ON THE WITNESSING OF COMMISSIONING AND TESTING OF 11000 VOLT SWITCHGEAR AND TRANSFORMERS

NOTE:- Any activity or work connected with this service should only be carried out and witnessed by authorised persons as defined in Health Technical Memorandum No.2021. Under no circumstances should personnel other than authorised persons enter the 11Kv enclosure once the system is energised.

Contents List **Page**

APPENDIX 1:

SAMPLE TEST SHEETS

34. GUIDANCE ON THE WITNESSING OF COMMISSIONING AND TESTING OF 11000 VOLT SWITCHGEAR AND TRANSFORMERS

1. General

This Guidance has been prepared to demonstrate the basic steps involved in the sequence of events from initial assembly checks to final commissioning tests.

The checks and commissioning tests to be carried out by the manufacturer or the Electrical Contractor and witnessed by the Commissioning Advisor who must be an Authorised Person properly certified by the Electricity Board or the appropriate Authorising Authority.

2. Site Inspection

After erection on site all the equipment shall be thoroughly inspected by the Engineer in the presence of the Electrical Contractor's representative. The Engineer will issue a written report detailing any damage, defects and shortages on the equipment.

The Electrical Contractor shall undertake to repair, replace and make good any items detailed in the report, in the shortest possible time and before commencing site testing.

3. Site Testing

After rectification of items listed in the site inspection report, the Electrical Contractor shall arrange for a competent Test Engineer to test all equipment in the presence of the Engineer to the Engineer's requirement as specified or where not specified, in accordance with the appropriate British Standard.

The prime function of the Test Engineer will be to prove that all the equipment supplied meets the requirements of the Authority.

The Electrical Contractor shall replace or repair at his cost any piece of equipment that fails to meet the requirements of the specification and engineer.

All testing shall be conducted with strict observance of Hospital Technical Memorandum 2021 Safety Code for high voltage installations, with test permits to work issued as and when required by the Safety Rule Book.

4. Visual Inspection

a. Check that all items listed in the Engineer's Inspection report have been attended to.

b. Ensure that all labels are fitted securely and have the correct inscriptions. All circuit breakers and related incoming/outgoing cable boxes are correspondingly labelled.

c. Check switchboard for alignment and levelling and continuity of all earthing conductors. Check that phase colour markings are correctly positioned.

d. Check that all wiring terminations are satisfactory and wire ferrules are correct. Checkrating of fuse, colour of holder and bases.

e. Check all circuit breakers for free travel, alignment of main contacts, racking main contact spouts, racking auxiliary contacts, shutter mechanisms and all circuit breaker modes.

f. Check each voltage transformer (Vt) for satisfactory free travel, shutter mechanism and examine HV & LV fuse ratings.

g. Check circuit breaker main and auxiliary contact operation by use of slow Open/ Close device.

h. Fill oil circuit breakers with oil approved by the manufacturer.

j. Check that all loose items are present ie. essential operating maintenance tools, special auxiliary apparatus, keys, padlocks, tool and key cabinet.

k. Ensure that the appropriate "mimic diagram" has been supplied and will give indication of all positions of circuit breaker (ie. On/Off isolation and earth).

l. All safety notices have been supplied and positioned on walls, and sufficient notices of "Danger men at work" and "Caution" for each circuit breaker. Ensure that a telephone has been installed and emergency lighting.

m. Ensure that emergency exit door(s) have been provided and a portable fire extinguisher if no other system has been provided.

n. Record serial numbers of all equipment and other details of the manufacturer labels.

5. Bus Bar Tests

Bus Bar Continuity

A visual check is made on all bus bars joints and links for correct assembly, freedom from damage and cleanliness. Ensure that the correct high tensile bolts have been fitted and secured to the correct torque recommended by the manufacturer.

The continuity of each bus bar phase is from each panel to adjacent panels, by passing a relatively large direct current through each bus bar and measuring the potential difference from panel to panel.

The results are compared with the manufacturers calculated values and, if satisfactory, are recorded on to appropriate test schedules.

A ductor tester is the most commonly used instrument and gives an indicated reading directly in microhms.

6. Pressure Tests - Test Voltage Calibration

Sphere gaps shall be used for the test equipment calibration prior to the application of each voltage test. Power frequency voltage tests shall be applied as follows:

a. To busbars and all 11000 volt circuits including current transformer primaries (VT primaries shall be withdrawn and earthed and OCBs') 24KV for 1 minute between each phase and earth.

b. Across open gaps of vacuum interruptions 24KV RMS for 1 minute with all other circuits earthed. The same test shall be applied for OCBs'.

c. Voltage transformer primary winding (Non earthed primary type only). All phases to earth 24KV RMS 1 minute.

d. Insulated earth bar to frame and earth (with all covers, cable chambers, glands etc. fitted) 4KV RMS for 1 minute.

e. Voltage transformer secondary windings and circuit to earth 2 KV RMS for 1 minute. Voltage transformer residual windings and circuit to earth 2KV RMS for 1 minute.

f. Current transformer secondary windings and circuits (including test windings relay coils etc.) 2KV RMS for 1 minute.

g. The insulation resistance of the incoming supplies and their bus bar wiring circuits shall be measured with a 1000 volt meggar between poles of feeds.

7. Circuit Breakers

a. When operational checks are being conducted attempts should be made on each and every unit to defeat interlocks and/or to overcome any feature designed to prevent potentially dangerous mal-operation.

b. Close and trip each circuit breaker electrically and/or manually at the equipment in the service position. Close and trip each circuit breaker electrically and/or in the earthed position and ensure that the circuit breaker cannot be tripped electrically in the earth position.

c. Check at the outgoing terminal blocks that the "On/Off" condition of the circuit breaker is correctly indicated.

d. Mechanism locked/free.

e. Ensure that no circuit breaker can be closed unless the isolating mechanism selector is in the locked position.

f. Anti Pumping

Check that this feature functions correctly by applying and maintaining a close signal to circuit breaker when simulating a closure onto a fault. (ie. with the trip circuit made except for closure of appropriate auxiliary switch on the circuit breaker).

8. Instrument Calibration

a. Voltmeters

Apply test voltage to R-Y and obtain not less than five readings on the voltmeter scale to check accuracy.

b. Ammeters

Apply test current to R-Y and obtain not less than five readings on the ammeter scale to check accuracy.

c. Check that all lamp type indicators operate correctly such as battery condition, circuit breaker On/Off etc. (This shall also include the battery charger ammeter).

9. Protection Relays

Testing of protection relays on site should be carried out by specialists preferably the Protection Department of the Electricity Board.

a. In the case of current transformer operated relays, check operation during relay calibration checks.

b. Auxiliary Elements

Check for satisfactory operation, record current setting and measure tripping current.

c. Circuit Breaker Trips

Check for tripping where applicable.

d. Flag Indicator and Remote Indicators

Check that all indications are correctly given.

Re-setting

Check that self re-set contacts function correctly and that hand reset contacts and flag indicators can be re-set.

Check that relays will not operate inadvertently because of any excess vibration (ie. Closing of relay panel doors).

10. Relay Tests

a. The Relay Tests are to be carried out with 50% of rated tripping supply voltage applied to the trip circuit bus bar wiring.

b. Test equipment for A.C. Single phase and D.C. relay tests shall be any of the well known A.C. secondary injection multi- range test sets proven of adequate range for A.C. equipment and coupled with a matched filter ideal for IDMT relays, or with a diode bridge smoothing unit satisfactory for D.C. equipment.

c. IDMT Relays (Type CDG)

Starting current check for pick up of disc for each plug setting. Check operating times for 130% and 200% injection on minimum and maximum plug setting and one other plug setting with an additional injection of 115%. The timing to be checked with time multiplier set at 1.0.

Check re-setting time of disc with zero current and time multiplier set at 1.0.

Check that tripping contacts make as the time multiplier is set at zero plug bridge short circuiting device and check for satisfactory operation.

d. Instantaneous Earth Fault Relays (Type CAG 14)

Check operating currents for settings 0.2, 0.3, 0.4, 0.5, 0.6, 0.7 and 0.8 with a test winding injection R-E.

Check operating currents for setting 0.2 and 0.8 for test windings injections Y-E and B-E. Plug bridge short circulating device and check for satisfactory operation.

e. Over Current Relays (Type CTG)

Inverse time/current characteristics

Check operating times for each plug setting with 400% of rated setting and at 300%, 500%, 600% with time multiplier set at 1.0 check operating currents for plug 4, 5 and 8.

f. Under Voltage Relays (Type VAV 21)

Check timing for minimum and maximum settings.

g. Operating Voltages

Measure 'Pick Up' and 'Drop Off' voltages and check that 'Drop Off' is in the order of the fixed setting of 70% of nominal rated voltage. Also check that the pick up and drop off voltage ratio is in the order of 115-120%.

h. Restricted Earth Fault Circuit

Stability and operation tests to be carried out by test winding injection simulating phase earth fault "in zone" and "out zone" condition to rated through earthfault current value.

Overall D.C. polarity test to verify relative polarity of phase and neutral current transformers.

If the restricted earth fault relay is of the instantaneous pattern then the value of the stabilising resistor is checked with reference to through fault.

j. Restrictive Earth Leakage Relays (CDG 11)

Starting current check for pick up of disc for each plug setting (ie. 10-40%). Check operating times for 20% and 40%. The timing to be checked with time multiplier set at 1.0.

Check resetting time for disc with zero current and time multiplier set at 1.0.

Check that tripping contacts make as the time multiplier is set at a Zero.

Normal operating time multiplier usually set at 0.1.

k. Direction Relay

Start Current.
Check for 'Pick Up' of disc for each plug setting.
Operating Times

l. Directional Discrimination

Check for discrimination with 100% and 10% of rated polarising voltage applied while increasing the current from zero to 15 times rated current on minimum plug setting.

Measure the operating currents 'Pick Up' and 'Drop Off' for the directional element.

(NB. These are sample relays and the basis of the test shall be adjusted for other type and rated relays depending what types are specified).

11. Current Transformers

a. Over Voltage Inter Turn Test

Use one of the following tests:

1. The secondary and test windings open circulated apply A.C. current to the primary winding sufficient to produce a voltage at the secondary terminals having a peak value of 10 x KPV RMS or 10KV (which ever the lower).

2. With the primary and test winding open circuited apply 10 x KPV RMS or 10KV (which ever the lower) to the secondary terminal for 1 minute.

b. Polarity Check

Using a low voltage source apply D.C. pulse to the primary of each current transformer. With the positive pole connection to P1 and a centre zero ammeter connected across the secondary then a positive flick should be obtained on the application of D.C. pulse and a negative flick on its removal. Each current transformer to be tested.

c. Ratio Tests

1. Inject rated primary current and measure the secondary currents, with normal burden connected.

2. Inject twice rated primary current and measure for spill currents between pairs of secondaries with normal burden connected.

d. Test Windings Test

1. Inject radio test rated test winding current and measure the induced secondary currents in each secondary with normal burden connected.

2. Stability Test

Inject twice rated test winding current and measure for spill currents between secondaries with normal burden connected.

e. Magnetisation Curves

Using a variable auto transformer apply voltage to the current transformer secondary with primary open circuited. The voltage should be slowly raised until the magnetising current is seen to rise very rapidly for a small increase in voltage. This indicates the approximate knee point of saturation flux level. The magnetising current should then be recorded for a number of voltage levels as the voltage is reduced to zero. Four or five spot readings should be sufficient to indicate that the current transformer compares favourably with manufacturers' typical characteristics for each current transformer type.

12. General Commissioning

It is likely that a firm commissioning date would be set for the KV switchgear to be energised. Therefore, all possible work would be completed by all contractors associated with the switchgear, cabling and remote equipment.

Any related subjects are discussed and minutes recorded at regular working party meetings set up under the chairmanship of the Client's engineer and consisting of competent personnel representing each of the contractors engaged in any work associated with the plant.

Commissioning check lists would also be compiled by each contractor for outstanding items which, when cleared, would be signed off as satisfactory by the Client's engineer. Included in the check lists would be verification that any related Plant Item Test Schedule had been satisfactorily completed.

Security. At some time prior to energisation and subject to a final group inspection ratified by working party agreement the switchboard would be placed under a Safety Rules laid down in HTM 2021. This would include the incomer cables and remote c.b. and voltage transformer equipment.

Commissioning Proposals

Before any item of plant is energised, a commissioning programme is serviced from the output of joint working party meetings.

It should be edited by the Client's Engineer and presented at a meeting sometime before the commissioning date, for appraisal by all relevant contractor's representatives.

Comments/modifications should be raised by the contractor's engineers with the Client's engineer and agreement to the programme would consolidate the commissioning date.

The programme should follow a step by step procedure:

- where possible, new equipment should be energised, buffered by proven protection and a previously commissioned circuit breaker;
- where applicable, minimum overcurrent and earth fault settings should be set for commissioning operations;
- the vicinity of new equipment to be energised should beprohibited to all personnel during switching operations;
- insulation resistance of all primary plant and conductors should be made within four hours of prospective energisation;
- a visual inspection by all parties concerned should be carried out immediately before energising equipment;

13. Associated Tests

a. During the assembly of the switchgear associated equipment test can also be processed. These tests can include:-

- Earth plates (High Voltage systems, Low Voltage systems)
- Battery systems for circuit breaker control and protection.
- LV.AC for heating lighting power and ventilation.

b. Sub Station Earthing

Dangerous high increase in potential can arise under fault conditions on electrical plant when fault current passes through a conductive path of relatively high ohmic value.

A number of good local earth plates in the vicinity of the sub-station connected to a common earth ring offsets this problem.

It is essential that the size of the transformer earthing conductor is of sufficient capacity to carry the short circuit fault current of the transformer.

Isolation links should be provided for disconnection from the common earth ring for routine testing.

Normally, tests are made by use of conventional earth megger,passing current supplied by the megger to the earth plate under test and the returned current via a conductor from a spike driven remote in non made ground. An intermediate spike is driven between the earth plate and remote spike which measures the p.d. of the earth path. The earth current is A.C. which nullifies errors occurring from the influences of natural voltages.

c. Results

The A.C. components are converted to D.C. in the instrument and the results indicated directly to ohmic value. A very good value to be obtained from combined plates would be about 0.5ohms, but this is usually very difficult to achieve. It will be necessary to calculate this requirement and is relative to the short circuit fault current magnitude and time clearance.

d. Battery Systems

Permanent D.C. supplies of adequate capacity are essential for operation of OCBs' (ie protection, alarm and indication).

When installation of battery and charger has been completed and battery readings taken over the period of discharge. Regular readings are recorded on test schedules, including discharge current, volts per cell, specific gravity and temperature.

The battery is again charged to full capacity and during the charge period "float" and "boost" values of current are recorded, together with operating values of 'High Volts', Low Volts', charge fail battery, 'earth fault', alarms, etc.

Section 34

Appendix 1.1

SHEET 1

CLIENT:- .....

HOSPITAL:- .....

SCHEME:- .....

COMMISSIONING OF 11KV SWITCHGEAR, COMPONENTS & INSTALLATION

SITE TEST REPORT - SWITCHGEAR .....

SCHEME .....

JOB NO. .....

MANUFACTURER .....

TYPE .....

RATING .....

Circuit Designation

ITEM	FOR COMPLETE SWITCHBOARD	BREAKER SERIAL NOS.
A		
B		
C		
D		
E		
F		
G		
H		
J		

TEST BY ..... DATE .....

PRESENT AT TEST REPRESENTING

.....

.....

Section 34

Appendix 1.2

SHEET 2

SITE TEST REPORT SWITCHGEAR .....

SCHEME .....

JOB NO. .....

OPERATIONAL CHECKS

ITEM	DESCRIPTION	A	B	C	D	E	F	G	H	J
1	Manual Close									
2	Manual Trip									
3	Electrical Close									
4	Electrical Close									
5	Manual Close in Circuit Earthed									
6	Manual Trip in Circuit Earthed									
7	Electrical Close in Circuit Earthed									
8	No Electrical Trip in Circuit Earthed									
9	Electrical Close in Bus Bar Earthed Position									
10	No Electrical Trip in Bus Bar Earthed Position									
11	Trip from Relays at Rated Voltage									
12	Trip from Relays at 50% Rated Voltage									
13	No Combination of FLC Relays can Trip C.B.									

TESTED BY ..... DATE .....

PRESENT AT TEST REPRESENTING

.....

.....

.....

.....

Section 34

Appendix 1.3

SHEET 3

MAIN CONNECTIONS CONTINUITY TESTS

ITEM	CIRCUIT DESIGNATION	RESISTANCE CABLE TERMINAL TO CABLE TERMINAL BUS BARS		
		RED PHASE	YELLOW PHASE	BLUE PHASE
A				
B				
C				
D				
E				
F				
G				
H				
J				

TESTED BY ..... DATE .....

PRESENT AT TEST REPRESENTING

.....

.....

.....

.....

.....

Section 34

Appendix 1.4

SHEET 4

PRESSURE AND INSULATION RESISTANCE TESTS

ITEM	DESCRIPTION	IR. AT V BEFORE	APPLIED VOLTAGE	TIME SEC	IR. AT V AFTER
1	Bus bars and all volts Circuits (All other circuits earthed) (a) Red Phase to Earth; (b) Yellow Phase to Earth; (c) Blue Phase to Earth;				
2	CT Secondaries to Earth				
3	VT Secondaries to Earth				
4	Control & Indication Circuits				
5	Between Poles of Closing Bus Bar Wires				
6	Between Poles and Tripping Control Bus Bar Wires				
7	Between Closing and Tripping Control Bus Bar Wires				
8	Across Open Gaps of Vacuum Interrupters				
9	Across Open Gaps of Oil Circuit Breakers				
10	VT Primary Earth				

TESTED ..... DATE .....

PRESENT AT TEST REPRESENTING

.....

.....

.....

.....

.....

Section 34

Appendix 1.5

SHEET 5

INSTRUMENT CALIBRATION CHECKS AND CIRCUITS

TEST	INJECTED R - Y	METER READING
1		
2		
3		
4		
5		

NOTES

VOLTMETER		
TEST	INJECTED VOLTAGE	METER READING
1		
2		
3		
4		
5		

NOTES

TESTED ..... DATE .....

PRESENT AT TEST REPRESENTING

.....

.....

.....

.....

.....

Section 34

Appendix 1.6

SHEET 6

C.T., V.T. AND INSTRUMENT DETAILS CIRCUIT

CURRENT TRANSFORMER DETAILS

DUTY	O	SERIAL NO.	MANUFACTURER	V.A. CLASS	RATIO	KPV S.T.C
IDMT	R					
	Y					
	B					
INST E.F.R.	R					
	Y					
	B					
O/C & EF Relay	R					
	Y					
	B					
RES. E/L	R					
	Y					
	B					

VOLTAGE TRANSFORMER DETAILS

DUTY	SERIAL NO.	MANUFACTURER	RATIO

RELAY DETAILS

DUTY	MANUFACTURER	SERIAL NO.	RANGE

INSTRUMENTS

DUTY	MANUFACTURER	TYPE	SERIAL NO.	RANGE	CT RATIO
Ammeter Volt Meter					

TESTED ..... DATE .....

PRESENT AT TEST REPRESENTING

.....

.....

.....

Section 34

Appendix 1.7

SHEET 7

C.T. PRIMARY AND TEST WINDING INJECTION

OVER CURRENT & EARTH FAULT RELAY TYPE SDG31								
ELEMENT	PLUG SETTING	TIME MULT	INJECTION	PICKUP CURRENT	TEST WDG CURRENT	RELAY CURRENT	TIME (SECONDS)	
RED PHASE O/C	0.5	1.00						RESET TIME
		1.00	130			0.65		SEC
		1.00	200			1		NOTES
	0.75	1.00						
	1	1.00						
	1.25	1.00						
		1.00	115			1.437		
		1.00	130			1.623		
		1.00	200			2.5		
	1.5	1.00						
	1.75	1.00						
	2	1.00						
		1.00	130			2.6		
		1.00	200			4.0		
E/F	0.2	1.00						RESET TIME
		1.00	130			0.26		SEC
		1.00	200			0.4		NOTES
	0.3	1.00						
	0.4	1.00						
	0.5	1.00	115			0.575		
		1.00	130			0.65		
		1.00	200			1.00		
	0.6	1.00						
	0.7	1.00						
	0.8	1.00						
		1.00	130			1.04		
		1.00	200			1.6		

continued.....

SECTION 34

Appendix 1.7

SHEET 7

OVER CURRENT & EARTH FAULT RELAY TYPE SDG31 continued.....								
ELEMENT	PLUG SETTING	TIME MULT	INJECTION	PICKUP CURRENT	TEST WDG CURRENT	RELAY CURRENT	TIME (SECONDS)	
BLUE PHASE O/C	0.5	1.00						RESET TIME
		1.00	130			0.65		SEC
		1.00	200			1.0		NOTES
	0.75	1.00						
	1.00	1.00						
	1.25	1.00						
		1.00	115			1.437		
		1.00	130			1.625		
		1.00	200			2.5		
	1.5	1.00						
	1.75	1.00						
	2.0	1.00						
		1.00	130			2.6		
		1.00						

TEST BY ..... DATE .....

PRESENT AT TEST ..... REPRESENTING .....

.....

.....

.....

Section 34

Appendix 1.8

SHEET 8

C. T. MAGNETISATION CURVE

DIRECTION OVERCURRENT RELAYS - TYPE CDD 23								
ELEMENT	PLUG SETTING	TIME MULT	INJECTION	PICKUP CURRENT	TEST WDG CURRENT	RELAY CURRENT	TIME (SECONDS)	
RED PHASE	0.2	1.00						RESET TIME
		1.00	130			0.26		SEC
		1.00	200			0.4		NOTES
	0.24	1.00						
	0.3	1.00						
	0.4	1.00						
		1.00	115			0.46		
		1.00	130			0.52		
		1.00	200			0.8		
	0.48	1.00						
	0.6	1.00						
	0.8	1.00						
		1.00	130			1.04		
		1.00	200			1.6		
YELLOW PHASE O/C	0.2	1.00						RESET TIME
		1.00	130			0.26		SEC
		1.00	200			0.4		NOTES
	0.24	1.00						
	0.3	1.00						
	0.4	1.00	115			0.46		
		1.00	130			0.52		
		1.00	200			0.8		
	0.48	1.00						
	0.6	1.00						
	0.8	1.00						
		1.00	130			1.04		
		1.00	200			1.6		

continued.....

Section 34

Appendix 1.8

SHEET 8

DIRECTION OVERCURRENT RELAYS - TYPE CDD 23 continued.....								
ELEMENT	PLUG SETTING	TIME MULT	INJECTION	PICKUP CURRENT	TEST WDG CURRENT	RELAY CURRENT	TIME (SECONDS)	
BLUE PHASE P/C	0.2	1.00						RESET TIME
		1.00	130			0.26		SEC
		1.00	200			0.4		NOTES
	0.24	1.00						
	0.3	1.00						
	0.4	1.00						
		1.00	115			0.46		
		1.00	130			0.52		
		1.00	200			0.8		
	0.48	1.00						
	0.6	1.00						
	0.8	1.00						
		1.00	130			1.04		
		1.00	200			1.6		

TEST BY ..... DATE .....

PRESENT AT TEST ..... REPRESENTING .....

.....

.....

.....

Section 34

Appendix 1.9

SHEET 9

RELAY CALIBRATION TESTS

CURRENT TRANSFORMER MAGNETISATION CURVES				
DUTY	PHASE	AS	MAGNETISATION CURVES	NOTES
IDMT		V		
	R	mA		
	Y	mA		
	B	mA		
O/C &E/F RELAY		V		
	R	mA		
	Y	mA		
	B	mA		
RESTRICTED E/F		V		
	R	mA		
	Y	mA		
	B	mA		
NOTES				

TEST BY ..... DATE .....

PRESENT AT TEST ..... REPRESENTING .....

.....

.....

.....

Section 34

Appendix 1.10

SHEET 10

SITE TEST REPORT - SWITCHGEAR .....

SCHEME .....

JOB NO.....

During the Pre-commissioning tests the following were noted as being unsatisfactory and/or requiring attention:

TEST BY .....DATE .....

PRESENT AT TEST ..... REPRESENTING .....

.....

.....

.....

35. THE COMMISSIONING OF STAND-BY ELECTRIC GENERATING PLANT AND INSTALLATIONS

Contents List **Page**

35. THE COMMISSIONING OF STAND-BY ELECTRIC GENERATING PLANT AND INSTALLATIONS

Scope

The following applies to the commissioning of engine driven electric generating plant and installations, used to give emergency supplies to Health Buildings in the event of the public supply system failing.

The emergency supplies are usually at low voltage ie. 415 Volts 3 phase 50 Hz alternating current; the following does not deal with high voltage generating plant and associated installations.

It does not deal with emergency electricity distribution systems in or about health buildings: the commissioning of such systems should follow the guidance contained in the appropriate Hospital Technical Memorandum.

Preliminaries to Commissioning

Notes for Designers

Standby generating plant units vary over a range of sizes from about 35 to 350 kw usually driven by a diesel engine; occasionally the motive power may be gas or steam.

The smallest sizes are often self-contained power units with engine, generator, engine starting and alternator control panel all mounted on a bed-plate or frame. These small units may have automatic voltage regulation of the generator output and in such cases only minimal work is required on site to connect the unit into the essential services distribution network.

Larger sizes will require more elaborate engine starting facilities, including arrangements for over-riding the automatic engine starting provision. Alternator voltage control will be more elaborate and local failure indication panels together with a remote alarm system may be provided.

With the object of improving the reliability of starting of standby generating plant parallel operation of smaller units is being adopted and automatic synchronisation of alternator output is usual in these cases.

The engine and generator unit should be subjected to tests at manufacturer's works and to the maker's standard procedures. Inspection and witness of these tests together with the provision of the manufacturer's Test Certificate should be required under the terms of the Contract.

In these circumstances the on-site testing and commissioning may be confined to verifying that no damage has been sustained since testing at manufacturers' works and that the site facilities which are required are completed and functioning correctly.

Provision for on-load tests away from the maker's works may be difficult for the larger size of standby generator unit; with the smallest sizes dummy loads eg. liquid resistors may be used.

Load tests may have to be deferred until the health building is completed and in use and the client's representative should be present when on-load tests are undertaken at manufacturer's works and when final accepting tests are carried out. In particular hospital personnel will need to be informed of the procedures for routine starting and testing of standby generating plant as part of the maintenance routine.

Pre-Commissioning Requirements

A Commissioning Brief, prepared by the designer, will be required by the Contractor's Commissioning Engineer. Typical schedules of preliminaries, checks and tests are included and these should be amended and supplemented as the designer considers necessary.

Commissioning Procedure and Performance Tests

The designer should prepare for inclusion in the Contract documents a list of tests and measurements which are to be taken by the Contractor and recorded by him, at works and on site. He may accept the standard test procedure and forms recording measurements used by the manufacturer. He may supplement these by providing in the Contract documents for any special commissioning procedures and measurements which he considers are needed to ensure that the plant and system operate in accordance with the design intent.

The testing procedure will be witnessed by the Commissioning Advisor or Project Engineer or on his behalf and the results, if approved, will be circulated by him in accordance with the Client's instructions.

The installation, on completion should be operated by the Contractor as a whole and subject to any specified performance tests. Where more than one standby generator set is installed and parallel operation is intended, special instructions may need to be included in the Contract.

Typical schedules of checks and performance tests are included together with Final Acceptance Record Sheets. These should be amended and supplemented as the designer considers necessary.

Once the Client's Commissioning Advisor is satisfied that the installation meets the design intent the FAR sheets should be completed; in the event of performance not being acceptable the matter should be dealt with in accordance with the Contract requirements.

Commissioning and Demonstration of Diesel Driven Generator Plant

Pre Commissioning Checks

The checks outlined should be completed and be to the Commissioning Advisor's satisfaction prior to starting up the plant.

Start Up

The plant should be started by the manufacturers' representative in accordance with the recommendations given.

Output Tests and Automatic Operation

These tests shall be carried out in accordance with the appropriate clauses of this section and the sound level tests completed and recorded.

Final Checks

The final examination and checking of the installation shall be in accordance with the details given on the FAR Sheets included in the Appendices.

Handover

At handover to the user's representative, the Commissioning Advisor shall ensure the documents listed, comprising the following:

- Wiring Diagrams
- Schematic Drawings of the Installation
- All Instruction Manuals
- Spare Parts Lists
- As Installed Drawings
- Commissioning Report

are complete and in accordance with the installation, and are provided within a single stiff covered folder bearing details of the scheme in accordance with the Specification.

Reservations

Any reservations, outstanding items of work or items not available at handover, shall be recorded and copies handed to the representatives present.

Note:

The Commissioning Advisor should ensure the plant is properly earthed and connected into the main panel in accordance with approved specification and diagrams before agreeing that the plant is ready to be started.

Stand-by Electric Generating Plant and Installation

Diesel-engine-driven Plant

Pre-Commissioning Checks and Tests

1. Plant and installations have been provided and installed in accordance with Specification and drawings.

2. Works Test Certificate and copy of Test Results supplied by manufacturer.

3. Engine starting equipment (battery or compressed air cylinders) in position and connected; battery electrolyte level and specific gravity correct; compressed air cylinders fully charged to correct pressure.

4. Water levels, water jacket and radiators filled to correct level; radiator circuit contains water/antifreeze mixture of correct specific gravity.

5. Water drains freely from drain test points; no leakage when closed.

6. Cooling water make-up tank filled and ball float valve works freely; overflows run satisfactorily, discharge water not causing flooding or damage.

7. Lubricating oil tanks, engine sump and lubricant circuits filled with correct grade of oil; oil lines primed and vented; vents closed.

8. Fuel tanks filled with adequate quantity of correct grade of fuel; fuel lines primed and vented; clean fuel filters fitted.

9. Fire shut-off valve in fuel line operates freely.

10. Earthing and bonding arrangements for control panel and ancillary machinery satisfactory.

11. System earthed via generator neutral.

12. All outgoing connections on the generator and at control panel correct and phase marked consistent with external distribution switchboard.

13. Connections complete to essential services distribution systems through essential services switch and change-over contactor. Contactor sensing circuit complete.

14. Phasing and phase colours correct.

15. Labels, circuit markings etc are complete and correct.

16. Protective devices, relays etc in accordance with Specification and drawings.

17. Satisfactory operation of mechanical locking and interlocking devices.

18. Insulation resistance tested and results recorded.

19. On multi-set installations facilities for parallel operation (if specified) are complete and all safety features specified are provided.

20. Synchronising equipment and circuits in accordance with Specification and drawings. Manufacturer's Test Certificate supplied for automatic synchronisation equipment.

Commissioning Checks and Tests

1. With generators disconnected mains failure sensing system and operation of automatic change-over switches is satisfactory.

2. Each generator set starts up correctly using manual start facility.

3. Battery starting or compressed air starting arrangements satisfactory. Automatic charging arrangements operate satisfactorily.

4. Units start-up and shut-down under operation of automatic controls and safety devices.

5. Meters, indicators and alarms operate correctly.

6. Phase rotation is as marked at generator terminals.

7. Each generator set stops correctly using manual stop facility; generator contactor drops out when voltage at terminals falls below specified level (ie. 85 to 95% of normal full voltage).

8. Each generator set starts up and shuts down correctly using automatic supply failure sensing arrangements (no-load test).

9. Each generator set under automatic conditions starts up on failure of supply and takes up load within the time specified.

10. Carry out load tests on each generator over full range of loads; record the phase current and voltage for each phase in turn and the frequency of generated supply. Duration of full load test to be in accordance with the Specification and drawings.

11. Phase balance under loaded conditions satisfactory.

12. Engine temperatures, function of components, exhaust conditions satisfactory. Protective devices operate satisfactorily.

13. Note consumption of fuel, lubricating oil and examine water levels on completion of load test.

14. Multi-unit installations start-up and synchronise successively as load increases and shut-down progressively as load falls, satisfactorily and safely in accordance with Specification and drawings.

Appendix 1.1

DIESEL DRIVEN GENERATOR PLANT

Final Acceptance Record Sheets - Sound Level Tests

Hospital: Scheme: Job No.

Distance from Enclosure :

Sound Level Test Meter Type: Serial No.

Microphone Sensitivity : Octave Band:

Sound Level Readings					
63Hz	125Hz	250Hz	500Hz	1KHz	2KHz
(All pass at 63Hz)					
A					
B					
C					
D					

Test Commenced at : On:

Enclosure doors : Opened/Closed (delete as applicable)

Approx.Generator Load on Test : %

Test Results

Comments

Test Conducted by : .....

Representing : .....

Witnessed by : .....

Representing : .....

Section 35

Appendix 1.2

DIESEL DRIVEN GENERATOR PLANT

Final Acceptance Record Sheets - Plant Record

Hospital: Scheme: Job No.

1. Diesel Engine

Manufacturer		:	
Engine No.		:	
Model No.		:	
Nominal Horsepower		:	
Running Speed at Full Load		:	
Approx.Stated Fuel Consumption		:	Actual:
Date of Manufacture		:	
Injection Torque		:	
Injector Travel		:	
Valve Lash	Cold	:	Hot:

2. Alternator

Manufacturer		:	
Serial No.		:	
Type/Model		:	
Nominal Output	KVA		Hz Phases
Power Factor		:	
Starter Connection		:	
Star Rating		:	
Type of Enclosure		:	
Ambient Operating Temperature		:	
Excitation		:	Volts Amps
Insulation Class		:	

3. Set Panel

Type		:	
Serial No.		:	
Volts: Hz:	Cos Ø	:	Phases rpm
Engine No.		:	Generator No.
Manufacturer		:	

4. Remote Change Over Panel

Location		:	
Rating Category		:	
Type		:	
Serial No.		:	
Rating:	KVA	:	KW Amps
Volts: Hz:	Cos Ø	:	Phases rpm
Engine No.		:	Generator No.

Section 35

Appendix 1.2

Main Circuit Breaker	: Manufacturer:	Type:
Poles General	:	
Change Over Contactor	: Manufacturer:	Type:

Maximum Rating

The Pre-Commissioning checks, setting to work and commissioning, including sound level tests have been satisfactorily completed in accordance with the foregoing FAR Sheets.

The system is satisfactory and ready for use.

Signed .....

Status .....

Company .....

Date .....

I confirm having witnessed the above tests and confirm the installation is satisfactory and ready for use.

Client's Commissioning Advisor .....

For ..... Client .....

Date .....

36. THE COMMISSIONING OF GENERAL ELECTRICAL SERVICES

Contents List **Page**

36. THE COMMISSIONING OF GENERAL ELECTRICAL SERVICES

Description and General

General electrical services will include cabling and wiring thoughout the development together with switch boards, fuse boards, circuit breakers etc. ie. all electrical items not covered as specialist electrical services.

The majority of the testing will be carried out by the Senior Electrical Site Engineer and his staff and will be completed section by section as the work of installation proceeds. It is essential that the work is properly checked before any cabling wiring etc. is concealed or where, in conduit, the conduit is buried either externally or by plastering over in internal situations.

Such tests will include earth continuity and polarity checks as well as continuity within circuits.

Switchboards other than main boards should also be checkd as installation proceeds particularly for earthing and correct connection to labelled fuses or circuit breakers. It will be appreciated that early completion of the commissioning of general electrical services is essential as the majority of general commissioning will require power to be available. It is of course essential to ensure circuits etc. are satisfactory as it has been found that persons commissioning equipment and other services tend to accept that if power is available at the point of use the system is satisfactory and it has also been found in practice that much time can be wasted during commissioning because of this assumption.

Whilst as stated, the majority of the work required under the commissioning of general electrical services will be carried outby the site staff the Commissioning Advisor should maintain a check on this work via a close liaison with the site engineers and ensure correct procedures have been followed and acceptable results obtained.

A matter which has been found to cause future difficulties and which can be easily checked at this stage of a contract is the need to ensure adequate spare ways are available on boards. Where doubt exists the matter should be raised with the Project Engineer as modification at this stage is both cheap and easy. If the problem arises after the commissioning and handover it can be difficult and costly to resolve.

The work should be inspected, tested and certified in accordance with the attached sheets and finally demonstrated as a system and witnessed by the Commissioning Advisor.

Section 36

Appendix 1

GENERAL ELECTRICAL SERVICES

CHECK LIST FOR INITIAL INSPECTION OF INSTALLATIONS

Visual inspection as required by Regulation 612-1 of the IEE Regulations should include a check of the following items, as relevant to the installation:

- connections of conductors,
- identification of conductors,
- selection of conductors for current-carrying capacity and voltage drop,
- connection of single-pole devices for protection or switching in phase conductors only,
- correct connection of socket outlets and lampholders,
- presence of fire barriers and protection against thermal effects,
- methods of protection against direct contact (including measurement of distances where appropriate), ie.:
  - protection by insulation of live parts,
  - protection by barriers or enclosures,
  - protection by obstacles,
  - protection by placing out of reach,
  - protection by non-conducting location.
- presence of appropriate devices for isolation and switching,
- choice and setting of protective and monitoring devices,
- labelling of circuits, fuses, switches and terminals,
- selection of equipment and protective measures appropriate to external influences,
- presence of danger notices and other warning notices,
- presence of diagrams, instructions and similar information.

Section 36

Appendix 2

FORMS OF COMPLETION AND INSPECTION CERTIFICATES

COMPLETION CERTIFICATE
(as prescribed in the IEE Regulations for electrical installations)

Completion Certificate to be given by the contractor or other person responsible for the construction of the installation, or alteration thereto, or by an authorised person acting on his behalf.

I CERTIFY that the electrical installation at:

has been inspected and tested, in accordance with the Regulations for electrical installations, published by the Institution of Electrical Engineers 16th Edition (Note 1) and that, to the best of my knowledge and belief, the installation summarised in the drawings/schedule attached/ overleaf (Note 2) complies, at the time of my test, with the Edition of those Regulations current at the date of contract for the work, except as stated overleaf.

I RECOMMEND that this installation be further inspected and tested after an interval of not more than ..... years (Note 3).

Signed ..... Date .....

For and on behalf of: .....
.....

Address .....
.....

NOTE - This Completion Certificate does not cover portable appliances or equipment connected to socket outlets, for which an Inspection Certificate may be obtained.

Note 1. See Inspection Certificate attached.

Note 2. For simple installations, the particulars of the installation mentioned overleaf are regarded as a sufficient schedule for the purposes of Regulation 514-3.

Note 3. The space provided in the form for inserting the recommended number of years intervening between inspections should, for installations in general, be filled in by the figure 5 or such lesser figure as is considered appropriate to the individual case. For temporary installations on construction sites, the figure 3 should be inserted and the word 'years' changed to read 'months'. For caravan site installations, the figure should be 1, or such longer period (not exceeding 3 years) as is considered appropriate to the case. For agricultural premises the figure should be 3.

Section 36

Appendix 2

Particulars of the installation covered by this certificate**

New installation. Alteration/Extension to existing installation

Number of lighting points: Number of socket outlets:

Details of fixed current-using equipment:

Applicable ANT Scheme certificate numbers (if any):

Details of departures (if any) from the Regulations:

Comments (if any) on existing installation (where this certificate relates to an alteration or addition):

** Delete or complete items as appropriate to the work.

SECTION 36
Appendix 2

INSPECTION CERTIFICATE

(as prescribed in the IEE Regulations for electrical installations)

Inspection Certificate to be given by the contractor or other person responsible for carrying out an inspection and test of an installation, or part of an installation, or by an authorised person acting on his behalf.

I CERTIFY that the electrical installation at:

has been inspected and tested, in accordance with the IEE Regulations for electrical installations (16th Edition) and that the results are satisfactory in the respects mentioned below, except as indicated in the comments below.

I RECOMMEND that the installation be further inspected and tested after an interval of not more than ..... years (Note 1).

Items inspected or tested (Note 2):

Type of earthing arrangements: TN)
TT) (Regulations 312-3)
IT)

Type(s) of protective device:
- overcurrent protective devices,
- residual current device(s),
- fault-voltage operated protective device(s).

Prospective short circuit current at the origin (Regulations 313-1 and 434-2)

Earth fault loop impedance at the origin (Regulation 313-1)

Continuity of ring final circuit conductors (Regulation 613-2)

Continuity of protective conductors and equipotential bonding (Regulation 613-3)

Earth electrode resistance (Regulation 613-4)

Insulation resistance of the fixed installation (Regulations 613-5 to 613-7)

Insulation resistance to earth of each item of equipment tested separately (Regulation 613-8)

Protection against direct contact, by insulation (Regulations 613-9 and 613-10)

Protection against direct contact, by barriers or enclosures (Regulation 613-12)

Note 1. The space provided in the Certificate for inserting the recommended number of years intervening between inspections should for installations generally, be filled with the figure 5 or such lesser figure as is considered appropriate to the individual case. For temporary installations on construction sites the figure 3. should be inserted and the word 'years' changed to read 'months'. For caravan site installations, the figure should be 1, or such longer period (not exceeding 3 years) as is considered appropriate to the case. For agricultural premises the figure should be 3.

INSPECTION CERTIFICATE

Section 36

Appendix 2 continued.....

Note 2. Delete or complete items, as appropriate. Where a failure to comply with the Regulations is indicated further details should be entered, if necessary, overleaf.

Resistance of non-conducting floors and walls, where relied upon for protection against indirect contact (Regulation 613-13)
Polarity, and position of single-pole devices for protection and switching (Regulation 613-14)
Earth fault loop impedance, for operation of devices relied upon for earth fault protection (Regulation 613-15)
Operation of residual current operated/fault-voltage operated device for earth fault protection (Regulation 613-16)
Method of compliance with Regulation 413-3 (see also Regulation 413-1(i))
Protection against indirect contact by measures other than automatic disconnection (Regulations 613-10 and 613-11)
Condition of flexible cables and cords, switches, plugs and socket outlets (Regulation 612-1)
Sizes of live conductors and their methods of installation, in relation to design currents of circuits and to the operating currents of overcurrent protective devices (Regulation 612-1)

Equipment tested includes/does not include portable equipment.

Applicable ANT Scheme certificate numbers (if any):

Comments (if any) and departures from the IEE Regulations:

Signed ..... Date .....

For and on behalf of: .....
.....

Address: .....
.....
.....

SECTION 36
APPENDIX 3.1
SHEET 1

ELECTRICAL FINAL ACCEPTANCE RECORDS
CONTINUITY OF RING FINAL CIRCUIT CONDUCTORS

Project: .....

Location: .....

Dist. Board: .....

Drawing No: .....

Way	Conductors MM²		Protective Device Rating (A)	Location of Test Point	Resistance of Ring Main Cables			Resistance of CPC (if applicable)		
	Ph / N	CPC			Ring	Centre	Results	Ring	Centre	Results

Remarks / Instrument Used

Test Leads

Signature: .....

Date of Tests: .....

Witnessed: .....

Date: .....

SECTION 36
APPENDIX 3.2
SHEET 2

ELECTRICAL FINAL ACCEPTANCE RECORDS
RESISTANCE OF PROTECTIVE CONDUCTORS
CONTINUITY OF BONDING CONDUCTORS

Project: .....

Location: .....

Dist. Board: .....

Drawing No: .....

Circuit Ref.		Test Taken		Resistance OHMS	Remarks
Under Test	Phase	From	To		

Earth Continuity on completion is satisfactory YES / NO

REMARKS
Protective conductor may be separate conductor, trunking / conduit installation
Time of Test may vary to suit type of Protective conductor

Signature: .....

Date of Tests: .....

Witnessed: .....

Date: .....

SECTION 36
APPENDIX 3.3
SHEET 3

ELECTRICAL FINAL ACCEPTANCE RECORDS
EARTH ELECTRODE RESISTANCE

Project: .....

Location: .....

System: .....

Drawing No: .....

Item Under Test	'Resistance' Ohms	Depth	Ground Conditions	Remarks

Soil Resistivity Test

Signature: .....

Date of Tests: .....

Witnessed: .....

Date: .....

SECTION 36
APPENDIX 3.4
SHEET 4

RECORD OF ELECTRICAL TEST
INSULATION TESTS

Project: . . . . . .

Location: . . . . . .

System: . . . . . Installed by: . . . . . .

Drawing No: . . . . . Designed by: . . . . . .

Switch / Dist Board Ref: . . . . . Supply Volts: . . . . . .

Insulation Resistance to earth . . . . . M (ohms)

Way	Phase	Rating of FUSE, MCB., RCD., ELCB., Amps	Cable sizes as installed mm²			Circuit Description	Insulation M (Ohms)						Loop Imp	Polarity	Remarks
											CPC Earth				
			Ph	N	E		R-Y	R-B	B-Y	RYB-N	N	Ph			
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															

Remarks

Signature: . . . . . .

Date of Tests: . . . . . .

Witnessed: . . . . . .

SECTION 36
APPENDIX 3.5
SHEET 5

ELECTRICAL FINAL ACCEPTANCE RECORDS
LOW & MV CABLE SWITCHGEAR INSULATION TESTS

Project: .....

Location: .....

System: .....

Drawing No: .....

Cable Size Type No. of Cores	Switchgear / Protection at Sending End	Insulation Res					Phase Rotation	Switchgear / Protection at Receiving End
		R/Y	R/B	B/Y	Ph/E	Ph/N		

Remarks

Signature: .....

Date of Tests: .....

Witnessed: .....

Date: .....

SECTION 36
APPENDIX 3.6
SHEET 6

ELECTRICAL FINAL ACCEPTANCE RECORDS
PROTECTION AGAINST DIRECT CONTACT BY BARRIERS OR ENCLOSURES PROVIDED DURING ERECTION

Project: .....

Location: .....

System: .....

Record Drawing No: .....

Equipment Under Test: .....

.....

.....

Will the British Standard finger (1PLK) penetrate * to end conductors	
Will a 1mm rod penetrate and at the screw holes etc.	
Any holes left unfilled	

* Test Finger 1 - BS 3042 1971

Signature: .....

Date of Tests: .....

Witnessed: .....

Date: .....

SECTION 36
APPENDIX 3.7
SHEET 7

ELECTRICAL FINAL ACCEPTANCE RECORDS
OPERATION OF RCD AND
FAULT-VOLTAGE OPERATED PROTECTIVE DEVICES

Project: . . . . . .

Location: . . . . . .

System: . . . . . .

Record Drawing No: . . . . . .

Circuit Reference	Protect Device Max Load	CALCULATED	MEASURED	CALCULATED	MEASURED	Remarks
		Trip Current	Trip Current	Tripping Time		

Signature: . . . . . .

Date of Tests: . . . . . .

Witnessed: . . . . . .

Date: . . . . . .

SECTION 36
APPENDIX 3.8
SHEET 8

ELECTRICAL FINAL ACCEPTANCE RECORDS
PROSPECTIVE SHORT-CIRCUIT CURRENT
& PHASE IMPEDANCE (Zph)

Project: .....

Location: .....

System: .....

Record Drawing No: .....

Test Point Dist. Board / Switch Fuse	Design KA	Test KA	These figures only at designer's request				Remarks
			DESIGN		TEST		
			Z Earth	Z Phase	Z Earth	Z Phase	

REMARKS

Signature: .....

Date: .....

Witnessed: .....

Date: .....

SECTION 36 APPENDIX 3.9 SHEET 9

ELECTRICAL INSTALLATIONS TEST CERTIFICATE

FINAL CIRCUITS TO THE 16th EDITION IEE WIRING REGULATIONS

PROJECT:..... CONTRACTOR:..... DATE:.....

TEST RESULTS UP TO DISTRIBUTION BOARD..... WITH FINAL CIRCUITS DISCONNECTED:

EXTERNAL IMPEDANCE (ZE).....OHMS INSULATION RESISTANCE: POLES TO EARTH..... POLES..... M

DEPARTMENT

Circuit Reference	Radial or Ring	Overload Device			Short Circuit Protection	Design Current (1a)	Live Cond. Size (mm^2)	Prot. Cond. Size (mm^2)	Actual Length (m)	Max. Length (m)	Max. Discon. Time (1)	Live Cond. Imp. (ohm)	Prot. Cond. Imp. (ohm)	Actual Sys. Imp. (Zs) (ohm)	Max. Sys. Imp. (Zs) (ohm)	Max. Sys. Imp. at 0°C (ohm)	Insulation Tests		Conti-nuity (ohm)	RCD Trip Current (mA)	RCD Trip Time (ms)	Visual Inspect	Supp. Send
		Device	Type	Rating (A)													Poles to Earth (Mohm)	B'tween Poles (Mohm)					

Page 36-16

Section 36

Appendix 3.10

SHEET NO 10

GENERAL ELECTRICAL SERVICES - COMMISSIONING

FILE NO .....

JOB NO .....

SCHEME:- ..... DATE .....

.....

.....

DEMONSTRATION OF SYSTEM:- .....

.....

DATE OF DEMONSTRATION:- .....

RESERVATIONS:-

COMMENTS:-

SIGNATURE .....

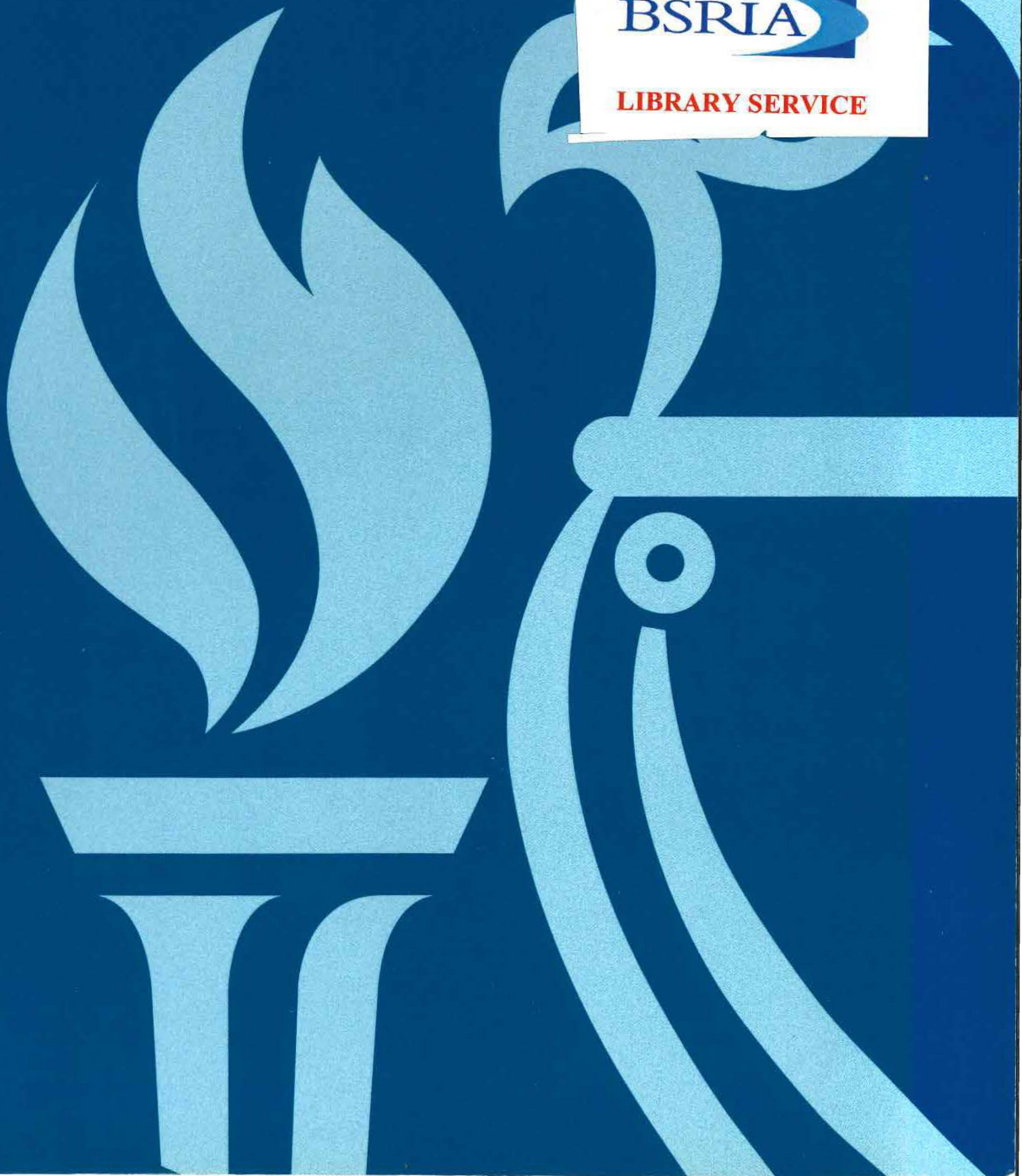
WITNESSED & CONFIRMED BY .....

COMMISSIONING ADVISOR

DATE:- .....

Air distribution systems

CIBSE Commissioning Code A: 1996 (2006)



CIBSE

Air distribution systems

CIBSE Commissioning Code A

CIBSE

This edition first published August 1996; reviewed and confirmed August 2004. Reprinted June 2010.

ISBN 0 900953 73 X

Typeset by CIBSE Publications Department

Printed in Great Britain by Page Bros. (Norwich) Ltd.,
Norwich, Norfolk NR6 6SA

Note from the publisher

This publication is primarily intended to provide guidance to those responsible for the design, installation, commissioning, operation and maintenance of building services. It is not intended to be exhaustive or definitive and it will be necessary for users of the guidance given to exercise their own professional judgement when deciding whether to abide by or depart from it.

Foreword

Since the late 1960s when the CIBSE Commissioning Code A was first published, developments in design and changes in commissioning procedures have highlighted some shortcomings and inadequacies calling for a complete revision of the original format.

The new Code as prescribed in this document encompasses all the desirable aspects of the previous code with expansion, additions and revisions, where necessary.

The commissioning of modern building services systems, particularly in large and sophisticated projects, has become increasingly complex with significant demands placed on construction personnel, not least the commissioning specialist. Quite apart from the specific commissioning tasks to be carried out, commissioning requires careful liaison between all the parties concerned and the effective programming of specific activities. Contained within the revised Code is a flow chart highlighting the key stages involved in the commissioning of air distribution systems. It is hoped that this will help all construction professionals to appreciate the activities required to commission an air distribution system.

The Task Group has endeavoured to strike the right balance between commonly used commissioning procedures and contractual practices, without introducing formal contractual responses into the document.

A considerable amount of time, effort and debate from a wide range of interested professionals has gone into the production of this document. As a result, it is hoped that all concerned with the design, installation, commissioning and witnessing of air distribution systems will take up and adopt the recommendations of this Code.

I wish to acknowledge the assistance of all those who have contributed to the preparation of this Code, and in particular the individual Task Group members and the Commissioning Specialists' Association.

G H Peters (Chairman)

Task Group

J Coppin (Ove Arup & Partners)
T S Day (Commissioning Management Ltd.)
R Gooding (Secretary) (Commissioning Specialists' Association)
A T Muggleton (JPS Environmental Services Ltd.)
J O'Grady (O'Grady Technical Services)
R J Oughton (F C Foreman & Partners)
G H Peters (Chairman) (Applied Energy Ltd.)

TPC Liaison

D D Lawrence (formerly Laing Technology Group Ltd)

Editor

J Wilson

Co-ordinating Editor

R Yarham

CIBSE Publishing Manager

Jacqueline Balian

Contents

List of figures and table

Air distribution systems

A0 Introduction

A0.1 Scope

This Code deals with the work stages required to commission typical air distribution systems. The procedures represent a standard of good practice generally accepted in the building engineering services industry and are, therefore, presented in the form of recommendations and guidance.

The Code sets out generally to inform on 'what should be done'. Manuals published by the Building Services Research and Information Association (BSRIA) inform on 'how it should be done'.

The flow chart in Figure 1 illustrates the key stages involved in the commissioning of air distribution systems covered by this Code. Attention is drawn to the fact that there are other, subsequent stages that do not form part of this Code.

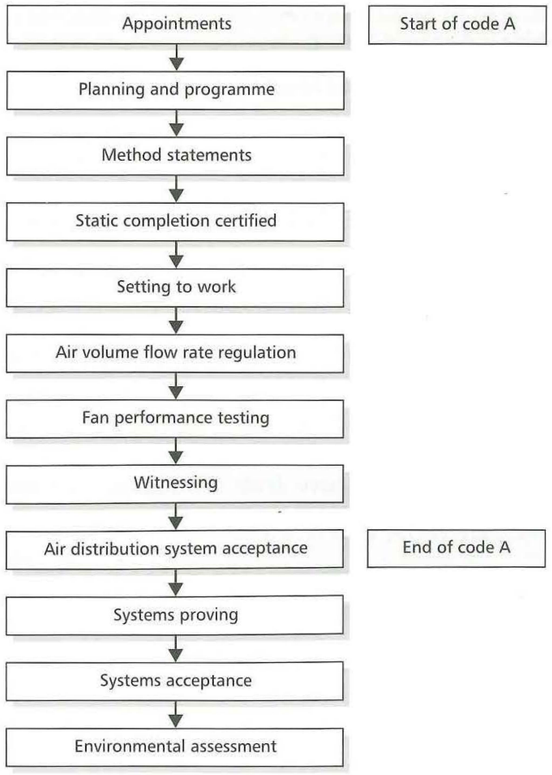


Figure 1 Key stages involved in the commissioning of air distribution systems

A0.2 Definitions

For the purpose of this Code the following definitions apply.

Accuracy

Accuracy is a compounding of the following factors: instrument accuracy, flow measuring device accuracy and operator accuracy. Refer to the BSRIA Application Guide 3/89.1: *The commissioning of air systems in buildings*[1] for further information.

Accuracy — flow measuring device

Variations in the reading arising from manufacturing tolerances of the flow measuring device.

Accuracy — instrument

Variations in the reading arising from manufacturing tolerances in the instrument.

Accuracy — operator

Any error introduced by the operator such as parallax in the reading of instruments or test points not ideally positioned.

Commissionable system

A system designed, installed and prepared to specified requirements in such a manner as to enable commissioning to be carried out.

Commissioning

The advancement of an installation from the state of static completion to full working order to specified requirements. It includes the setting to work of an installation and regulation of the system flow rates.

Commissioning management

The planning, organisation, coordination and control of commissioning activities.

Commissioning manager

The firm or person appointed to manage the commissioning process.

Commissioning specialist

The firm or person appointed to carry out specified duties in connection with commissioning.

Definitive air volume flow rate

The inferred volume flow rate derived from measurements taken using a pitot tube in accordance with defined techniques.

Design criteria

The specified environmental conditions, fluid flow rates and equipment outputs required to meet a particular design performance.

Diversity

A hypothetical aggregate simultaneous air volume flow rate at design maximum system performance, compared with the summation of the design maximum air volume output of all terminal units. The diversity ratio is often quoted as a percentage.

Fine tuning

Local adjustment to the system where usage and system proving have shown a need for it. This may also include the re-assessment of control set points and values to achieve optimum performance.

Hood

A proprietary or custom-made device used to capture air flow from an air distribution terminal for the purposes of measurement (flow or velocity).

Index (terminal/sub-branch/branch)

The terminal/sub-branch/branch in a distribution system which, prior to regulation of air flow, receives the lowest indicated percentage of design fluid flow rate.

Indicated air volume flow rate

The inferred volume flow rate derived from measurements, typically at terminal outlets, taken using proprietary instrumentation and devices (e.g. terminal air collection hoods).

Pressure and leakage testing

The process of measuring and recording specified pressure retention or permitted rate of leakage in an air distribution system or component part thereof.

Regulation

The process of adjusting volume flow rates of a fluid in a distribution system to achieve specified values (within tolerances).

A52825963

Scan — final

The final set of recorded measurements taken of a system upon completion of the regulation process.

Scan — initial

The first set of recorded measurements taken of a system with all regulation devices in the fully open position prior to any regulaton.

Setting to work

The process of putting a static system into dynamic operation.

Specification

The document that prescribes the requirements for commissioning by reference to drawings, information schedules and relevant codes, manuals, guides and standards.

Static completion

The state of a system installed in accordance with the specification, ready for 'setting to work'. This includes cleaning and pressure leakage testing of the distribution system (where required).

System

A set of connected components for heating, cooling, ventilation or air conditioning consisting of plant, distribution ducting and terminal units together with arrangements to control their operation.

System proving

Measuring, recording, evaluating and reporting on the seasonal performance of a system against specified design criteria.

Testing

The measurement and recording of system parameters to assess specification compliance.

Tolerance

Permissible deviation from a specified design requirement.

A0.3 Commissioning method statements

To ensure that all technicians work to the same procedures and sequences, the commissioning specialist should compile a commissioning method statement particular to the project. This method statement should include particulars, in principle or in detail as appropriate, of the following:

(*a*) equipment and instrumentation to be used

(*b*) preliminary checks to be applied (e.g. sections A1.2 to A1.7)

(*c*) commissioning procedures to be followed (e.g. sections A2 and A3)

(*d*) tolerances to be applied in air flow regulation

(*e*) arrangements, where appropriate, for witnessing (e.g. the advance notice to be given).

In some instances, the commissioning specification may require the commissioning specialist to submit a method statement for approval. Where this is not a requirement, the commissioning specialist may nonetheless wish to make a formal submission of a particular method statement to the contractor/client. By this means, interested parties would be informed of the commissioning intent, thus providing scope for any concerns regarding methods or procedures to be addressed before commissioning is commenced.

A0.4 Specification

The Code assumes that the installation is complete and properly constructed to an agreed specification. The specification should state permissible tolerances within which the system should operate.

A0.5 Inspection and testing

The requirements of this Code do not replace the need for regular inspection of the installation which should be carried out during construction. All ductwork and mechanical and electrical plant should be tested as required by the specification and the test results recorded and documented. Testing carried out in accordance with the requirements of the specification, both on and off site, should be recorded and the documents made available to the commissioning specialist prior to the commencement of their works.

A0.6 Commissioning records

It is essential that all checks and measurements are recorded in writing at the time they are made. Breaks in the continuity of commissioning operations are likely, and proper records will show the state of progress at any stage. It is most important that commissioning records are provided as part of the 'hand-over' documentation. It is recommended that a standardised format be agreed for recording the necessary commissioning performance data for a particular project.

A0.7 Responsibility

The responsibility for commissioning is a contractual matter outside the scope of this Code. Nevertheless, it is recommended that the management of the whole commissioning process be under the guidance and control of a single authority. Total commissioning management may be considered as an option.

A0.8 Practical considerations

The measuring, regulating and apportioning of air flow in a distribution system as applied in the commissioning procedures described in this Code is a means to an end. The primary objective is to ensure that the performance of the commissioned installation is adequate to maintain the specified space environmental conditions with optimum efficiency.

It should be borne in mind that flow rate apportionment to unnecessarily close tolerances will result in high commissioning costs, with little or no practical advantage. Also, the use of additive tolerances (e.g. –0% +10%) could result in running cost penalties throughout the life of the installation. It is the responsibility of the designer to specify flow rate tolerances and to ensure that these are appropriate to the particular design, installation and application.

A1 Preliminary checks

A1.1 Objective

The purpose of the procedure given in this section is to check that the system is in a satisfactory and safe condition before starting up. All the following checks should be carried out in the sequence given before the initial running of fans.

A1.2 State of the building and system

Before starting regulation it is essential that the following conditions are fulfilled:

(*a*) the building is complete and windows and doors are open or shut consistent with their normal state (see section A3.5 when dealing with pressure related areas e.g. laboratories, operating theatres etc.)

(*b*) the air distribution system is complete and, where required by the specification, leakage testing is satisfactorily concluded, inclusive of builders' work ducts and shafts

(*c*) the requirements of this section, sections A1.3–A1.7 and A2.2–A2.5 have been met

(*d*) all main and branch heaters and coolers on supply systems are shut off to maintain consistent air density during testing. However, in cold weather and particularly on full outside air systems, some heating may be applied to the main airstream (which handles the total air flow) in order to temper the air delivered by the system (see also section A2.4).

A1.3 System cleanliness

Note: it is important to ensure a reasonable standard of system cleanliness before start-up. Debris may be entrained by air flow on start-up, significantly reducing the life of the filter media and other system components.

Prior to the fitting of filters, check the following for cleanliness:

(*a*) air intake screens

(*b*) fan and other equipment chambers

(*c*) fan internals

(*d*) heater and cooler batteries

(*e*) cooling coil condensate trays

(*f*) condensate drainage traps

(*g*) eliminators

(*h*) humidifiers

(*i*) volume control dampers and linkages

(*j*) fire dampers

(*k*) ducting and other airways

(*l*) sensing elements

(*m*) terminal units.

The commissioning specialist should formally report any instances of unsatisfactory cleanliness to the appropriate level in the project management.

A1.4 Air regulating devices and other components within airways

The following checks should be made:

(*a*) turning vanes, thermal insulation, acoustic linings, battery fins and sensing elements have been fitted and are undamaged

(*b*) heater and cooler batteries, humidifiers, filters, silencers etc. are installed correctly in relation to air flow

(*c*) volume control dampers are operating

(*d*) there is freedom of movement, throughout range, on motorised damper control linkages

(*e*) dampers throughout the system are secured in the fully open position (except where other requirements may be specified)

(*f*) there is free movement of fire dampers, together with the location of, access to and fitting of fusible link assemblies; all fire dampers are finally secured in the open position

(*g*) all adjustable louvres set without deflection, i.e. normal to face of grille; adjustable cones on diffusers set either all in the fully up or all in the fully down position

(*h*) test holes are provided at strategic points for the measurement of branch and total air volume flow rates.

A1.5 Visual checks for air tightness

Check to ensure that:

(*a*) builders' work ducts and shafts are sealed

(*b*) plant access doors are sealed around whole periphery

(*c*) ductwork joints, including flexible couplings, are air tight

(*d*) inspection covers are fitted

(*e*) drainage trap water seals are intact

(*f*) plugs or covers for test holes are fitted.

A1.6 Fan checks

The following should be checked:

(*a*) internal and external cleanliness

(*b*) all components, bolts, fixings etc. are secure

(*c*) impeller secured, free to rotate, of correct handing and correct clearances

(*d*) axial-flow-type fans installed for correct air flow direction and, where compounded, in correct order

(*e*) anti-vibration mountings and the removal of transit bolts and packing materials

(*f*) correct drive is fitted

(*g*) securing and alignment of pulleys and couplings

(*h*) belt tension and match

(*i*) where necessary, lubrication has been applied in accordance with manufacturer's requirements

(*j*) drive guards fitted, access for speed measurement provided

(*k*) where appropriate, satisfactory operation of inlet guide vanes and variable pitch fans over full range of movement.

A1.7 Electrical checks

Prior to the initial running of any electrically driven fan, electric air heater or automatically advancing filter, the following procedures should be adopted:

A1.7.1 With all electrical supplies isolated

Check:

(*a*) local isolation of motor and control circuits

(*b*) no unshrouded live components within panels

(*c*) panels and switchgear clean

(*d*) motor and surrounding area clean; air heaters clean

(*e*) transit packing removed from contactors and other equipment

(*f*) no mechanical damage to switchgear or air heaters

(*g*) all mechanical checks on fan, motor and automatic filter complete (see section A1.6)

(*h*) all connections tight on busbars and wiring

(i) internal links on starter correct

(*j*) all power and control wiring completed in detail to the circuit diagram (special attention to circuits for star-delta connected or specially wound motors)

(*k*) fuse ratings correct

(*l*) starter overloads set correctly in relation to motor nameplate full current rating

(*m*) insulation tests on motor satisfactory

(*n*) adjustable thermal cut-outs set correctly

(*o*) all cover plates fitted.

A1.7.2 With electrical supplies available

Check:

(*a*) declared voltage available on each supply phase

(*b*) motor starter systems prior to energising the motor.

Note: specialist cleaning of ductwork distribution systems is outside the scope of this Code.

A2.4 Precautions against frost

Before starting fans in cold weather it is essential to ensure that any equipment susceptible to frost damage, such as in-duct air heating or cooling coils, is adequately protected from freezing or is drained. Consideration should also be given to the protection of spray systems and air washer sumps.

A2.5 Initial running of fan set

A2.5.1 Limiting the load

Wherever possible, the first start of any motor should be on light load. This may be achieved by limiting the air volume flow rate. A knowledge of the fan characteristic is required to ensure that excessive suction or delivery pressures are not applied to the ductwork system.

A2.5.2 Initial start

On starting the motor, check:

(*a*) direction of rotation of motor shaft

(*b*) motor, drive and fan are free from vibration or undue noise

(*c*) motor starting current for sequence timing adjustment (e.g. star-delta changeover point)

(*d*) motor running current on all phases, and that these are recorded

(*e*) no sparking at commutator or slip rings

(*f*) no overheating of motor

(*g*) no seepage of lubricant from housing

(*h*) no overheating of bearings

(*i*) oil rings running freely

(*j*) speeds and motor running currents over full range on multi-speed and variable speed motors, and that these are recorded.

A2.5.3 Initial run

A light load run should be sustained until the commissioning specialist is satisfied from the checks listed in section A2.5.2 and from motor insulation test readings that further load may be applied. Repetitive starting of the motor should be avoided to prevent overstressing of fuses, switchgear and motor.

A2.5.4 Start at normal load

Subsequent to the satisfactory conclusion of the initial light load run, the fan should be stopped and restarted at normal starting load and the checks listed in section A2.5.2 repeated. Again, avoid repetitive starting.

A2 Setting to work

A2.1 Procedure

This section deals with the procedures for setting to work all air distribution systems.

A2.2 Preliminary checks

All checks listed in section A1 must be completed before applying this section.

Before any commissioning activities involving system operation are carried out, the commissioning specialist should check that the air distribution installation meets the following parameters:

(*a*) the duct system is complete and meets specified leakage limits and, in the case of high velocity systems, pressure testing is satisfactorily concluded

(*b*) the standard of cleanliness of system components detailed under section A1.3 is satisfactory.

A2.3 Precautions against airborne detritus

The system should be checked for cleanliness in accordance with section A1.3, but the following additional precautions should be considered before starting the fans for the first time:

(*a*) disconnect final flexible connections to terminal units that are susceptible to damage by ingress of foreign matter (e.g. induction units and variable air volume boxes)

(*b*) remove all high efficiency filters that are susceptible to rapid choking

(*c*) provide temporary protection for anything within spaces served by the system that could be damaged by an initial discharge of dust from supply outlets at first start-up

(*d*) install main inlet filter cells to avoid introducing dirt into the ductwork system after start-up

(*e*) provide temporary filters at extract or return air terminals to minimise contamination.

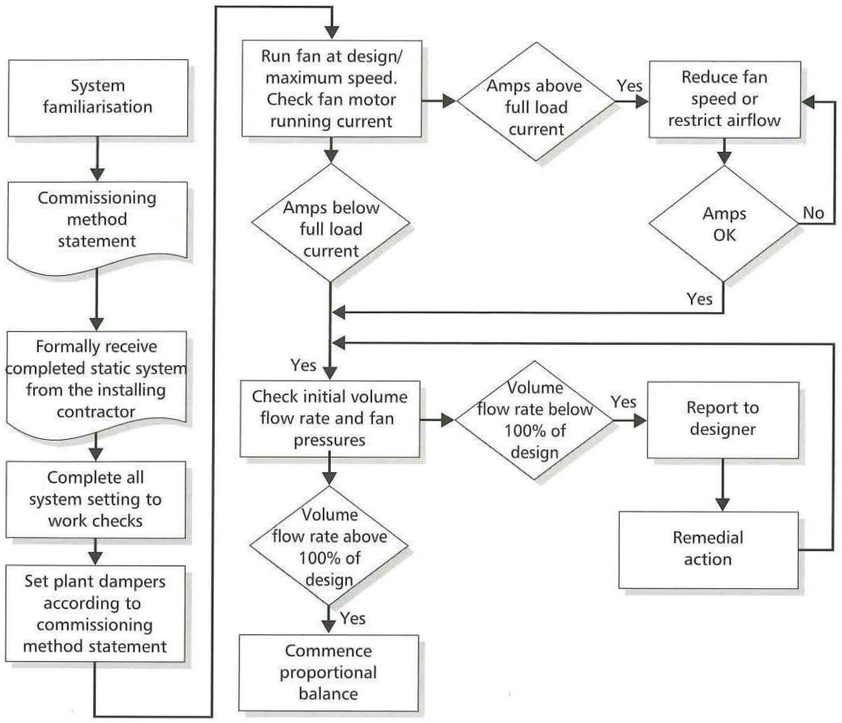


Figure 2 Flow chart for activities prior to proportional balancing

A2.5.5 Running-in period

After a short run at normal load (usually, a few minutes should suffice), any flexible connections, terminal filters etc. that were removed as suggested in section A2.3 should be reconnected. Subsequently, a running-in period should be sustained until the commissioning specialist is satisfied that the fan set is a reliable continuous-running machine that can safely be placed under the normal operation regime. The regulation of the air distribution system should be delayed until the running-in period (which may last some days) is completed satisfactorily.

A3 Regulation of air flow

A3.1 Principles

A3.1.1 Introduction

The key activities prior to commencing the regulation of air flow (commonly referred to as proportional balancing) are summarised in Figure 2. Regulation of air volume flow rates should be carried out in accordance with the following procedure. It is applicable to all air distribution systems that require manual regulation. Only the method of measuring air flow at the terminals is particular to the type of system involved. The instruments and methods of measurement to be employed on the various types of terminal, together with other information pertaining to the regulation of air flow, are detailed in BSRIA Application Guide 3/89.1: *The commissioning of air systems in buildings*[1].

A3.1.2 Fundamentals

The method is based on the principles defined in 'Balancing air flow in ventilating duct systems' (Harrison and Gibbard, 1965[2]). It consists essentially of working back to the fan from the remote branches, setting the correct proportional air flow at each junction of the system in turn (without regard for definitive flow rates) and so balancing the system. This done, the definitive air volume flow rates throughout the system are brought to their design values by adjusting the fan total volume flow rate (see Appendix AA3.4).

This principle is illustrated by consideration of air flow at the junction PQR in a system AZ as shown in Figure 3. Q is a dampered branch on the duct RP, and the required design volumetric rates of air flow are shown. With damper Q fully open, it might be found by measurement that P handles 1.4 m^3/s and Q handles 1.2 m^3/s — 70% and 120%, respectively, of their design rates of air flow. To balance this junction, damper Q should be closed until P and Q handle the same proportion of their respective

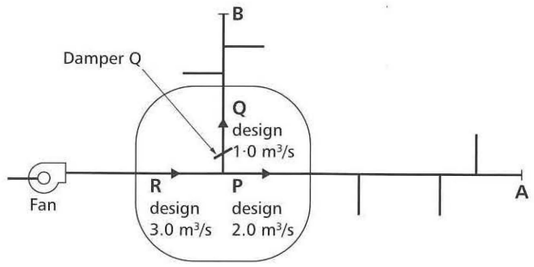


Figure 3 Air distribution junction

design air flow rates. This might result in a balance of P handling 1.6 m^3/s (80% of its design) and Q handling 0.8 m^3/s (80% of its design). It follows that R will now also be handling 80% of its design rate, i.e. 2.4 m^3/s.

Once damper Q is set — provided there is no alteration to any dampers in the system QB downstream of Q or in the system PA downstream of P — the air flow at R will be divided into the correct design proportions between P and Q at this junction PQR, i.e. two-thirds to P and one-third to Q. This holds true whatever the definitive value of the air flow at R.

Working back up the system towards the fan, adjusting dampers at other junctions between R and the fan, the definitive values of flows in R, P and Q will be changed but the ratios of those flows will remain unchanged at 3:2:1. Ultimately, when all the junctions have been balanced, the main damper (where provided) should be adjusted to obtain the design definitive flow rate in the main duct from the fan. This correct total flow will now be divided by the system, as set, in the correct proportions at each succeeding junction until R is reached, where 3.0 m^3/s will be flowing. This will now divide into 2.0 m^3/s in P and 1.0 m^3/s in Q, exactly as required by the design.

In practice, a particular routine is adopted when balancing successive junctions to avoid both cumulative errors and the need for test points and dampers in ducts between junctions. Referring to Figure 4, when A and B have been balanced, A, B and C are all handling the same proportion of their respective design air flow rates. Thus, when balancing the junction CDE, D can be balanced against A or B as well as against C. In practice, it is usual to select A as the reference point and the air flows in B, D and F are, in turn, balanced against the air flow in A.

Adjusting the distribution dampers to obtain only a proportional balance has an important implication: the definitive values of rate of air flow in any part of the system do not need to be known at this stage. Hence, the instrument used for measuring the air flow at the terminals or branches of a distribution system need not necessarily indicate the true value of air velocity. This means that inherent errors in the instrument that cause a consistently higher or lower velocity reading than the true value can be ignored. Also, provided the same method of measurement is used, factors such as those for effective grille areas are usually self-cancelling and can be disregarded.

The definitive value of the system total air flow rate does not need to be established until the entire distribution system has been proportionally balanced.

Note: while carrying out a proportional balance of a system it is advisable to maintain the balanced section of the system at between 70% and 130% of true design flow rate. If a system is balanced outside these limits, the proportional balance may be impaired when the system total flow rate is adjusted to the design value.

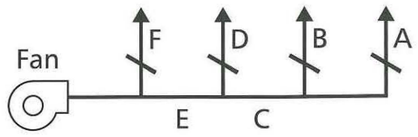


Figure 4 A typical branch duct configuration

A3.2 Procedures

A3.2.1 Preliminaries to regulation

Figure 5 illustrates a typical low velocity supply air system, but note that the following applies equally to all other types of system, including extract systems.

(*a*) Check that the dampers on all terminal grilles or diffusers 1, 2, 3, 4 etc. are fully open; also that sub-branch dampers AA, AB etc. and branch dampers A, B and C are all fully open. All adjustable louvres should be set without deflection (i.e. normal to face of grille). Adjustable cones on diffusers should be set either all in the fully up or all in the fully down position. Set automatic plant mixing dampers OA and RC to one extreme position (i.e. normally either full outside air or full recirculation).

(*b*) Run the fan and ensure the fan motor full load current is not exceeded. If necessary, take temporary measures to reduce the current drawn.

(*c*) Measure and record the fan total volume flow rate delivered. At this stage, it should be in excess of 100% of design. (Where there is a significant deficiency, this may indicate a problem with the system that should be investigated before proportional balancing proceeds.)

(*d*) Measure and record the indicated rates of air flow at all terminal grilles, diffusers 1, 2, 3, 4 etc., preferably using one instrument and method (see BSRIA Application Guide 3/89.1: *The commissioning of air systems in buildings*[1]), although where this is not possible refer to Appendix AA3.3. Express these initial measurements as 'indicated percentages of design'. It is important that the design rates of air flow (with which the measured rates of air flow are compared) are all based on a common datum of density, usually that of standard air or, occasionally, that of air at design density at fan inlet. During these initial measurements, the air must be of reasonably consistent temperature throughout the distribution system, although this temperature datum need not necessarily equate with the density datum adopted for the design values of air flow.

Variations in wind, stack effect, fan motor voltage, filter resistance etc. will all have some effect on the performance of the system. For this reason, the initial measurements (and the final measurements, see section A3.3.4) should be made in one continuous operation so that the readings will normally be truly comparable. Elsewhere in the procedure, performance changes of this type do not generally impair the validity of the regulation work for the reasons discussed in section A3.1.

Note: records of the system 'initial scan' are invaluable to indicate the extent of the balancing required on the system. They may be useful in the investigation of any problems, such as excessive noise or system resistance, experienced with the system once it is balanced.

(*e*) Study the general pattern indicated by the initial readings. It may be useful at this stage to submit the records of these to the designer or the commissioning manager. This will avoid time wasted attempting to balance a system where the initial

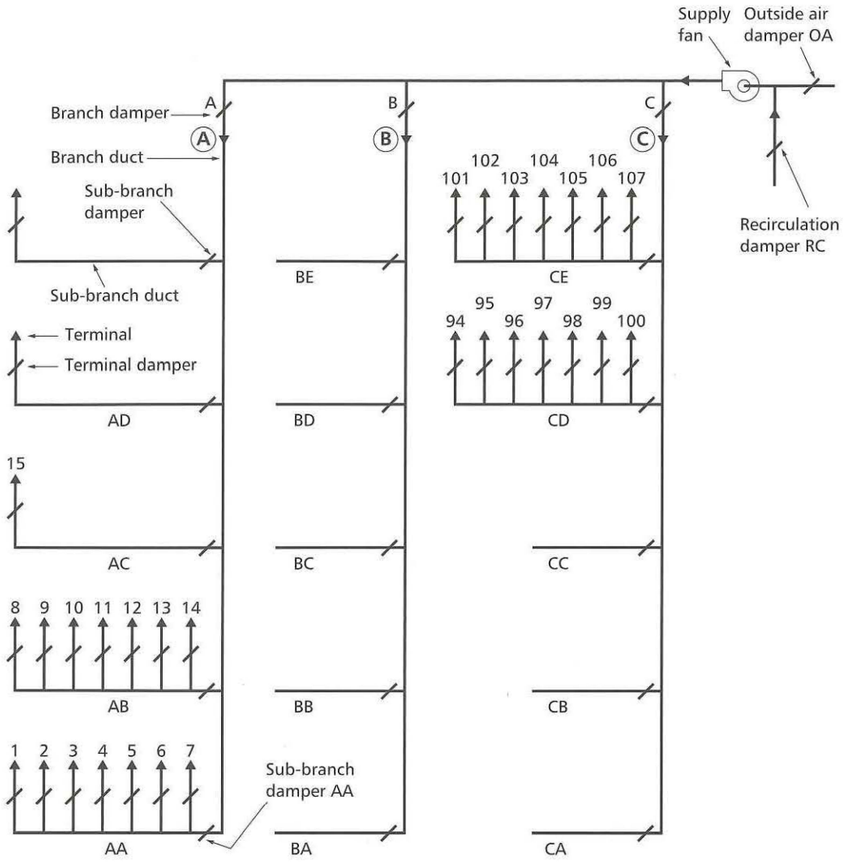


Figure 5 A typical air distribution system

indicated performance suggests that the prospect of successful balancing to design requirements is doubtful. The principal points of interest are:

(*i*) If the total rate of air flow handled by the system is less than 100% of the design air flow, physical changes to the air handling system will probably be necessary before regulation can begin. The fan performance curve will assist in the assessment of the problem and give an indication of the scope for enhancing fan performance.

(*ii*) Are there any obvious faults such as possible blockages, leakages or design errors indicated by, for example, large differences in air flow readings between apparently similar branches and terminals? Such faults will require correction.

(*iii*) What are the indicated values of air flow in relation to design requirements in each branch A, B, C and each sub-branch AA, AB etc. of the system (obtainable by totalling appropriate sub-branch values)? This will usually determine the order in which branches and groups of terminals are tackled in the regulation procedure.

(*iv*) What is the location of the least favoured terminal (i.e. the terminal with the lowest indicated percentage of design air flow) on each sub-branch AA, AB etc. of the system? This information is necessary for deciding the optimum sequence for the regulation of terminals.

A3.2.2 Proportional balancing

(*a*) On any branch A, B or C of the system, the first task is to regulate the terminal dampers on that branch. The order in which this work is tackled will normally be decided from the initial readings described in section A3.2.1 paragraph (*d*) ensuring that the balanced part of the system remains as close to 100% design air flow as possible. To help to achieve this, the terminals on the branch with the highest indicated flow rate may be balanced first.

(*b*) The fan total volume flow rate may be adjusted from time to time during the balancing process (ensuring that the fan motor does not become overloaded) in order to maintain the balanced portion of the system within the limits suggested in the Note to section A3.1.2

Note: if a portion of the system to be balanced is below the desired percentage of design, other unbalanced sections of the system may be temporarily regulated down to increase the air flow rate to 'starved' sections of the system. However, the commissioning specialist should be alert to the possibility that a branch with a low

initial flow rate may not reach the specified design performance and should report significantly low readings immediately. The designer can then define physical changes to the system or revise tolerances on air flow rates without delay.

(*c*) Assume that it has been decided to commence the system balance at sub-branch CE for the reasons given above. For the regulation of terminal dampers, the group of terminals on each sub-branch of the system will be treated independently of groups of terminals on other sub-branches. Thus on sub-branch CE, dampers on terminals 101 to 107 will be adjusted to obtain the same indicated percentage of design flow (within specified tolerances) at each of the terminals within this group. (This percentage could be, say, 120%.) On sub-branch CD, the dampers on terminals 94 to 100 will be adjusted to obtain the same indicated percentage of design flow (within specified tolerances) at each of the terminals within this group. (This percentage could be, say, 110%.) During the regulation of groups of terminals, all the sub-branch dampers (and the branch dampers) will be left untouched in the original, fully open position.

(*d*) When all the groups of terminals on the chosen branch C have been adjusted in this way, the next task is to regulate the group of sub-branch dampers CA to CE on branch C. The sub-branch dampers CA to CE will be adjusted to obtain the same indicated percentage of design flow at each sub-branch within this group. Now, for the first time, each terminal on branch C will be handling the same percentage of design flow (within specified tolerances) as every other terminal, in whatever group, on branch C.

(*e*) When the regulation of both terminal and sub-branch dampers on branch C has been completed, the branch with the second highest indicated percentage of design flow may be identified from the initial readings as, say, B and the procedure described in paragraphs (*a*), (*b*) and (*c*) repeated for this branch, and so on for all other branches. The preferred sequence is in descending order of indicated percentage of design flow, based on the initial readings.

Note: throughout this procedure, branch dampers A, B and C are normally left untouched in the fully open position.

(*f*) When the regulation of terminal and sub-branch dampers has been completed on all branches, the next task is to regulate the branch dampers A, B and C to obtain the same indicated percentage of design air flow in each branch (this could be, say, 115%). Each terminal on the entire system will now be handling the same percentage of design air flow (within specified tolerances) as every other terminal in the entire system.

(*g*) Finally, when the regulation of all branch dampers has been completed, the fan output should be adjusted to obtain the specified definitive air flow (within the required tolerance) in the main duct.

Note: the order of working suggested is usually the best one but, if necessary, a different order may be adopted provided that this basic rule is not broken: at any junction in the system (e.g. the junction of terminal with sub-branch or sub-branch with branch) no damper which regulates the air flow to any one branch of that junction should be adjusted until all dampers on any branch farther from the fan have been adjusted. For example:

(*i*) Branch damper C should not be adjusted until branch dampers A and B and sub-branch dampers CA, CB, CC, CD and CE have all been adjusted.

(*ii*) Sub-branch damper CE should not be adjusted until terminal dampers 101 to 107 and sub-branch dampers CA, CB, CC and CD have all been adjusted.

(*iii*) Terminal damper 107 should not be adjusted until terminal dampers 101 to 106 inclusive have all been adjusted.

Note: the procedure is normally broken down into a series of self-contained operations; for example, one group of terminals is balanced without relation to conditions elsewhere in a large system, perhaps on another day. This minimises the errors in regulation work due to the effect of variations in filter resistance, wind effect, stack effect etc. on system performance over a prolonged period. Furthermore, errors due to shorter term variations (e.g. an instantaneous change in fan motor voltage) are minimised by regulating the air flow at each branch or terminal to balance proportionally with the concurrent air flow at the reference terminal.

A3.3 Techniques

A3.3.1 Regulation of terminals

Assume that the initial system volume flow rate has been measured and noted, the 'initial scan' has been recorded and analysis of these readings shows no obvious reason why balancing should not commence. It has been decided, in the way described in section A3.2, that balancing will commence on sub-branch CE. Assuming that the least favoured terminal on this sub-branch is 101, the end terminal, then proceed as follows:

(*a*) Measure the indicated air flow at terminal 101, which will be used as the index terminal for this group. Express this measurement as an indicated percentage of design rate of air flow. This percentage will be used as the lower balancing limit for this group of terminals.

(*b*) With the same instrument and using the same method, measure the air flow at terminal 102 and express this also as an indicated percentage of design air flow.

(*c*) Compare the indicated percentages of design flow at terminals 101 and 102.

(*d*) If the indicated percentages of design flow at the two terminals are within the tolerances specified (see Appendix AA3.4), the dampers on these two terminals will require no adjustment.

(*e*) If the indicated percentages of design flow are outside the tolerances specified, close the damper on terminal 102 by a small amount.

(*f*) Measure the adjusted air flow at 102 and express this as an indicated percentage of design air flow.

(*g*) Return to 101 and measure the indicated air flow. Again express this as an indicated percentage of design air flow.

(*h*) Compare the indicated percentage of design air flow now handled by 101 and 102.

(*j*) If the indicated percentages of design flow at the two terminals are within the tolerances specified, the terminals are now in balance and the dampers on these two terminals will require no further adjustment.

(*k*) If the indicated percentages of design flow are still not within the tolerances specified, make a further careful adjustment of terminal 102 damper, take new readings of indicated air flow at 102 and 101 and make a further comparison.

With practice, a commissioning specialist will normally achieve a balance by a single adjustment of terminal 102 damper. The rule is to close 102 damper by the least amount necessary to bring the indicated percentage of design flow at 102 below the upper tolerance limit when compared with the reference terminal 101. By avoiding over-dampering at terminals, the increase in air flow at terminal 101 is kept small, making it easier to judge the value to which other terminals should be regulated.

(*l*) When terminal 102 has been regulated to balance with 101 (the group index terminal), balance terminal 103 against 101 in the same way.

(*m*) Terminals 104, 105, 106 and 107 should be regulated, in turn, to balance with terminal 101 until every terminal on that sub-branch CE has been regulated to balance with 101 within the specified tolerances. All terminals within this group are now in balance with each other within the tolerances specified and need no further adjustment.

Note: a change in setting of terminal damper 103 has less effect on the air flow at 101 (and 102) than a change in setting of damper 102 would have on the air flow handled by 101. Therefore, as the commissioning specialist proceeds away from group index terminal 101 towards the fan during the course of the regulation procedure, the effect that adjusting the setting of a terminal damper has on the air flow at the group index terminal 101 (and all other terminals already regulated) progressively diminishes. As successive terminals are regulated, it quickly becomes unnecessary to check air flow at the group index terminal after every adjustment.

(*n*) Where the least favoured terminal on the branch is not 101, but some intermediate terminal, close 101 damper until it is the least favoured (checking 101 against the intermediate terminal which was the least favoured), then regulate as described in paragraph (*a*) onwards, using 101 as the group index terminal.

(*o*) Regulate the terminals on each of the other sub-branches on this branch C, using the above procedure.

Note: the terminals on any one sub-branch will be treated as an independent group and will be regulated to balance with a reference terminal within the group; for example, on sub-branch CD, terminals 95 to 100 will be regulated to balance with group index terminal 94. All sub-branch and branch dampers should be left in the fully open position throughout this procedure. The group of terminals on each sub-branch is now in a state of proportional balance within the specified tolerances. The next step is to regulate the sub-branch dampers so as to bring all the sub-branches on branch C into balance with each other within the specified tolerances.

A3.3.2 Regulation of branches

The method used is similar to that for the regulation of terminals (see section A3.3.1).

(*a*) Measure the indicated air flow handled by each of the dampered sub-branches CA to CE and express this as an indicated percentage of design air flow. Wherever possible, establish this percentage by measuring the indicated air flow from the sub-branch index terminal. (This should remain the terminal on the sub-branch with the lowest indicated percentage of design flow rate, but within the specified tolerance.)

The definitive duct air flow is not normally measured, except where the type of terminal on some sub-branches differs from the type of terminal on other sub-branches. If this is the case, measurements will have to be made so that indicated rates of air flow at the differing types of terminals can be compared satisfactorily.

(*b*) Regulate the sub-branches CA to CE by applying the same procedures described in section A3.3.1 (i.e. by considering each sub-branch as a terminal grille on the branch duct C), but using the appropriate specified balancing tolerances (see Appendix AA3.4). The sub-branch CA will be used as the index sub-branch for this operation in exactly the same way that terminal 101 was used as the group index terminal for the regulation of terminals 101 to 107.

Note: throughout this procedure, the branch damper C should be left untouched in the fully open position. At the conclusion of the work, the sub-branch dampers will have been adjusted to achieve the same indicated percentage of design flow (within the required tolerances) in each of the sub-branches CA to CE.

(*c*) When the regulation of both terminal and sub-branch dampers on branch C has been completed, the next branch will be selected, which in this example is branch B. Once again, the first task is to regulate the groups of terminals on this branch as described in section A3.3.1 and, subsequently, to regulate the sub-branch dampers as described above in paragraphs (*a*) and (*b*).

This procedure will be repeated for all branches in turn, leaving the least favoured branch (in this case branch A) to the last. During this work, branch dampers A, B and C are normally left untouched in the fully open position.

(*d*) When the regulation of terminal and sub-branch dampers has been completed on all branches, the branch dampers A, B and C will be regulated to achieve the same percentage of design flow (within the specified tolerances) at each branch. The method used will be that described for the regulation of sub-branches in paragraph (*b*) above (i.e. each branch of the system should be considered as a terminal grille on the main duct) and the procedure described in section A3.3.1 adopted.

Once again, the indicated percentage of design flow at each branch should be established, wherever possible, by measuring the indicated air flow at the index terminal. Branch A will be used as the index branch for the regulation procedure in exactly the same way that terminal 101 was used as the group index terminal for the regulation of terminals 101 and 107. During this work, any main damper or other arrangement for regulating fan performance may be adjusted to ensure that balancing is carried out at approximately the specified design air flow rates.

All terminals, on whatever branch or sub-branch, are now in a state of proportional balance within the tolerance required and it remains only to adjust the fan output to achieve the design definitive rates of flow to all parts of the system.

A3.3.3 Regulation of total rate of air flow

(*a*) Measure the definitive value of the total air flow, preferably in the main duct. Where a reliable reading cannot be obtained in the main duct, the total air flow can be established by adding together the branch rates of air flow.

(*b*) Compare the measured total air flow with the specified design requirement. If necessary, adjust the fan output until the measured value is within the specified tolerance on the design value of total air flow (see Appendix AA3.4). Record in full the results of the final measurement. At the same time, measure and record the fan motor current, the fan rotational speed, the fan suction and discharge static pressures, the resistance of any air filters and the (manual) settings of any automatic modulating dampers.

Note: with systems that contain fabric filters, or more particularly 'absolute' or high efficiency filters, the dirtiness of the filter may have a significant effect on the total rate of air flow. As the clean filter condition is the only state that can be readily identified and selected on site, measurements of total air flow should be made, wherever possible, with clean filters and the results compared with the specified design requirements.

(*c*) Where the plant contains automatically operated dampers for varying proportions of outside/exhaust/recirculation or face and by-pass air, measurement of the total air flow and regulation of the fan output should be conducted with these dampers in the full outside air, full exhaust or full face positions, provided that this mode of operation is within the design intent. The proportions and the total air flow handled at the other extreme of the damper cycles must then be investigated, recorded and, where necessary and where facilities are provided, adjusted to meet the specified design air flow (without further adjustment of the fan output).

The characteristic of the automatically operated dampers will, of course, determine what change, if any, in total air flow occurs at intermediate damper positions.

Note: wherever one air handling system is directly connected with another system (e.g. a supply system connected with an extract system via a recirculation duct with fixed or variable mixing dampers), first proportionally balance the distribution networks of both systems independently, then regulate the total air flow in both systems with the dampers set as described above. Finally, the proportions of outside/exhaust/recirculation air can be checked, adjusted and recorded with the dampers set in the minimum outside air condition, taking care not to alter previously established settings.

(*d*) When the regulation of total air flow is complete, all branches and terminals on the system will be handling the required design definitive rates of air flow, within the sum of the tolerances accumulated during the balancing procedure.

A3.3.4 Conclusion to regulation

(*a*) After a satisfactory proportional balance has been established and the correct total air volume flow rate achieved, in accordance with the tolerances specified, final system readings should be recorded in one continuous operation. The results on the record/test sheets should show velocity and indicated percentage of design flow rate.

Readings should be taken at each terminal device, preferably using one instrument.

Where there is more than one type of terminal device on the system, the appropriate factors must be applied to the readings and noted on the record/test sheet.

The terminal flow rates are not, of course, definitive rates of air flow at terminals; their purpose is merely to indicate a satisfactory proportional balance between terminals.

Note: random alterations to damper settings should not be made in an attempt to correct imbalances: any corrective action will require careful planning to minimise the amount of rebalancing needed. If any adjustments are made, then a total rescan of the final readings will be required to ensure that the recorded results are truly representative of the adjusted system balance.

(*b*) Once proportional balancing and total volume flow rates have been satisfactorily established, all dampers should be locked in their final positions and the damper regulating mechanisms scribed or indelibly marked in an approved manner.

(*c*) Finally, all adjustable louvres, cones or other air direction devices should be adjusted to create the correct air distribution patterns as predetermined and specified or advised by the designer.

The flow chart in Figure 6 summarises the main activities involved in proportional balancing.

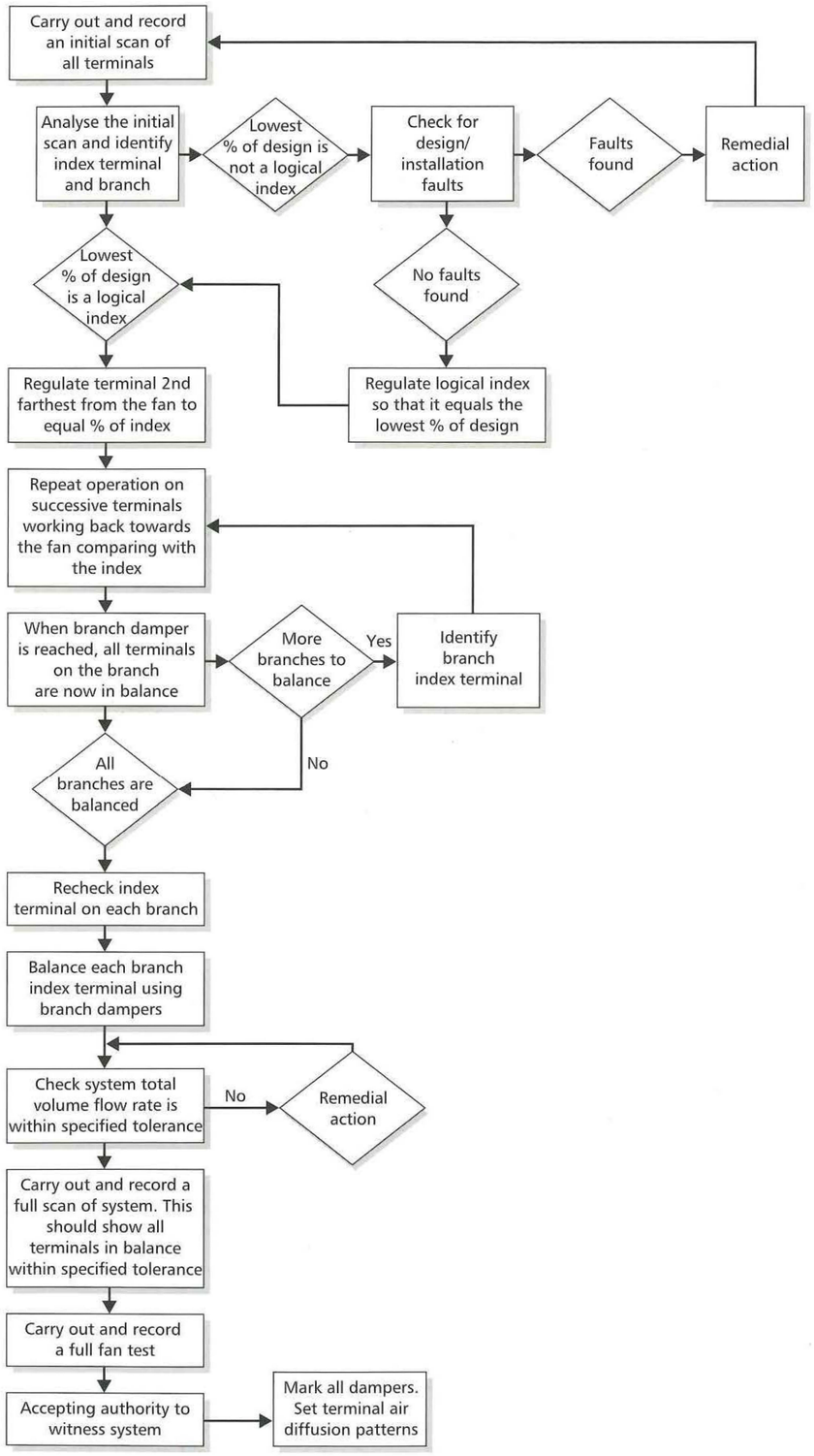


Figure 6 Flow chart for proportional balancing and testing of air systems

A52825963

A3.4 Variable air volume systems

A3.4.1 Introduction

Variable air volume (VAV) systems are dynamic air distribution systems and, as their name implies, the air volume flow rate is varied according to various parameters to achieve the required design conditions. vav systems can employ many different combinations of components and control methods, and new terminal unit designs and concepts are regularly introduced. The fact that vav systems are designed to vary system performance imposes a number of specific tasks on the commissioning specialist, which must be carried out in order to achieve satisfactory overall performance.

Proprietary units may employ a variety of means of regulating air volume flow rate including motorised dampers, inflating bellows, restricting flexible duct sections or a combination of such devices.

System control actuators may be driven by duct pressure (self-powered), electronic or pneumatic means based on local control elements or a central building management system, or a combination of these.

Control sensors may measure air flow by means of pressure differential, pitot tube, flow grid or thermal anemometer using spot or averaging sensors.

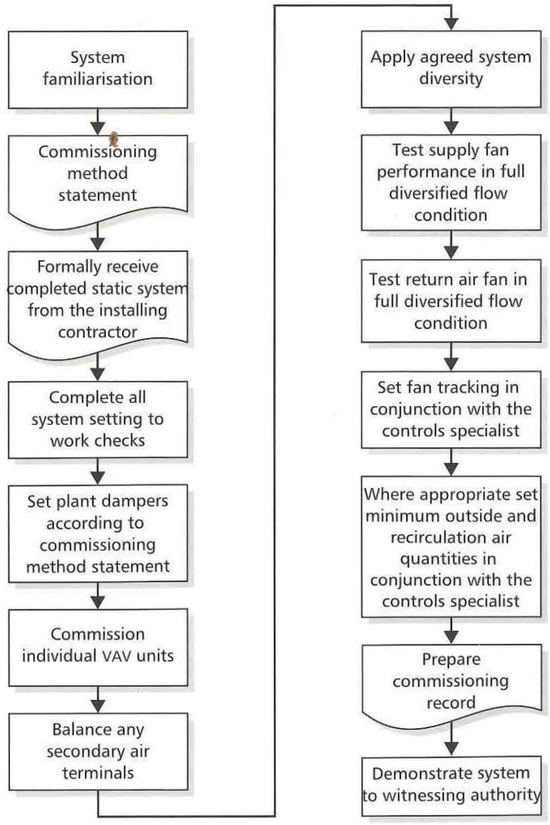


Figure 7 Flow chart for commissioning of VAV systems

Clearly, no single method of commissioning VAV systems will suit all the above options. The guidance in this section is intended to outline a suitable method of approach to be adopted by the commissioning specialist in regulating a VAV system. The guidance is not system-specific, because the detailed tasks associated with one system type may not be the same for another type. As an overall guide, the flow chart in Figure 7 illustrates the key activities involved.

A3.4.2 Commissioning method statement

Each system should be considered on its own merits and a detailed commissioning method statement produced and agreed with the designer and/or witnessing authority prior to commissioning. VAV system technology offers such a wide range of design options and proprietary components that the resulting installations are likely to require different commissioning techniques.

It is particularly important that the designer provides full information on all relevant aspects of the design of the VAV system in sufficient detail that the commissioning specialist can produce a suitable method statement.

To ensure that the appropriate commissioning procedures are employed, the commissioning specialist should carefully review the recommendations of the equipment suppliers. When optimum procedures for the particular equipment and components have been ascertained, these should be incorporated within the commissioning method statement.

A3.4.3 System components

VAV systems typically comprise the following components, some of which may require specialist commissioning by the manufacturer in addition to general commissioning as part of a complete air distribution system:

— variable performance supply fan

— variable performance extract fan

— fan performance control system

— outside/recirculation/exhaust air dampers and associated automatic controls

— supply and extract distribution ductwork systems, primary and secondary as appropriate

— variable volume terminal units, supply and extract as appropriate

— filters, heat exchangers, humidifiers etc. and associated automatic controls.

A3.4.4 Preliminary checks

(*a*) All checks required in section A1 should be carried out.

(*b*) Additional checks may be made for accessibility:

(*i*) for easy detachment of flexible connections from terminal units

(*ii*) to access panels in terminal units and for associated controls.

(*c*) A particular check should be made to ensure that distribution ductwork internals are clean throughout. (Any dust present may be entrained by the air stream. Should this settle out in the terminals it may interfere with the proper operation of these units.) If there is any doubt regarding the state of system cleanliness, the commissioning specialist should formally draw attention to this.

A3.4.5 Commissioning sequence

The particular sequence applied to a VAV installation should be appropriate to the system design and other relevant considerations. The following may be useful as a general guide:

— setting to work

— VAV terminal units

— secondary air distribution

— return air spigots

— system diversity

— fan design performance check

— system performance checks:

(*a*) fan tracking (coordination of supply and extract fan performance)

(*b*) minimum outside air.

A3.4.6 Setting to work

On completion of all setting to work checks (see section A2) and prior to any testing, the commissioning specialist should set or fix the outside/exhaust/recirculation air dampers in either full outside air or full recirculation positions (as detailed in the commissioning method statement).

The supply and extract fan systems should be set to their minimum speed conditions by manual operation of the automatic fan speed control or other suitable means, and started in the sequence required by the design. With the supply and extract fans operating simultaneously, the running speed should be increased gradually. Motor running current checks should be made at various increments, and the results recorded for each fan, to assess performance and prevent overloading of the motor.

The static pressure checks should preferably be made at, or close to, the position specified by the designer for the pressure sensor for automatic regulation of fan speed, and also at terminals near to the fans, to prevent overpressurisation of system components.

If excessive static pressures occur during this operation, the fan setting should be returned to minimum speed conditions using the automatic control. The fans should then be stopped and made safe so that the cause of the static pressure irregularity can be investigated and rectified by the appropriate personnel before proceeding further. It is essential to avoid overpressurisation of the system.

The running speed of the fans should be increased until there is sufficient static pressure in the system to commence commissioning of individual VAV terminal units, again carefully monitoring the pressure at terminal units near the fans. If the vav return air system consists of ducted spigots, the VAV return air fan should be run up to maximum design speed/volume while ensuring the motor running current does not exceed the motor full load current.

Note: during the commissioning of the individual vav terminals, it may be necessary to further fine-tune the fan speed to compensate for any system pressure variations.

A3.4.7 Terminal units

All procedures and techniques to be applied in checking terminal unit volume flow rates should be in accordance with the manufacturer's instructions and should be incorporated into the commissioning method statement.

Proprietary VAV units may be 'factory set' to the required specified flow rates, or provided with an easy means of setting to meet the specified performance requirements. Verification of these arrangements is necessary, and the number of VAV terminal units to be checked should be defined within the project commissioning specification.

Note: at the outset of the VAV terminal checks, the commissioning specialist should select a number of units with inlet duct configurations suitable for in-duct flow measurements to be taken. Volume flow rate checks by pitot-static duct traverse should be conducted on these terminals to validate the method of flow rate measurement adopted within the commissioning method statement, for example, measuring across terminal differential sensing grid or voltage at the controller.

Volume flow rate measurements should be carried out and the results recorded:

(*a*) at maximum specified volume flow rates

(*b*) at minimum specified volume flow rates

(*c*) at any intermediate settings that may be required by the specification.

A.3.4.8 Secondary air distribution

In some instances, VAV terminal units may be arranged to deliver air to a number of secondary outlets which in turn discharge the air to the conditioned space. With such an arrangement, the commissioning specialist must balance proportionally each of the secondary terminals by the methods detailed in section A3.2 so that they discharge the specified proportion of the volume of air delivered by the vav terminal, within the specified (or appropriate) tolerances as detailed in Appendix AA3.4. This exercise should be completed with the terminal unit set to maximum design volume and the details recorded.

A3.4.9 Return air spigots

Air inlets to the return air system may comprise any of the following arrangements:

(*a*) VAV return air terminals

(*b*) return air registers in the space served by ducted connections

(*c*) return air duct spigots drawing from a plenum (e.g. ceiling void).

For all the above arrangements, regulation of the return air inlets must be carried out to achieve a proportional balance within the specified tolerance limits (see Appendix AA3.4).

A3.4.10 System diversity

It may be necessary to impose a reduced air flow condition on a number of terminals to achieve the required design diversity. The means of arranging this will depend on the proprietary terminals and on their associated control provisions. Where necessary, guidance should be obtained from the unit supplier or manufacturer and close liaison with the designer is recommended to take account of any particular arrangements that may be required.

A3.4.11 Fan design performance check

The commissioning specialist should conduct a check on the supply and extract fan systems to ensure that they are capable of stable operation while delivering the design maximum volume flow rate, with the system diversity applied.

With the required design system diversity applied, total flow rates should be measured and recorded by pitot traverse. Ductwork branch flow rates to zones or floors should be measured and recorded. In conjunction with this, the static pressure at the least favoured unit should be monitored and the system operating pressure set to its optimum point, i.e. the lowest system operating pressure that still satisfies the least favoured unit. When this has been achieved, the static pressure should be measured and recorded at the least favoured unit and at the static pressure controller sensor position(s).

With the system in this mode, the pressure drop across each component of the air handling unit should be measured and recorded.

With the fans at their minimum specified performance settings, a further check of the static pressure at the fan control sensor position(s) should be made to ensure that this remains at the previously recorded level.

A3.4.12 System performance checks

(*a*) *Coordination of supply and extract fan performance (fan tracking)*

It is important to ensure that the sensors intended to provide automatic control of fan performance are so located that they offer responsive, stable and reliable regulation across the full range of fan operation.

Indicative positioning should be specified by the designer, based on the distribution ductwork system layout and the calculated system resistance characteristics.

The performance of the extract system must follow that of the supply system in a stable manner. It is, therefore, necessary to set up the fan performance controls for checking both maximum and minimum volumes, in addition to checking the equivalent performance at other intermediate points. All results should be recorded.

Note: limitations of instrument accuracy at low velocities may make it impossible to achieve repeatable measurements of fan performance at minimum volume (see BSRIA Application Guide 1/91: *Commissioning of vav systems in buildings*[3]).

Note: unless the fan control systems employ accurate air volume flow rate measurement, the extract system may not follow precisely the supply system performance between the two set point (pressure or velocity) extremes. Such discrepancies are normally due to the differing pressure/volume characteristics of the supply and extract systems.

The setting of the automatic control system should be finalised by the controls specialist in liaison with the commissioning specialist. The set point should provide optimum operation of the commissioned system.

(*b*) *Minimum outside air*

With the supply and extract fans delivering their design maximum air volumes, adjust the outside air damper until the required design volume flow rate is achieved. With the system in its fully turned down condition, the minimum outside air quantity should be checked to ensure that the correct ratio has been maintained. Note and record the position of the outside and recirculated air control dampers at this setting.

Note: where air velocities in the outside air duct militate against stable measurement, it may be possible to record total and recirculated air volume flow rates and establish the difference between these as the outside air volume flow rate.

The setting of the minimum outside air requirement should be finalised in conjunction with the controls specialist.

A3.5 Pressure regimes

A3.5.1 General

The design objective for certain mechanical ventilation systems may be to achieve a pressure differential between areas served, either for purposes of isolation or containment. In some instances, the required pressure differential may be simply notional while some applications may require a specific pressure gradient. The purposes of pressure differential may be described as:

(*a*) Isolation, where it is necessary to prevent ingress of possibly contaminated or unconditioned air to an area (such as an operating theatre, clean room or pressurised escape route).

(*b*) Containment, where it is necessary to prevent egress of contaminated air from an area. In its simplest form this applies to kitchen and toilet areas but, more importantly, to laboratories and similar areas where there may be chemical, biological or radioactive contamination.

The pressure differential between adjacent spaces may be controlled by the use of self-acting or automatic pressure stabilising devices.

A3.5.2 Preparation

A written commissioning method statement should be prepared and agreed formally by all relevant parties including the witnessing authority. The statement must take account of the detailed procedures that need to be undertaken to meet the specified acceptance criteria.

It is essential that before commencing commissioning of the system(s), all building works, doors, door undercuts, windows, floor finishes etc. are complete and in their final, normal operational state and that the commissioning specialist is given sole access to the entire area served by the system(s).

A3.5.3 Procedure

The following procedure is suggested as suitable for the commissioning of typical ventilation systems designed to produce pressure regimes within a space. The flow chart in Figure 8 illustrates the process.

(*a*) With all doors, hatches etc. between the pressurised areas open, and a suitable path for spill or make-up air provided, run either the supply or extract systems. It is advantageous to choose the system that is simplest (least terminals) or that which is expected to be the most stable.

(*b*) Carry out a proportional balance of all terminals on this system and set the total volume flow rate of the fan to the specified design requirement. Tolerances in this case should be kept to the minimum possible.

(*c*) Close all doors etc. so that the entire area served by the system(s) is in its normal operating condition.

(*d*) Running both supply and extract system fans, carry out a proportional balance of the previously unbalanced system and set the fan total flow rate to the specified design requirement, adjusting to a similar tolerance to that previously allowed in (*a*) above. Set up/commission any pressure control devices such as pressure stabilisers in accordance with the manufacturer's instructions.

(*e*) Recheck the system balance described in (*a*) and (*b*) above and, where necessary, make adjustments to reinstate the balance of the previously set total volume flow rate.

Note: Where no adjustments are found necessary, proceed to (*f*) below. Where adjustments have been made, the system set up as described in (*b*) above must also be rechecked.

(*f*) This procedure should be repeated until there is no necessity to make further adjustments to the system.

(*g*) Measure and record the pressure differentials between all adjacent spaces using a suitable instrument and compare the measurements with the specified design requirements.

At this stage the results obtained should be submitted to the designer or accepting authority.

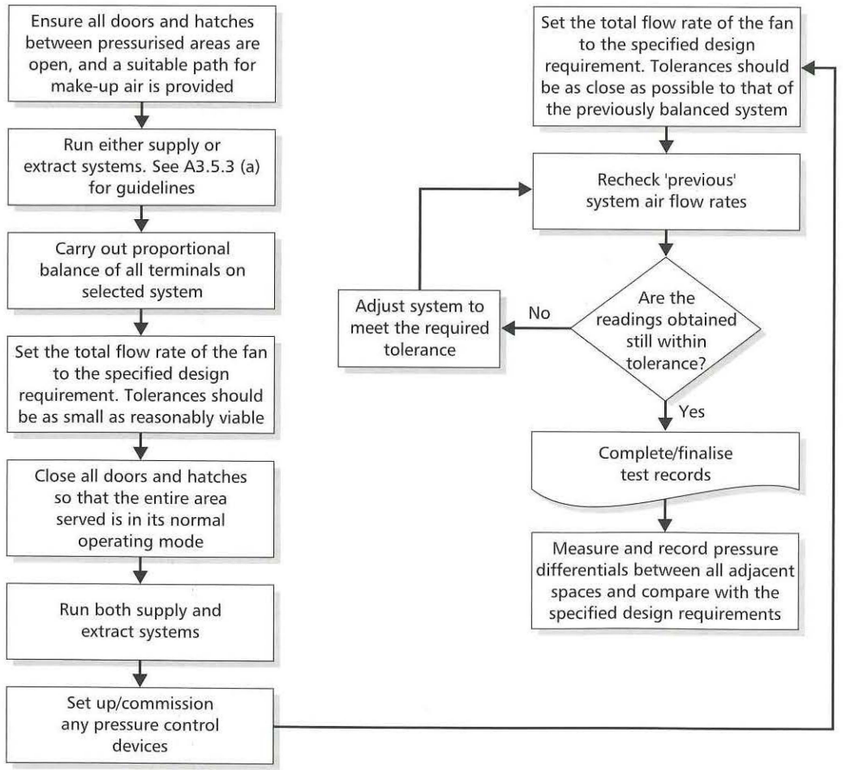


Figure 8 Flow chart for commissioning of typical ventilation systems designed to produce pressure regimes within a space

It should be recognised that a system can be proportionally balanced in accordance with the tolerances and procedures described in section A3.2 but still require further adjustment to establish the specified pressure regimes.

If the results obtained do not indicate a correct or acceptable pressure regime, the designer may need to plan remedial attention to the ventilation systems or building fabric. This may consist of revisions to the design air flow rates or alterations to the building components or fabric to modify air leakage paths.

Once acceptable conditions are obtained, it is imperative to record final balance figures including air volume flow rates and pressure differentials. These should also be verified by the accepting authority.

A4 Commissioning documentation

A4.1 Content

Documentation should be prepared recording all the salient details of the installed air distribution systems that have been subjected to the commissioning procedures set out in the specification and/or described in any method statement.

All commissioning documentation, including method statements, should be collated for retention and future reference by interested parties.

Commissioning documentation should be logical and unambiguous and should provide space for relevant comments by the commissioning specialist.

A4.2 Format

It is not the objective of this Code to set out the format and typographical style of such commissioning documentation, but the general intent of such records should be to provide clear identification of each main component by means of its:

— design description
— plant reference number
— location
— manufacturer
— type
— serial number
— design performance parameters
— actual performance parameters.

Any particular requirements as to the presentation of commissioning records, including the number of copies required, should be stated in the specification. All such proforma documentation should be completed neatly by hand (or by the use of an on-site laptop computer) by the commissioning specialist at the time of carrying out the tests and should, preferably, not be retyped subsequently. (Any transcription of these records, including typed presentation, would introduce scope for error and could detract from their significance.)

The format of the test record sheets to be used should be agreed in advance of commissioning with the designer and witnessing authority.

A5 Witnessing

A5.1 Introduction

For most projects, the specification requires the commissioning results to be approved as a condition of system acceptance. The most common form of acceptance procedure is to undergo a process of witnessing as a means of ensuring that the air distribution systems have been commissioned to meet the specified requirements.

Witnessing is defined as the repetition of specific commissioning results in the presence of the witnessing authority such that the witnessing authority can observe, confirm and countersign the results.

This section of the Code outlines recommendations concerning witnessing generally.

A5.2 Objective

The objective of the witnessing stage is to enable the witnessing authority (typically, the building services consulting engineer or an agent acting on behalf of the engineer) to establish a level of confidence in the commissioning results being presented. Unless the designer has specifically called for all commissioning aspects to be witnessed, an assessment of a proportion of results should satisfy this requirement.

The specification should define any aspects or parameters requiring special attention.

Witnessing duties should include verification that the recorded commissioning results are:

— repeatable
— within the specified tolerances
— in accordance with the overall design requirements.

A5.3 Selection of the witnessing authority

The witnessing authority should be conversant with the requirements of the air distribution system under consideration, this Code and, where appropriate, any relevant statutory requirements. The witnessing authority should also be experienced in commissioning procedures generally.

The witnessing authority should be provided with formal terms of reference for the role, together with clearly stated responsibilities and reporting procedures. The extent of

the witnessing authority's role should be made clear to the commissioning specialist and other relevant parties.

The witnessing authority should be able to make a considered comparison between the measured performance and the design requirements and associated tolerances, and to arrive at an assessment of their acceptability.

A5.4 Programme

The witnessing of air distribution systems commissioning will require a specific amount of time to be allocated within the overall construction programme. Liaison should take place with the other relevant parties involved in the construction process such that the implications of commissioning in general, and the commissioning and demonstration stage in particular, can be properly coordinated into the overall project programme.

A5.5 General

To ensure that all parties understand the requirements, the overall extent and scope of witnessing should be set out at the design stage.

Scope for subjective judgement should be minimised because this can lead to disputes. The principles and bases for any allowable deviations from specified tolerances or standard methods of testing should be established and agreed in advance of witnessing.

The witnessing authority should be available to discuss and establish an understanding of any problems that arise during the course of commissioning. The following factors will, typically, have a bearing on the scope of commissioning works:

— the extent and complexity of the air distribution system

— the requirements of the specification

— the project timescales.

Where it is necessary to superimpose artificial conditions on installed plant in order to 'demonstrate' the design level of performance, the practical on-site implications of this should be given careful consideration by the relevant parties. This is particularly important in the case of dynamic systems such as vav systems.

A5.6 Witnessing arrangements

It is recommended that, prior to proceeding to witnessing, the witnessing authority should arrange a meeting with the commissioning specialist. The purpose of the meeting should be to provide an opportunity for the commissioning specialist to summarise and explain his/her experience with the work on the system and to highlight points considered to be noteworthy. Similarly, the witnessing authority has an opportunity to explain objectives and to agree with the commissioning specialist the optimum strategy for achieving these. The meeting should include a joint tour of inspection of the system and its associated plant and equipment.

When presenting a commissioned system for witnessing, the commissioning specialist should aim to replicate the conditions under which air balancing was carried out. Thus, results recorded during the commissioning process can be repeated and demonstrated to the witnessing authority without undue influence from other factors that could jeopardise the outcome.

When carrying out spot checks on recorded data, the witnessing authority should recognise that, because of prevailing conditions, identical results are unlikely to be achieved. It would be prudent therefore to expect a deviation (of, say, ±5%), provided that this does not increase the tolerances specified or suggested in Table A1 (see Appendix AA3.4).

To permit a full assessment of implications on system design performance, records of the witnessed results should be copied to the designer.

A5.7 Air distribution system acceptance

Appropriate documentation should be provided by the commissioning specialist for the witnessing authority to countersign to confirm details of the tests observed and that the results are within the specified tolerances. When the documentation is completed, the system can be deemed to be commissioned in accordance with the recommendations of this Code.

It should be recognised that such certification is usually only part of the overall project acceptance procedures and, therefore, may not necessarily result in the completion of commissioning. However, the objective of the air distribution system acceptance should be to bring to a conclusion the activities detailed in this Code.

The 'accepted' air handling plant should be left in an agreed state of operation and control, with defined responsibility for its operation.

Note: air distribution system acceptance infers only the satisfactory completion of commissioning in accordance with this Code. It should not be confused with handover which may have other implications outside the scope of commissioning.

Appendices

AA1 Design implications

AA1.1 Introduction

Commissioning is not an optional process and the designer must accept the implications of the commissioning procedures to which the air distribution system will be subjected. In particular, inadequate commissioning of an air distribution system could result in poor environmental performance, energy wastage, draughts and noise.

The notes that follow are given as general guidance to the design implications of the procedures described in this Code. They are intended to serve to remind designers of the pertinent points of design that have a direct bearing on the commissionability of air distribution systems. The guidance in this appendix is intended to supplement the design information provided in other CIBSE related publications (to which the designer should make reference). It is not intended to be a design guide and, therefore, does not reproduce or summarise design procedures contained in such guides.

AA1.2 Design requirement

Commissioning in general, and the regulation of air flow rates in particular, will be considerably influenced by the facilities afforded by the design. In the context of this Code, the designer's objective must be to design an air distribution system where the arrangement of ductwork and the selection and disposition of components within airways, particularly the means of air flow regulation, will promote a stable and balanced air flow. Following the guidance given in this appendix will help to ensure that the design incorporates the necessary provisions for access and other factors that affect commissionability, including the location of test points.

To ensure that the design aspects are properly and effectively communicated to other parties involved in the construction process, it is recommended that an unequivocal specification be prepared to describe the works. Early discussions with commissioning specialists may prove to be helpful to the designer in optimising the practical aspects of testing and balancing.

AA1.3 Design information

AA1.3.1 General

The production of the information identified in this appendix may become the responsibility of various parties involved in the design and construction process. It is not the task of this Code to assign such responsibilities, but to point out that the overall objective should be to ensure that the information is properly communicated to the commissioning specialist. Failure to provide the commissioning specialist with complete information will seriously limit the effectiveness with which the various tasks associated with commissioning as prescribed by this Code can be carried out.

AA1.3.2 Schematic drawings

A properly prepared and detailed schematic drawing or 'functional diagram' is an extremely useful method for passing the designer's intent to the commissioning specialist.

Such a drawing should show the general disposition and sizes of the distribution ductwork, including the positions of:

— test points

— branch dampers

— fire dampers

— fans

— louvres

— control sensors

— grilles (together with details)

— heater/cooler batteries

— filters

— terminal units

— energy recovery devices.

Design flow rates (including any special tolerances) and pressure drops should be recorded on the drawing, ideally at the positions of selected test points.

Such a drawing should enable the commissioning specialist to visualise the system and gain a broad understanding of the commissioning requirements at a glance.

AA1.3.3 System description

A clear, specific and concise description of the system, including all operational modes and the overall control philosophy, should be part of the package of information provided to the commissioning specialist.

AA1.3.4 Layout drawings

Layout drawings are primarily intended to show how the air distribution system is to be fitted into the structure and, as such, have a different purpose from the schematic drawing, which serves mainly to locate components within the air distribution system. Many layout drawings are normally needed to show how the installation is to be achieved, whereas the aim of a schematic drawing is to show the complete system on as few drawings as possible (ideally on one).

AA1.3.5 System specification

A specification should be provided detailing materials, construction methods, controls, site erection and commissioning requirements. The specification should identify any specific commissioning and testing activities that may be required.

It is essential that all airways have a high degree of air tightness. For high velocity ductwork systems, recognised air leakage tests should be specified.

AA1.4 Design development considerations

AA1.4.1 General

It is particularly important that the designer gives careful consideration, during design development, to the many factors that can have a significant effect on the commissionability of an air distribution system. Reference to the following factors should assist the designer in ensuring

that the commissioning process is not adversely affected by design team decisions.

AA1.4.2 Accessibility

When positioning plant within a structure, sufficient access should be provided to enable the commissioning specialist and, ultimately, maintenance operatives to carry out their duties safely. For example, the configuration of ductwork should be such that a pitot tube can be inserted, which typically requires clearances of at least 1.5 times the duct diameter/width.

The ductwork should include access panels where items such as dampers, sensors etc. are located so that these items can be inspected and, where necessary, set up during the commissioning process. The access panels should be of a size that allows safe and effective inspections to be carried out.

AA1.4.3 System flow rates

Consideration should be given to the method of ductwork sizing. Typical methods are based on velocity or pressure drop, but whichever method is used, the designer should ensure that the resulting velocities at specified test points or control sensor locations are readily measurable and as stable and uniform as possible. Ductwork configurations that give rise to excessive air turbulence should be avoided.

AA1.4.4 Test point positions

The position of test points and how the necessary measurements are to be taken at such locations need to be considered. Locations for test points should be selected where there is sufficient straight ductwork upstream to ensure stable and uniform air flow. See BSRIA Application Guide 3/89.1: *The commissioning of air systems in buildings*[1].

AA1.4.5 VAV systems

Operating principles of VAV systems are necessarily more complex and, therefore, merit more careful explanation by the designer.

As part of the design basis for VAV systems, the designer should determine a VAV diversity ratio (see section A0.2).

Consideration should be given by the designer as to how the diversity is to be imposed on the system during commissioning. All such information should be included in the package of information provided to the commissioning specialist.

AA1.4.6 Grilles and diffusers (terminals)

Where the design incorporates terminals, such as slot diffusers, that do not lend themselves to the process of air volume flow rate measurement, the designer should consider carefully how final terminal air velocity measurements can be made. An assessment should be made of the impact that factors such as the accuracy of these measurements may have on the system performance and how this might affect design requirements. The designer should also address how air distribution patterns within the conditioned space will be set up and, if necessary, measured and/or visualised to ensure they meet the design concept.

Note: ensuring that all terminals on any one branch are of the same type will simplify proportional air balancing.

AA1.4.7 Controlled space pressures

The specific requirements for pressure differentials between various parts of a building (e.g. between sterile and non-sterile facilities) need to be considered, including how the pressure differentials are to be set up, measured and demonstrated. This will invariably require an analysis of the performance of building fabric elements such as doors and windows.

Pressure regimes are often difficult to set up because they involve many factors, some of which may be outside the direct control of the commissioning specialist. Consequently, there is an even greater requirement for effective communication between the various parties involved. Detailed, agreed commissioning method statements are essential.

Where it is the designer's intent to pressurise one section of the building with respect to another, the required area-to-area pressure differentials should be clearly defined in both the design and acceptance criteria for the associated ventilation systems.

AA1.4.8 Specialised products and fitments

The location in the air distribution system of specialised items (e.g. energy recovery devices) and their effect on system pressure and flow rate should be considered. (Provision for measurement of flow and pressure across such equipment is necessary for the effective trouble-shooting of performance problems, either during commissioning or in later operational stages.) Access to such equipment requires special consideration to enable operatives to perform trouble shooting and measurement tasks safely.

Proprietary self-regulating devices and commissioning (measuring) aids, e.g. constant volume dampers, flow grids and orifices, will provide their full performance potential only if installed in strict accordance with manufacturer's information. Any limitations specified by the manufacturer must be taken into account by both designer and installer if such devices are to be used successfully.

AA1.4.9 Specialised testing methods

Specialised testing procedures can range from the simple to the very elaborate, with a consequent effect on the overall commissioning process. Should the designer require any specialised testing to be carried out, requirements should be clearly identified in the specification, along with the objectives of the tests and how they are to be performed

Smoke visualisation techniques, for example, can be helpful during the final setting up of a system to ensure that the desired air flow patterns are achieved.

AA1.4.10 Avoidance of draughts

It is important that air distribution to occupied spaces is achieved without causing draughts, particularly where people are likely to be sedentary. Draughts from air distribution systems can be a source of nuisance to a building's occupants and the choice of terminal outlet, and how it is to be commissioned, should be considered at an early stage and clearly specified.

Note: airflow impingement on occupants may be desirable where metabolic activity rates are high.

AA1.4.11 Avoidance of noise

Design consideration should be given to ensure that plant noise is minimised and that the system can be correctly set up by the commissioning specialist without the introduction of regenerated noise.

AA1.4.12 Manufacturer's information

Manufacturer's information should be made available to the commissioning specialist at the outset of the work.

Where a particular product is specified, it is important to ensure that the means are provided to enable the commissioning specialist to commission it as part of the whole system, either directly or in conjunction with the manufacturer's commissioning personnel.

AA1.4.13 Witnessing

Careful consideration should be given to the scope of the witnessing requirements. Such factors might include the nomination of the witnessing authority and specification of witnessing procedures and reporting arrangements. The requirement for commissioning management should also be addressed.

AA2 Installation

AA2.1 Introduction

Installers must accept that commissioning is not an optional process and should, therefore, pay particular attention to the installation of facilities that affect the commissionability of a system.

The recommendations that follow are given as general guidance to assist in the achievement of a satisfactory installation, such that the recommendations of this Code can be properly implemented by the commissioning specialist.

Such guidance is intended to supplement the installation information provided in CIBSE and other similar guidance.

AA2.2 Requirements

The installer should have a thorough understanding of the specified commissioning requirements prior to commencing installation, including the implications of the programme, ease of access and facilities to be provided.

The installation objective is to interpret the design requirements correctly and so bring the system to static completion. Installation includes any cleaning and leakage testing of the distribution ductwork in accordance with the specification, prior to the commissioning process being implemented.

When preparing working drawings and physically positioning plant and ductwork within a structure, sufficient access should be provided to enable the commissioning staff and, ultimately, the maintenance operatives to go safely about the tasks of measurement, regulation and servicing. This entails particular considerations, such as the provision of suitable access for pitot traverses for air flow rate measurements. (Note that, typically, a clearance of 1.5 times the duct width/diameter is required to insert a pitot tube into a duct.)

Early consultation with the commissioning specialist is helpful.

AA2.3 Cleanliness

During the installation of air distribution systems it is of prime importance to prevent the ingress of general building debris. The installing contractor should promote a 'good housekeeping' initiative to protect open-ended ducts, terminal devices and air handling units from contamination. Ductwork risers should be capped to prevent use as rubbish chutes.

Terminal devices such as constant and variable volume regulators should be disconnected from the distribution system until such time as the main ductwork has been cleaned, inspected and tested.

In some instances, decontamination (disinfection) procedures may need to be implemented. Where this requirement applies, facilities should be provided for the work to be carried out.

AA2.4 Inspections

Commissioning does not include the detailed inspection of ductwork systems for defects and deficiencies. Regular inspections by the relevant authority should take place during, and at completion of, the installation of all systems to ensure readiness for commissioning to commence (see section A0.5). These inspections should ensure that ducts, dampers, terminal devices, hangers, flexible connections etc. are installed in accordance with the project specification and the manufacturer's recommendations.

Particular attention should be paid to the order, aspect and direction of air flow through air system components, as well as to the general cleanliness of the installation.

All main, branch and terminal unit dampers should be inspected for free operation and be left in the fully open position in preparation for the commissioning process.

AA2.5 Ductwork leakage testing

It is essential that all airways have an appropriate degree of air tightness.

Where required by the specification, ductwork leakage testing should be carried out in accordance with DW142 *Specification for sheet metal ductwork: Low, medium and high pressure/velocity air systems*[4] or other related standards, as specified. (See also DW143: *A practical guide to ductwork leakage testing*[5].)

Ductwork leakage testing is normally carried out during installation with remedial action undertaken, where necessary, by the installer prior to the commencement of commissioning. The test results should be properly documented and the records included with the commissioning information.

All leakage testing should be carried out prior to the installation of false ceilings, cladding of risers or application of thermal insulation. Precise records must be kept of the location of temporary blanking plates, which must be removed immediately on successful demonstration of system integrity for the section under test.

Where systems are not subject to a recognised leakage test, meticulous ongoing visual inspections should be carried out during installation to ensure that jointing arrangements are satisfactory.

AA2.6 Static completion certification

The installer should carry out a formal inspection procedure so that the static completion of each system or group of systems can be established and certified. Any commencement of commissioning prior to the static completion of a system is likely to be abortive and to result in cost penalties for both the installer and the commissioning specialist.

The installer should provide the commissioning specialist with copies of all relevant documentation verifying the static completion of each system prior to commencement of the commissioning process. This should include certification of air leakage test acceptances where appropriate.

AA3 Measurement of air flow and calibration of instrumentation

AA3.1 Equipment, instruments and measuring techniques for typical applications

The BSRIA Application Guide 3/89.1: *The commissioning of air systems in buildings*[1] provides details of equipment, instrumentation and procedures for optional on-site flow measuring techniques for a range of air flow applications.

The options offered are well proven techniques which, in general, are universally acceptable for the particular application. The commissioning specialist should select the appropriate option from the range of techniques available, ensuring that this satisfies the specification or meets the approval of the witnessing authority.

AA3.2 Instrument calibration

The commissioning specialist should ensure that all instrumentation to be used on a project meets the calibration requirements of the specification. In the event of any doubt, the commissioning specialist should prepare a detailed schedule of the instrumentation proposed for use and seek formal approval of this.

Instrument calibration is an expensive process and it is therefore desirable to ensure that calibration requirements are appropriate to the application.

AA3.3 Comparison of two or more methods of measurement

Where an air distribution system incorporates differing sizes or types of terminals which dictate different methods of measurement, the following procedure should be adopted to compare the indicated rates of air flow at terminals.

Choose one terminal of each type that is preceded by sufficient straight ductwork of a uniform size to enable a satisfactory measurement of air flow to that outlet alone to be made. For each of the chosen terminals, the indicated rate of air flow is measured first at the terminal in the manner appropriate to its type and then within the duct connection to the outlet by means of a pitot-static tube and manometer. In both cases, the methods described in the BSRIA Application Guide 3/89.1: *The commissioning of air systems in buildings*[1] should be used. Corrections for air density will not normally be necessary in this instance.

The ratio of indicated values of rate of air flow thus obtained is the factor relating the measurement at the terminal to its 'equivalent pitot' measurement at that rate of flow. The rate of air flow at the terminal should then be altered and the operation repeated to obtain the factors relating terminal and 'equivalent pitot' measurements over a range of rates of air flow appropriate to the particular system concerned. For convenience, the measured data may be plotted in graphical form to provide ready reference to 'equivalent pitot' flow rates within the range of the comparative measurements made.

This done, any measurement at terminals of indicated rates of air flow can be expressed in terms of their 'equivalent pitot' values by applying the factors already established. Once expressed in this common equivalent value form, the readings obtained at different types of outlet by different methods of measurement can be compared.

AA3.4 Tolerances for regulation of air flow

During the regulation of a group of terminals or branches (see sections A3.3.1 and A3.3.2), the adjustment of dampers to obtain identical indicated percentages of design air flow for all outlets or branches within the group is both unnecessary and impractical. Nor is it necessary or practical during the regulation of total air flow (see section A3.3.3) to make adjustments to obtain a definitive value of total air flow which is precisely the design total air flow. In all cases, realistic tolerances must be defined which, while satisfying the ultimate design requirements, provide targets that can be attained with reasonable economy during the regulation procedure. Suitable tolerances that may be considered good practice for general use on most air distribution systems are suggested in Table A1. The tolerances for a particular system may vary from those suggested, depending on the layout and prevailing requirements.

The responsibility for defining the tolerances rests with the designer of the system, who should recognise that unnecessarily close tolerances, if attainable at all in practice, will add significantly to the cost of commissioning the system.

The commissioning specialist should report to the designer at the earliest opportunity any difficulty in meeting the specified tolerances, so that a decision may be taken as to whether to widen the tolerances or to modify the system.

It must be noted that the tolerances detailed in Table A1 are based on repeatable, reproducible air flow measurements. Any error inherent in the instrumentation or resulting from the technique or operator are excluded. An indication of the likely magnitude of such errors may be estimated from the details given in BSRIA Application Guide 3/89.1: *The commissioning of air systems in buildings*[1] and from the data provided by the instrument manufacturer. It must be borne in mind that the various elements of possible error may or may not be cumulative.

Note: the tolerances given in Table A1 for terminals or branches are suggested as the allowable increase over the lowest measured indicated percentage: that is, if the lowest terminal on a low performance effect system indicates 80% of design, then the highest terminal should be no more than 80+(80 × 20%) = 96. Tolerances given for total flow rate are suggested allowable deviations from definitive design volume flow rate.

Where the supply total air flow rate tends toward the limit, i.e. 100% or 110%, the associated extract total air flow rate should be regulated toward the same limit. Tolerances shown for terminal balance are those accumulated during terminal and sub-branch regulation.

Where a separate branch balance is not carried out and the total system terminals are scanned in one continuous operation, the permissible tolerance for the terminal balance would normally be the sum of the figures shown in Table A1 for terminal and branch balance.

Table A1 Cumulative tolerance limits for regulation of air flow

Type of system	Performance effect	Terminals	Branches	Total airflow
Mechanical ventilation Comfort cooling	Low	+20% of lowest terminal	+10% of lowest branch	+10% −5%
Air conditioning Pressurisation of escape routes	Medium	+15% of lowest terminal	+8% of lowest branch	+10% −0%
Close control air conditioning	High	+10% of lowest terminal	+5% of lowest branch	+5% −0%

AA4 Health and safety arrangements

AA4.1 Introduction

Although the health and safety arrangements summarised below do not form part of the commissioning procedures prescribed in this Code they are important, fundamental requirements that should be borne in mind by the commissioning specialist. For full details of the requirements, reference should be made to the appropriate Approved Codes of Practice published by the Health and Safety Commission, and to the CIBSE Technical Memoranda TM20: *Health, safety and welfare in the built environment*[6].

With the advent of *The Construction (Design and Management) Regulations 1994*, much of what was previously good practice in health and safety has now become a formal, statutory requirement.

AA4.2 Contractor's duties

All contractors on a construction project, including subcontractors and any specialists engaged by them (e.g. the commissioning specialist), must be able to satisfy the person appointing them that they are competent to carry out or manage the work for which they are responsible. This competence would include all health and safety aspects. To meet this general requirement it may be construed that all contractors should have a health and safety policy, together with management procedures for health and safety, covering all aspects of their work sector package. All contractors must also be able to demonstrate their procedures to develop and implement the project health and safety plan. This plan may either be that prepared by the project design team, or the base plan as already developed by the main (principal) contractor.

The contractor must also be able to demonstrate the approaches to be adopted to deal with any high risk areas of the work and the arrangements for monitoring the work to ensure compliance with health and safety legislation. Personnel employed by the contractor to carry out or manage the work must have the requisite skills and training and be allocated time to complete their work without risks to health and safety.

The preparations that a contractor is required to make include formal risk assessments of the work to be planned or carried out under their contractual responsibility. Where the work entailed is generic or typical (e.g. working at heights) these assessments may form part of the contractor's standard documentation. The principles for carrying out risk assessments as detailed in *The Management of Health and Safety at Work Regulations 1992. Approved code of practice*[7] form a useful basis, but it should be borne in mind that a construction site environment is likely to be more hazardous than established workplaces.

In addition to the requirements outlined above, which are generally of a preparatory nature, the contractor when on site is required to:

(*a*) cooperate with and comply with the directions of the main contractor

(*b*) comply with the project health and safety plan

(*c*) provide the main contractor with any information that might affect health and safety and notify the main contractor of any accident

(*d*) ensure that all employees are aware of the name of the main contractor and the project planning supervisor and of all relevant content of the project Health and Safety Plan.

References

1 Parslow, C J *The commissioning of air systems in buildings* Application Guide **3/89.1** (Bracknell: Building Services Research and Information Association) (1992)

2 Harrison E and Gibbard N Balancing air flow in ventilating duct systems *JIHVE* **33** p 201 (1965)

3 *Commissioning of VAV systems in buildings* Application Guide **1/91** (Bracknell: Building Services Research and Information Association) (1991)

4 *DW142 Specification for sheet metal ductwork: Low, medium and high pressure/velocity air systems* (Penrith: Heating and Ventilating Contractors' Association) (1982, amended 1988)

5 *DW143 A practical guide to ductwork leakage testing* (Penrith: Heating and Ventilating Contractors' Association) (1994)

6 *Health, safety and welfare in the built environment* CIBSE Technical Memoranda **TM20** (London: Chartered Institution of Building Services Engineers) (1993)

7 *Management of Health and Safety at Work Regulations 1992. Approved code of practice* HSE Legal Series **L21** (Sudbury: Health and Safety Executive) (1992)

Index

A52825963

The Chartered Institution of Building Services Engineers
222 Balham High Road, London SW12 9BS
+44 (0)20 8675 5211
www.cibse.org

NHS Greater Glasgow and Clyde
Acute Services Strategy Implementation and Planning Directorate
Project Executive Group

Minutes of Meeting held on Wednesday 30th August 2006 at 2.00pm
Conference Room, Southern General Hospital

		ACTION
1.	**Apologies/Introduction** See attached sederunt for attendees. Helen Byrne congratulated the ACAD Team on the FBC being approved by the Scottish Executive.	
2.	**Minutes of ASR Programme Board/Project Executive Joint Meeting held on 26th July, 2006** The following points were noted as amendments to the minute of 26th July, 2006. <u>Childrens Hospital Amendments</u> • Point 4 should read – Outpatient Clinic Group is moving forward with some outstanding issues. • Last paragraph should read – Morgan Jamieson confirmed that the Ronald MacDonald House have aspirations to provide funding for 30 families who require, due to patients condition, to be locally based. • Also last paragraph – Alan Rodger is linking with the Teenage Cancer Trust on behalf of the Beatson Cancer Centre, and separately Morgan is liaising with the Trust about the Children's Hospital.	**EH**
3.	**Matters Arising** • Morgan Jamieson asked what the outcome of Brian Cowan's meeting with Charles Swainson, Medical Director, Lothian Health Board was in relation to Neurology Paediatrics. Brian confirmed a meeting with Charles had been held but the meeting did not conclude with future agreement of the way forward. The national report next year will progress discussions. • Helen Byrne provided feedback on the Clyde review to date. A meeting held on 23 August on Inverclyde Hospital where the work to date was fed back. Helen advised that the first working group of the RAH was established last week. The RAH meetings will include Paediatrics and Obstetrics in the future. Communications will be ongoing with Jacqui Campbell. Rosslyn Crockett to meet and discuss neonatal issues. Work is progressing in relation to the Vale also. It was agreed that the work will be drawn to a conclusion to form a strategy by end December 2006.	RC

	• Workforce is being led by Derek Morgan with the directorates for the New Hospitals in Glasgow OBC.	
	• Clinical Strategy final document has been issued widely. Helen asked for the document to be re-issued to PEG members to ensure everyone had received a copy. Helen thanked Heather for her work in finalising the document.	**EH**
	• Helen advised that a service redesign meeting has taken place on 30th August 2006. The re-design post is being advertised and it has been agreed that the main focus of the post will be establishing the current position as a start point and then setting down the direction of travel.	**HB**
	• Maternity Strategy work is ongoing, focussing on the closure of the Queen Mother ward by November 2006. Work also ongoing in relation to SGH Maternity Wing and accessing work at PRMH. Tony Curran is to produce a paper for the next meeting.	**TC**
	• Helen is chairing the GGH Review Steering Group and advised that the sub groups and membership are now established. The work of the groups will be updated at the SMG on 28th September 2006 with the aim to complete the review in 2007. Jim Crombie emphasised the need to ensure the Laboratory and Imaging reviews are updated on any changes to the extant position of the GGH. There was concern raised by Brian Cowan that the Imaging Review had not taken the extant position into account. It was agreed that the GGH Review would keep the Diagnostic Directorate appraised of any developments agreed to the extant position which would be reviewed through the correct process. Morgan Jamieson highlighted the Cystic Fibrosis services and possible combined adult and paediatric service. This would have an impact on the extant position of GGH. Helen advised this would have to go through the due process of the Review via the Unscheduled Care Sub Group. She will raise the issue with Grant Archibald, Chair of their Group.	**HB** **HB**
	• The technical advisers fees in relation to the Children's Hospital have now been agreed and Heather informed the group that this was now with Alan Lyndsey.	
4.	**New South Glasgow Hospital** • **Adult Hospital Update** Heather Griffin provided a brief on the key pieces of work: – Schedules of Accommodation. The following has been agreed at this stage: – 1176 beds – 26 bedded wards – 50% single rooms in wards – Revenue implications to be completed by end September 2006.	**HG**

	– The architects are advising what the requirements are of the site relocation, as in what is free area to relocate and phasing of the build. Timescale – end September 2006. – JMP will undertake a travel impact assessment and prepare a green travel plan. Main issue will be around procurement for both the Adult and the Children's Hospitals, for a meeting in October 2006, following a workshop in August 2006. The Group then had the following discussions: • Sandra Davidson asked if any meetings have been held with the staff side in relation to FM services. Alan Seabourne confirmed that there had been difficulties setting up the meetings and that meetings were set up with officials on 21st/28th September which Alex McIntyre and Alan will attend. • Peter Gallagher agreed that work had been completed on the Capital Charges but had concern about the detail of the additional finance streams and timescales. Fiona Mercer advised that, for the Children's Hospital, high level and broad brush figures are being worked up on revenue costs. Alex McIntyre also added that the OBC requires to have robust figures to take forward to FBC. • Margaret Smith added that the nursing and midwifery workforce has provided more detail than is required for OBC but is part of the ongoing strategy and will provide the information required for the OBC. Brian wished to note that the workforce planning for medical staffing is not highlighting a radical difference in the current configuration of medical staffing (junior and consultant cover). From the current establishment to the future, Robert raised the affordability of this within the business case for the New Hospitals. **Children's Hospital Update** Fiona Mercer updated on the Children's Hospital. • First bed modelling report was received from CHKS which identifies a reduction in bed numbers. CHKS will provide a final report, after discussing areas which were unclear by the end of this week. One issue is CHKS view re paediatric population reduction and the parameters, which GG&C want to use. • CHP's managers are engaged. Work ongoing. • Work is underway on workforce and finance and Fiona emphasised the information was high level for the OBC. • Morgan added that the paediatric event of the 29th August was well supported. • Alan Seabourne asked for confirmation that surgical neonatal bed were to be included in the new Children's Hospital.	**AS**

	Robert/Helen confirmed this was the case. • Scottish Executive Meeting – Alan updated that at the recent meeting with the Scottish Executive, the work plans and work streams had been discussed in relation to the new South Glasgow Hospitals. It was agreed that the OBC requirements should follow the National and GG strategy at this stage. Alan added that it was a positive meeting.	
5.	**Infectious Diseases** Brian Cowan outlined the work carried out over July 2006 on the Infectious Diseases Location of Service Option Appraisal. The work included weighting, scoring and financial details for the final report. Brian pointed out that uniquely in the UK, Glasgow's IDU is based in a non-acute setting at GGH. In order to ensure the co-location of the services and desirable link to key specialties, it is proposed to relocate the unit to the new hospital acute site at SGH. It was recognised that there would be a significant additional cost associated with relocation to the SGH and a further option of a partial transfer of the service was added in May 2006. The options for the future location of ID were defined as follows: Option 1 – ID Service remains at GGH, with £500k capital development funding Option 2 – ID Service fully transferred to new SGH Option 3 – ID Service partially transferred to new SGH Option 3 would involve inpatients and the OHPAT (Outpatient and Home Parental Antibiotic Therapy) service being transferred to SGH while the administrative base and outpatients remain at GGH. An overall comparison identified Option 1 being the best financial option and Option 2 the best clinical option. Robert Calderwood expressed that at a high level, the cost of option 2 brings a challenge to Capital Funding. Peter Gallacher pointed out the significant financial challenges posed by Option 2. Brian Cowan expressed concerns, from a clinical point of view, about not having ID services on an acute site in the future. For example, if a new SAR's breakout was to happen, then ID would be best placed close to A&E and ITU Mandy Robertson asked what staff involvement there had been in the option appraisal. Brian Cowan advised that it had not been included formally but there had been additional staff representation from the Brownlee Centre at the first meeting to facilitate the exchange of information. The transfer of services to a new acute site was received favourably. Margaret Smith asked if the clinical model was robust as her understanding was that ID were moving towards ambulatory care provision. Brian agreed that this is the vision and the benefits would be that locating on an acute site the service would be able to link closer to A&E clinicians and patients on site. Therefore there would fewer admissions and fewer beds required.	

	Robert Calderwood suggested that, depending on the outcome of the Gartnavel Review, GRI could be an option at a later stage. Brian agreed that there would be the same clinical views for siting on GRI or SGH which will have A&E and ITU facilities. It was agreed that when presenting to the Board, stressing the importance of the conclusions of the GGH reviews, if less acute, that Option 1 was not viable and the SGH/GRI would be the site options. Therefore it was agreed the decision would be put on hold until the outcome of the GGH Review.	**BC**
6.	**Bed Modelling** Helen advised the group the Bed Modelling paper will be finalised to go to the Board Seminar on 3rd October 2006. The following work requires to be finalised by the last week of September. • Heather Griffin is finalising bed numbers for the new South Glasgow Hospital. • Fiona Mercer progressing bed numbers for the Children's Hospital. • Jane Grant meeting with colleagues to discuss surgery and 5-day ward issues which have been raised. Jane also raised that one of the issues included in the bed modelling is waiting times at 15 weeks and 12 weeks and will provide comments to Joe Clancy. • Anne Harkness is taking forward the bed numbers for all aspects of rehabilitation to clarify the placement of bed numbers. • Cardiology bed numbers are coming to a closure in terms of resource transfer to the GJH. Robert noted that there would be a potential Clyde impact on the new South Glasgow Hospital, particularly in relation to regional services such as head and neck regional planning. Part of centralised service planning and impact still to be analysed.	**HG** **FM** **JG** **AH**
7.	**University Involvement** Meetings with the University have made it explicit that the action is required from the University on how they foresee how to move forward in line with the ASR plans. Helen briefed the group on the update so far: • Professor Barlow has agreed that the University would wish to have a major presence on the SGH site but not necessarily embedded in the new build. • Current site locations requires to be reconciled with costs of relocation. Three main areas require to be considered – Educational Centre, University building and clinical research facility. Heather has received a letter from Prof Barlow setting out requirements and agreed to share this letter urgently with Robert and Tony. Heather agreed to provide an update to the next meeting.	**HG**

	Margaret Smith also emphasised the need for nursing, midwifery and AHP education and links with the appropriate universities. Morgan noted that librarian services need to be considered. Margaret agreed to feedback from the Group reviewing all educational facilities lead by Jim Miller for the next meeting and update on links with wider universities.	**MS**
8.	**Transport** Niall McGrogan presented a presentation `Public Transport to New Hospitals Campus'. The presentation highlighted the following to the group: Niall analysed the major patient, visitor and staff flows that related both to the current SGH and Childrens Hospital and to the new reconfigured hospital complex. He highlighted the importance of transport routes from the City Centre, the West of Glasgow and the South East of Glasgow to the new Hospital Complex in underpinning good access from all parts of the Boards area. Further, Niall explained that the route from the city centre and from the West oF Glasgow were important in terms of providing access to the new SGH for those arriving by public transport from across Scotland. Niall then presented on proposals to develop major infrastructure developments which could support this access. these include the current rebuilding of Partick Interchange, the proposed rebuilding of Govan Underground and the proposal to develop a Light Rapid Transit System from the City Centre along the Clyde out to the SGH. Should these proposals come to fruition, the new SGH will have excellent access arrangements. Niall also highlighted further work which was taking place to improve public transport. This included the development of an action plan with the Regional Transport Partnership, the development of a pilot project to integrate resources held by SAS, Glasgow City Council and SPT, support for the community transport sector and work to build capacity within the CHCPs to undertake transport work. Niall finished by outlining the possible work that CHCPs could undertake. Niall also highlighted the following <u>CHP/CHCP Transport Streams</u> Below are listed some components of transport related work likely to be common to each CHCP: • Supporting the health and social care input into Local Transport Strategies. • Data gathering, development of local intelligence • Participating in community planning transport workstreams • Participating in community safety partnerships/safety initiatives • Supporting staff travel initiatives • Supporting the introduction of travel plans by Local Authority partners and schools. • Developing local transport initiatives eg. access to GPs, access to acute sector, fresh food, employment, social care facilities, transport for housebound patients, transport to rehabilitation groups, support transport volunteering schemes for specific services. • Developing and promoting Active Travel Initiatives – Cycling, Walking, School Walking buses etc. • Supporting integration of social services resources with SAS/SPT/CT.	

	• Contributing to Board policy development and intelligence gathering. • Transporting user involvement and community engagement. The input of the CH(C)) Ps into the transport agenda needs clarifying as they have a key role to play.	
9.	**Community Engagement** • The Children's first focus group has taken place. • Early October 2006 - aiming for a public launch. • Feedback from Yorkhill focus group is positive.	
10.	**Arts and Well-being in New Hospitals** Anna Baxendale talked to the group in relation to the progress with the ACAD Arts Project and Proposal for the new South Glasgow Hospitals. Anna provided background to date and the work ongoing with ACAD, which she advised was late in the engagement process and proposed engagement with the new South Glasgow Hospitals should commence as soon as possible. There is also a strategic role required to develop new developments. Clear area is to link with community development. There is a requirement to link into the new hospital OBLI FBC process and ACAD incorporation so far. The group agreed that there would be three main streams of works as follows: • Accommodation of art work • Ongoing curation of art work • Space for out events Margaret Smith/Brian Cowan/Helen Byrne commented that a strategy is required and detail for the new SG Hospitals Business Case would be required. They emphasised at this stage, prior to investment in an external resource, to take this forward internally by actioning the following suggested by Niall McGrogan: • Looking at integrated art and revenue implications • Curatorship and cost • Developments with Govan Action Plan. It was also suggested that development work elsewhere be considered and researched. It was suggested a small group look at the above options.	**AB**
11.	**A.O.C.B** Morgan Jamieson is meeting with GEMs to discuss further location of service and will involve Alan and Grant.	**MJ**
12.	**Date of Next Meeting** Monday 25th September, 3.00pm Conference Room, Southern General Hospital	

GREATER GLASGOW AND CLYDE NHS BOARD

ACUTE SERVICES STRATEGY IMPLEMENTATION AND PLANNING DIRECTORATE

PROJECT EXECUTIVE GROUP

Meeting to be held on Wednesday 30th August 2006 at 2:00 pm
Conference Room, Southern General Hospital

SEDERUNT

Name	Present	Apology
Grant Archibald	✓	
Anna Baxendale	✓	
Helen Byrne	✓	
Dorothy Cafferty		✓
Robert Calderwood	✓	
Iona Colvin (Fiona Moss attending on behalf)		✓
Brian Cowan	✓	
Cathie Cowan		✓
Jim Crombie	✓	
Tony Curran	✓	
Sandra Davidson	✓	
Peter Gallagher	✓	
Jane Grant	✓	
Heather Griffin	✓	
Elaine Harris	✓	
Morgan Jamieson	✓	
Calum Kerr		✓
Anne MacPherson (Gerry Slevin, Head of HR Projects will attend on her behalf)		✓
John McCarthy		✓
Ally McLaws		✓
Niall McGrogan	✓	
Alex McIntyre	✓	
Fiona Mercer	✓	
Mandy Robertson	✓	
Alan Seabourne	✓	
Gerry Slevin (attending on behalf of Anne MacPherson)	✓	
Margaret Smith	✓	
Fiona Wade	✓	
Fiona Moss (attending on behalf of Iona Colvin)	✓	

NHS Greater Glasgow and Clyde - Project Executive Group Meeting 14th February 2007.

NEW SOUTH GLASGOW HOSPITALS - PROGRESS WITH STAGE 1 DESIGN WORK

Background

The design related outputs for Stage 1 are listed below and were set out in the Board's briefing document for Technical Advisers, as prepared in May 2005. The key design deliverables were;

- Development of the Design Brief.
- Option appraisal – preparation of options for site configuration based on the functional requirements for the new Adult Acute Hospital and latterly the new Children's Hospital.
- Campus Plan – Development of site master plan including associated phasing drawings.
- Preparation of Robust Public Sector Comparator based on requirements in NHS Estates – Design Brief Framework for PFI Public Sector Comparators at OBC Stage.

Current Position

Design Brief – the design brief for the new South Glasgow Hospitals is under continued development, which will be ongoing up to the issue of the ITP / ITN documentation. The preparation of the briefing document is a shared exercise between the Board's Project Team and the TA team. Documentation from our draft brief has recently been shared with Architecture & Design Scotland to inform the forthcoming Design Assessment of the NSGH project as part of the Gateway Review for OBC.

Option Appraisal – the site development options were developed in early Autumn 2006 and a preferred option agreed in October. The current site master plan reflects the Board's requirements of key service adjacencies (Maternity, Neonatal, Children's and Adult Services); related new developments on site (laboratories, University etc), all while maintaining operation of a large acute hospital campus. The preferred option has been further developed and incorporated into the Campus Plan and is the basis for the Outline Planning application to be submitted in late March 2007.

Campus Plan & Outline Planning Application – A detailed Campus Development Plan has been prepared and was submitted to Glasgow City Council in early December 2006. This has initiated what has become a regular dialogue with the City Planner's in the run up to the Outline Planning application (OPA).

The OPA is a key milestone for the project, as consent is required before the Board can take the project to the market and issue the OJEU advert (SEHD confirmed). The TA team are currently preparing the OPA submission and have confirmed that the documentation should be complete by end of March 2007.

Public Sector Comparator – the team are preparing a PSC design to meet the guidance and requirements of the NHS Estates document noted above. This work is required to inform the OBC submission in respect of design intent as well as confirmation of the level of capex, lifecycle and revenue costing work within the OBC. The level of design detail is set out in the guidance document and is summarised below, note this summary does not list all the requirements of the PSC design solution at OBC stage.

- Written statements on design approach, analysis, proposals and construction approach.
- Design brief.
- Report on Design Development / Strategic Concept.
- 1:1250 Site Development Control drawings – including phasing requirements.
- 1:500 Block Departmental Plans at all levels – adjacencies.
- 1:200 Floor plans showing typical ward layouts, key entrance and public space and a number of key departments. The review of detailed layouts will inform the communications % included within the capex for the OBC.

The PSC design information should be complete by mid April 2007.

GREATER GLASGOW AND CLYDE NHS BOARD

DIRECTORATE OF ACUTE SERVICES STRATEGY IMPLEMENTATION AND PLANNING

PROJECT EXECUTIVE GROUP MEETING

Notes of the meeting held on Wednesday 14th March 2007 at 15:00 in the Conference Room, Management Building, SGH

Present: Helen Byrne, Director Acute Services Strategy, Implementation and Planning (Chair)
Alan Seabourne, Project Director, New Hospitals' Project Team
Sharon Adamson, Head of Acute Services Planning and Redesign
Brian Cowan, Medical Director
Sandra Bustillo, Head of Communications (Acute)
Morgan Jamieson, Medical Director, New Hospitals' Project Team
Heather Griffin, Planning Manager, New South Glasgow Hospital
Mairi Macleod, Planning Manager, New Children's Hospital
Mandy Robertson, Joint Secretary, Area Partnership Forum
Sandra Davidson, AJOC Staff-side Representative
Anne MacPherson, Associate Director of HR (Acute)
Margaret Smith, Director of Nursing
Tony Curran, Head of Capital Planning and Procurement
Jane Grant, Director of Surgery and Anaesthesia
Derek Morgan, Workforce Planning Manager

Apologies: Fiona Wade, Assistant Director of Finance
Iona Colvin, Director of South West Glasgow CHCP
Alex McIntyre, Director of Facilities
Peter Gallagher, Finance Director
Anna Baxendale, Head of Health Promotion and Health Inequalities
Niall McGrogan, Head of Community Engagement and Transport
Robert Calderwood, Chief Operating Officer
Calum Kerr, Scottish Ambulance Service
Cathie Cowan, Director of South East Glasgow CHCP
Jim Crombie, Director of Diagnostics
John McCarthy, Head of Resourcing

In attendance: Andrea LaRoche, Secretariat Administrator (minutes)

1. Apologies

ACTION

Apologies were accepted from the above.

2. Notes of the previous meeting held on Wednesday 14th February 2007

Accuracy

- A Seabourne requested that last paragraph under item 5 be amended to say 'formally note the additional fees of £104k' and he will ensure that Ernst and Young have been notified of this decision; **ALaR AS**

- M Jamieson asked if his action point on page 5 was accurate around the requirement to check the formal procedures that need to be followed with NSD. It was thought to be accurate – M Jamieson will action. **MJ**

Matters arising

- **ACADs update** – will be discussed at the next meeting of the ASR Programme Board scheduled for Monday 30th April 2007;

- **A&E MIU Audit** – S Adamson advised that she met with M Smith to take this forward. They are looking at undertaking a full A&E audit. Kevin Begbie is leading this work;

- **Clyde work (South)** – H Byrne advised that the Board has given approval to the South of Clyde Strategy. A letter has been submitted to the Minister and feedback is expected within the next couple of weeks. There are some concerns around Dermatology services at the RAH but we are working with clinicians to progress;

- **Clyde work (North)** – H Byrne gave a detailed presentation to colleagues at the Beardmore Hotel on 26/2 about the developments on the strategy for North of the Clyde. The work has closed for now, ahead of the election period. M Robertson asked if the staff partnership arrangements had been put into place around any potential involvement of beds. H Byrne reassured that this would take place if appropriate;

- **Facilities Management –** A Seabourne advised that he met with A MacPherson, A McIntyre and staff partnership representatives to review the FM process. A MacPherson felt that the meeting was positive however unfortunately only one full-time officer attended. A paper will be submitted to the next PEG meeting for approval. A Seabourne advised that project support for the in-house bid would be included in the paper. The paper will be distributed to the staff-side groups that were not present at the meeting to allow them time to feedback and comment prior to formal sign-off. M Robertson and S Davidson will encourage their staff-side colleagues to provide comments. **AS**

3. Matters arising

Recruitment update

- **Workforce Planner** – H Griffin advised that Neil Wilson, Workforce Planner has started in post from 26/2. It was proposed that Neil Wilson has part-time accommodation at Hillington; Heather advised that a hot-desk is available for that purpose.

- **Procurement Officer** – A Procurement Officer will commence in post in April. They will continue to be based in Procurement but will provide support to the New Hospitals Project Team.

Update on West of Scotland work

- The next West of Scotland meeting will be held on 18/4. Preparation work is being completed ahead of the meeting;

- H Byrne advised that she attended the Children's Cancer Services Option Appraisal meeting on 7/3 however it was felt that there was inadequate information available on the day to make a decision about the preferred option. Following the meeting, she wrote a letter to the SEHD about her concerns. Tom Divers nominated H Byrne, Rosslyn Crocket and a number of other colleagues to represent GGC on the advisory panel that has now been established to progress the process.

4. Update on GEM Model – Generic Economic Model

This Model is being taken forward by finance. In the absence of Finance, H Griffin gave an update on the progress of GEMs.

H Griffin advised that the GEM Model for the children's hospital should be easier than the adult's to complete as it is seen as a 'discrete' entity moving to the SGH site.

The adult hospital model will be more complex as it will essentially be made up of segments of five other adult hospitals moving onto one site. The team is awaiting feedback from Finance around the level of detail required to allow the GEM Model to be undertaken.

H Byrne asked H Griffin for feedback on the meeting held with Forth Valley (FV). H Griffin advised that FV completed the GEMs for their FBC and that the information provided was very high-level. There is concern around the difference between the OBC and FBC stages – we must not be more than 10% outwith our original estimates.

H Griffin, M Macleod and F Wade met with Neil Wilson, Workforce Planner to look at information collation relating to the new children's hospital; they are liaising with M Smith and B Cowan around previous work done.

D Morgan advised that Neil would provide dedicated Workforce Planning support for the New South Hospitals. He has begun his work by looking at the new children's hospital and should have the GEMs work finished in May. Neil has scheduled meetings with the Acute Directors. There was discussion around whether having detailed information would be of benefit however it was agreed that the information gathered would help to inform the detail for the steps beyond. M Smith advised that a lot of work has been invested in this area previously; Neil will begin by looking at the work that has already been completed.

H Byrne stressed the importance of undertaking the Workforce Planning work in co-operation with clinical colleagues and the need to ensure that the Scottish Executive is kept up to date.

S Adamson advised that work around the Bed Model is continuing. Surgical and Medical Services are the largest and most complex areas for bed modelling. It is difficult to 'anchor' activity and the model assumes growth.

5. New South Glasgow Hospitals – next steps

H Griffin spoke to enclosure 2.

New South Glasgow Hospital: Re-engaging with User Groups
The adult project team are re-engaging with the Clinical Advisory Board and its component user sub-groups to validate and complete next stages.

Heather advised that the Clinical Advisory Group has been re-formed and B Cowan advised that there has been good feedback on this from clinicians.

New Children's Hospital: Continuation with User Groups
The project team have been playing "catch-up" with the adult project, therefore the Clinical Advisory Group and the user sub-groups are still meeting and continue to influence the emerging design of the new hospital.

Both Hospitals: Next Steps
The next steps for both hospitals are to complete the OBC and PSC and then move onto the production of the Clinical Output Specifications (COS). The COS is required as part of the Invitation to Participate (ITP), this document informs the bidders of the NHS client requirements.

As the project approaches OBC submission, the schedules of accommodation require to be validated. For a small number of areas, detailed layout drawings will be needed for both hospitals; these are:

- Main entrance, concourse, foyer and facilities;
- A typical Ward;
- Radiology;
- Critical Care;
- Emergency Department.

The briefs will be developed into the Clinical Output Specification (COS). The COS will show how the services will run, the patient pathway and activity. Further development of equipment schedules is necessary.

6. Technical Advisors

A Seabourne advised that he was planning on submitting a paper around the future cost of the Technical Advisors to the next meeting. This will also be an agenda item for the next ASR Programme Board meeting on 30th April. The additional TA fees of £104k were agreed at the PEG meeting on 14th February 2007.

AS
ALaR

7. Design Assessment – A&DS

A Seabourne tabled the Healthcare Design Assessment report from Architecture and Design Scotland. A&DS advise on the design of public buildings, looking at the physical design incorporating internal and external aspects. They will assess us on key stages of the Project. This is the first time that A&DS are dealing with a health project of this size.

The report relates to the design assessment carried out prior to the completion and submission of the OBC for the new hospitals. As part of the design assessment process, the Team were asked to submit information and to give a presentation to A&DS on 15th February 2007. The assessment is based on the written information provided by the Team prior to the assessment and supplemented by the presentations made on the day.

Overall, the Project Team were not satisfied with the assessment report, as it did not take into account either the information given in the briefing documents, or presented on the day of the assessment. A letter to this effect has been sent to A&DS, and a further meeting is being arranged with A&DS to discuss these points.

A Seabourne explained that the report is based on a 'traffic light' system; red are items that require immediate attention, amber meaning that the aspect requires ongoing attention and green indicates aspects that are progressing well.

A MacPherson asked A Seabourne what it would mean if we were given 'red' ratings for all of the items in the report – what would be the worst-case scenario? A Seabourne advised that we would need to progress all areas requiring urgent attention.

8. Taking forward work with the University/link with the Education Centre

B Cowan advised that there is an issue around the Clinical Skills Centre; clarity is required around its location on the SGH site and the timing. A Seabourne agreed to discuss the configuration plan with R Calderwood and look at how the university buildings fit onto this site or not. **AS/RC**

A Seabourne advised that there would be an opportunity to discuss the schedule of accommodation in more detail at a later date. There was a meeting to discuss the academic schedules of accommodation scheduled for today (14/3) however it was cancelled at the last minute. A Seabourne will be the central point of contact for the University work. It was suggested that A Seabourne should contact Professor Jim McKilloch on the academic work. **AS**

9. Architecture and Design Scotland – Design Plan update

GGC is implementing the Policy on Design Quality for NHS Scotland. One of the mandatory actions from the policy is to nominate Design Champions to take forward Design work for the Board. H Byrne and T Curran are the Design Champions, tasked with championing design for all capital builds for GGC.

A Baxendale and Mark McAllister are leading the work around developing a Design action plan. The Design Champion network meetings have been convened and membership includes key individuals who have an interest in design; the group is looking for a consultant representative. The group will meet four times throughout the year in order to deliver the Design Plan. A seminar will take place in June to bring in wider views from other partners and to look at the key principles that underpin good design. Currently, the timescale aims for submission of the Plan to the Board in October 2007 and for it to be finalised in November.

A LaRoche will circulate the briefing paper to all PEG members for information. This will be submitted to the Board in April and will be discussed at the next ASR Programme Board. **ALaR**

10. Timescales and next steps

H Byrne advised that the OBC would be submitted to the Board in May/June. Discussions are ongoing around affordability and it remains to be hugely challenging. We are adhering to the existing timescales.

An update paper is being submitted to the PRG next week (20/3) to ensure Board members are kept up to date on this development and on the ASR across the city.

11. AOCB

The Maternity OBC was submitted to the Board on 20/2 and subsequently approved. The OBC was then submitted to the Capital Investment Group (CIG) on 6/3. *(Update: Kevin Woods advised that the CIG approved the OBC in his letter to Tom Divers dated 14th March. The Maternity OBC will now proceed to FBC).*

T Curran advised that he is holding a series of meetings with the Design Team to look at finalising the Schedules of Accommodation and to ensure everyone is clear on the timescales.

12. Date and time of next meeting

The next meeting will be held on Wednesday 18th April 2007 at 16:00 – 18:00 in Boardroom 2, Ground Floor, Dalian House.

Please note change of date, time and venue.

GREATER GLASGOW AND CLYDE NHS BOARD

DIRECTORATE OF ACUTE SERVICES STRATEGY IMPLEMENTATION AND PLANNING

PROJECT EXECUTIVE GROUP MEETING

Notes of the meeting held on Wednesday 18th April 2007 at 16:00 in Board Room 2, Ground Floor, Dalian House

---

Present: Helen Byrne, Director Acute Services Strategy, Implementation and Planning (Chair)
Robert Calderwood, Chief Operating Officer
Alan Seabourne, Project Director, New Hospitals' Project Team
Alex McIntyre, Director of Facilities
Anne MacPherson, Associate Director of HR (Acute)
Brian Cowan, Medical Director
Iona Colvin, Director of South West Glasgow CHCP
Jane Grant, Director of Surgery and Anaesthesia
Jim Crombie, Director of Diagnostics
Mairi Macleod, Planning Manager, New Children's Hospital
Mandy Robertson, Joint Secretary, Area Partnership Forum
Margaret Smith, Director of Nursing
Mark McAllister, Community Engagement Manager
Morgan Jamieson, Medical Director, New Hospitals' Project Team
Neil Wilson, Workforce Planning Manager
Niall McGrogan, Head of Community Engagement and Transport
Peter Moir, Deputy Head of Capital Planning
Rosslyn Crocket, Director of Women and Children's Services
Sandra Bustillo, Head of Communications (Acute)
Sandra Davidson, AJOC Staff-side Representative
Sharon Adamson, Head of Acute Services Planning and Redesign
Tony Curran, Head of Capital Planning and Procurement

Apologies: Anna Baxendale, Head of Health Promotion and Inequalities
Derek Morgan, Workforce Planning Manager
Fiona Wade, Assistant Director of Finance
Grant Archibald, Director of Emergency Care and Medical Services
Heather Griffin, Planning Manager, New South Glasgow Hospital
Peter Gallagher, Finance Director

In attendance: Andrea LaRoche, Secretariat Administrator (minutes)

		ACTION
1.	**Apologies and welcome**	
	Apologies were accepted from the above. The group welcomed Neil Wilson, Workforce Planning Manager.	
2.	**Notes of the previous meeting held on Wednesday 14th March 2007**	
	• H Byrne asked that the second bullet point under item 2, page 2 read 'movement of beds' rather than 'involvement of beds'.	**ALaR**
	• T Cocozza requested an amendment under item 4, page 2 'Update on GEM Model'. The update should note that Finance are currently working on an 'incremental cost model' and will be working towards a Generic Economic Model post OBC approval;	**ALaR**
	• On the agenda, item 14 should read 'Glasgow Emergency Medical Services'.	**ALaR**

3. Matters arising

- **Taking forward work with the University/link with the Education Centre** – A Seabourne advised that he attended a meeting with Robert Calderwood, Brian Cowan, Jim Miller and Jim McKilloch to discuss the lastest thinking on the University developments. He advised that there were two critical elements to be considered. Firstly, the timing of access to construct the developments and secondly the issue of on-site versus off site. The feeling from the meeting was that having the facilities constructed before the new hospitals was preferable to being then on SGH site. Therefore it appeared that the site adjacent to the Maternity Unit would be the best choice.

  AS advised he had further meetings planned with the University and would update appropriate offices timeously.

- **West of Scotland work** – A Seabourne advised that he met with WoS colleagues earlier (18/4). The purpose of the meeting was to give a general update on progress relating to the new Children's Hospital. He advised them that the Project Team is continuing to work towards the June 2007 deadline to present to the Board. A further West of Scotland meeting will be organised for mid June 2007;

  H Byrne advised that she and R Crocket are participating in a video-link conversation with colleagues from the Children's Cancer Advisory Group in Grampian and Tayside on 27/4; **MS**

- **A&E/MIU Audit** – M Smith will provide an update on progress at the next PEG Meeting. R Calderwood asked if there was a protocol for the survey and if Stan Murray/Linda de Caestecker would be meeting with the A&E Community. S Adamson will discuss with G Archibald. **SA/GA**

- **Update on Clyde work –** H Byrne advised that the Minister for Health formally approved the proposal for changes South of the Clyde. The next meeting to discuss work North of the Clyde will be held at the end of April 2007.

4. Facilities Management – paper for approval

A McIntyre spoke to enclosure 2. The paper sets out the bidding process to support an internal team and provides supporting documentation. The group discussed the table under item 2.1 on page 2 identifying soft FM services to be tested. R Calderwood asked if any of the services shown would be covered by other service reviews e.g. car parking. A McIntyre will review. **AMcI**

M Robertson asked what would happen to this process if after the election, the wider political agenda changes. R Calderwood advised it would be reflected in the debate with the Board but he suggested that the bidding process would remain the same.

M Smith emphasised the importance of reviewing previous work and lessons learned from the ACAD project. A McIntyre advised that the Senior General Manager leading the project would meet with leads from the ACAD project.

The group reviewed the timetable in Appendix 1 on page 6. Consultation will take place during Summer 2008. The unions will nominate one joint representative to be consulted.

5. New South Hospitals

M Macleod advised that one Public Sector Comparator (PSC) is being completed for both hospitals. The schedules of accommodation have been reviewed and most have been agreed. 1:200 scale drawings for five departments in each hospital are being completed and the design will be reviewed over the next few weeks.

M Smith felt it would be useful to know who is signing off the schedules of accommodation. M Macleod will provide M Smith with the information. **MMacl**

6. Generic Economic Model

T Cocozza advised that the GEM is being considered at the total ASR level; Ernst and Young will be working with Finance and will be looking at affordability at ASR level. Tony will continue to lead this work. **TC**

7. Technical Advisors – future costs

P Moir tabled a paper, 'Technical Advisor Fees and Increased Scope of Project'.

As Stage 1 is concluded, the Project Team has reviewed the options open to the Board to take the existing TA appointment forward into Stages 2-6. The scope of the project has changed with the inclusion of the New Children's Hospitals and the proposed new Laboratory Block and consideration needs to be given in respect of compliance with Board SFIs and EU procurement rules and thresholds.

The Davis Langdon team has submitted a revised estimate of fees to complete the project, in the amount of £1.577m, an increase of £416k over their original bid. They have also prepared a full estimate of fees to take the New Children's Hospital forward through Stages 2-6, which amounts to £472k added to this is an estimate of £325k to include the Lab Project.

PM provided the views of the legal advisers and auditors which was to re-tender this work.

The Project Executive Group was asked to consider the information in the paper and give approval for the Project Team to advertise and re-tender the Technical Advisor team role for the new projects at the Southern General Hospital.

H Byrne and R Calderwood agreed with the recommendation to go to market. A Seabourne advised that this would need to be taken to the PRG.

8. Design Assessment – A&DS

A Seabourne submitted the letter from A&DS (enclosure 3) for information.

9. Planning update

A Seabourne advised that the Outline Planning Application had been submitted to GCC, which included the campus plan, a design statement, transport assessment and environmental statement. All neighbours to the SGH site have been notified about the development plans.

10. Design Plan update – briefing paper

A Baxendale's attachment was reviewed in her absence.

It was agreed the approach to the Design Plan would ensure wider involvement from partners and delivery of the design plan on time to the Board and SEHD/Architecture and Design Scotland (A&DS).

11. Social and Economic Benefits Analysis of New South Glasgow Hospitals

M McAllister spoke to enclosures 5a and 5b. Enclosure 5a outlines progress made in securing funding and commitment from partners to undertake a detailed socio-economic benefits analysis of the new South Glasgow campus. The PEG was asked to note the contents of the paper and the attached summary of proposed analysis.

R Calderwood suggested that we chose one or two treasury-funded projects to test these concepts on e.g. Barrhead Health Centre.

R Calderwood asked M McAllister how this would fit in with the Govan Initiative/South West Regeneration Project. M McAllister advised that he was keen to capture that in the proposal.

Work would not be duplicated and resources would be co-ordinated. R Calderwood suggested that M McAllister meet with the CE of South West Regeneration to look at previous work completed. I Colvin advised that a city strategy would be launched including an employability strategy. She recently held a meeting with John McCarthy to link in Workforce Planning and Recruitment to ensure the targets were being met. It is expected that the Employability Strategy for South West Glasgow would be developed by the end of May 2007. **MMcA**

12. Update on Community Engagement/Transport

N McGrogan spoke to enclosure 6.

NHSGGC has given support to First Bus in its application to the Bus Route Development Grant to increase the frequency and quality of the 89/90 bus service and to introduce a new 747 service linking the Airport, SGH, Partick and Glasgow University.

The Evening Visitor Scheme has proved successful. It is transporting twice the number of passengers modelled in the business case's best-case scenario. The Health Minister requested a briefing paper on its operation and wishes to see its extension across Scotland. **NMcG**

M Robertson asked if the Evening Visitor Scheme would be extended to the Vale of Leven. N McGrogan advised that this comes under the West Dunbartonshire Transport Group. There is an existing funding stream and early discussions are in place to address transport to hospitals and other health care facilities in the area. **NMcG**

13. Glasgow Emergency Medical Services

M Jamieson gave a verbal update.

He advised that he met recently with Dr Gaw and other colleagues to look at centralising the GEMS service on the SGH site. The service would be a general GEMS service and not specific to children. The proposal would be looked at in more detail and a further meeting will be set with Dr Gaw and Rhona Robertson later in the year. Provision of a GEMS service on the SGH site would not change the overall design. The only changes would be minor (in outpatient waiting areas, for example). This will be considered at a later date.

The benefits of having GEMS on the Victoria site were discussed. GEMS should remain a 24/7 service at the Victoria.

I Colvin advised that the GEMS would move into the new CHCP build in the interim. The new build will be seen as a service-hub for the south west of Glasgow housing out-of-hours nursing, mental health and children's services.

14. Timescales and next steps

H Byrne advised that work is progressing around affordability. H Byrne and R Calderwood will discuss with Tom Divers the possibility of a Board Seminar taking place in June to enable the OBC to be submitted in June to the Board Meeting. The hard work continues keep on track of the timescales and lots of progress has been made. **HB/RC/PG/ DG/TD**

15. Any other competent business

There were no further items for discussion

16. Date and time of next meeting

The scheduled meeting on Wednesday 9th May was cancelled.

The next meeting will be on Wednesday 13th June 2007 at 8:30 – 10:30 in the Large Meeting Room, Ground Floor, Project Offices, Hillington.

GREATER GLASGOW AND CLYDE NHS BOARD

DIRECTORATE OF ACUTE SERVICES STRATEGY IMPLEMENTATION AND PLANNING

PROJECT EXECUTIVE GROUP MEETING

Notes of the meeting held on Wednesday 9th April 2008
Conference Room, Management Building, Southern General Hospital

---

Present: Helen Byrne, Director Acute Services Strategy, Implementation and Planning (Chair)
Mairi Macleod, Planning Manager, New Children's Hospital
Morgan Jamieson, Medical Director, New Children's' Project Team
Neil Wilson, Workforce Planning Project Manager
Peter Moir, Deputy Head of Capital Planning
Rosslyn Crocket, Director of Women and Children's Services
Sandra Davidson, AJOC Staff-side Representative
Sharon Adamson, Head of Acute Services Planning and Redesign
Tony Cocozza, Acting Head of Finance Capital & Planning

Apologies: Alan Seabourne, Project Director, New Hospitals' Project Team
Alex McIntyre, Director of Facilities
Anne MacPherson, Associate Director of HR (Acute)
Jim Crombie, Director of Diagnostics
Brian Cowan, Medical Director
Cathie Cowan, Director, South East Glasgow CHCP
Derek Morgan, Workforce Planning Manager
Eunice Muir, Interim Director of Nursing
Grant Archibald, Director of Emergency Care and Medical Services
Heather Griffin, Planning Manager, New South Glasgow Hospital
Iona Colvin, Director of South West Glasgow CHCP
Jane Grant, Director of Surgery and Anaesthesia
Mandy Robertson, Joint Secretary, Area Partnership Forum
Niall McGrogan, Head of Community Engagement and Transport
Peter Gallagher, Director of Finance (Acute)
Robert Calderwood, Chief Operating Officer
Sandra Bustillo, Head of Communications (Acute)
Tony Curran, Head of Capital Planning and Procurement

In attendance: Gordon Robertson, Communications (on behalf of Sandra Bustillo)
Andrea LaRoche, Secretariat Administrator (notes)

1. Apologies and welcome

ACTION

Apologies were accepted from the above.

2. Notes of the previous meeting held on 13th February 2008

The notes of the previous meeting were accepted as an accurate record.

3. Matters arising

Lothian – there have been no further meetings. Their OBC will be submitted in May although they are not through the Gateway process yet. Their self-assessment has been submitted. This should cause no delay to our OBC.

Clyde – Helen advised that we are out to consultation on all aspects of Clyde except Unscheduled Care, which it is hoped will go out soon. Maternity services went out for consultation W/C 31/3 and Mental Health Services went out for consultation on 9/4.

Planning update – Peter Moir advised that a meeting will be held within the next two weeks to look at outstanding transport issues around the Section 75 Agreement. Our contribution to the Fast Link project and potential options for the enhancement of bus services will be looked at.

Morgan Jamieson raised the point about the phrasing in the MIU Audit paper as discussed at the previous meeting in February – Grant Archibald has since made changes to the phrasing in the paper to make it clearer.

4. Update from sub-group meeting held on 28th March 2008

The meeting held on 28th March was a smaller group meeting to give a brief update on progress made since the meeting in February. Helen highlighted the main issues discussed at the meeting:

The issues raised by Mike Baxter in relation to the OBC were discussed and the Project Team has responded to his questions.

Sharon Adamson gave an update on the Bed Model.

Sharon also updated on the recent site visit made to Guys and St Thomas' Hospital in London. The visit was organised as a way of benchmarking our work against that of other organisations. Medicine and Elderly Care were two areas that were looked at during the visit where real changes had been made. The lengths of stay had been reduced and there were practical changes made around the way clinical staff engaged with the management team. A clinical decision unit staffed by A&E consultants had been established to enable more senior decision-making. Different ways of working were looked at – they have a strong focus on supporting real-time data. They have recognisable differences in demographics however it was very useful and interesting.

Helen gave an update from the Team's recent visit to Birmingham on 3/4. They are in the middle of building a new hospital; their new build is very different to our design. They have a strong focus on light, colour and the use of glass. We are more progressed in terms of our Bed Model. They have undertaken some in-depth modelling work around occupancy levels as opposed to efficiency levels. It was very interesting to hear about the issues surrounding the movement of two hospitals into one hospital. The double-running costs were discussed and estimated at around £15m for a three-month period. Clinical Governance arrangements were looked at as they moved from the old system to the new as well as HR policies and Workforce Planning arrangements. Our work around the engagement of staff is more progressed however they had some interesting ways of engaging with their staff e.g. Staff Newspaper and 'Involve' leaflets. Helen will share these with Gordon Robertson for information. Overall, it was a good learning experience and it was interesting to see their new hospital being built.

5. OBC progress update

Response from Government – The Project Team responded to over 50 queries raised by Mike Baxter in his letter and he thanked them for a prompt response.

Procurement update – Peter Moir advised that procurement and funding options have been reviewed. A workshop was held on 19/2 where a series of presentations were given on different options of procurement. 8 options were looked at and a series of in-house meetings were conducted to further consider the options. Two options were looked at in greater detail mainly focussing on a two-stage design and build process; this is dependent on the market. It will cost around £7m - £10m to bid. A marketing engagement will take place later this month as an opportunity for senior executives to meet with interested companies. A meeting with Financial Advisors – Shepherd and Wedderburn and Ernst and Young, will be arranged to discuss the ways forward. Helen is keen to progress this as soon as possible.

Rosslyn pointed out that we need to be mindful of the gap between the new hospital opening and the closure of the Queen Mother's. We need to think about the synergy with maternity. Helen advised that Robert had made the point about the timescales for the new children's hospital and if Rosslyn would like more involvement in this. Helen also pointed out that the new Site Co-ordinating Group will ensure that all strands of work are tied-in to the process. Peter Moir advised Rosslyn that he would be happy to attend her Team meetings to give feedback if requested.

Labs update – Mairi Macleod advised that Alan is leading this as part of the OBC – all aspects need to be coordinated. We are waiting for the announcement from the government.

6. Practical arrangements for new governance structure

Helen spoke to enclosures 2a and 2b highlighting the changes to the governance structure. Enclosure 2a, Governance and Project Management Structures was agreed at the most recent meeting of the ASR Programme Board on 26th March.

The ASR Programme Board will continue under its current schedule. The membership and terms of reference have been updated. The Project Executive Group will be disbanded and replaced by a smaller, tighter group called the New South Glasgow Hospitals Executive Board. An ASR Systems Redesign Group is being set up to oversee the impact of implementing the ASR on the whole organisation and co-ordinate the service transformation programme across the organisation. The Procurement and Finance Group will take the procurement process forward, once the model has been identified as well as to looking at funding, affordability and value for money aspects. The new Site Programme Co-ordinating Group will monitor, co-ordinate and control all on-site works.

Sub-structures for the groups will be developed and sub-groups may be established.

Rosslyn asked about IM&T involvement on the groups. It was suggested that Richard Copland be a member of the ASR Programme Board. We need to be clear on what the IM&T strategy will look like and how we would be involved. We need to engage IT around their priorities. Helen advised that Richard was sighted on our issues and on finances. She is meeting with Tom Divers on 14/4 and will discuss this further with him.

Sandra Davidson asked if the document had been shared with Donald Sime (Donald has seen it and came back with comments, feedback and nominations) and Sandra asked which Staff Side representatives would be included and at what levels. Helen advised that this will be taken to the Performance Review Group when finalised.

This is the last meeting of the Project Executive Group. Helen thanked everyone for their input into this group.

Letters are being drafted to previous, current and new members of the Project Executive Group, New South Glasgow Hospitals Executive Board and ASR Programme Board.

7. Community Engagement update

Although a representative from Community Engagement was not present at the meeting, Iona Colvin advised that Mark McAllister had presented to the Area Co-ordination Group chaired by Steve Inch. The presentation was around how Community Engagement will play into the local regeneration process. Steve Inch will produce a paper around the Govan Initiative and the overall investment in the area. Mark is working on the structure for Community Engagement work. Helen advised that good progress had been made and wider Community Engagement work is also ongoing around the maternity, new children's and adult hospitals and the Ambulatory Care Hospitals.

Gordon advised that Communications would be active around the time of the OBC announcement.

8. Timescales and next steps

An announcement on the OBC is expected before the end of April 2008.

9. AOCB

Helen advised that a formal paper around the Arts Strategy had been developed. We need to work together to look at opportunities for fundraising and ensure that it is included in our direction of travel. A practical action plan has been developed. Helen will share the paper widely.

Acute Services Strategy & Implementation Planning Directorate

Project Team Meeting

Notes of a meeting held on Monday 20th October 2008 at 10.00 am in the Conference Room, Hillington Project Office

Present: -

Alan Seabourne	Project Director	(AS)
Frances Wrath	Project Manager – Enabling Works	(FWr)
Mairi Macleod	Project Manager, New Children's Hospital	(MM)
Peter Moir	Head of Major Capital Projects/PPP	(PM)
Hugh McDerment	Senior Project Manager	(HMcD)

Apologies:-

Tony Cocozza	Acute Finance	(TC)
Heather Griffin	Project Manager, New South Glasgow Hospital	(HG)
Morgan Jamieson	Children's Hospital – Project Medical Director	(MJ)

In Attendance:

Andy Bell	Senior capital Projects Administrator	(AB)

1 Apologies **Action**

As noted above

2. Notes of last Meeting (3rd October 2008)

The Notes of the Project Meeting held on Friday 3rd October were approved as a true and accurate record.

3. Matters Arising

All items arising were covered under today's agenda.

4. Output from working with Healthcare Planners

- **Work Completed**
- **Work in Progress**
- **Timeline**

AS advised that he and PM had met with the Medical Planners who had requested the opportunity to review current assumptions around clinical pathways and departmental adjacencies. To aid this task they had been working on the premise that the Project Teams work on the completion of the Clinical Output Specifications would be finalised by the end of October.

Following discussion it was agreed that the information for the New Children's Hospital would be available by the end of October/mid November while the information on the New Adult Hospital would be completed by the end of December. MM/HG

PM added that the current design assumptions as prepared by the Davis Langdon Team had been requested and forwarded to Buchan Associates for their attention. Clarity around the information to be provided for the above work-streams would be sought at the first Joint Project Team meeting to be held later in the day.

5. Facilities Management

- **Discussion on Output Specification**

AS advised that the MAK would be working with the Team on the preparation of the FM Spec's post 1st November. One of MAK's first tasks would be assisting the Team in briefing the FM Yard, supporting accommodation and traffic analysis. MAK would also advise on how FM functioned within the new facilities. All of this information being crucial to assessing the footprint of the building and for inclusion within the Project Master Plan. Again clarity around what information the Design Team required for completion of Stage 1 would be sought at the meeting to be held later in the day. AS to provide update at next meeting. AS

6. Labs Development

- **Labs Project Update**

AS confirmed, due to various reasons, that the option to lease accommodation as part of the Labs project was now no longer an option. He also confirmed, following discussions with the COO, that it would be the COO's intention that as the Labs were included within the overall OBC package for the New South Glasgow Project then this should be tendered as part of the 1st Stage Process. Currently there is no capital budget for Pathology and Genetics to be built on the Southern general site. Once the Guaranteed Maximum Price had been submitted post July 2009 then a view would be taken as to whether additional capital funding was required should the GMP exceed the approved £841M financial envelope.

7. Master Planning

AS noted that both he and PM had met with the Planners, Architect and Design Team to discuss critical issues in terms of the Master Plan. A note of the meeting which had been held on 13th October was to be discussed as part of the Agenda at the Joint Project Team Meeting to be held later in the day.

To assist the Design team in assessing spacial awareness PM confirmed that he had passed copies of earlier drawings as prepared by Avanti for their attention. The Design Team had also been asked to source comparable projects to benchmark against.

8. Procurement
Output from procurement Workshop (1st October 2008)
Feedback from Board Seminar (7th October 2008)

AS advised that the outcomes from the above workshop and seminar had proven positive with briefing sessions on each having been given by himself to the Board Chairman at a meeting held on Friday 17th October.

This information would in turn be reported formally at the Board meeting to be held on Tuesday 21st October, where it is anticipated the Board will approve the Procurement Model.

9 Mental Health Services

- **Adult Services**
- **Children's Services**

AS reported that again much debate had centered around the provision of on site metal health services. Agreement in principle having been reached that this would comprise a 20 bedded ward with an 8 bed perinatal facility and psychiatric liaison services at a cost of circa £7.7M. Copies of the SOA's for each having been passed to the Users for comment and final agreement at a meeting to be held on 20th November. FWr to provide update at next meeting. FWr

It was noted that the proposal for the Adult services is to be sited on the area currently utilised as the Management car park while the Project Architect have been asked to consider two options for the siting of the children's facilities i.e. integrated within the new hospital or stand alone. Again these options would be considered at the aforementioned meeting. MMc to progress with Stephen McLeod the SOA and pass to the project Architect. MM

10 Risk Register

A copy of the revised Risk Register was tabled for consideration. AS noted that he wished to include additional comments and these would be passed to AB for inclusion. Thereafter the Register would be reviewed on a monthly basis. AS

AS advised that the revised register would require to be submitted for the approval of both the Executive Board and the Audit Committee. AS

11. Recruitment – Discussion

AS welcomed HMcD to the meeting. Hugh had been appointed to the post of Senior Project Manager for both the new Stobhill & Victoria Hospitals and would also work with the Team on the New South Glasgow project following completion of the ACAH's

The Post of Project Manager to support the Team had been advertised internally with the position not having been filled. The post would be advertised in the Herald at the weekend.

Following advertisement of the Senior Nurse Post a number of enquiries have been received. With regard the Nurse advisor to the Children's hospital MM confirmed she awaited a response from HR on the job spec.

FM – MAK would support the Team post 1st November.

Procurement - A meeting with Gordon Beattie had been arranged.

12. Change Control Process

Proposals to be discussed at the next Project Meeting along with Risk Register and Issues Log PM/AB

13. Issues Register

As above PM

14. Acute Services Partnership Forum – 24th November

AS requested that MM & HG present an update to staff at the next meeting in his absence. MM/HG

15. Health & Safety Visit

FWr reported that the HSE would be visiting a number of hospital sites during the week to look at a number of projects to review paper work in terms of H&S statutory requirements. The HSE had requested to meet with her to discuss the enabling works at the New South Glasgow. FWr to update at next meeting. FWr

AS requested that the subject of statutory documentation for the boiler house project be added to the Agenda for the next Site Planning Group. FWr

16. PID

AS requested that the PID be completed for formal sign off of the Executive Board at it's next meeting. MM

17. AOB

17.1 Ronald MacDonald

It was noted that a paper had been submitted to the September meeting of the Property Committee. FWr/MM would liaise with Moira Anderson on the development of the SOA and Cost Plan. Moira to take forward legal issues in terms of wayleaves, site access etc. MM & FWr to provide outline plan for sale of current property and new build proposal – first draft next meeting. MM/FWr

18. Date of Next Meeting

AS stated that it would be the intention to schedule the Project Team at fortnightly intervals. The joint Project Team meeting would be held each alternate week. A revised schedule of meeting would be circulated to the Team.

From:	Seabourne, Alan
To:	"Jim Hackett"; Moir, Peter; Griffin, Heather; Macleod, Mairi; Bell, Andy; Wrath, Frances; McDerment, Hugh; Jamieson, Morgan; "mmcveigh[redacted]"; "Haldane, Juliet"; "Claire Phillips"; "Kennedy, Julia"
Cc:	Frew, Shiona; Hirst, Allyson; Boggan, Gayle; Craig, Carol
Subject:	procurement model
Date:	21 October 2008 16:46:04

Hi all,

Just to let you know that the NHS Board at its formal meeting today approved the procurement model, therefore I would like to thank you all for your input to the process.

Alan

From: Frew, Shiona
To: Frew, Shiona
Subject: info
Date: 28 January 2009 17:27:06
Attachments: SGH - Gateway.msg
RE New South Glasgow Hospital - Extended Compliance.msg
RE New South Glasgow Hospital - Extended Compliance.msg
New South Glasgow Hospital - Extended Compliance.msg
notes of meeting - 19 Nov.msg

Shiona Frew

PA to Project Director

New South Glasgow Hospitals Project

1 Jubilee Court

Hillington

G52 4LB

[redacted]

[redacted]

From: Claire Phillips
To: Seabourne, Alan
Subject: RE: New South Glasgow Hospital - Extended Compliance
Date: 05 January 2009 17:26:21

No problem, I have just emailed you saying I would ring for a catch-up. I'll leave it to you to ring me, give you and Peter a chance to discuss.
Claire

From: Seabourne, Alan [redacted]
Sent: 05 January 2009 17:24
To: Claire Phillips
Subject: RE: New South Glasgow Hospital - Extended Compliance

Claire, sorry for not getting back to you on this but Peter and I had a date penciled in for today to discuss further. Will get back to you later in the week.
Alan

From: Claire Phillips [redacted]
Sent: 15 December 2008 11:22
To: Seabourne, Alan
Subject: RE: New South Glasgow Hospital - Extended Compliance

Alan,

I have checked the notes I did of the last meeting, all advisers were asked to come back to you on this, have they? I think better to have a meeting based on some outline ideas, or at least get one adviser to take responsibility and lead the meeting, time is getting quite short…! I'm more than happy to help with this.

I have spoken with several colleagues, especially those who work with MOD, they dabble with this type of thing a lot. Some good outcomes, some not so good.

The advisers should be able to give you access to a large pool of options and examples, and if we get something scoped in outline that fits your objectives then it is easier to pick relevant projects or organisations to speak to, happy to help with this.

Regards,

Claire

From: Seabourne, Alan [redacted]
Sent: 15 December 2008 11:09
To: Claire Phillips
Subject: RE: New South Glasgow Hospital - Extended Compliance

Thanks Claire very helpful indeed. Yes you are right in thinking it is mostly M&E systems although there are building issues e.g. wind and water tight, robustness of finishes which can affect the effectiveness and availability of the facility. I will set something up to discuss with advisor team but I need Alex McIntyre, Dir. Of Facilities to be present. Is it worth speaking with some organizations first to get a practical view on pros & cons.
Alan

From: Claire Phillips [redacted]
Sent: 15 December 2008 09:59

To: Seabourne, Alan
Subject: New South Glasgow Hospital - Extended Compliance

Alan,

I have done some thinking on how you might achieve your objectives on “extended compliance”. I should say I don’t like the term extended compliance, it suggests you are asking for something extra when in fact you are trying to ensure you get what you (think you) are paying for, validation period might be better?

In any event I have set out some thoughts below which are meant to assist, and, if you think it would be helpful, perhaps catalyse some thinking and debate among the team. Although C&B are leading this, my view is that it will need input from all disciplines to crack this.

Given the importance of this, I expect you will want to see a fully worked up options paper for the Project Board which could also support you through Gateway (who will home in on this I suspect). Happy to assist take this forward.

All meant to be helpful!

Kind regards,

Claire

Background
GG&C are going to procure a large new hospital (really 2 hospitals) using approx £840m of public capital funding, and a D&B procurement approach. Typically this type of D&B means a one year retention, and then the contractor walks away.

GG&C will maintain the building post-construction completion but will consider a shared maintenance operation over a number of years with the private sector, as GG&C builds its own capability.

What are we trying to achieve?
GG&C is concerned that the building, in particular it’s critical M&E systems [Alan, am I correct this is the biggest concern?], are fit for purpose, reliable and functional , especially in the time period up to the first scheduled LC replacement.

Firstly, a number of positive steps can be taken towards meeting this objective in the management/design of the D&B contract: careful specification, site supervision, handover criteria, commissioning procedures, independent certification and so on. However (I think) the “exam question” is how can we assist meet this overall fitness for purpose/quality objective using commercial means.

Some Options?
The available solutions I think cover the following range. These solutions are not mutually exclusive, rather they might be regarded as toolkit from which you can develop a bespoke solution:

- Performance bonds
- Deferred Milestone Payments
- Extended retention periods
- Warranties
- Performance payments
- Others?

Some thoughts on some of these set out below.

Extended Retention
This in many ways appears the simplest solution but calibration of the retention to; a) make it meaningful, b) acceptable to bidders, and c) affordable to GG&C, will be challenging. Whether this could be dovetailed in some way with incentives linked to the maintenance support function seems

worthy of consideration.

There are ways of further refining a retention solution, so for instance if there is an extended retention of, say, 3 years and there is a call on the retention fund, the clock can be reset for the element which has failed. C&B will have access to many examples like this.

The Warranty Approach
In the health sector, of course, it is not uncommon for warranties to be used for equipment, and this is perhaps an approach which could be extended to building components and systems.

If we look outside of health there are some interesting examples, for instance in the procurement of commercial aircraft, and in the MOD with its procurement of naval craft (destroyers/ air craft carriers and so on). In these industries warranties are used to provide comfort that critical components (eg engines) and/or systems (eg navigation) will perform to standard and fulfil their design performance over a number of years. There will be operational parameters laid down which caveat the warranty (so many hours flying or sailing), servicing requirements and so on, but there are perhaps some similarities in this approach with a hospital if, for instance, GG&C were to focus on M&E systems whose successful operation was critical (perhaps so as not to endanger life).

In the ships/ planes example the lead contractor acts as an integrator of the various manufacturers' components/ systems and also fronts the provision of the warranties. This is critical as where this approach can fall down is where gaps open up at the interfaces between different contractors, or caveats on maintenance/ use and so on. The lead contractor may well insure this liability.

It strikes me in our hospital example, although maintenance is not being provided solely by the Contractor, the fact he may be supporting GG&C to maintain the building for, say, the first 5 years, could be used as an argument in support of him accepting "extended compliance" as he will be present to validate maintenance operations etc.

Trying to apply this approach unilaterally to the whole facility is unlikely to be affordable (we are back to PPP), but there seems merit in at least exploring some more focused use of the warranty approach, perhaps alongside other measures.

Of course, in common with other approaches, this will come with a price tag.

Service/ Performance Payment
If the maintenance is to be a shared operation for, say, 5/7 years then GG&C will expect to pay for this service. If this payment is performance based then there is possibly an opportunity to hold back payment for failed service delivery caused by component failure. This is trying to mimic PPP and would only work if the D&B contractor was also responsible for maintenance. There are difficulties with this; if the private sector element tails off over say 5 years then the amount available for deduction may not be a sufficient incentive. This needs calibration by the advisers.

For interest, this is the approach used in the Edinburgh Trams project. It is a large D&B with a linked 7 year operational contract, so some similarities. Bidders were asked to bid against a range of deferred milestone payments and performance bonds during procurement.

Evaluation
The importance GG&C places on bidders' willingness to price and accept extended compliance risk should be reflected in the evaluation strategy and its weightings. Bidders could also be asked to bid innovative ways of delivering GG&C's objectives. I think however it is important you have a reference solution otherwise evaluation could become extremely difficult and perhaps easy to challenge. S&W need to advise but I suspect this will fall under the CD strand of the procurement.

Partnerships UK wishes you season's greetings

We choose to send electronic Christmas cards and send the money saved to The Passage (a charity for the homeless in Westminster). The link will take you to our ecard for this year.
http://www.partnershipsuk.org.uk/xmas/index.html

****
This email is intended for the addressee(s) named above. It may contain confidential or privileged information and should not be read, copied or otherwise used by any person for whom it was not intended.
If you have received this mail in error please contact the sender by return email and delete the email from your system.Partnerships UK plc Registered in England number 3993425 10 Great George Street
London SW1P 3AE.http://www.partnershipsuk.org.uk .telephone number +44 (0)20 7273 8383.Recipients are advised to apply their own virus checks to this message on delivery.
****

****
NHSGG&C Disclaimer

The information contained within this e-mail and in any attachment is confidential and may be privileged. If you are not the intended recipient, please destroy this message, delete any copies held on your systems and notify the sender immediately; you should not retain, copy or use this e-mail for any purpose, nor disclose all or any part of its content to any other person.

All messages passing through this gateway are checked for viruses, but we strongly recommend that you check for viruses using your own virus scanner as NHS Greater Glasgow & Clyde will not take responsibility for any damage caused as a result of virus infection.

****

Partnerships UK wishes you season's greetings

We choose to send electronic Christmas cards and send the money saved to The Passage (a charity for the homeless in Westminster). The link will take you to our ecard for this year.
http://www.partnershipsuk.org.uk/xmas/index.html

****
This email is intended for the addressee(s) named above. It may contain confidential or privileged information and should not be read, copied or otherwise used by any person for whom it was not intended.
If you have received this mail in error please contact the sender by return email and delete the email from your system.Partnerships UK plc Registered in England number 3993425 10 Great George Street
London SW1P 3AE.http://www.partnershipsuk.org.uk .telephone number +44 (0)20 7273 8383.Recipients are advised to apply their own virus checks to this message on delivery.
****

****
NHSGG&C Disclaimer

The information contained within this e-mail and in any attachment is confidential and may be privileged. If you are not the intended

recipient, please destroy this message, delete any copies held on your systems and notify the sender immediately; you should not retain, copy or use this e-mail for any purpose, nor disclose all or any part of its content to any other person.

All messages passing through this gateway are checked for viruses, but we strongly recommend that you check for viruses using your own virus scanner as NHS Greater Glasgow & Clyde will not take responsibility for any damage caused as a result of virus infection.

****

Partnerships UK wishes you season's greetings

We choose to send electronic Christmas cards and send the money saved to The Passage (a charity for the homeless in Westminster). The link will take you to our ecard for this year.
http://www.partnershipsuk.org.uk/xmas/index.html

****

****

ADB	Room Environmental Data	B1602

Project:	08045	New South Glasgow Hospital
Department:	GEN-SGH	Generic Rooms
Room:	B1602	Isolation single bedroom: Critical care
Room Number:		**Revision Date:** 07/04/2009

AIR	Requirements	Notes
Winter Temperature (DegC):	27	Summer and winter (local control) temperature control: 16 to 27 deg.C
Summer Temperature (DegC):	16	
Mechanical Ventilation (Supply ac/hr):	6.0	Mechanical ventilation (supply): To provide source or protective isolation. Mechanical ventilation (extract): To provide source or protective isolation.
Mechanical Ventilation (Extract ac/hr):	6.0	
Pressure Relative to Adjoining Space:	BAL	Final filtration: EU10/11 to suit clinical requirements. Humidity: 40-60
Filtration (%DSE and % Arrestance):	/	
Humidity (%RH):	60	
General Notes:		
LIGHTING		
Service Illumination (Lux):		see local illumination
Service Illumination Night (Lux):	10.0	Bedhead
Local Illumination (Lux):	400.0	Bed (dimming required)
Colour Rendering Required:	Y	
Standby Lighting Grade:	A	Lighting of the level and quality equal or nearly equal to that provided by normal lighting
General Notes:		
NOISE		
Privacy Factor Required (dB):	80	Ref: HTM2045
Mechanical Services (NR):	30	
Intrusive Noise (NR Leq):	35	
***Acceptable Sound Level [L10dB(A)]:**		
***Speech Privacy Required:**	N	
***Quality Which Cannot Be Tolerated:**		
(* alternative format)		
General Notes:		
SAFETY		
Hot Surface Max. Temp (DegC):	43	
Hot Water Max. Temp (DegC):	41	
General Notes:		
FIRE		
Enclosure:		
Automatic Detection:		Smoke

ADB	Room Design Character	B1602

Project:	08045	New South Glasgow Hospital
Department:	GEN-SGH	Generic Rooms
Room:	B1602	Isolation single bedroom: Critical care
Room Number:		**Revision Date:** 07/04/2009

Walls:	Surface Finish (HTM 56): 3 i.e. Impervious, jointless, smooth Moisture Resistance (HTM 56): N i.e. Normal humidity. Cleaning Routine (HTM 56): To manufacturers recommendations
Floor:	Surface Finish (HTM 61): 3: Hard, impervious, jointless, smooth Cleaning Routine (HTM 61): To manufacturers recommendations
Ceiling:	Surface Finish (HTM 60): 1 i.e. Smooth, imperforate, jointless Moisture Resistance (HTM 60): N i.e. Normal Humidity Cleaning Routine (HTM 60): To manufacturers recommendations
Doorsets:	(HTM 58) Two sets of doors: 1x 1500mm, one & a half leaf, vision panel, obscurable; bed access. 1x 900mm, single leaf, vision panel, obscurable; person access
Windows:	(HTM 55) Clear, solar control, privacy control
Internal Glazing:	(HTM 57) Clear with privacy control
Hatch:	
Notes:	

ADB	Room Environmental Data	B1805

Project:	08045	New South Glasgow Hospital
Department:	GEN-SGH	Generic Rooms
Room:	B1805	Isolation single bedroom: Children/young people, with relatives overnight stay
Room Number:		**Revision Date:** 23/04/2009

AIR	Requirements	Notes
Winter Temperature (DegC):	21	Winter temperature (degC): up to 24. independent control
Summer Temperature (DegC):	23	
Mechanical Ventilation (Supply ac/hr):		Mechanical ventilation (supply): Refer to HBN text. Mechanical ventilation (extract): In-patient barrier nursing. Refer to HBN text.
Mechanical Ventilation (Extract ac/hr):		
Pressure Relative to Adjoining Space:	BAL	Filtration: BS6540 Humidity: 65-42 summer, 68-38 winter
Filtration (%DSE and % Arrestance):	85/	
Humidity (%RH):		
General Notes:		Pressure relative: WC NEG to bedroom.

LIGHTING		
Service Illumination (Lux):	100	Floor. not less than 100 lux. Bed centre. 30-50 Bedhead.
Service Illumination Night (Lux):	5.0	Floor. 1-5 Bed centre. 1 Bedhead. Evening (lux): 50 Bed centre.
Local Illumination (Lux):	150.0	Bedhead. Control ON/OFF/ DIM switch & bedhead.
Colour Rendering Required:	Y	Not night and local.
Standby Lighting Grade:		B: Lighting of the level and quality one third to one half that provided by normal lighting. Day Bed centre: A: Lighting of the level and quality equal or nearly equal to that provided by normal lighting. For local examination & inspection.
General Notes:		

NOISE		
Privacy Factor Required (dB):	80	Ref: HTM2045
Mechanical Services (NR):	30	
Intrusive Noise (NR Leq):	35	
***Acceptable Sound Level [L10dB(A)]:**		
***Speech Privacy Required:**	Y	
***Quality Which Cannot Be Tolerated:**		
(* alternative format)		
General Notes:		

SAFETY		
Hot Surface Max. Temp (DegC):	43	
Hot Water Max. Temp (DegC):	41	
General Notes:		

FIRE	
Enclosure:	
Automatic Detection:	Smoke

From:	Seabourne, Alan
To:	Frew, Shiona
Subject:	Fw: NEW SOUTH GLASGOW HOSPITALS - EVALUATION PROCESS
Date:	30 April 2009 14:06:22
Attachments:	NSGH - ITPD Vol3 - draft 3 - current rv3.doc

Can you get me a copy of this soon
****

Sent from NHSGG&C Blackberry Device
****

From: Moir, Peter
To: 'James.Stewart@[redacted]
Cc: Seabourne, Alan
Sent: Thu Apr 30 13:35:47 2009
Subject: NEW SOUTH GLASGOW HOSPITALS - EVALUATION PROCESS

James

Firstly apologies for dropping this on you, we are working hard to get everything complete for tomorrow.

Following on from last Fridays meeting we have further developed the evaluation process and MEAT scoring which is now set out in Volume 3 of our ITPD document, attached.

The methodology is set out in section 2 and to try and leave room for manoeuvre, to capture your point that……. if all bids achieve quality threshold would you wish to reflect and take the cheapest financial bid. We will supply our benchmark MEAT score as a threshold which must be passed by bidders.

The team have considered this and Alan, Helen, Robert and Peter Gallagher are meeting with advisors tonight to discuss the content of a table at the rear of the Vol 3 document and hence make a final decision on the evaluation process of option 1,2 or 3. The outcome will be inserted as the fourth stage of the evaluation process. In short we have three options

1) Accept the best MEAT score above our threshold as they stand.
2) If all bids pass our benchmark but are very close say no more than 3% margin, re-assess on scores for three key priority areas.
3) If all bids pass our benchmark but there is a range of scores we re-assess on scores for five key priority areas.

Its clearer in the attachment. I would welcome any thoughts or advice on the final draft if at all possible by close of play today.

Thanks

Peter Moir

Head of Major Projects
NHS Greater Glasgow & Clyde
Project Office
St Andrew's House
80 Queen Elizabeth Avenue
Hillington
Glasgow G52 4NQ

[redacted]

NHS Greater Glasgow and Clyde

New South Glasgow Hospitals (NSGH) Project

INVITATION TO PARTICIPATE IN COMPETITIVE DIALOGUE

VOLUME THREE

BID DELIVERABLES AND EVALUATION

ISSUE	DATE	BY	CHECKED	COMMENTS
	22/01/09	MGB	-	C&B use, initial compilation for discussion and structure.
	11/02/09	MGB	-	Pen-picture structure for C&B + S+W review.
	04/03/09	DJR	-	Updated evaluation technical / commercial
	28/04/09	DJR		Updated to ~~mrefkect~~reflect discussion 27/04/09
	30/04/09	DJR		Updated with S&W comments, E&Y process, Stage 4 evlauation process TBC

Contents

Appendices

1.0 Introduction

This Volume of the ITPB sets out the Bid Deliverable Requirements and the Bid Evaluation Process.

2.0 Selection Procedure and Evaluation Criteria

2.1 Introduction

The Tender Return Date is for submissions relating to this Project is 11 September 2009. In terms of the Public Contracts (Scotland) Regulations 2006 (as amended), which implement EU directives into UK law, the Board will award the contract on the basis of the most economically advantageous Bid.

The Board must be satisfied that the proposed solution offers value for money and meets the Board's affordability criteria and minimum requirements for the Project. This will be determined by reference to the bid submission requirements in the Appendix A of Volume 3 of this ITPD and the evaluation criteria set out in Section 2.3. The Board reserve the right to reject any bid submission that exceeds the Boards budget allocation for design, construction and risk, which is currently assessed to be in the range of £[~~580M~~ 603M - £6210~~0~~]M.

Commented [s1]: Presume this number will be fixed. If so, will the figure tend towards the higher level (remembering that this also includes retained risk)? As discussed before, S+W's view is that, if this is going to be used as a criteria for down-selection then it should be pitched at a realistic level. Otherwise, it will not be of much use in practice as a differentiator. Put another way, if it is unrealistically low, then all of the bids are likely to be unaffordable and a down-selection decision will not be able to be made on this basis. We note that this is a swing of almost 5% of the cap ex price and that the Board does not expect the priced bids received to vary to this degree between one another.

2.2 Evaluation Team

A team composed of individuals with relevant knowledge and expertise will carry out the evaluation of technical and commercial submissions. The Evaluation Team will comprise relevant individuals from the Board, Technical, Legal and Financial Advisors, and representatives from the Board. A Team Leader shall be appointed to co-ordinate the review of the bid submissions under the following sections:-

- Design Group
- Site Logistics Group
- Commercial Group

2.3 Evaluation Methodology

The bid evaluation process is outlined as follows:-

- *Stage 1 - Compliance & Completeness Review*

Each bid submissions will be subject to an initial compliance and completeness review. This initial review will not involve a qualitative assessment of a Bidder's proposals but will simply check whether or not the submission requirements of the ITPD have been satisfied. Any omissions will be notified to the Team Leader via a Compliance & Completeness Review Schedule and forwarded to the Project Director. All requests for missing information will be made to Bidders from the Project Director and requested information should be provided within 7 days of request. ~~.~~

The Financial Evaluation Team will undertake a high level review of the priced bids and any bid above the maximum affordability threshold may be discarded at this initial stage.

At this stage the Board reserves the right to either reject any non-compliant or substantially incomplete Bids or request further information from the Bidder to address any such non-compliance or shortcomings with the Bid.

- *Stage 2 – Bid Evaluation*

In order to determine the bid that represents the Most Economically Advantageous Tender, each bid will be subject to the following process:-

1. A ~~D~~detailed scoring evaluation will be undertaken in accordance with the Bid Evaluation Schedule included in Appendix B and the scoring matrix below to determine the Qualitative Score. Further detail on the Board's approach to the evaluation of the Bidders' responses on the draft Contract and ancillary matters is set out in Appendix [C].

Scores	Value	Description
Excellent	9 - 10	Performs significantly well on all key factors and offers substantial additional benefits
Good	7 - 8	Performs well on all key factors and offers some additional benefits
Adequate	5 - 6	Passes thresholds on all key factors but offers few additional benefits
Poor	3 - 4	Fails to meet threshold on some key factors
Very Poor	2	Fails to meet threshold on majority of key factors
Unacceptable	1	Fails to meet threshold on all key factors

2. Pricing evaluation will then be carried out, based on price / risk scenario modelling to assess the most likely final outturn price to the Board. This process aims to evaluate the true cost of the bids to the Board and reflect a comparable risk position between bids. The expected outturn price will be determined based on cost modelling of bid submissions with the assessed impact of Board retained risk. ~~[Further detail on the methodology for this part of the evaluation is set out in Appendix D.]~~Modelling will consider scenarios to establish the expected outturn price by reference to the bidders price submissions, priced risk registers for contractor accepted risk and board retained risk, and the pain / gain ratio's

3. A Value for Money / Most Economically Advantageous Tender assessment will follow, the outcome of which will be determined by dividing the Qualitative ~~Price~~ Score by the expected outturn price (MEAT Score). ~~The expected outturn price will be determined based on cost modelling of bid submissions with the assessed impact of Board retained risk.~~

~~4. STAGE 4 TO BE CONCLUDED WITH BOARD @ MTG 30/04/09The outcome of the calculation performed in accordance with Paragraph 3, above, would identify a provisional combined ranking of the tenders assessed. The MEAT score Score for each bidder must achieve a minimum overall level as determined with reference to meeting the baseline requirements of Volume 3 Employer Requirements The Board will then examine what scores were awarded to the tenders through the evaluation in the following priority areas:~~

- ***~~[Design solution that provides compliance with the clinical adjacency requirements~~***
- ***~~Design solution that meets the requirements of the clinical output specifications~~***
- ***~~The required linkages between the new hospital building and new laboratory building, and new hospital and Maternity / Neo natal and Neurosciences buildings, have been provided~~***
- ***~~Whole life cost / operation benefits are optimised~~***

Commented [s2]: The next few changes are just drafting changes to make this section read better as a whole.

Commented [s3]: This wording has been moved up from the end of the next paragraph but otherwise is unchanged.

Commented [s4]: Michael McVeigh has undertaken to provide a short paper setting out the process for the financial evaluation. We have suggested that this could be inserted as Appendix D.

Commented [s5]: We presume this should refer to Quality Score?

Formatted: Font: Bold, Italic, Font colour: Red

Formatted: Indent: Left: 1.27 cm

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

~~[~~***~~Target and Maximum Price proposals~~***~~]~~

- ~~That there are no L~~limits of liability~~, or those that are proposed are acceptable~~ and insurance ~~levels are acceptable.~~

~~If the tender has been awarded a score through evaluation which is deemed unacceptable by the Board in relation to any of these priority areas, then the Board may in its discretion down select that tender, notwithstanding that it would otherwise have been assessed as highest ranked through the processes described in Paragraphs 1-3, above.~~

~~This will be the final test in assessing which tender is the most economically advantageous.~~

As part of the evaluation process the Board reserve the right to convene meetings with the Bidders in order to clarify any part of the bidders submission where the proposals are considered to be unclear.

The Board also reserve the right to request the bidders to attend an Interview / Presentation in order that the Bidder can fully explain his design proposals, management procedures, construction methodology, and any other matter considered relevant to the Board. The Interview / Presentation will not form part of the bid evaluation process

3.0 Bid Deliverables

The bid deliverables to be submitted by bidders for are set out in Appendix A

4.0 Mandatory and Variant Bids

[Bidders must submit a fully compliant bid in accordance with the Employers Requirements and Bid Deliverables contained in Appendix A.

The Board require a Variant bid proposals for Maximum Temperature to New Hospitals as identified in Employers Requirements.

Bid evaluation and selection will be based on Mandatory Bid requirements. The additional cost identified with the variant requirements will be utilised to issue a post contract award Compensation Event to confirm the Boards change in requirements and adjust the Maximum Price T~~t~~arget Cost Proposals.]

5.0 Submission of Bids

The format of the bid submissions shall be as follows:-

- Separate volumes or sections for each of the Bid Deliverable categories identified in Appendix A
- Front Cover for each Volume noting
  - New South Glasgow Hospitals Project
  - Volume Nr & Bid Deliverables Sections
  - Bidder Name & Logo
- General text minimum font size 10pt
- A4 or A3 paper size
- Each page to have Header with – New South Glasgow Hospitals Project & Bidders Name (no Company logo)
- Each page to have Footer with – Volume Nr and Page Nr

Commented [s6]: We are not sure that this reflects the agreed list of 5-6 priority issues. The list contained in Simon Fraser's e-mail of Thu 23/04/2009 10:29 was:

1) Provision of linkages between the laboratories and the hospital;

2) Compliance with the clinical adjacencies as set out in the 1:500 drawings;

3) Provision of BREEAM scores of "Excellent"; (**NB - This was changed by Alan on Thursday 23/4**)

4) Compliance with the critical care plan linking maternity/neo-natal and neurological wards; and

5) Overall design illustration. (**NB - reference to limits of liability proposed by S+ W last night and agreed by the Board**).

In particular, although Simon Fraser had suggested that Price and Whole Life Costs might be included as priority issues, we had understood that the Board was not minded to include them. Please confirm. If they are to be included, we should be clear what the Board's requirements are e.g. will a low Target and Maximum Price be preferred? Or is there another preference in this area?

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Commented [s7]: This wording was contained in Simon Fraser's e-mail of Thu 23/04/2009 10:29, but it was not clear whether or not it required to be included. Apologies for the lack of clarity. We have amended the wording slightly, but believe that it is important to include it to describe how you get from a provisional view of the MEAT and the final view.

Commented [s8]: Alan Seabourne to confirm whether the requirement for a Mandatory Variant Bid can be removed. If not, S+ W's advice is that, if the Mandatory Variant will be accepted prior to Contract Award and form the basis of the award decision, then these should be evaluated separately to the Standard Bid and the most economically advantageous of the 6 bids received should be chosen.

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

- 2 or 4 hole punch Lever Arch Folders
- A1 Drawings folded and contained in plastic folders within appropriate volume

Appendix A Bid Deliverables

Formatted: Font: 18 pt

NEC3 CONDITIONS OF CONTRACT - CONTRACT DATA PART 2 – DATA POROVDED BY THE CONTRACTOR

The Bidders tender submission require to be a full and comprehensive response to the Works Information (Employers requirements) clearly demonstrating compliance, and as a minimum requires the following information to be submitted.

Section	Submission	Checklist
1.0 Accommodation Schedule		
1.1	Net Area – room by room, including all ducts, pipe boxing and service zones	
1.2	Circulation area	
1.3	Communication & plant space area	
1.4	Total Gross Floor Area	
2.0 Drawing Information		
2.1	1:500 scale Masterplan proposals, indicating the following information:- ▪ Communication routes into and out of the site & buildings for ○ Vehicles • Public transport (Buses & fastlink) • Private cars • Taxis • Ambulances • Services Vehicles • Cycles ○ Pedestrians • Patients • Visitors • Staff ▪ Planning restrictions affecting the development and modifications to highways, response to specific local authority planning requirements ▪ Orientation of buildings and relationship to other buildings and infrastructure on the site ▪ Hard & soft landscaping proposals ▪ Car Parking arrangements with distribution of spaces and use identified ▪ Areas of differing Carriageway Construction ▪ Road, footway and cycle way geometry ▪ Indicative Signalised layouts at external roads ▪ Main access points to buildings (existing & proposed) ▪ Major service routes ▪ Response to the surrounding and wider urban context ▪ Phasing plans / temporary works plans for the implementation of roads and drainage infrastructure	
2.2	1:500 departmental relationship drawings for all levels indicating functional relationships & main circulation routes	
2.3	1:200 departmental layouts (minimum 11nr) indicating the following information:- ▪ Room adjacencies ▪ Circulation layouts ▪ Corridor widths	

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 1.27 cm + 9.39 cm

Formatted: Bullets and Numbering

Formatted: Indent: Left: 0.44 cm, Bulleted + Level: 2 + Aligned at: 2.22 cm + Tab after: 2.86 cm + Indent at: 2.86 cm, Tab stops: 1.08 cm, List tab + Not at 2.54 cm + 2.86 cm

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 0.63 cm + 9.39 cm

Formatted: Bullets and Numbering

	▪ Door widths ▪ Communication routes / wayfinding ▪ Entrances ▪ Egresses	
2.4	1:200 departmental drawing for Accident & Emergency Department, ▪ floor finishes ▪ ceiling finishes ▪ wall finishes ▪ door types & ironmongery ▪ wall protection ▪ Lighting proposals ▪ CCTV locations ▪ door entry locations	
2.5	1:200 departmental drawing for Adult Theatres Department, fully annotated to indicate :- ▪ floor finishes ▪ ceiling finishes ▪ wall finishes ▪ door types & ironmongery ▪ wall protection ▪ Lighting proposals ▪ CCTV locations ▪ door entry locations	
2.6	1:200 departmental drawing for Adult Ward, fully annotated to indicate ▪ floor finishes ▪ ceiling finishes ▪ wall finishes ▪ door types & ironmongery ▪ wall protection ▪ Lighting proposals ▪ CCTV locations ▪ door entry locations	
2.7	1:200 departmental drawing for Childrens Ward, fully annotated to indicate ▪ floor finishes ▪ ceiling finishes ▪ wall finishes ▪ door types & ironmongery ▪ wall protection ▪ Lighting proposals ▪ CCTV locations ▪ door entry locations	
2.8	1:200 departmental drawing for Childrens A&E Department fully annotated to indicate ▪ floor finishes ▪ ceiling finishes ▪ wall finishes ▪ door types & ironmongery ▪ wall protection ▪ Lighting proposals ▪ CCTV locations ▪ door entry locations	

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 2.22 cm + 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 2.22 cm + 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 2.22 cm + 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 2.22 cm + 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 2.22 cm + 9.39 cm

Formatted: Bullets and Numbering

2.9	1:50 room layout and wall elevations fully developed for the rooms included as part of the Employers Requirements indicating:- ▪ room size and useable floor space ▪ room shape and compliance with ergonomic data and minimum critical dimensions ▪ room elevations ▪ reflected ceiling plans ▪ access points / locations of doors and windows ▪ location of utilities, engineering and specialist services ▪ location of equipment	
2.10	1:500 Fire Strategy drawings & Fire Strategy Report indicating the following information:- ▪ Strategic plans, highlighting evacuation strategies and staff implications in the event of fire ▪ Specialist Fire Engineer's Report providing a clear understanding or risk and protection measures ▪ Outline of principles adopted underlying approach to fire safety indicating compliance with Employers Requirements, NHS Firecode and Technical Standards	
2.11	1:200 Elevations – incorporating external signage proposals	
2.12	1:200 Roof plan indicating the following ▪ Form ▪ Materials ▪ Helipad proposals	
2.13	1:200 Exemplar sections indicating the following:- ▪ Floor to floor heights ▪ Floor to ceiling heights ▪ Architectural vision – space, height, form, composition, scale, character and use of materials ▪ Consideration of patient environment – natural light, views etc	
2.14	3D images / perspective (internal & external) indicating the following:- ▪ Architectural vision – space, height, form, composition, scale, character and use of materials	
2.15	Hospital Main Entrance / atrium / public space proposals / visuals	
2.16	1:500 site hard & soft landscaping proposals indicating:- ▪ Soft landscaping strategy ▪ Hard landscaping strategy ▪ Car Parking arrangements with distribution of spaces and use identified ▪ Areas of differing Carriageway Construction ▪ Road, footway and cycle way geometry ▪ Indicative Signalised layouts at external roads ▪ Retention / protection of existing trees ▪ Incorporation of art ▪ Special features ▪ Courtyards	
2.17	*Typical Sections and details to appropriate scale showing:-* Carriageway Construction	

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 0.63 cm + 9.39 cm

Formatted: Bullets and Numbering

Formatted: Indent: Left: 0 cm, Hanging: 0.44 cm, Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 0.63 cm + 9.39 cm

Formatted: Indent: Left: 0 cm, Hanging: 0.44 cm, Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 0.63 cm + 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 0.5 cm + 9.39 cm

Formatted: Bullets and Numbering

Formatted: Indent: Left: 0 cm, Hanging: 0.44 cm, Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 0.5 cm + 9.39 cm

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 0.5 cm + 9.39 cm

Formatted: Indent: Left: 0 cm, Hanging: 0.44 cm, Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 0.63 cm + 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 1.27 cm + 9.39 cm

Formatted: Bullets and Numbering

	Footway / Cycleway Construction	
2.18	1:1250 (or greater) plans showing :- ▪ Drainage provision in support of SUDS and Drainage Strategy	
2.19	1:500 scale plans showing:- ▪ Layout of roads and buildings ▪ Layout of sewers, outfalls, underground storage, and SUDS features	
2.20	Finishes Schedule for 10 Nr Departments (other than those identified above for detailed 1:200 drawing submissions) and key circulation & communication routes, and main entrances	
2.21	Door & ironmongery Schedule for 10 Nr Departments (other than those identified above for detailed 1:200 drawing submissions) and key circulation & communication routes, and main entrances	
2.22	Outline design drawings demonstrating structural philosophy and should include as a minimum: ▪ Foundations: Typical layout and detail of proposed solution ▪ Basement: Outline construction detail; plan of slabs, sections of retaining walls ▪ Ground level slab: Typical layout and details ▪ Podium level floor: Typical layout and details, transfer structures ▪ Ward level floors: Typical plan layout indicating slab and supporting structure, (columns, beams), core layout (stability elements) ▪ Roof level: Typical layout indicating structure, including helipad (Acute Adults & Childrens)	
2.23	1:200 Energy Centre Services Layout and Plant Room locations	
2.24	Schematic for Main Services incoming routes and distribution from Energy Centre to Main Hospital Building – tunnel cross sections	
2.25	MTHW Schematic	
2.26	LTHW Schematic	
2.27	Hot & Cold Water Services Schematic	
2.28	Filtered Water Schematic	
2.29	Renal Water Schematic	
2.30	Medical gases schematic	
2.40	Sprinklers schematic	
2.41	Fire alarm & damper controls schematic	
2.42	BMS schematic	
2.43	MV Power Schematic	
2.44	LV Schematic	
2.45	Air supply schematic, including additional sketches for Theatre supply	
2.46	Air extract schematic, including additional sketches for Theatre supply	
2.47	Air Treatment Schematic (cooling), including additional sketches for Theatre supply	
3.0 Design Strategy		
3.1	Architectural design strategy	

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

Formatted: Indent: Left: 0 cm, Hanging: 0.44 cm, Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

3.2	Wayfinding strategy	
3.3	Acoustic Report indicating the following information:- ▪ Specialist Acoustic Engineer's report providing a clear demonstration of compliance with HTM 08-01 ▪ Outline principles adopted underlying bidder approach to acoustics with particular regard to issues around items such as rooftop helipad, atrium etc	
3.4	Structural Engineering design strategy	
3.5	Main incoming utilities design / connection strategy	
3.6	Water Services & Drainage design strategy	
3.7	Heating design strategy	
3.8	Ventilation & air treatment design strategy, including statements on odour control from adjacent sewage works	
3.9	Mains power distribution design strategy	
3.10	Sub-mains power distribution design strategy	
3.11	Lighting design strategy, including reference to energy and aesthetics to improve patient experience	
3.12	Lift Engineering design strategy	
3.13	Communication design strategy	
3.14	Protective systems design strategy	
3.15	Medical gases design strategy	
3.16	Pneumatic tube system design strategy	
3.17	Fire engineering design strategy	
3.18	Plant room design strategy	
3.19	Energy strategy including approach to renewables, sustainability	
3.20	BREEAM scoring schedule	
3.21	Helipad M&E services design strategy	
3.22	Maintenance & major plant and equipment replacement strategy	
3.23	Building Services Commissioning, Handover, Training strategy	
3.24	Drainage strategy including:- ▪ Methodology for Addressing the requirements of the Hydraulic Assessment and Flood Risk assessment as scoped out on the Drainage Impact Assessment and Strategy Report ▪ SUDS and Drainage Strategy statement which recognises the requirements as outlined in the Drainage Impact and Strategy Report	
3.25	Structural Design Strategy which should include:- ▪ Outline description demonstrating understanding of: topography, geology, soil conditions, contamination, ground water, history, services ▪ Demonstrate outline principles or design including, general description, stability, joints, floors, vertical structure, foundations, stairs and ramps, retaining walls, earthworks, slope stability, drainage, external works etc. ▪ Design Standards and Sources of Reference (Codes of Practice and Standards)	
4.0 Specifications		
4.1	Substructure	
4.2	Frame	
4.3	Upper Floors	

Formatted: Indent: Left: 0 cm, Hanging: 0.44 cm, Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 1.27 cm + 9.39 cm

Formatted: Bullets and Numbering

Formatted: Indent: Left: 0 cm, Hanging: 0.44 cm, Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 1.27 cm + 9.39 cm

Formatted: Bullets and Numbering

Formatted: Indent: Left: 0 cm, Hanging: 0.44 cm, Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

4.4	Roof Structure	
4.5	Roof coverings	
4.6	Roof drainage	
4.7	Roof lights	
4.8	Stair structure	
4.9	Stair finishes	
4.10	Stair balustrades & handrails	
4.11	External walls	
4.12	Windows	
4.13	External doors	
4.14	Internal walls and partitions	
4.15	Internal doors	
4.16	Wall finishes	
4.17	Floor finishes	
4.18	Ceiling finishes	
4.19	Fittings, fixtures & furniture	
4.20	Soft furnishings	
4.21	Works of Art	
4.22	Equipment	
4.23	Sanitary appliances	
4.24	Services equipment	
4.25	Disposal installations	
4.26	Mains Water installations	
4.27	Cold water services	
4.28	Hot water services	
4.29	Steam & condensate	
4.30	Heat source	
4.31	Space heating	
4.32	Space cooling	
4.33	Ventilating system	
4.34	Electric source & mains	
4.35	Electric power supplies	
4.36	Electric lighting & fittings	
4.37	Gas installations	
4.38	Lift installations	
4.39	Sprinkler installations	
4.40	Fire-fighting installations	
4.41	Lightning protection	
4.42	Communication installations	
4.43	Special installations– Renal Water, Filtered Water	
4.44	Special installations – Building management System	
4.45	Special installations– Pneumatic tube system	
4.46	Roads, car parks, pavements, cycle paths	
4.47	Soft landscaping	
4.48	Site enclosure	
4.49	External fittings & furniture	
4.50	Drainage	
4.51	Water Mains	
4.52	Fire Mains	
4.53	Heating Mains	
4.54	Gas mains	
4.55	Electric mains	
4.56	Site Lighting	

4.57	Minor building works	
5.0 Component / Product & Manufacturer Schedule		
5.1	Boilers	
5.2	Calorifiers	
5.3	Pumps	
5.4	Switchgear	
5.5	AHU's	
5.6	Fans	
5.7	Internal Doors	
5.8	Ironmongery	
5.9	External doors & screens	
5.10	Roof Coverings	
5.11	Cladding / Curtain Walling / Windows	
5.12	Vinyl Flooring	
5.13	Carpet	
5.14	Ceiling systems	
6.0 Equipment Schedule		
6.1	Proposed Equipment Schedule	
7.0 HTM / SHTM Compliance Statement		
7.1	Confirm compliance with required HTM's and state how compliance is being achieved	
8.0 ADB Compliance Statement		
8.1	Confirm compliance with requirements of ADB sheets issued	
9.0 Programme		
9.1	Master programme	
9.2	Stage 1 Laboratory sub-programme	
9.3	Stage 2 FBC Stage sub-programme	
9.4	Stage 3 Construction stage sub-programme	
10.0 Project / Site Management		
10.1	Project Execution Plan comprising:-	
	▪ Management structure	
	▪ Management Staff – key personnel & structure	
	▪ Design Staff - key personnel & structure	
	▪ Temporary Accommodation & Welfare	
	▪ Logistics	
	▪ Traffic Management	
	▪ Car Parking	
	▪ Staff Movement	
	▪ Site Security	
	▪ Site Safety, including Construction Phase Health & Safety Plan	
	▪ Site interfaces	
	▪ Waste management	
	▪ Community engagement	
11.0 Contract Conditions		
11.1	Marked up copy of draft contract	
11.2	Statement on unacceptable contract terms	
11.3	Evidence of Insurance provisions	
11.4	Performance Bond	

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

11.5	Performance Damages	
11.6	Collateral Warranties	
12.0 Financial		
12.1	Statement on Commercial proposals, operation of Target Pricing, Open Book audit	
12.2	Target & Maximum Price Proposals ▪ Overall Project ▪ Stage 1 New Labs ▪ Stage 2 FBC Design ▪ Stage 3 Design & Construction New Hospitals	
12.3	Detailed Elemental Cost Plan, comprising elemental summary with supporting detail comprising work items, approximate quantities, rates etc ▪ Stage 1 New Labs ▪ Stage 2 FBC Design ▪ Stage 3 Design & Construction New Hospitals ▪ Stage 3A Hard & Soft Landscaping Completion	
12.4	Priced Activity Schedules & Supporting Monthly Cashflows ▪ Overall Project ▪ Stage 1 New Labs ▪ Stage 2 FBC Design ▪ Stage 3 Design & Construction New Hospitals ▪ Stage 3A Hard & Soft Landscaping Completion	
12.5	Payment proposals	
12.6	Priced Risk Register & Risk Allocation ▪ Stage 1 New Labs ▪ Stage 2 FBC Design ▪ Stage 3 Design & Construction New Hospitals ▪ Stage 3A Hard & Soft Landscaping Completion	
12.7	Incentivisation Proposals Pain / Gain ▪ Stage 1 New Labs ▪ Stage 2 FBC Design ▪ Stage 3 Design & Construction New Hospitals & Stage 3A Hard & Soft Landscaping Completion	
12.8	Whole Life Cycle Cost Estimate for 30 year period detailing, replacement costs & timescales, planned & preventative maintenance, energy usage including:- ▪ Overall Project Summary ▪ Stage 1 New Labs ▪ Stage 3 Construction New Hospitals ▪ Stage 3A Hard & Soft Landscaping Completion Energy costs assumptions should be clearly stated	

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

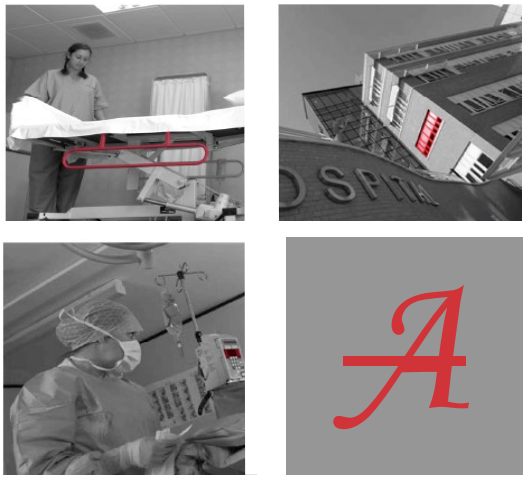
Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

Formatted: Bulleted + Level: 1 + Aligned at: 0 cm + Tab after: 9.39 cm + Indent at: 0.6 cm, Tab stops: 0.44 cm, List tab + Not at 9.39 cm

Formatted: Bullets and Numbering

Appendix B Qualitative Scoring Schedule



ITPD Evaluation Criteria	Individual Weighting	Technical Weighting
DESIGN	**550**	**50**
Space	**20**	
The design should achieve appropriate clinical space standards as required by the ITPD Schedule of	10	
The circulation, communication & plant space should be adequate and optimised	10	
Drawing information:-	**250**	
1:500 scale Masterplan proposals	30	
1:500 departmental relationship drawings for all levels indicating functional relationships & main	50	
1:200 departmental layouts reflect the required space standards and functionality	45	
1:200 departmental drawing for Adult Theatres Department, fully	15	
Annotated		
1:200 departmental drawing for Adult Ward, fully annotated	15	
1:200 departmental drawing for Childrens Ward, fully annotated	15	
1:200 departmental drawing for Childrens A&E, fully annotated		
1:50 room layout and wall elevations fully developed	10	
1:200 Elevations – incorporating external signage proposals	5	
1:200 Exemplar sections	5	
3D images / perspective (internal & external) indicating the following:-		
▪ Architectural vision – space, height, form, composition, scale, character and use of materials		
▪ Hospital Main Entrance / atrium / public space proposals / visuals	15	
1:500 site hard & soft landscaping proposals indicating:-		
▪ Soft landscaping strategy		
▪ Hard landscaping strategy		
▪ Car Parking arrangements with distribution of spaces and use identified		
▪ Areas of differing Carriageway Construction		
▪ Road, footway and cycle way geometry		
▪ Indicative Signalised layouts at external roads		
▪ Retention / protection of existing trees		
▪ Incorporation of art		
▪ Special features		
▪ Courtyards	10	
Finishes Schedule for X Departments and key circulation & communication routes, and main entrances	10	
Door & ironmongery Schedule for X Departments key circulation & communication routes, and main	10	
Roof level: Typical layout indicating structure, including helipad (Acute Adults & Childrens)	5	
Architectural design strategy statement in support of drawing information	5	
Wayfinding strategy	5	

ITPD Evaluation Criteria	Individual Weighting	Technical Weighting
Design Strategy	**155**	
Acoustic Strategy & Report	5	
Fire engineering design strategy including drawings	5	
Structural Engineering design strategy including outline design drawings demonstrating structural	5	
Drainage design strategy including 1:1250 (or greater) plans showing drainage provision in support of		
▪ Layout of roads and buildings		
Layout of sewers, outfalls, underground storage, and SUDS features	5	
Main incoming utilities design / connection strategy including Schematic for Main Services distribution	5	
Water Services Strategy including Hot & Cold Water Services Schematic, Filtered Water Schematic and	5	
Heating design strategy including MTHW Schematic & LTHW Schematic	10	
Ventilation & air treatment design strategy including Schematic drawings	10	
Mains and Sub-mains power distribution design strategy including MV Power Schematic and LV Power	10	
Lighting design strategy	10	
Lift Engineering design strategy	10	
Communication design strategy	5	
Protective systems design strategy including Sprinklers schematic and Fire alarm & damper controls	5	
Medical gases design strategy including schematic drawings	5	
Pneumatic tube system design strategy including schematic drawings	5	
Plant room design strategy	5	
Control systems including BMS schematic	5	
Helipad M&E services design strategy	5	
Maintenance & major plant replacement strategy	40	
Sustainability	**75**	
Sustainable design statement	25	
BREEAM scoring schedule	25	
Energy strategy including approach to renewables, sustainability	25	
AEDET Review	**50**	
Overall AEDET review score	50	
Design Score	**550**	**50**

ITPD Evaluation Criteria	Individual Weighting	Technical Weighting
DELIVERABILITY AND APPROACH	**250**	**30**
Project management:	**100**	
Structure & approach	20	
Site Management Team;	5	
Design Team;	5	
Community Engagement	70	
Construction Approach:	**30**	
Phased planning and construction should be well organised;	5	
There should be minimal impact on service delivery;	10	
The construction exploits any innovation benefits from standardisation and prefabrication;	10	
The construction techniques must minimise generation of waste, through the development of a site waste	5	
Site Management:	**80**	
Temporary Accommodation proposals	15	
Logistics proposals	10	
Traffic management	10	
Car Parking	10	
Staff Movement	5	
Site Security & Safety	10	
Site interfaces	10	
Waste Management	10	
Programme:	**40**	
Master programme	5	
Stage 1 Laboratory programme	10	
Stage 2 FBC sub programme	10	
Stage 3 Construction programme	10	
Stage 3A Hard & landscaping completion programme	5	
Commissioning & Handover	**50**	
▪ Commissioning plans, including Building Services testing & commissioning	20	
▪ Handover process	15	
▪ Extended defects requirement	15	
Logistics Score	**250**	**30**

ITPD Evaluation Criteria	Individual Weighting	Commercial Weighting
COMMERCIAL	**200**	**20**
Contract:	**25**	
Compliance with Contract Conditions	5	
Insurances	5	
Performance Bond	10	
Collateral Warranties	5	
Pricing	**175**	
Statement on Commercial proposals, operation of Target Pricing, Open Book audit	5	
Target / Maximum Price assessment	25	
Priced Risk Register & Risk Allocation	65	
Stage 1 Laboratory Design & Construction detailed elemental cost & resource plans	5	
Stage 1 Laboratory Design & Construction Priced Activity Schedules, Cashflow & Payment Proposals	5	
Stage 2 FBC Stage Priced Activity Schedules including supporting detailed costed resource plan,	10	
Stage 3 Adult / Childrens / Site Works Design & Construction detailed elemental cost & resource plans	5	
Stage 3 Adult / Childrens / Site Works Design & Construction Priced Activity Schedules, Cashflow &	5	
Project Whole Life Cycle Cost Plan	50	
Total Commercial Score	**200**	**20**

PURPOSE OF MEETING:

Design Dialogue No.2 – M & E Break Out Meeting

PERSONS PRESENT & ORGANISATION:

Name	Representing	Name	Representing	Name	Representing
Davis Hall	C & B				
Susan Logan	BREEAM/Carbon Reduction				
Hugh ?	?				
John Bushfield	Board Technical Advisor – Wallace Wittle				
Brian Gillespie	NHS GG+G Services				
Ed McIntyre	Mercury Engineering				
Les Roach	Mercury Engineering				
Steve Pardy	Zisman Bowyer & Partners LLP				

DISTRIBUTION:

BCL, NA, D&S, WSP, MER

ITEM NO.	DESCRIPTION	ACTION	DATE CLEARED
1.0	**SUSTAINABILITY**		
1.1	SP presented a typical format for the energy consumption analysis (based on Peterborough PFI). The format was acceptable with the following noted: • Investigate the use of dynamic weather data rather than Degree Days. • RFI to be raised to confirm departmental operating times as basis of calculation. • Use of historic energy consumption data to be introduced. • Energy/carbon analysis to relate to development only. Site wide energy currently outside scope.	**ZBP**	
1.2	Low/Zero Carbon Solutions • Proposals for natural ventilation strategies to be presented. • ZBP proposed that LZC solutions should achieve target savings with the best overall value. • The Board would seek to achieve a public view of renewable technologies to support the main 'behind the scenes' LZC solutions. • Rain water harvesting – not considered appropriate to clinical spaces but may be used as public facilities or irrigative. Better option to use in Labs /FM complex.	**ZBP**	

- Possible use of aquifer as cooling source, but depends on viability of source. A site study is currently being undertaken by the Board to determine viability.
- CHP/CHP Trigeneration – likely to yield large carbon reductions. To be considered against future retained estate profile.
- CHP analysis to consider sensitivity of differentials between gas and electricity tariffs.
- High efficiency chillers could be used to support absorption base load cooling.
- Wind / Solar / PV could be used as public view of Board's commitment to carbon reduction.
- The Board is currently investigating with Scottish water bio-gas production at the adjacent sewage works with a pipe link to the site. The Board to further advise.
- Investigate dual fuel bio gas / nat gas CHP.
- Proposals to consider the cost of carbon / climate change / risk of change.

1.3 **BREEAM**

The following points were noted:

- An 'Excellent' BREEAM rating is required
- The rating is to reflect The Board's requirements for high quality design. The challenge is not only to consider the easy credits, but is to give importance to long term whole life costings.
- Achieving the whole life credit is very important and the value of the bid will be based on whole life benefit.
- The Board are currently working on the Client Credits of BREEAM, noting the following:
    - An ecology specialist is being appointed to advise
    - Archaeology is completed
    - An assessment for the labs is underway
- DDM4 should have a group dedicated to BREEAM. **BCL**

2.0 EXEMPLAR ENGINEERING SOLUTIONS

2.1 ENERGY CENTRE(s)

- The existing boiler house has now been decommissioned and replaced by decentralised plant across the existing site.
- A connection on the MTHW system is to be allowed to serve the retained estate and make use of a site wide energy source. However, whilst heating mains sizing is to take account of this, only space provision to be made for additional plant.
- The provision of the second energy centre was to provide resilience to the site, but exact location has to be finalised. If sufficient resilience can be provided at the main energy centre and a cost

benefit shown, this second centre may not be necessary. Proposals to be put forward for a single energy centre option:

- With the increase in the lab block height, the energy centre can also increase in height to allow more space.
- A CHP selection is to take account of the heating profile of the retained estate.
- The basement location for oil storage was chosen due to restricted site area. The oil storage will also be used to bowser oil to remote generators around the site.
- The labs/FM buildings will need to connect to the energy centre when complete to make use of the site LZC systems. However the number of small modular boilers will be included in the lab scheme, which will eventually act as additional provision for resilience. Is there an alternative?

A brief review now took place of main system schematic diagrams issued.

2.2 11kV Distribution

- It was noted by ZBP that there was a potential single point of failure (SPF) in the REC's 33KV substation by having a shared switch room and incoming supplies along the same route. The Board are currently in discussion with the REC, but may not be able to influence this.
- It was noted, however, that the site 11KV system is robust and has full provision standby generation.
- It was suggested by JB that the temporary 11KV feed labs could be used as a back feed from the REC network to give an alternative, but limited source of supply.
- It was confirmed that the current arrangement for 11KV follows HTM 06 Fig 19. ZBP to raise an RFI on limiting dual supplies to cat 3 & 4 zones only. **ZBP**
- Currently standby generations are inducted as LV sets with step up transformers to 11KV. The use of 11KV generators is acceptable of technical issues can be overcome.
- Provision is required for the connection of a mobile generator (LV step up to 11KV) on each side of the ring.

2.3 HEATING

- The use of MTHW is an option and an alternative LTHW system could be offered if shown to be viable.
- The use of steam distribution is unlikely to be viable from an energy point of view. ZBP's view is that steam will be generated locally as required, avoiding the use of electricity is practical.
- The use of variable speed pumping/ 2 port valves was raised as schemes currently indicate constant volume/ 3 port valves. VVP would save significant amounts of energy. ZBP have used this on major systems for many years. An RFI is to be raised to propose this way forward. **ZBP**

2.4 CHILLED WATER

- See comment above regarding VVP.
- The exemplar schematics currently show decentralised cooling, but this does not make use of central trigeneration opportunity. Proposals to be put forward for alternative arrangements.
- Heat / cool meters to be provided at major load centres for energy monitoring purposes.

2.5 WATER SYSTEMS

- A filtration system to the incoming water supply was confirmed.
- Renal water requires a bulk chemical store for the Adult unit, but local containers were proposed for the children's hospital.

2.6 VENTILATION

- It was noted that HTM 03 allows clean and foul extract to be combined, the SHTM may have different requirements. The SHTMs are due to be uploaded to BIW and cross checks should be made on all HTM/SHTMs.
- Thermal wheels are proposed to maximise energy recovery. Whilst permitted under HTM they should be checked against HAI Scribe.
- The use of heat pipes to be investigated as they offer advantages in healthcare facilities.

3.0 MISCELLANEOUS

- The ER requirements on resilience (8.1.1.17 and 8.1.1.18) require certification on the extent of departments served.
- ZBP to put forward a proposal for Board review. **ZBP**
- It was noted that NSGH will be a major hub in Scottish healthcare and the highest levels of resilience are required. Resilience generally follows that set down in SHTM 07.
- The definition of 'Clinical' areas was queried as to which spaces this applied to. SB noted that he had prepared a note to clarify that which would be issued to the bidders. **NSGH**
- Retained estate systems such as BMS and fire alarms, etc are to be monitored only by the new development.

File Name	Iss.	Rev.	Title	Status	Issue Date	Publishing Company	Publishing User
NSGACL ITPD Volume 1	1	1	Project Scope & Commercial Doc	V1 General	01/05/2009	Currie & Brown	Gilmour, Ian
NSGACL Contract Bond ITSFB Issue - Vol 1	1	1	NSGACL Contract Bond ITSFB Issue - Vol 1.pdf	V1 General	14/08/2009	NHS Greater Glasgow & Clyde	Frew, Shiona
NSGACL Contract Form of Agreement	1		The Contract : Form of Agreement	V1 General	04/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Form of Consultant Collateral Warranty	1		The Contract : Consultant's Collateral Warranty	V1 General	04/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Form of Novation Agreement	1		The Contract : Novation Agreement	V1 General	04/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Form of novation agreement ITSFB Issue - Vol 1	1	1	NSGACL Form of novation agreement ITSFB Issue - Vol 1.pdf	V1 General	14/08/2009	NHS Greater Glasgow & Clyde	Frew, Shiona
NSGACL Form of sub-consultant warranty ITSFB Issue - Vol 1	1	1	NSGACL Form of sub-consultant warranty ITSFB Issue - Vol 1.pdf	V1 General	14/08/2009	NHS Greater Glasgow & Clyde	Frew, Shiona
NSGACL Form of Sub-Contractor Collateral Warranty	1		The Contract : Sub-Contractor's Collateral Warranty	V1 General	04/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Form of subcontractor warranty ITSFB Issue - Vol 1	1	1	NSGACL Form of subcontractor warranty ITSFB Issue - Vol 1.pdf	V1 General	14/08/2009	NHS Greater Glasgow & Clyde	Frew, Shiona
NSGACL NEC Contract Document ITSFB Issue - Vol 1	1	1	NSGACL NEC Contract Document ITSFB Issue - Vol 1.pdf	V1 General	14/08/2009	NHS Greater Glasgow & Clyde	Frew, Shiona
NSGACL Vol 1 - Appendix C Rev 3	1	3	NSGACL Vol 1 - Appendix C Rev 3.pdf	V1 General	14/08/2009	NHS Greater Glasgow & Clyde	Frew, Shiona
0401	1	.	PROPOSED SHEAR WALL LAYOUT	V1 General	30/06/2009	URS Corporation Ltd	Gorman, George
0404	1	.	PROPOSED SUPERSTRUCTURE	V1 General	03/07/2009	URS Corporation Ltd	Gorman, George
0406	1	.	PROPOSED ROOF STRUCTURE	V1 General	30/06/2009	URS Corporation Ltd	Gorman, George
SK-0010	1	.	DETAIL OF 2 PILE PILECAP	V1 General	19/06/2009	URS Corporation Ltd	Denton, Chris
SK-0011	1	.	DETAIL OF 3 PILE PILECAP	V1 General	19/06/2009	URS Corporation Ltd	Denton, Chris
SK-0012	1	.	SECTION INDICATING PILECAP LOCATION BELOW PLANT SLAB / BASEMENT	V1 General	19/06/2009	URS Corporation Ltd	Denton, Chris
SK-0013	1	.	SECTION INDICATING PILECAP LOCATION BELOW LABRATORY / OFFICES	V1 General	19/06/2009	URS Corporation Ltd	Denton, Chris
SK-0014	1	.	DETAIL OF 1 PILE PILECAP	V1 General	19/06/2009	URS Corporation Ltd	Denton, Chris
SK-0015	1	.	DETAIL OF 4 PILE PILECAP	V1 General	19/06/2009	URS Corporation Ltd	Denton, Chris
SK-0017	1	.	SECTION X-X	V1 General	19/06/2009	URS Corporation Ltd	Denton, Chris
SK-0018	1	.	SECTION Y-Y	V1 General	19/06/2009	URS Corporation Ltd	Denton, Chris

SK-0019	1	.	SECTION Z-Z	V1 General	19/06/2009	URS Corporation Ltd	Denton, Chris
SK-0020	1	.	PROPOSED PILE AND GROUND BEAM LAYOUT	V1 General	19/06/2009	URS Corporation Ltd	Denton, Chris
SK-0030	1	.	PART PLAN SHOWING TRANSFER STRUCTURE OVER SERVICE YARD ACCESS ROAD	V1 General	30/06/2009	URS Corporation Ltd	Gorman, George
SK-016	1	.	DETAILS OF TEMPORARY RETENTION	V1 General	19/06/2009	URS Corporation Ltd	Denton, Chris

File Name	Iss.	Rev.	Title	Status	Issue Date	Publishing Company	Publishing User
NSGACL PD-HLM-L(00)X-XX-001 - Existing Site Plan	1	1	Existing Site Plan	V2.1 Appendix A The Site	01/05/2009	HLM Architects	Allan, Steve
NSGACL PD-HLM-L(00)X-XX-001 - Existing Site Plan	2	1	Existing Site Plan	V2.1 Appendix A The Site	21/05/2009	HLM Architects	Allan, Steve
NSGACL-PD-HLM-S(00)X-XX-005 - Phased Construction Site Plan	1	1	Phased Construction Site Plan	V2.1 Appendix A The Site	06/05/2009	HLM Architects	Allan, Steve
NSGAC OPD Activity NCH	1		NSGAC OPD Activity NCH	V2.1 Appendix B Clinical Output Specifications	08/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL AAU NSG	1		Clinical Output Specification	V2.1 Appendix B Clinical Output Specifications	05/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Adult and Childrens Hospital Combined Bioengineering NSG NCH	1		CLINICAL OUTPUT SPECIFICATION	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL ADULT AND CHILDRENS HOSPITAL Med illus NSG NCH	1		CLINICAL OUTPUT SPECIFICATION	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL ADULT AND CHILDRENS PHARMACY NSG NCH	1		CLINICAL OUTPUT SPECIFICATION	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Anticoagulation NSG	1		Clinical Output Specification	V2.1 Appendix B Clinical Output Specifications	05/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Audiology NCH	1		NSGACL Audiology NCH	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Cardiac Rehab NSG	1		NSGACL Cardiac Rehab NSG	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL Cardiac Services NCH	1		NSGACL Cardiac Services NCH	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Cardiology NSG	1		Clinical Output Specification	V2.1 Appendix B Clinical Output Specifications	05/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Care of Elderly NSG	1		NSGACL Care of Elderly NSG	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL Chaplaincy NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Chaplaincy Spiritual Care NSG	1		NSGACL Chaplaincy Spiritual Care NSG	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL Child Protection NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Clinical Psychology NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Community paediatrics NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Continence Service NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Critical Care NSG	1		Clinical Output Specification	V2.1 Appendix B Clinical Output Specifications	05/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Day Medical NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Dental NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Departmental Adjacency Matrix NCH	1		New Children's Hospital Departmental Adjacency Matrix	V2.1 Appendix B Clinical Output Specifications	21/05/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Departmental Adjacnecy Matrix NSG	1		NSGACL Departmental Adjacnecy Matrix NSG	V2.1 Appendix B Clinical Output Specifications	15/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Dermatology NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Dermatology NSG	1		Clinical Output Specification	V2.1 Appendix B Clinical Output Specifications	05/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Diabetes Endocrinology NSG	1		Clinical Output Specification	V2.1 Appendix B Clinical Output Specifications	05/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Diabetes NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Dietetic NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Dietetic NSG	1		Clinical Output Specification	V2.1 Appendix B Clinical Output Specifications	05/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Discharge Lounge NSG	1		NSGACL Discharge Lounge NSG	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL ECLS NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL EMERGENCY DEPARTMENT NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Emergency Department NSG	1		Clinical Output Specification	V2.1 Appendix B Clinical Output Specifications	05/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Endocrinology NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Endoscopy NSG	1		NSGACL Endoscopy NSG	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL ENT Audiology NSG	1		NSGACL ENT Audiology NSG	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL ENT NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Entrance Hall NSG	1		Clinical Output Specification	V2.1 Appendix B Clinical Output Specifications	05/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Gastro NCH	1		NSGACL Gastro NCH	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Gastroenterology NSG	1		NSGACL Gastroenterology NSG	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL Gen Outpatients NSG	1		NSGACL Gen Outpatients NSG	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL Gen Surg NCH	1		NSGACL Gen Surg NCH	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL General Surgery NSG	1		NSGACL General Surgery NSG	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL General Surgery NSG	2		NSGACL General Surgery NSG	V2.1 Appendix B Clinical Output Specifications	01/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Generic Ward Matrix NCH	1		New Children's Hospital Patient/Public/Staff - Pathways/Adjacencies	V2.1 Appendix B Clinical Output Specifications	21/05/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL GENERIC WARD NCH	1		CLINICAL OUTPUT SPECIFICATION	V2.1 Appendix B Clinical Output Specifications	01/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL GENERIC WARD NCH	2		CLINICAL OUTPUT SPECIFICATION	V2.1 Appendix B Clinical Output Specifications	21/05/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Generic Wards NSG	1		Clinical Output Specification	V2.1 Appendix B Clinical Output Specifications	05/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson

NSGACL Haemato Oncology NSG	1		NSGACL Haemato Oncology NSG	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL Haemat-Oncology NCH	1		NSGACL Haemat-Oncology NCH	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL HaN NCH	1		NSGACL HaN NCH	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Health Records NSG	1		NSGACL Health Records NSG	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL Imaging NCH	1		NSGACL Imaging NCH	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL IMMUNOLOGY NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Laboratory Medicine NSG	1		Clinical Output Specification	V2.1 Appendix B Clinical Output Specifications	05/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Liaison Psychiatry NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Mat_Neonate Psychology NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Medical Day Unit NSG	1		NSGACL Medical Day Unit NSG	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL Medical Paediatric NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL METABOLIC MEDICINE NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Neurology NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Neurology NCH	2		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Neurophysiology NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Neurophysiology NCH	2		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL NEUROSURGRY NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Nuclear Medicine NSG	1		Clinical Output Specification	V2.1 Appendix B Clinical Output Specifications	05/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL OCCUPATIONAL THERAPY NCH	1		CLINICAL OUTPUT SPECIFICATION	V2.1 Appendix B Clinical Output Specifications	01/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Operational Procedure Domestic Services NSG	1		Operational Procedure	V2.1 Appendix B Clinical Output Specifications	07/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Operational Procedure Linen NSG	1		Operational Procedure	V2.1 Appendix B Clinical Output Specifications	07/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Operational Procedure Portering NSG	1		Operational Procedure	V2.1 Appendix B Clinical Output Specifications	07/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Operational Procedure Waste NSG	1		Operational Procedure	V2.1 Appendix B Clinical Output Specifications	07/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Ophthalmology NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Ophthalmology NCH	2		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Ophthalmology NSG	1		NSGACL Ophthalmology NSG	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL Ophthalmology NSG	2		NSGACL Ophthalmology NSG	V2.1 Appendix B Clinical Output Specifications	01/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Orthopaedic NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Orthopaedic NCH	2		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Orthopaedics NSG	1		NSGACL Orthopaedics NSG	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL Orthotics NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Orthotics NCH	2		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL OT Orthotics NSG	1		Clinical Output Specification	V2.1 Appendix B Clinical Output Specifications	05/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Out of Hours NSG	1		Clinical Output Specification	V2.1 Appendix B Clinical Output Specifications	05/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL OUTPATIENTS DEPARTMENT NCH	1		CLINICAL OUTPUT SPECIFICATION	V2.1 Appendix B Clinical Output Specifications	01/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Pain NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Pain NCH	2		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Physiotherapy NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Physiotherapy NCH	2		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Physiotherapy NSG	1		Clinical Output Specification	V2.1 Appendix B Clinical Output Specifications	05/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL PICU NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL PICU NCH	2		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL PLASTICS NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Play Service NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Play Service NCH	2		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Psychiatric Inpatients NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Psychiatric Inpatients NCH	2		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Radiology NSG	1		Clinical Output Specification	V2.1 Appendix B Clinical Output Specifications	05/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Renal Dialysis NSG	1		Clinical Output Specification	V2.1 Appendix B Clinical Output Specifications	05/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Renal NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Renal NCH	2		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson

NSGACL Renal NSG	1		Clinical Output Specification	V2.1 Appendix B Clinical Output Specifications	05/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL RESPIRATORY NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Respiratory NSG	1		Clinical Output Specification	V2.1 Appendix B Clinical Output Specifications	05/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Rheumatology NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Rheumatology NCH	2		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Rheumatology NSG	1		Clinical Output Specification	V2.1 Appendix B Clinical Output Specifications	05/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL SPEECH AND LANGUAGE THERAPY NCH	1		CLINICAL OUTPUT SPECIFICATION	V2.1 Appendix B Clinical Output Specifications	01/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Speech Language Therapy NSG	1		Clinical Output Specification	V2.1 Appendix B Clinical Output Specifications	05/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Stroke NSG	1		Clinical Output Specification	V2.1 Appendix B Clinical Output Specifications	05/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL THEATRES NCH	1		CLINICAL OUTPUT SPECS	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Theatres NSG	1		Clinical Output Specification	V2.1 Appendix B Clinical Output Specifications	05/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL TRANSPORT NCH	1		CLINICAL OUTPUT SPECIFICATION	V2.1 Appendix B Clinical Output Specifications	01/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Urology NSG	1		NSGACL Urology NSG	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL Vascular NSG	1		NSGACL Vascular NSG	V2.1 Appendix B Clinical Output Specifications	30/04/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL Schedule of Accommodation - Excel format - NCH	1		New Children's Hospital Schedule of Accommodation For ER's in Excel format	V2.1 Appendix C Schedule of Accommodation	12/05/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Schedule of Accommodation - Excel format - NSG	1		New Adult Hospital Schedule of Accommodation for ER's - Excel format	V2.1 Appendix C Schedule of Accommodation	12/05/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Schedule of Accommodation NCH	1		Schedule of Accommodation NCH	V2.1 Appendix C Schedule of Accommodation	05/05/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Schedule of Accommodation NSG	1		Schedule of Accommodation for Adult Hospital	V2.1 Appendix C Schedule of Accommodation	06/05/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL D.1 Outline Planning Conditions	1	1	App D (1 of 2) Outline Planning	V2.1 Appendix D Outline Planning	01/05/2009	Currie & Brown	Gilmour, Ian
NSGACL D.2 Planning Matrix	1	1	App D (Part 2 of 2) Planning Matrix	V2.1 Appendix D Outline Planning	01/05/2009	Currie & Brown	Gilmour, Ian
NSGACL-Generic ADB Room Data Sheets	1	1	Board Exemplar ADB Room Data Sheets	V2.1 Appendix E ADB Rm Data Sheets	06/05/2009	HLM Architects	Allan, Steve
NSGACL-Generic ADB Room Data Sheets	2	1	Board Exemplar ADB Room Data Sheets	V2.1 Appendix E ADB Rm Data Sheets	22/05/2009	HLM Architects	Allan, Steve
NSGACL 1149-03A	1	A	Landscape Masterplan	V2.1 Appendix G Site Masterplan	06/05/2009	Hirst Landscape Architects	Miller, Paul
NSGACL - 3D Image 1 - View from new entrance boulevard	1	1	3D Image 1 - View from new entrance boulevard	V2.1 Appendix G Site Masterplan	01/05/2009	HLM Architects	Allan, Steve
NSGACL - 3D Image 2 - View of childrens entrance	1	1	3D Image 2 - View of childrens entrance	V2.1 Appendix G Site Masterplan	01/05/2009	HLM Architects	Allan, Steve
NSGACL - 3D Image 3 - View of emergency entrances	1	1	3D Image 3 - View of emergency entrances	V2.1 Appendix G Site Masterplan	01/05/2009	HLM Architects	Allan, Steve
NSGACL - 3D Image 4 - View of new tower across parkland	1	1	3D Image 4 - View of new tower across parkland	V2.1 Appendix G Site Masterplan	01/05/2009	HLM Architects	Allan, Steve
NSGACL PD-HLM-L(00)X-XX-002 - Proposed Site Plan	1	1	Proposed Site Plan	V2.1 Appendix G Site Masterplan	01/05/2009	HLM Architects	Allan, Steve
NSGACL PD-HLM-L(00)X-XX-002 - Proposed Site Plan	2	1	Proposed Site Plan	V2.1 Appendix G Site Masterplan	21/05/2009	HLM Architects	Allan, Steve
NSGACL App H -Board Exemplar Layouts 1 to 500 Cover	1	1	Cover Sheet	V2.1 Appendix H Board Exemplar Layouts (1:500)	07/05/2009	HLM Architects	Allan, Steve
NSGACL PD-HLM-L(00)00-x-XX-001-Dept Adj Level 0	1	1	Departmental Adjacencies Level 0	V2.1 Appendix H Board Exemplar Layouts (1:500)	07/05/2009	HLM Architects	Allan, Steve
NSGACL PD-HLM-L(00)00-x-XX-001-Dept Adj Level 0	2	1	Departmental Adjacencies Level 0	V2.1 Appendix H Board Exemplar Layouts (1:500)	13/05/2009	HLM Architects	Allan, Steve
NSGACL PD-HLM-L(00)-01-X-XX-001-Dept Adj Level -1	1	1	Departmental Adjacencies Level -1	V2.1 Appendix H Board Exemplar Layouts (1:500)	07/05/2009	HLM Architects	Allan, Steve
NSGACL PD-HLM-L(00)-01-X-XX-001-Dept Adj Level -1	2	1	Departmental Adjacencies Level -1	V2.1 Appendix H Board Exemplar Layouts (1:500)	13/05/2009	HLM Architects	Allan, Steve
NSGACL PD-HLM-L(00)01-X-XX-001-Dept Adj Level 1	1	1	Departmental Adjacencies Level 1	V2.1 Appendix H Board Exemplar Layouts (1:500)	07/05/2009	HLM Architects	Allan, Steve
NSGACL PD-HLM-L(00)01-X-XX-001-Dept Adj Level 1	2	2	Departmental Adjacencies Level 1	V2.1 Appendix H Board Exemplar Layouts (1:500)	08/05/2009	HLM Architects	Allan, Steve
NSGACL PD-HLM-L(00)01-X-XX-001-Dept Adj Level 1	3	2	Departmental Adjacencies Level 1	V2.1 Appendix H Board Exemplar Layouts (1:500)	13/05/2009	HLM Architects	Allan, Steve
NSGACL PD-HLM-L(00)02-X-XX-001-Dept Adj Level 2	1	1	Departmental Adjacencies Level 2	V2.1 Appendix H Board Exemplar Layouts (1:500)	07/05/2009	HLM Architects	Allan, Steve
NSGACL PD-HLM-L(00)02-X-XX-001-Dept Adj Level 2	2	2	Departmental Adjacencies Level 2	V2.1 Appendix H Board Exemplar Layouts (1:500)	08/05/2009	HLM Architects	Allan, Steve
NSGACL PD-HLM-L(00)02-X-XX-001-Dept Adj Level 2	3	2	Departmental Adjacencies Level 2	V2.1 Appendix H Board Exemplar Layouts (1:500)	13/05/2009	HLM Architects	Allan, Steve
NSGACL PD-HLM-L(00)03-x-XX-001-Dept Adj Level 3	1	1	Departmental Adjacencies Level 3	V2.1 Appendix H Board Exemplar Layouts (1:500)	07/05/2009	HLM Architects	Allan, Steve
NSGACL PD-HLM-L(00)03-x-XX-001-Dept Adj Level 3	2	1	Departmental Adjacencies Level 3	V2.1 Appendix H Board Exemplar Layouts (1:500)	13/05/2009	HLM Architects	Allan, Steve
NSGACL PD-HLM-L(00)03-x-XX-001-Dept Adj Level 3	3	A	Departmental Adjacencies Level 3	V2.1 Appendix H Board Exemplar Layouts (1:500)	12/06/2009	HLM Architects	Allan, Steve
NSGACL PD-HLM-L(00)03-x-XX-001-Dept Adj Level 3	4	A	Departmental Adjacencies Level 3	V2.1 Appendix H Board Exemplar Layouts (1:500)	17/07/2009	HLM Architects	Allan, Steve
NSGACL PD-HLM-L(00)04-X-XX-001-Dept Adj Level 4	1	1	Departmental Adjacencies Level 4	V2.1 Appendix H Board Exemplar Layouts (1:500)	07/05/2009	HLM Architects	Allan, Steve
NSGACL PD-HLM-L(00)04-X-XX-001-Dept Adj Level 4	2	1	Departmental Adjacencies Level 4	V2.1 Appendix H Board Exemplar Layouts (1:500)	13/05/2009	HLM Architects	Allan, Steve
NSGACL PD-HLM-L(00)04-X-XX-001-Dept Adj Level 4	3	A	Departmental Adjacencies Level 4	V2.1 Appendix H Board Exemplar Layouts (1:500)	12/06/2009	HLM Architects	Allan, Steve
NSGACL PD-HLM-L(00)04-X-XX-001-Dept Adj Level 4	4	A	Departmental Adjacencies Level 4	V2.1 Appendix H Board Exemplar Layouts (1:500)	17/07/2009	HLM Architects	Allan, Steve
NSGACL-PD-HLM-L(00)00-X-OP-001 - Outpatient Adults Clinic Adj Level 0	1		Board Exemplar Layout - Outpatient (Adults) Clinic Adjacencies, Level 0 - 1:500	V2.1 Appendix H Board Exemplar Layouts (1:500)	03/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL-PD-HLM-L(00)01-X-OP-001 - Outpatient Adults Clinic Adj Level 1	1		Board Exemplar Layout - Outpatient (Adult) Clinic Adjacencies, Level 1 - 1:500	V2.1 Appendix H Board Exemplar Layouts (1:500)	03/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL-PD-HLM-L(00)02-X-OP-001 - Outpatient Adults Clinic Adj Level 2	1		Board Exemplar Layout - Outpatient (Adult) Clinic Adjacencies, Level 2 - 1:500	V2.1 Appendix H Board Exemplar Layouts (1:500)	03/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol

2447 AL (00)22 Emergency Department flow diagram	1	1	NSGACL Emergency Department (Children) Flow Diagram	V2.1 Appendix I Board Exemplar Layouts (1:200)	09/07/2009	HLM Architects	Allan, Steve
2447 AL(00)20P - Theatre flow diagram	1	1	NSGACL Theatre (Children) Flow Diagram	V2.1 Appendix I Board Exemplar Layouts (1:200)	09/07/2009	HLM Architects	Allan, Steve
2447 AL(00)23 Radiology flow diagram	1	1	NSGACL Radiology (Children) Flow Diagram	V2.1 Appendix I Board Exemplar Layouts (1:200)	09/07/2009	HLM Architects	Allan, Steve
NSGACL - PD-HLM-L(00)00-X-AA-001 - Acute Assessment Adults	1	1	Board Exemplar Layout - Acute Assessment Adults - 1:200	V2.1 Appendix I Board Exemplar Layouts (1:200)	06/05/2009	HLM Architects	Allan, Steve
NSGACL - PD-HLM-L(00)00-X-AA-001 - Acute Assessment Adults	2	2	Board Exemplar Layout - Acute Assessment Adults - 1:200	V2.1 Appendix I Board Exemplar Layouts (1:200)	12/05/2009	HLM Architects	Allan, Steve
NSGACL - PD-HLM-L(00)00-X-AA-001 - Acute Assessment Adults	3	2	Board Exemplar Layout - Acute Assessment Adults - 1:200	V2.1 Appendix I Board Exemplar Layouts (1:200)	13/05/2009	HLM Architects	Allan, Steve
NSGACL - PD-HLM-L(00)00-X-ED-001 - Emergency Department Adults	1	1	Board Exemplar Layout - Emergency Department Adults - 1:200	V2.1 Appendix I Board Exemplar Layouts (1:200)	06/05/2009	HLM Architects	Allan, Steve
NSGACL - PD-HLM-L(00)00-X-ED-001 - Emergency Department Adults	2	2	Board Exemplar Layout - Emergency Department Adults - 1:200	V2.1 Appendix I Board Exemplar Layouts (1:200)	12/05/2009	HLM Architects	Allan, Steve
NSGACL - PD-HLM-L(00)00-X-ED-001 - Emergency Department Adults	3	2	Board Exemplar Layout - Emergency Department Adults - 1:200	V2.1 Appendix I Board Exemplar Layouts (1:200)	13/05/2009	HLM Architects	Allan, Steve
NSGACL - PD-HLM-L(00)00-X-RA-001 - Radiology Adults	1	1	Board Exemplar Layout - Radiology Adults - Ground Floor - 1:200	V2.1 Appendix I Board Exemplar Layouts (1:200)	06/05/2009	HLM Architects	Allan, Steve
NSGACL - PD-HLM-L(00)00-X-RA-001 - Radiology Adults	2	2	Board Exemplar Layout - Radiology Adults - Ground Floor - 1:200	V2.1 Appendix I Board Exemplar Layouts (1:200)	12/05/2009	HLM Architects	Allan, Steve
NSGACL - PD-HLM-L(00)00-X-RA-001 - Radiology Adults	3	2	Board Exemplar Layout - Radiology Adults - Ground Floor - 1:200	V2.1 Appendix I Board Exemplar Layouts (1:200)	13/05/2009	HLM Architects	Allan, Steve
NSGACL - PD-HLM-L(00)01-X-CC-001 - Critical Care Facility Adults	1	1	Board Exemplar Layout - Critical Care Facility Adults - 1:200	V2.1 Appendix I Board Exemplar Layouts (1:200)	06/05/2009	HLM Architects	Allan, Steve
NSGACL - PD-HLM-L(00)01-X-CC-001 - Critical Care Facility Adults	2	2	Board Exemplar Layout - Critical Care Facility Adults - 1:200	V2.1 Appendix I Board Exemplar Layouts (1:200)	12/05/2009	HLM Architects	Allan, Steve
NSGACL - PD-HLM-L(00)01-X-CC-001 - Critical Care Facility Adults	3	2	Board Exemplar Layout - Critical Care Facility Adults - 1:200	V2.1 Appendix I Board Exemplar Layouts (1:200)	13/05/2009	HLM Architects	Allan, Steve
NSGACL - PD-HLM-L(00)01-X-RA-001 - Radiology Adults	1	1	Board Exemplar Layout - Radiology Adults - 1st Floor - 1:200	V2.1 Appendix I Board Exemplar Layouts (1:200)	06/05/2009	HLM Architects	Allan, Steve
NSGACL - PD-HLM-L(00)01-X-RA-001 - Radiology Adults	2	2	Board Exemplar Layout - Radiology Adults - 1st Floor - 1:200	V2.1 Appendix I Board Exemplar Layouts (1:200)	12/05/2009	HLM Architects	Allan, Steve
NSGACL - PD-HLM-L(00)01-X-RA-001 - Radiology Adults	3	2	Board Exemplar Layout - Radiology Adults - 1st Floor - 1:200	V2.1 Appendix I Board Exemplar Layouts (1:200)	13/05/2009	HLM Architects	Allan, Steve
NSGACL - PD-HLM-L(00)04-X-WA-001 - Generic Ward Floor (Adults)	1	1	Board Exemplar Layout - Generic Ward Floor Adults - 1:200	V2.1 Appendix I Board Exemplar Layouts (1:200)	06/05/2009	HLM Architects	Allan, Steve
NSGACL - PD-HLM-L(00)04-X-WA-001 - Generic Ward Floor (Adults)	2	2	Board Exemplar Layout - Generic Ward Floor Adults - 1:200	V2.1 Appendix I Board Exemplar Layouts (1:200)	12/05/2009	HLM Architects	Allan, Steve
NSGACL - PD-HLM-L(00)04-X-WA-001 - Generic Ward Floor (Adults)	3	2	Board Exemplar Layout - Generic Ward Floor Adults - 1:200	V2.1 Appendix I Board Exemplar Layouts (1:200)	13/05/2009	HLM Architects	Allan, Steve
NSGACL-PD-BMJ-L(00)00-X-ED-001 - Emergency Department Childrens	1	1	Board Exemplar Layout - Emergency Department Childrens - 1:200	V2.1 Appendix I Board Exemplar Layouts (1:200)	08/05/2009	HLM Architects	Allan, Steve
NSGACL-PD-BMJ-L(00)00-X-OW-001 - Observation Ward Childrens	1	1	Board Exemplar Layout - Observation Wards Children - 1:200	V2.1 Appendix I Board Exemplar Layouts (1:200)	08/05/2009	HLM Architects	Allan, Steve
NSGACL-PD-HLM-L(00)00-X-AA-002 - Acute Assessment (adult) Flow	1		NSGACL-PD-HLM-L(00)00-X-AA-002 - Acute Assessment (adult) Flow	V2.1 Appendix I Board Exemplar Layouts (1:200)	08/06/2009	HLM Architects	MacDonald, Donald
NSGACL-PD-HLM-L(00)00-X-ED-002 - Emergency Department Adult Flow Diagram	1		NSGACL-PD-HLM-L(00)00-X-ED-002 - Emergency Department (adult) Flow Diagram	V2.1 Appendix I Board Exemplar Layouts (1:200)	08/06/2009	HLM Architects	MacDonald, Donald
NSGACL-PD-HLM-L(00)00-X-OP-002 - Outpatient (adults) Flow	1		NSGACL-PD-HLM-L(00)00-X-OP-002 - Outpatient (adult) Flow Diagram	V2.1 Appendix I Board Exemplar Layouts (1:200)	08/06/2009	HLM Architects	MacDonald, Donald
NSGACL-PD-HLM-L(00)00-X-RA-002 - Radiology (adult) Flow	1		NSGAL-PD-HLM-L(00)00-X-RA-002 - Radiology (adult) Flow Diagram	V2.1 Appendix I Board Exemplar Layouts (1:200)	08/06/2009	HLM Architects	MacDonald, Donald
NSGACL-PD-HLM-L(00)01-X-CC-002 - Critical Care Facility (adult) Flow	1		NSGACL-PD-HLM-L(00)01-X-CC-002 - Critical Care Facility (adult) Flow Diagram	V2.1 Appendix I Board Exemplar Layouts (1:200)	08/06/2009	HLM Architects	MacDonald, Donald
NSGACL-PD-HLM-L(00)01-X-OP-002 - Outpatients (Adults) Flow	1		NSGACL-PD-HLM-L(00)01-X-OP-002 - Outpatients (adult) Flow Diagram	V2.1 Appendix I Board Exemplar Layouts (1:200)	08/06/2009	HLM Architects	MacDonald, Donald
NSGACL-PD-HLM-L(00)01-X-RA-002 - Radiology (adult) Flow	1		NSGACL-PD-HLM-L-(00)01-X-RA-002-Radiology (adult) Flow Diagram	V2.1 Appendix I Board Exemplar Layouts (1:200)	08/06/2009	HLM Architects	MacDonald, Donald
NSGACL-PD-HLM-L(00)02-X-OP-002 - Outpatient (adults) Flow	1		NSGACL-PD-HLM-L(00)02-X-OP-002 - Outpatient (adults) Flow Diagram	V2.1 Appendix I Board Exemplar Layouts (1:200)	08/06/2009	HLM Architects	MacDonald, Donald
NSGACL-PD-HLM-L(00)02-X-OT-002 - Operating Theatres (adult) Flow	1		NSGACL-PD-HLM-L(00)02-X-OT-002 - Operating Theatres (adult) Flow Diagram	V2.1 Appendix I Board Exemplar Layouts (1:200)	08/06/2009	HLM Architects	MacDonald, Donald
NSGACL-PD-HLM-L(00)02-X-OT-002 - Operating Theatres (adult) Flow	2	A	NSGACL-PD-HLM-L(00)02-X-OT-002 - Operating Theatres (adult) Flow Diagram	V2.1 Appendix I Board Exemplar Layouts (1:200)	21/07/2009	HLM Architects	Allan, Steve
NSGACL-PD-HLM-L(00)04-X-WA-002 - Generic Ward (adult) Flow	1		NSGACL-PD-HLM-L(00)04-X-WA-002 - Generic Ward (adult) FLow Diagram)	V2.1 Appendix I Board Exemplar Layouts (1:200)	08/06/2009	HLM Architects	MacDonald, Donald
NSGACL - PD-HLM-L(00)02-X-OT-001 - Operating Theatres Adults	1		Board Exemplar Layout - Operating Theatres Adults - 1:200	V2.1 Appendix I Board Exemplar Layouts (1:200)	03/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL-Generic ADB Room Layouts	1	1	Board Exemplar ADB Room Layouts	V2.1 Appendix J Board Room Layouts (1:50)	06/05/2009	HLM Architects	Allan, Steve
NSGACL Appendix K - Design Development	1	1	App K Design Development	V2.1 Appendix K Design Development FBC Requirement	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 5001	2	B	EXEMPLER MASTERPLAN ROADS LAYOUT	V2.1 Appendix L Civils & Structural Infomation	29/04/2009	URS Corporation Ltd	Denton, Chris
NSGACL 5001	3	C	EXEMPLER MASTERPLAN ROADS LAYOUT	V2.1 Appendix L Civils & Structural Infomation	01/05/2009	URS Corporation Ltd	Denton, Chris
NSGACL 5001	4	C	EXEMPLER MASTERPLAN ROADS LAYOUT	V2.1 Appendix L Civils & Structural Infomation	11/06/2009	URS Corporation Ltd	Denton, Chris
NSGACL 5001 PDF	1	C	EXEMPLAR MASTERPLAN ROADS LAYOUT	V2.1 Appendix L Civils & Structural Infomation	11/06/2009	URS Corporation Ltd	Denton, Chris
NSGACL 5002	2	-	CONSTRUCTION AND REFURBISHMENT REQUIREMENTS	V2.1 Appendix L Civils & Structural Infomation	29/04/2009	URS Corporation Ltd	Denton, Chris
NSGACL 5002	3	A	CONSTRUCTION AND REFURBISHMENT REQUIREMENTS	V2.1 Appendix L Civils & Structural Infomation	01/05/2009	URS Corporation Ltd	Denton, Chris
NSGACL 5002	4	A	CONSTRUCTION AND REFURBISHMENT REQUIREMENTS	V2.1 Appendix L Civils & Structural Infomation	11/06/2009	URS Corporation Ltd	Denton, Chris
NSGACL 5002 PDF	1	a	EXEMPLAR CONSTRUCTION & REFURBISHMENT REQUIREMENTS	V2.1 Appendix L Civils & Structural Infomation	11/06/2009	URS Corporation Ltd	Denton, Chris
NSGACL GLRP0012 Substructure Options Report	1	-	NSGACL SUBSTRUCTURE OPTIONS REPORT	V2.1 Appendix L Civils & Structural Infomation	17/06/2009	URS Corporation Ltd	Denton, Chris
NSGACL NHS Greater Glasgow & Clyde - NSGH Drainage Strategy Report	1	-	NSGH Drainage Strategy Report	V2.1 Appendix L Civils & Structural Infomation	28/04/2009	URS Corporation Ltd	Denton, Chris
NSGACL NHS Greater Glasgow & Clyde - NSGH Drainage Strategy Report	2	A	NSGH Drainage Strategy Report	V2.1 Appendix L Civils & Structural Infomation	01/05/2009	URS Corporation Ltd	Denton, Chris
Scottish Water DIA Response Letter 090609	1		Scottish Water DIA response	V2.1 Appendix L Civils & Structural Infomation	24/06/2009	URS Corporation Ltd	Denton, Chris

sk-0200	1		proposed underground building drainage schematic sheet 1 o 2	V2.1 Appendix L Civils & Structural Infomation	19/06/2009	URS Corporation Ltd	Denton, Chris
sk-0201	1		proposed off site drainage works schematic sheet 2 of 2	V2.1 Appendix L Civils & Structural Infomation	19/06/2009	URS Corporation Ltd	Denton, Chris
NSGACL Adult Isolation Rooms	1		Update on the Isolation Rooms for the New South Glasgow (Adult) Hospital	V2.1 Appendix M Mechanical&Electrical Information	05/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Update - Infection Control Feedback NSG	1		Update on Infection Control Feedback re Critical Care, Day Areas & Dialysis Unit for New South Glasg	V2.1 Appendix M Mechanical&Electrical Information	18/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL G1274_E(60)01-A1	1		Main Power Schematic	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL G1274_E(60)02-A1	1		Power Distribution Schematic	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL G1274_E(67)01-A1	1		Fire Alarm Schematic	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL G1274_E(68)01-A0	1		CCTV/Staff Attack & intruder Schematic	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL G1274_E(68)02-A1	1		Nurse Call Schematic	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL G1274_E(68)03-A1	1		Data Schematic Diagram	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL G1274_M(54)01-A1	1		Medical Gas Pipeline Schematic	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL G1274_M(54)02-A3	1		Natural Gas Schematic	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL G1274_M(55)01-A1	1		Chilled Water Distribution Schematic	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL-Appendix M&E1	1		New Hospital Building Services and Utility Connections	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL-Appendix M&E2	1		New Hospital Base Building Loads	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL-Appendix M&E3	1		Plant Strategy and Design Criteria	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL-Appendix M&E4	1		Sustainable Design Consideration	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL-Appendix M&E5	1		Integrated Building Management System	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL-Appendix M&E6	1		Renal Water	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL-Appendix M&E7	1		Pneumatic and Automated Material Transfer	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL-G1274_M(56)01-A1	1		MTHW Distribution Schematic	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL-G1274_M(56)02-A0	1		LTHW Distribution Schematic	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL-G1274_M(56)03-A0	1		Indicative Heating Distribution Route	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL-G1274_M(57)01-A3	1		Isolation Suites Plant Room Adjacent Ventilation System	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL-G1274_M(57)02-A4	1		Isolation Suite Vent System With Plant Room Above	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL-G1274_M(57)03-A1	1		Typical Adult Ward Tower Ventilation Schematic	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL-G1274_M(57)04-A1	1		Operating Theatre Ventilation Outline Plan and Schematic	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL-G1274_ME(60)01-A1	1		Proposed Energy Centre Plant Room Layout mthw solution	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL-G1274_ME(60)02-A3	1		Indicative Primary Sub Station Layout	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL-G1274_ME(60)03-A3	1		Indicative Layout of Main Services Tunnel	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL-G1274_P(53)01-A0	1		Typical CWS Distribution Layout	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL-G1274_P(67)01-A1	1		Sprinkler Installation Schematic	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL-G1274_P(67)02-A1	1		Wet Riser Distribution Schematic	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL-G1274_U(96)01-A0	1		Water, Gas and Electric Site Incoming Services	V2.1 Appendix M Mechanical&Electrical Information	01/05/2009	Wallace Whittle	Lorimer, Martin
NSGACL GLRP0010 ASR2 Southern General Geo-env Report Draft	1	-	Southern General Geo-env Report Draft	V2.1 Appendix N Site Investigation Information	30/04/2009	URS Corporation Ltd	Denton, Chris

NSGACL 6834 Chapter 01_Introduction	1	1	Chapter 1 Introduction	V2.1 Appendix O Environmental Assessment	28/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Chapter 02_Approach and Methodology	1	1	Chapter 2 Approach & Methology	V2.1 Appendix O Environmental Assessment	28/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Chapter 03_Need for the Project	1	1	Chapter 3 Need for the Project	V2.1 Appendix O Environmental Assessment	28/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Chapter 04 Consideration of Alternatives	1	1	Chapter 4 Consideration of Alternatives	V2.1 Appendix O Environmental Assessment	28/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Chapter 05_Proposed Development	1	1	Chapter 5 Proposed Development	V2.1 Appendix O Environmental Assessment	28/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Chapter 06_Land Use	1	1	Chapter 6 Land Use	V2.1 Appendix O Environmental Assessment	28/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Chapter 07_Ground Conditions	1	1	Chapter 7 Ground Conditions	V2.1 Appendix O Environmental Assessment	28/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Chapter 08 Policies and Plans	1	1	Chapter 8 Policies & Plans	V2.1 Appendix O Environmental Assessment	28/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Chapter 09_Community, Pedestrians and Cyclists	1	1	Chapter 9 Community Pedestrians and Cyclists	V2.1 Appendix O Environmental Assessment	28/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Chapter 10_Townscape and Visual	1	1	Chapter 10 Townscape and Visual	V2.1 Appendix O Environmental Assessment	28/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Chapter 11_Water Quality and Drainage	1	1	Chapter 11 - Water Quality and Drainage	V2.1 Appendix O Environmental Assessment	28/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Chapter 12_Noise	1	1	Chapter 12 Noise	V2.1 Appendix O Environmental Assessment	28/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Chapter 13_Air Quality	1	1	Chapter 13 Air Quality	V2.1 Appendix O Environmental Assessment	28/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Chapter 14_Cultural Heritage	1	1	Chapter 14 Cultural Heritage	V2.1 Appendix O Environmental Assessment	28/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Chapter 15_Ecology, Nature Conservn and Biodivy	1	1	Chapter 15 Ecology Nature Convservation and Biodiversity	V2.1 Appendix O Environmental Assessment	28/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Chapter 16_Sustainable Development	1	1	Chapter 16 Sustainable Development	V2.1 Appendix O Environmental Assessment	28/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Chapter 17_Disruption Due to Construction	1	1	Chapter 17 Disruption due to Construction	V2.1 Appendix O Environmental Assessment	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Chapter 18_Cumulative Impacts	1	1	Chapter 18 Cumulative Impacts	V2.1 Appendix O Environmental Assessment	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Chapter 19_Schedule of Environmental Commitments	1	1	Chapter 19 Schedule of Environmental Commitments	V2.1 Appendix O Environmental Assessment	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Contents Pages	1	1	Contents pages	V2.1 Appendix O Environmental Assessment	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Front Page	1	1	Appendix O Front page	V2.1 Appendix O Environmental Assessment	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Info Sheet	1	1	Appendix O Information sheet	V2.1 Appendix O Environmental Assessment	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Part 1	1	1	Appendix O Fly sheet part 1	V2.1 Appendix O Environmental Assessment	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Part 2	1	1	Appendix O Fly Sheet part 2	V2.1 Appendix O Environmental Assessment	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Part 3	1	1	Appendix O Fly Sheet part 3	V2.1 Appendix O Environmental Assessment	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Part 4	1	1	Appendix O Fly Sheet part 4	V2.1 Appendix O Environmental Assessment	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL 6834 Part 5	1	1	Appendix O Fly Sheet part 5	V2.1 Appendix O Environmental Assessment	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix O - Environmental Assessment Cover	1	1	Appendix O Cover Page	V2.1 Appendix O Environmental Assessment	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL - P.3 Draft Operational Procedure - Domestic Services	1	1	Appendix P.3 Draft Op Procedures (Domestic Linen)	V2.1 Appendix P Board Policies	01/05/2009	Currie & Brown	Gilmour, Ian
NSGACL - P.3 Draft Operational Procedure - Linen	1	1	Appendix P.3 Draft Op Procedures (Linen)	V2.1 Appendix P Board Policies	01/05/2009	Currie & Brown	Gilmour, Ian
NSGACL - P.3 Draft Operational Procedure - Waste	1	1	Appendix P.3 Draft Op Procedures (Waste)	V2.1 Appendix P Board Policies	01/05/2009	Currie & Brown	Gilmour, Ian
NSGACL P.1 Lists of Board Policies	1	1	App P List of Board Policies	V2.1 Appendix P Board Policies	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL P.2 Board Carbon Management Plan	1	1	App P Board Carbon Management Plan	V2.1 Appendix P Board Policies	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL A Policy on Design Quality for NHSScotland	1	1	App Q Policy on Design for NHS Scotland	V2.1 Appendix Q Related Design Information	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix Q - Related Design Information cover	1	1	App Q Related Design Info Cover	V2.1 Appendix Q Related Design Information	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL NHSGG&C Design Action Plan	1	1	App Q Design Action Plan	V2.1 Appendix Q Related Design Information	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL NHSGG&C Design Action Plan (Supp Guidance Handbook)	1	1	App Q NHSGG&C Design Action Plan (Supp Guidance Handbook)	V2.1 Appendix Q Related Design Information	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Planning Advice Note 84 - Reducing Carbon	1	1	App Q Planning Advice Note 84 Reducing Carbon	V2.1 Appendix Q Related Design Information	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Scottish Planning Policy SPP6 - Renewable Energy	1	1	App Q Scottish Planning Policy SPP6 Renewable Energy	V2.1 Appendix Q Related Design Information	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix R - Fire Strategy	1	1	App R Fire strategy	V2.1 Appendix R Fire Strategy	01/05/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix S - Acoustic Requirements	1	1	App S Acoustic requirements	V2.1 Appendix S Acoustic Requirements	01/05/2009	Currie & Brown	Gilmour, Ian
NSGACL Southern General PCI Issue 1	1		NSGACL Pre - Construction Information Pack	V2.1 Appendix T Pre Construction Information CDMC	06/05/2009	URS Corporation Ltd	Denton, Chris
NSGACL Appendix U - BREEAM Design Guide	1	1	Breeam design Guide	V2.1 Appendix U BREEM Guidance	05/05/2009	Currie & Brown	Gilmour, Ian
NSGACL BREEAM Initial Score Potential Main Development	1		Main Development Initial Score Potential	V2.1 Appendix U BREEM Guidance	30/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Whole Site and Planning Issues related to BREEAM June 2009	1		Schedule of collated documents and planning issues relating to BREEAM	V2.1 Appendix U BREEM Guidance	30/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Appendix V -Community Benefits	1	1	Appendix V	V2.1 Appendix V Community Benefits	06/05/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix W - Travel Plan	1	1	Travel Plan	V2.1 Appendix W Travel Plan	30/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix X - Critical Failures	1	1	App X Critical Failures	V2.1 Appendix X Critical Failures	01/05/2009	Currie & Brown	Gilmour, Ian
NSGACL - ITPD Volume 2	1	1	Employers Requirements (Hospital)	V2.1 General	01/05/2009	Currie & Brown	Gilmour, Ian
NSGACL-PD-HLM-SK(00)X-XX-001 - Illustration Of 10 Bed Unit HDU	1	1	3D Illustration of Ward Nurse Station	V2.1 General	05/05/2009	HLM Architects	Allan, Steve
NSGACL-PD-HLM-SK(00)X-XX-002 - Illustration Of 10 Bed Unit ICU	1	1	3D Illustration of 10 Bed Unit HDU	V2.1 General	05/05/2009	HLM Architects	Allan, Steve

NSGACL-PD-HLM-SK(00)X-XX-003 - Illustration Of Ward Circulation	1	1	3D Illustration of Ward Circulation	V2.1 General	05/05/2009	HLM Architects	Allan, Steve
NSGACL-PD-HLM-SK(00)X-XX-004 - Illustration Of Ward Nurse Station	1	1	3D Illustration of 10 Bed Unit ICU	V2.1 General	05/05/2009	HLM Architects	Allan, Steve

File Name	Iss.	Rev.	Title	Status	Issue Date	Publishing Company	Publishing User
NSGACL Appendix A1	1	1	V2.2 Appendix A Part 1	V2.2 Appendix A Pt 1 Site Master Planning Strategy	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix A2.1	1	1	V2.2 Appenix A Pt 2 Arch Location Drwgs (1 of 2)	V2.2 Appendix A Pt 2 Architectural Location Dwgs	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix A2.2	1	1	V2.2 Appendix A Pt 2 Arch Location Drwgs (2 of 2)	V2.2 Appendix A Pt 2 Architectural Location Dwgs	29/04/2009	Currie & Brown	Gilmour, Ian
2475 AL(05)20	1	-	South Elevation	V2.2 Appendix A Pt 3 Outline Design Layouts	22/06/2009	Boswell Mitchell & Johnston	Deb, Rajib
2475 AL(05)21	1	-	East Elevation	V2.2 Appendix A Pt 3 Outline Design Layouts	22/06/2009	Boswell Mitchell & Johnston	Deb, Rajib
2475 AL(05)22	1	-	View Throgh Service Courtyard	V2.2 Appendix A Pt 3 Outline Design Layouts	22/06/2009	Boswell Mitchell & Johnston	Deb, Rajib
2475 AL(05)23	1	-	View Through Service Courtyard 2	V2.2 Appendix A Pt 3 Outline Design Layouts	22/06/2009	Boswell Mitchell & Johnston	Deb, Rajib
2475 AL(05)24	1	-	North Elevation	V2.2 Appendix A Pt 3 Outline Design Layouts	22/06/2009	Boswell Mitchell & Johnston	Deb, Rajib
2475 AL(05)25	1	-	West Elevation	V2.2 Appendix A Pt 3 Outline Design Layouts	22/06/2009	Boswell Mitchell & Johnston	Deb, Rajib
2475 AL(05)26	1	-	View Through Service Courtyard 3	V2.2 Appendix A Pt 3 Outline Design Layouts	22/06/2009	Boswell Mitchell & Johnston	Deb, Rajib
NSGACL Appendix A3.1	1	1	Outline Design Layouts (1 of 6)	V2.2 Appendix A Pt 3 Outline Design Layouts	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix A3.2	1	1	Outline Design layouts (2 of 6)	V2.2 Appendix A Pt 3 Outline Design Layouts	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix A3.3	1	1	Outline Design Layouts (3 of 6)	V2.2 Appendix A Pt 3 Outline Design Layouts	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix A3.4	1	1	Outline Design layouts (4 of 6)	V2.2 Appendix A Pt 3 Outline Design Layouts	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix A3.5	1	1	Outline Design Layouts (5 of 6)	V2.2 Appendix A Pt 3 Outline Design Layouts	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix A3.6	1	1	Outline Design Layouts (6 of 6)	V2.2 Appendix A Pt 3 Outline Design Layouts	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix A4	1	1	Typical Rm Data Sheets	V2.2 Appendix A Pt 4 Typical Rm Data Sheets/Layout	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix A5	1	1	Outline Design Elevations	V2.2 Appendix A Pt 5 Outline Design Elevations	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix A6.1	1	1	Outline Description M&E Services (1 of 2)	V2.2 Appendix A Pt 6 Outline Desc of M&E Services	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix A6.2	1	1	Outline Description of M&E Services (2 of 2)	V2.2 Appendix A Pt 6 Outline Desc of M&E Services	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix A7	1	1	Outline Structural Proposals	V2.2 Appendix A Pt 7 Outline Structural Proposals	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix A8	1	1	Glasgow City Mortuary	V2.2 Appendix A Pt 8 Glasgow City Mortuary	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix A9	1	1	Massing 3D Views	V2.2 Appendix A Pt 9 Massing 3D Views	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix B1	1	1	Outline Brief Facilities Management	V2.2 Appendix B Pt 1 Outline Brief Facilities Man	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix B2	1	1	Outline Brief Mortuary	V2.2 Appendix B Pt 2 Outline Brief Mortuary	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix B3	1	1	Outline Brief Blood Sciences	V2.2 Appendix B Pt 3 Outline Brief Blood Sciences	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix B4	1	1	Outline Brief Genetics	V2.2 Appendix B Pt 4 Outline Bried Genetics	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix B5	1	1	Outline Brief Pathology	V2.2 Appendix B Pt 5 Outline Brief Pathology	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix B6	1	1	Outline Brief Microbiology	V2.2 Appendix B Pt 6 Outline Brief Microbiology	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix C1	1	1	Outline Architectural Specs	V2.2 Appendix C Pt 1 Outline Architectural Specs	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Appendix C2	1	1	Outline Structural Specs	V2.2 Appendix C Pt 2 Outline Structural Specs	29/04/2009	Currie & Brown	Gilmour, Ian
NSGACL Employers Requirements	1	1	V2.2 Employers Requirments Main Doc (Labs)	V2.2 General	29/04/2009	Currie & Brown	Gilmour, Ian

File Name	Iss.	Rev.	Title	Status	Issue Date	Publishing Company	Publishing User
NSGACL Cashflow	1	1	NSGACL Cashflow Template (Appendix to Vol 3)	V3 General	07/05/2009	Currie & Brown	Gilmour, Ian
NSGACL MPTC Calculator Blank	1	1	MPTC Calculator Template (Appendix to Vol 3)	V3 General	07/05/2009	Currie & Brown	Gilmour, Ian
NSGACL SCM Standard Fee Workbook	1	1	SCM Standard Fee Workbook Template (Appendix to Vol 3)	V3 General	07/05/2009	Currie & Brown	Gilmour, Ian
NSGACL SCM Standard Fee Workbook	2	2	SCM Standard Fee Workbook Template (Appendix to Vol 3)	V3 General	22/06/2009	Currie & Brown	Gilmour, Ian
NSGACL SCP_Workbook_Issue	1	1	SCP Workbook Issue Template (Appendix to Vol 3)	V3 General	07/05/2009	Currie & Brown	Gilmour, Ian
NSGACL SCP_Workbook_Issue	2	2	SCP Workbook Issue Template (Appendix to Vol 3)	V3 General	22/06/2009	Currie & Brown	Gilmour, Ian
NSGH - ITPD Vol3	1		NSGACL ITPD Volume 3 Bid Deliverables & Evaluation	V3 General	01/05/2009	Currie & Brown	Bradford, Lynn
NSGACL - ITPD Vol3 - Contractor Issue Rev 1	1	1	NSGACL - ITPD Vol3 - Contractor Issue Rev 1.pdf	V3 General	14/08/2009	NHS Greater Glasgow & Clyde	Frew, Shiona
NSGACL Commercial CD Session Nr 1	1		PRESENTATION	V3 General	22/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Labs Bidders Presentation 2	1		PRESENTATION	V3 General	22/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Labs CD Session Nr 1	1		PRESENTATION	V3 General	22/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Presentation Logistics CD no 1	1		PRESENTATION	V3 General	22/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL SCM_Eng Workbook_Issue	1		Engineering and Construction SCM Workbook	V3 General	14/08/2009	NHS Greater Glasgow & Clyde	Craig, Carol

File Name	Iss.	Rev.	Title	Status	Issue Date	Publishing Company	Publishing User
NSGACL PD-HLM-SK(00)X-XX-005 - General Section Illustrating Bridge Links To Exisitng Buildings	1	1	General Section Illustrating Bridge Links To Exisiting Buildings	V4 Supplementary Information	02/07/2009	HLM Architects	Allan, Steve
NSGACL PD-HLM-SK(00)X-XX-005 - General Section Illustrating Bridge Links To Exisitng Buildings	2	A	General Section Illustrating Bridge Links To Exisiting Buildings	V4 Supplementary Information	23/07/2009	HLM Architects	Allan, Steve
(AL0) Ground floor	1		Stage 3A Demolition Info	V4 Supplementary Information	14/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
(AL1) First floor	1		Stage 3A Demolition Info	V4 Supplementary Information	14/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
(AL2) Second floor	1		Stage 3A Demolitions Info	V4 Supplementary Information	14/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
(AN) Biochemistry	1		Stage 3A Demolition Info	V4 Supplementary Information	14/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
(DC) HDU & SITU	1		Stage 3A Demolition Info	V4 Supplementary Information	14/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
(DG) Orthopaedic Theatres	1		Stage 3A Demolition Info	V4 Supplementary Information	14/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
2291 AL(00)	1		Maternity Offices - updated general arrangement ground floor plan	V4 Supplementary Information	22/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
A&E Orthopaedics - type 2 summary	1		Stage 3A Demolition Info	V4 Supplementary Information	14/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
A&E-Therapy-General OPD PH3A	1		Stage 3A Demolition Info	V4 Supplementary Information	14/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
Biochemistry - type 2 summary	1		Stage 3A Demolition Info	V4 Supplementary Information	14/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
DRAFT - Southern General Hospital Travel Plan 3Comp121207	1		NSGACL - Draft Travel Plan	V4 Supplementary Information	10/06/2009	NHS Greater Glasgow & Clyde	Controller, Tender
HDU SITU - type 2 summary	1		Stage 3A Demolition Info	V4 Supplementary Information	14/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL - Agreed Contract Changes 20090611	1		Agreed Contract Changes - All Bidders - 11th June 2009	V4 Supplementary Information	12/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL - Appendix K - updateRev 1 - Vol 4	1	1	NSGACL - Appendix K - updateRev 1 - Vol 4.pdf	V4 Supplementary Information	14/08/2009	NHS Greater Glasgow & Clyde	Frew, Shiona
NSGACL - Detailed Employers Requirements & Procedures for Radiation Protection Advisors (Health Physics) Input into Project V3	1		Radiation Protection Advisers' Input Into New Adult Hospital and New Children's Hospital	V4 Supplementary Information	24/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL - Indicative Demolition Dates	1		NSGACL - Indicative Demolition Dates	V4 Supplementary Information	22/07/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL - Labs - L0	1		NSGACL - Labs - L0.dwg	V4 Supplementary Information	10/06/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL - Labs - L1	1		NSGACL - Labs - L1.dwg	V4 Supplementary Information	10/06/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL - Labs - L-1	1		NSGACL - Labs - L-1.dwg	V4 Supplementary Information	10/06/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL - Labs - L2	1		NSGACL - Labs - L2.dwg	V4 Supplementary Information	10/06/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL - Labs - L3	1		NSGACL - Labs - L3.dwg	V4 Supplementary Information	10/06/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL - Labs - L4	1		NSGACL - Labs - L4.dwg	V4 Supplementary Information	10/06/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL - NSGH Existing Site Services	1		NSGACL - NSGH Existing Site Services.dwg	V4 Supplementary Information	10/06/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL - Supersede of Radiation Protection MRI References - Vol2 1 ITPD Section	1		Supercede of Radiation Protection & MRI References - Vol 2/1 ITPD : Sections 7.5.5, 7.9.6 & 8.1.1	V4 Supplementary Information	24/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGacl - Vol 4 - Lift Analysis Information	1		NSGacl - Vol 4 - Lift Analysis Information.pdf	V4 Supplementary Information	10/06/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL - Vol4 - Energy Guidance	1		NSGACL - Vol4 - Energy Guidance.pdf	V4 Supplementary Information	14/08/2009	NHS Greater Glasgow & Clyde	Frew, Shiona
NSGACL - Vol4 - Technical _various_ 19nr	1	1	NSGACL - Vol4 - Technical _various_ 19nr.pdf	V4 Supplementary Information	14/08/2009	NHS Greater Glasgow & Clyde	Frew, Shiona
NSGACL 090330 AGREED List of Key Rooms NCH Rev1	1		Updated agreed list of key rooms - New Children's Hospital	V4 Supplementary Information	11/08/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL 090330 AGREED List of Key Rooms NSGH Rev1	1		Updated agreed list of key rooms - New Adult Hospital	V4 Supplementary Information	11/08/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL 20090330 AGREED List of Key Rooms NCH	1		Agreed List of Key Rooms re New Children's Hospital	V4 Supplementary Information	23/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL 20090330 AGREED List of Key Rooms NSGH	1		Agreed List of Key Rooms re New Adult Hospital	V4 Supplementary Information	23/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL 20090615 Equipment List	1		NSGH Equipment List (Adult & Children)	V4 Supplementary Information	09/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL 3T MRI REQUIREMENTS	1		Siting Requirements For 3T MRI Systems	V4 Supplementary Information	17/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL AitkenLaboratoriesSiteInvestigation	1		Geotechnical Historical Information - Aitken Laboratories Ltd	V4 Supplementary Information	15/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL ARUPBoreholes	1		Geotechnical Historical Information from Arup - Boreholes	V4 Supplementary Information	15/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Clarification Wireless LAN Density Vol 2 1 Sect 8 3 8	1		Clarification to Bidders re Wireless LAN Density Allowance	V4 Supplementary Information	31/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Commercial CD Session Nr 1	2		PRESENTATION	V4 Supplementary Information	22/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Cover Note re Drawing 2291 AL	1		Additional Note re Drawing 2291 AL (Maternity Offices)	V4 Supplementary Information	22/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL December1989SiteInvestigationReport	1		Geotechnical Historical Information - 1989 site investigation	V4 Supplementary Information	15/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Design Report Final Version	1		Report on patient & carer input to design process for New South Glasgow Hospitals - April 2009	V4 Supplementary Information	20/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Draft Labs Fire Strategy	1		Draft Laboratory Fire Strategy	V4 Supplementary Information	12/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Draft Section 75	1		Minute of Agreement - Draft Section 75	V4 Supplementary Information	01/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Drainage and Sewerage Impact Assessment Report 2007	1		Southern General Hospital, Drainage & Sewerage Impact Assessment - June 2007	V4 Supplementary Information	05/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL FUGROSoilsInvestigationReport	1		Geotechnical Historical Information - Soil Investigation 1985	V4 Supplementary Information	15/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Generic Ward Matrix NCH	2		New Children's Hospital Patient/Public/Staff - Pathways/Adjacencies	V4 Supplementary Information	12/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Geotechnical&ContaminationReport	1		Geotechnical Historical Information - Geotechnical and Contamination Report 1998	V4 Supplementary Information	15/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol

NSGACL Halcrow Flood Risk 2005	1		Southern General Hospital, Flood Risk Assessment - April 2005	V4 Supplementary Information	05/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Hoists	1		Clarification re Ceiling Mounted Tracking Hoists	V4 Supplementary Information	20/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL ITPCD Clarification - Decontamination Equipment Services	1		Competitive Dialogue Clarification Note re Decontamination Equipment Services	V4 Supplementary Information	31/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL ITPCD Clarification - Vol2.1 ME7 Food Waste Systems	1		Competitive Dialogue Clarification Note re Food Waste Systems	V4 Supplementary Information	31/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Labs Area Schedules	1		New Laboratory Area Schedules	V4 Supplementary Information	12/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Labs Bidders Presentation 2	2		PRESENTATION	V4 Supplementary Information	22/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Labs CD Session Nr 1	2		PRESENTATION	V4 Supplementary Information	22/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Lev 0 compartmentation	1		New Laboratory Draft Fire Strategy - Level 0 compartmentation	V4 Supplementary Information	12/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Lev 1 compartmentation	1		New Laboratory Draft Fire Strategy - Level 1 compartmentation	V4 Supplementary Information	12/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Lev -1 compartmentation	1		New Laboratory Draft Fire Strategy, Level -1 compartmentation	V4 Supplementary Information	12/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Lev 2 compartmentation	1		New Laboratory Draft Fire Strategy - Level 2 compartmentation	V4 Supplementary Information	12/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Lev 3 compartmentation	1		New Laboratory Draft Fire Strategy - Level 3 compartmentation	V4 Supplementary Information	12/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Lev 4 compartmentation	1		New Laboratory Draft Fire Stategy - Level 4 compartmentation	V4 Supplementary Information	12/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL low carbon design trackerER version rev A inc CA comments	1		Low Carbon Design Tracker - Ecoteric Ltd	V4 Supplementary Information	06/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL main tender scoring matrix	1		Scoring Matrix for New South Glasgow Hospitals Sustainability BREEAM and Low Carbon	V4 Supplementary Information	06/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Masterplan Final 240709 small	1		New South Glasgow Hospitals Masterplan 2009	V4 Supplementary Information	06/08/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Outline Planning Consent Certificate - 07-01158-DC	1		Outline Planning Consent 07/01158/DC	V4 Supplementary Information	31/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Patient Catering - Vol 4	1	1	NSGACL Patient Catering - Vol 4.pdf	V4 Supplementary Information	14/08/2009	NHS Greater Glasgow & Clyde	Frew, Shiona
NSGACL Presentation Logistics CD no 1	2		PRESENTATION	V4 Supplementary Information	22/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGACL Removal of Maximum Temperature Variant	1		Removal of Maximum Temperature Variant	V4 Supplementary Information	20/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Report Demand Analysis 2007	1		Southern General Current and Future Demand Analysis (Water) - March 2007	V4 Supplementary Information	05/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL RocksoilSiteInvestigation1998	1		Geotechnical Historical Information - Site Investigation 1998	V4 Supplementary Information	15/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Schedule of Accommodation - ERrev1 -Vol 4	1	1	NSGACL Schedule of Accommodation - ERrev1 - Vol 4.pdf	V4 Supplementary Information	14/08/2009	NHS Greater Glasgow & Clyde	Frew, Shiona
NSGACL SHTM 02-01	1		SHTM 02-01, Medical Gases : Summary of Changes	V4 Supplementary Information	02/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL SHTM 03-01 Part A	1		SHTM 03-01, Ventilation for Healthcare Premises, Part A - Design & Validation	V4 Supplementary Information	02/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL SHTM 03-01 Part B	1		SHTM 03-01, Ventilation for Healthcare Premises, Part B - Operational Management & Performance Verif	V4 Supplementary Information	02/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL SHTM 04-01 Part A	1		SHTM 04-01, The Control of Legionella, Hygiene, "Safe" Hot Water, Cold Water and Drinking Water Syst	V4 Supplementary Information	02/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL SHTM 04-01 Part B	1		SHTM 04-01, The Control of Legionella, Hygiene, "Safe" Hot Water, Cold Water and Drinking Water Syst	V4 Supplementary Information	02/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL SHTM 06-01 Part A	1		SHTM 06-01, Electrical Services Supply and Distribution, Part A - Design Considerations	V4 Supplementary Information	03/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Southern General Hospital Ecology Report	1		Southern General Hospital Ecological Appraisal (URS, July 2009)	V4 Supplementary Information	27/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Staff and Hospitality Catering - Vol 4	1	1	NSGACL Staff and Hospitality Catering - Vol 4.pdf	V4 Supplementary Information	14/08/2009	NHS Greater Glasgow & Clyde	Frew, Shiona
NSGACL Technical Clarification (various)	1		Technical Clarifications arising from ongoing reviews and considerations of the Board	V4 Supplementary Information	20/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Thorburn&PartnersGeotechnicalStudy	1		Geotechnical Historical Information - Geotechnical Study 1978	V4 Supplementary Information	15/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Updated Appendix R - Fire Strategy	1		Updated Appendix R - Fire Strategy	V4 Supplementary Information	22/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL WimpeyHealthCareSeptember1994	1		Geotechnical Historical Information - Wimpey Healthcare Ltd 1994	V4 Supplementary Information	15/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGH Construction and Title Boundaries	1		Drawing showing the extent of the Board's land & proposed construction site boundary	V4 Supplementary Information	25/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGH SGH Topographical Survey 2D	1		NSGH SGH Topographical Survey 2D	V4 Supplementary Information	14/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
NSGH SGH Topographical Survey 3D	1		NSGH SGH Topographical Survey 3D	V4 Supplementary Information	14/05/2009	NHS Greater Glasgow & Clyde	Hirst, Allyson
Scottish Power Southern General Connection agreement	1		Scottish Power Energy Networks - Agreement for Connection to Distribution System	V4 Supplementary Information	25/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
Scottish Power Southern General quotation	1		Scottish Power Energy Networks quotation for the 33kv sub station	V4 Supplementary Information	25/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
SGH Block BC 2nd Floor Ward 62	1		Southern General Hospital, Neurosciences Building - 2nd Floor Plans	V4 Supplementary Information	04/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
SGH Block BC 4th Floor	1		Southern General Hospital, Neurosciences Building - 4th Floor Plans	V4 Supplementary Information	04/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
SGH Block BC 6th Floor	1		Southern General Hospital, Neurosciences Building - 6th Floor Plans	V4 Supplementary Information	04/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
SGH Block BC elevations 1	1		Southern General Hospital, Neurosciences Building - Elevations Drawing 1	V4 Supplementary Information	04/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
SGH Block BC elevations 2	1		Southern General Hospital, Neurosciences Building - Elevations Drawing 2	V4 Supplementary Information	04/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
SGH Block BC Ground Floor	1		Southern General Hospital, Neurosciences Building - Ground Floor Plans	V4 Supplementary Information	04/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
SGH Neurology 1st Floor	1		Southern General Hospital, Neurosciences Building - 1st Floor Plans	V4 Supplementary Information	04/06/2009	NHS Greater Glasgow & Clyde	Craig, Carol
Surgical Block- type 2 summary	1		Stage 3A Demolition Info	V4 Supplementary Information	14/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
Surgical Link Bridge - type 2 summary	1		Stage 3A Demolition Info	V4 Supplementary Information	14/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
Type 2 sheet- Biochemistry	1		Stage 3A Demolition Info	V4 Supplementary Information	14/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol

Type 2 sheets - Surgical	1		Stage 3A Demolition Info	V4 Supplementary Information	14/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
Type 2 sheets A&E	1		Stage 3A Demolition Info	V4 Supplementary Information	14/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
Type 2 Table Report - AE-Ortho	1		Stage 3A Demolition Info	V4 Supplementary Information	14/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
Type 2 Table Report - Biochemistry	1		Stage 3A Demolition Info	V4 Supplementary Information	14/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
Type 2 Table Report - situ	1		Stage 3A Demolition Info	V4 Supplementary Information	14/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
Type 2 Table Report - Surg link	1		Stage 3A Demolition Info	V4 Supplementary Information	14/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
Type 2 Table Report - Surgical	1		Stage 3A Demolition Info	V4 Supplementary Information	14/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
2007 04 05 TA Figures Document Final	1		New South Glasgow Hospitals Transport Assessment Figures Document April 2007	V4 Supplementary Information	25/06/2009	URS Corporation Ltd	Denton, Chris
2007 04 05 TA Final	1		New South Glasgow Hospitals Glasgow - Transport Assessment April 2007	V4 Supplementary Information	25/06/2009	URS Corporation Ltd	Denton, Chris

File Name	Iss.	Rev.	Title	Status	Issue Date	Publishing Company	Publishing User
01 Employers Requirements Stage D	1	-	01 Employers Requirements Stage D	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A1 Master Plan	1	-	A1 Master Plan	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A10 BREEAM	1	-	A10 BREEAM	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A13 Risk	1	-	A13 Risk	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A2 Architectural Location	1		A2 Architectural Location	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A3 Stage D Plans 1	1	-	A3 Stage D Plans 1	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A3 Stage D Plans 1	2	A	A3 Stage D Plans 1	V5 Labs Stage D Tender Issue	09/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A3 Stage D Plans 2	1	-	A3 Stage D Plans 2	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A4 Elevations	1	-	A4 Elevations	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A4 Elevations	2	A	A4 Elevations	V5 Labs Stage D Tender Issue	08/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A5 Builderswork Plans 1	1	-	A5 Builderswork Plans 1	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A5 Builderswork Plans 2	1	-	A5 Builderswork Plans 2	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A6 Fitment Plans 1	1	-	A6 Fitment Plans 1	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A6 Fitment Plans 2	1	-	A6 Fitment Plans 2	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A6 Fitment Plans 3	1	-	A6 Fitment Plans 3	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A6 Fitment Plans 4	1	-	A6 Fitment Plans 4	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A7 Fire Strategy	1	-	Fire Compartmentation Plans	V5 Labs Stage D Tender Issue	03/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A7.2 Fire Strategy Report	1		Fire Strategy Report	V5 Labs Stage D Tender Issue	03/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A8 Visuals 1	1	-	A8 Visuals 1	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A8 Visuals 2	1	-	A8 Visuals 2	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A8 Visuals 3	1	-	A8 Visuals 3	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A9 Planning Application 1	1	-	A9 Planning Application 1	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A9 Planning Application 1	2	A	A9 Planning Application 1	V5 Labs Stage D Tender Issue	21/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A9 Planning Application 2	1	-	A9 Planning Application 2	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A9 Planning Application 2	2	A	A9 Planning Application 2	V5 Labs Stage D Tender Issue	21/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A9 Planning Application 3	1	-	A9 Planning Application 3	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A9 Planning Application 3	2	A	A9 Planning Application 3	V5 Labs Stage D Tender Issue	21/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A9 Planning Application 4	1	-	A9 Planning Application 4	V5 Labs Stage D Tender Issue	21/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A9 Planning Application 5	1	-	A9 Planning Application 5	V5 Labs Stage D Tender Issue	21/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A9 Planning Application 6	1	-	A9 Planning Application 6	V5 Labs Stage D Tender Issue	21/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
A9 Planning Application 7	1	-	A9 Planning Application 7	V5 Labs Stage D Tender Issue	21/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
AL(00)01	1	-	Level -1	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
AL(00)02	1	-	Level 0	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
AL(00)03	1	-	Level 1	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
AL(00)04	1	-	Level 2	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
AL(00)05	1	-	Level 3	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
AL(00)06	1	-	Level 4	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
AL(00)07	1	-	Level 5	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
AL(05)01	1	-	Elevation 1	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
AL(05)02	1	-	Elevation 2	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
AL(05)03	1	-	Elevation 3	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
AL(05)04	1	-	Elevation 4	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
AL(05)05	1	-	Elevation 5	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
AL(05)06	1	-	Elevation 6	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
AL(05)07	1	-	Elevation 7	V5 Labs Stage D Tender Issue	02/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
AL(20)01	1	-	Section AA	V5 Labs Stage D Tender Issue	28/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
AL(20)02	1	-	Section BB	V5 Labs Stage D Tender Issue	28/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
AL(20)03	1	-	Section CC	V5 Labs Stage D Tender Issue	28/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
B2A Mortuary	1	-	Outline Brief Mortuary	V5 Labs Stage D Tender Issue	03/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
B3A Blood Sciences	1	-	Outline Brief Blood Sciences	V5 Labs Stage D Tender Issue	03/07/2009	Boswell Mitchell & Johnston	Deb, Rajib

B4A Genetics	1	-	Outline Brief Genetics	V5 Labs Stage D Tender Issue	03/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
B5A Pathology	1	-	Outline Brief Pathology	V5 Labs Stage D Tender Issue	03/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
B6A Micro-Biology	1	-	Outline Brief Micro Biology	V5 Labs Stage D Tender Issue	03/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
C Outline Specification rev A	1	-	Outline Specifications	V5 Labs Stage D Tender Issue	03/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
C Outline Specification rev A	2	B	Outline Specifications	V5 Labs Stage D Tender Issue	08/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
Site & Setting Out	1	-	A9 Site & Setting Out DWG	V5 Labs Stage D Tender Issue	21/07/2009	Boswell Mitchell & Johnston	Deb, Rajib
NSGACL B of approx Q	1	1	Labs BW B of Approx Quants	V5 Labs Stage D Tender Issue	22/07/2009	Currie & Brown	Gilmour, Ian
NSGACL Labs M&E Pricing Sch	1	1	M&E Pricing Sch for Labs	V5 Labs Stage D Tender Issue	22/07/2009	Currie & Brown	Gilmour, Ian
NSGACL 17-07m-16 mes stage d rev 01	1		Update - Appendix A11, Outline Description of Mechanical & Electrical Engineering Services & Outline	V5 Labs Stage D Tender Issue	22/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL 2475 Letter	1		Glasgow City Council Letter to BMJ re Labs Planning Submission 09/01676/DC	V5 Labs Stage D Tender Issue	31/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL G1313_ M(54)SK01-A3	1		Natural Gas Schematic	V5 Labs Stage D Tender Issue	11/08/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL G1313_ U(96)SK01 Z (A1)	1		Site Utility Routes	V5 Labs Stage D Tender Issue	11/08/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Laboratories BREEAM	1		Labs initial workshop template write up	V5 Labs Stage D Tender Issue	02/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Laboratory Block Con App Docs Final Draft	1		Laboratory block - Draft Consultants Appointment Document - 26 June 2009	V5 Labs Stage D Tender Issue	17/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Labs M&E Spec	1		Laboratory Development, Stage D Appendix 2, Mechanical & Electrical Services Specification 12th July	V5 Labs Stage D Tender Issue	14/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Lift Schedule Revision 3 07 08 09 Stage D	1		New Laboratory Facility, Lift Schedule Rev 03, 7 Aug '09 : Stage D	V5 Labs Stage D Tender Issue	10/08/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL Main M&E Plant Schedule - Labs	1		Labs Building - Main M&E Plant Schedule, 14/7/09	V5 Labs Stage D Tender Issue	16/07/2009	NHS Greater Glasgow & Clyde	Craig, Carol
NSGACL-G1313_ E(61)SK03	1		LEVEL 0 PLAN - MAIN ELECTRICAL CONTAINMENT ROUTES	V5 Labs Stage D Tender Issue	17/07/2009	NHS Greater Glasgow & Clyde	Controller, Tender
NSGACL-G1313_ E(61)(-)SK01	1		Power Connections Prior to Energy Centre	V5 Labs Stage D Tender Issue	03/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_ E(61)SK02	1		LEVEL -1 PLAN - MAIN ELECTRICAL CONTAINMENT ROUTES	V5 Labs Stage D Tender Issue	16/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_ E(63)(-)SK01	1		Schematic Layout of Emergency Lighting Installation	V5 Labs Stage D Tender Issue	03/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_ E(64)(-)SK01	1		Schematic Layout of CCTV & Intruder Alarm Installation	V5 Labs Stage D Tender Issue	03/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_ E(65)(-)SK01	1		Schematic Layout of Data/Comms Installation	V5 Labs Stage D Tender Issue	03/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_ E(67)(-)SK01	1		Schematic Layout of Fire Detection and Alarm System	V5 Labs Stage D Tender Issue	03/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_ E(68)(-)SK01	1		Data/Comms Schematic Site Distribution	V5 Labs Stage D Tender Issue	03/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_ M(50)(-)SK01	1		Schematic Layout of Domestic Water Services	V5 Labs Stage D Tender Issue	03/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_ M(50)(-)SK02	1		Schematic Layout of Main Cooling Services	V5 Labs Stage D Tender Issue	03/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_ M(50)(-)SK03	1		Schematic Layout of Main Heating Services	V5 Labs Stage D Tender Issue	03/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_E(62)(1)SK01	1		LEVEL 1 - INDICATIVE LAYOUT OF POWER SERVICES	V5 Labs Stage D Tender Issue	16/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_E(62)(1)SK01	2		LEVEL 1 - INDICATIVE LAYOUT OF POWER SERVICES	V5 Labs Stage D Tender Issue	17/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_E(63)(1)SK02	1		LEVEL 1 - INDICATIVE LAYOUT OF LIGHTING & EMERGENCY LIGHTING	V5 Labs Stage D Tender Issue	16/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_E(63)(1)SK02	2		LEVEL 1 - INDICATIVE LAYOUT OF LIGHTING & EMERGENCY LIGHTING	V5 Labs Stage D Tender Issue	17/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_E(67)(1)SK02	1		LEVEL 1 - INDICATIVE LAYOUT OF FIRE DETECTION & ALARM SYSTEM	V5 Labs Stage D Tender Issue	16/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_E(67)(1)SK02	2		LEVEL 1 - INDICATIVE LAYOUT OF FIRE DETECTION & ALARM SYSTEM	V5 Labs Stage D Tender Issue	17/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_M(50)SK04	1		LEVEL -1 PLAN - MORTUARY - TYPICAL MECHANICAL SERVICES	V5 Labs Stage D Tender Issue	16/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_M(50)SK04	2		LEVEL -1 PLAN - MORTUARY - TYPICAL MECHANICAL SERVICES	V5 Labs Stage D Tender Issue	17/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_M(50)SK05	1		LEVEL 0 PLAN - SHEET 1 of 3 - TYPICAL MECHANICAL SERVICES	V5 Labs Stage D Tender Issue	16/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_M(50)SK05	2		LEVEL 0 PLAN - SHEET 1 of 3 - TYPICAL MECHANICAL SERVICES	V5 Labs Stage D Tender Issue	17/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_M(50)SK06	1		LEVEL 0 PLAN - SHEET 2 of 3 - TYPICAL MECHANICAL SERVICES	V5 Labs Stage D Tender Issue	16/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_M(50)SK06	2		LEVEL 0 PLAN - SHEET 2 of 3 - TYPICAL MECHANICAL SERVICES	V5 Labs Stage D Tender Issue	17/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_M(50)SK07	1		LEVEL 0 PLAN - SHEET 3 of 3 - TYPICAL MECHANICAL SERVICES	V5 Labs Stage D Tender Issue	16/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_M(50)SK07	2		LEVEL 0 PLAN - SHEET 3 of 3 - TYPICAL MECHANICAL SERVICES	V5 Labs Stage D Tender Issue	17/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_M(56)(1)SK01	1		LEVEL 1 - INDICATIVE LAYOUT OF SPACE HEATING SERVICES	V5 Labs Stage D Tender Issue	16/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_M(56)(1)SK01	2		LEVEL 1 - INDICATIVE LAYOUT OF SPACE HEATING SERVICES	V5 Labs Stage D Tender Issue	17/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_M(57)(1)SK01	1		LEVEL 1 - INDICATIVE LAYOUT OF VENTILATION SERVICES	V5 Labs Stage D Tender Issue	16/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_M(57)(1)SK01	2		LEVEL 1 - INDICATIVE LAYOUT OF VENTILATION SERVICES	V5 Labs Stage D Tender Issue	17/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_ME(50)SK01	1		FRONT OFFICE BLOCK - FIRST, SECOND, THIRD & ROOF PLANS - TYPICAL M&E SERVICES	V5 Labs Stage D Tender Issue	16/07/2009	Wallace Whittle	Administrator, Tender
NSGACL-G1313_ME(50)SK01	2		FRONT OFFICE BLOCK - FIRST, SECOND, THIRD & ROOF PLANS - TYPICAL M&E SERVICES	V5 Labs Stage D Tender Issue	17/07/2009	Wallace Whittle	Administrator, Tender

From: Frew, Shiona
To: McAllister, Mark; McAllister, Mark (GCC); Burgoyne, Margaret; Green, Rachel; "mail@ecoteric.co.uk"
Subject: New South Glasgow Hospitals and Labs Project - Tender Evaluation - 21st August 2009
Date: 12 August 2009 12:33:43

Dear All

The process and programme for evaluating the bids for the New South Glasgow Hospitals and Labs Project was agreed at the NSGH&LP EB (New South Glasgow Hospitals and Labs Project Executive Board) at its meeting on 3rd August 2009. A requirement of the process is that all evaluators need to attend an evaluator training event and this has been scheduled to take place on Friday 21st August 2009 between 9am – 12noon in the Boardroom, NHS GG&C Contact Centre, 1 Jubilee Court, Hillington.

The table below identifies which work-stream(s) you have been identified to evaluate.

GROUP	DESIGN	LOGISTICS	LABS	COMMERCIAL
BOARD	Alan Seabourne Alex McIntyre Annette Rankin Fiona McCluskey Heather Griffin Hugh McDerment Mairi Macleod Mary Ann Kane Morgan Jamieson Peter Moir Stephen Gallacher Mark McAllister	Alan Seabourne Alex McIntyre Frances Wrath John Green Peter Moir	Alan McCubbin Alan Seabourne Alex McIntyre Annette Rankin Frances Wrath Hugh McDerment Jim Crombie (Lead) Isabel Ferguson Mary Ann Kane Peter Moir Margaret Burgoyne Rachel Green	Alan McCubbin Alan Seabourne Alex McIntyre Peter Gallagher Peter Moir
TA ADVISORS	David Hall (Lead) Graham Annandale Harry Smith Iain Buchan John Bushfield Robert Menzies Susan Logan	David Hall (Lead) Mark Baird	Douglas Ross Graham Annandale Neil Robson Raj Deb Stewart McKechnie	Douglas Ross (Lead) Jim Hackett Juliet Haldane Michael McVeigh Simon Fraser

I would be grateful if you could confirm your attendance at this training event.

Many thanks

Regards

Shiona

Shiona Frew
PA to Project Director
New South Glasgow Hospitals Project
St Andrew's House
80 Queen Elizabeth Avenue
Hillington
Glasgow
G52 4NQ
[redacted]

[redacted]

Brookfield

Introduction

Submission Reference:

11.0 Contract Conditions

Submission Response:

This volume contains the Contract Conditions and other related contractual matters that were concluded by agreement following a series of Commercial Dialogue meetings between Brookfield, NHS GG&C and its advisors. The meetings and discussions were conducted in a good spirit and we felt promoted an open and frank approach that allowed us to arrive at a mutually acceptable set of terms and conditions within the timetable.

The contract remains generally consistent with the standard NEC3 form of contract and accordingly retains a strong emphasis upon collaboration and fair dealing and we are confident it will enable the parties to build upon the rapport and relationships that have already been established to deliver together a highly successful project.

The version of the contract that we include in section 11.1 is that issued to us (and the other tenderers) by email Shepherd and Wedderburn in an email dated 13th August 2009 (which was then formally uploaded onto to BIW 14th August under addendum 31).

This form of contract is generally acceptable to Brookfield with one minor clarification as set out in section 11.2. Also included in section 11.1 are those further amendments that were agreed between the parties and which are specific to Brookfield and which NHS GG&C are minded to include in the contract should Brookfield be appointed as the successful bidder.

This volume is divided into six sections comprising:

11.1 Contract Conditions

11.2 Conditions for clarification

11.3 Insurance evidence

11.4 Performance Bond

11.5 Performance Damages

11.6 Collateral Warranties

11.7 Extended Defects Requirements

We refer to the ITSFB Clarification document issued to all bidders and confirm Brookfield's acceptance of these amendments.

Finally, please accept our apologies but we have not amended other volumes/sections of this bid submission to reflect the revised legal designation of "Greater Glasgow Health Board" due to the timing of the issue of the ITSFB clarification.

Legal Clarification – NEC Contract

1. In the Agreement, the correct legal designation of the Employer is "Greater Glasgow Health Board", not "Greater Glasgow and Clyde Health Board"
2. Add new Clause Z16A as follows:-
   "Z16A Add as a second bullet in Clause 50.2:- "the agreed profit as a proportion of the Work Done to Date ""
   Re-order bullets 2 and 3 as bullets 3 and 4.
3. It should be noted that 31 January 2012 is the Completion Date for Stage 1, in accordance with Clause X5 of the Contract Conditions.
4. With regard to Clause 7 of the contract, the order of precedence of the documents should read:
   - 4.1 This Agreement (excluding Appendix 1)
   - 4.2 The conditions of contract,
   - 4.3 Contract Data Part 1[which includes The Works Information]
   - 4.4 Contract Data Part two
   - 4.5 Appendix 1 of this Agreement

Brookfield

Submission Reference:

Section 11.1 The Contract Conditions

Submission Response:

Subject to the inclusion of those modifications agreed with the Greater Glasgow and Clyde Health Board as referred to in Section 11.1.1 below and agreement to our clarification amendment set out in Section 11.2 of this bid submission, Brookfield accepts without amendment the terms and conditions of contract contained within Version 9 as issued by the Board to the bidders on 13 August 2009 which, for the avoidance of doubt, consist of the following:

Agreement

between

GREATER GLASGOW AND CLYDE HEALTH BOARD of Dalian House, 350 St Vincent Street, Glasgow G3 8YZ ("the Employer"); and _____

having its principal place of business at _____

(the "Contractor").

Whereas: -

The Employer wishes to have the Contractor Provide the Works for the New South Glasgow Hospital comprising management and delivery of design and construction services as follows: -

Stage	Heading	Outline Activities
Stage 1	Design and Construct Laboratories	Detailed design and construction of the Laboratories and FM Hub. Concurrent with Stage 2.
Stage 2	Design Development - New Hospitals Building	Detailed design of New Adult Acute and New Children's Hospitals to Full Business Case Submission. Concurrent with Stage 1.
Stage 3	Design and Construct New Hospitals Building	Design and Construction of New Adult Acute and New Children's Hospitals and Energy Centre. Consecutive to Stage 2.
Stage 3A	Demolition of Surgery Block	Demolition of surgical block and associated buildings and completion of soft landscaping.

Now it is agreed that

1. The Contractor will Provide the Works in accordance with the NEC Engineering and Construction Contract, Option C: Target contract with activity schedules, June 2005 (as the same are amended in by the Contract Data) ("the conditions of contract") and the principles stated in Appendix 1 of this Agreement.
2. The Contractor acknowledges and agrees that the final Price for Work Done to Date plus the agreed profit will not exceed the following sums for each Stage:-

Stage	Stage Maximum Price
Stage 1	
Stage 2	
Stage 3	
Stages 3A	

(in each case "the Stage Maximum Price").

If the effect of a compensation event is to increase the total of the Prices for a Stage, the relevant Stage Maximum Price will be increased by that increase in the Prices multiplied by [the percentage differential between the Stage Target Price and the Stage Maximum Price]%. If the effect of a compensation event is to reduce the total of the Prices for a Stage and Clause 63.11 of the conditions of contract applies, the relevant Stage Maximum Price will be reduced by that reduction in the Prices multiplied by [the percentage differential between the Stage Target Price and the Stage Maximum Price]%. The Contractor acknowledges and agrees that the final Price for Work Done to Date for the whole of the works plus the agreed profit for the whole of the works will not exceed the Project Maximum Price, being the total of the Stage Maximum Prices.

3. On Completion of the whole of the works, the Employer calculates the total sum payable to the Contractor by adding together (i) the Price for Work Done to Date for each Stage, (ii) the Contractor's share of savings or share of excess for each Stage, and (iii) the agreed profit for each Stage ("Project Cost"). If the Project Cost is less than the Project Maximum Price and the Contractor has exceeded one or more of the Stage Maximum Prices and has paid 100% of that excess, the Contractor is paid that 100% excess, subject to the Project Maximum Price. If the Project Cost is less than the Project Maximum Price and the Contractor has not exceeded one or more of the Stage Maximum Prices the Contractor is not entitled to further payment. If the Project Cost is more that the Project Maximum Price, the Contractor is paid the Project Maximum Price and the Employer recovers any over payment as a debt.

Brookfield

4. The Employer will pay the Contractor the amounts due for each Stage of the works in accordance with this Agreement, the conditions of contract, the Contract Data and as may be detailed in the Works Information. The Contractor will Provide the Works for each Stage for the following Stage Target Price (as hereinafter defined).

Stage	Stage Maximum Price
Stage 1	
Stage 2	
Stage 3	
Stages 3A	

The Stage Target Price is the total of the Prices for the relevant Stage together with the Contractor's accepted risk allowance and the agreed profit.

5. The Contractor acknowledges and agrees that as at the Contract Date the Contractor shall be authorised to proceed with Stage 1 and Stage 2 only. The Contractor is authorised to commence and proceed with Stage 3 upon written authorisation given by the Employer in the form attached as Appendix 2 hereto. The Contractor is authorised to commence and proceed with Stage 3A upon written authorisation given by the Employer in the form attached as Appendix 3 hereto. In the event that the Contractor commences and proceeds with Stage 3 or Stage 3A without such written authority from the Employer, the Contractor does so at his own cost and risk.

6. The documents forming part of this contract are:

6.1 this Agreement

6.2 the conditions of contract,

6.3 Contract Data part one — data provided by the Employer

6.4 The Contractor's Tender Return Submission, reference _____ dated _____Including:

(i) Contract Data part two - Data provided by the Contractor including Appendices_____ to _____

(ii) The bid deliverables defined in Volume 3 Contract Documents and;

(iii) the following documents:

(other documents to be listed here)

7. In the event of conflict between the documents forming part of this contract the following order of priority will apply:-

7.1 This Agreement (excluding Appendix 1)

7.2 The conditions of contract,

7.3 The Works Information

7.4 Appendix 1 of this Agreement

IN WITNESS WHEREOF these presents consisting of this and the 2 preceding pages together with Appendices 1, 2 and 3 and the Contract Data part one (including its Appendices) and Contract Data part two are executed as follows: -

EXECUTED for and on behalf of the Employer at _____on the _____day of _____ 200____ as follows: -

(Authorised official)

Before this witness: -

Full name _____

Address _____

_____

EXECUTED for and on behalf of the Contractor at _____on the _____day of _____200____as follows: -

(Director/Authorised Signatory)

Before this witness: -

Full name _____

Address _____

_____

Brookfield

This is Appendix 1 to the foregoing Agreement between Greater Glasgow and Clyde Health Board and [Contractor]

Principles governing the Agreement Definitions

Defined Term	Definition
“Overriding Objective”	means the objective set out in Paragraph 4.
“Overriding Principle”	means principle set out in Paragraph 1.
“Professional Advisor”	means any party providing specialist advice to the Employer.
“Supply Chain”	means the individuals and organisations appointed by the Contractor and approved by the Employer who will be responsible for the majority of the management and delivery of design and construction (and where appropriate operation) in relation to the works including the Specified Subcontractors and Specified Consultants.

1. The Overriding Principle of this agreement is to work together with the Supply Chain and the Employer (and any Professional Adviser) in a co-operative and collaborative manner to achieve the Overriding Objective acting in good faith and in the spirit of mutual trust and respect.
2. In order to work together in co-operative and collaborative manner the Employer and the Contractor agree that they should each give to and welcome from each other, the Supply Chain and any Professional Adviser feedback on performance and shall share information openly and highlight any difficulties at the earliest practical time. The parties shall support collaborative behaviour and confront behaviour that does not comply with the Overriding Principle.
3. The terms of the Agreement shall be interpreted according to their natural meaning but in the event of any ambiguity in their natural meaning they shall be interpreted so as to give best effect to the Overriding Principle.
4. In entering into the Agreement the parties’ Overriding Objective is by working together in accordance with the terms of the Agreement to achieve the successful delivery by the Contractor of the works: -

4.1 to the standard and functionality defined or as reasonably inferred from the Employer’s requirements set out in the Works Information to a quality which meets or exceeds these requirements;

4.2 at a cost to the Employer that offers best value for money taking into account whole life (as well as capital) costs over the proposed design life of the works through the application of the principles of value engineering;

4.3 to the timescale acceptable to the Employer and agreed between the parties without compromising health and safety or the Employer’s required standards and the quality of the completed works and in any event before the Completion Dates set out in the Agreement; and

4.4 with an appropriate allocation of the risks associated with the works to the party best able to manage such risks.

5. The Contractor shall carry out the management and be responsible for the delivery, design and construction of the works in accordance with the Agreement and shall work and liaise with the Employer, the Supply Chain and any Professional Adviser as necessary or appropriate or as requested by the Employer in order to achieve the Overriding Objective.
6. The Contractor shall engage persons from the key people set out in the Contract Data — Part two in the performance of the works to be provided by the Contractor under the Agreement and shall not replace any of the key people without the approval of the Employer (such approval not to be unreasonably withheld). The Contractor will ensure that where a member of its key personnel is replaced that they have the skills, qualifications, experience and ability to provide the best service to the Employer.
7. When engaging its Supply Chain the Contractor shall either use the appropriate contract from the NEC3 Suite of Contracts and where they do not use the NEC3 Suite of Contracts they shall ensure that the forms of contract used reflect the principles and procedures identified in the Agreement and the NEC3 Suite of Contracts.
8. Throughout the period of the Agreement the performance of the Contractor shall in relation to the works be monitored against the Key Performance Indicators defined in the Works Information.
9. During the period of the Agreement amendments may be made to the Key Performance Indicators by agreement between the Employer and the Contractor except where the Employer is required by the Scottish Government or regulatory bodies to provide Key Performance Indicators. In such cases the Employer will provide information on any requirements to the Contractor as soon as reasonably practicable.
10. At 2 monthly intervals or at such other intervals as the parties may agree during the performance of the Agreement, the Employer and the Contractor shall undertake formal reviews of the performance of the Contractor against its Key Performance Indicators. [In addition the performance of the Employer against the Employer’s Key Performance Indicators as set out in the Agreement will be monitored.] The Employer and the Contractor will discuss any way in which the performance of the Contractor and/or the Employer may be improved.

Brookfield

11. The formal review process will also include an open book process where the Contractor will be subject to an independent ongoing review.

12. The Contractor shall keep a comprehensive record as specified by the Employer of all performance monitoring carried out under the Agreement in such form as the Employer may reasonably request for a period of 6 years after the expiry or earlier termination of this Agreement and shall provide copies of such records to the relevant Project Director for the works to enable him to record, disseminate and compare the performance of the Contractor. Each record shall be retained in a format that can be read and copied and kept with the IT requirements on an electronic based database.

13. Throughout the Agreement the Contractor will be required to operate an open book accounting regime providing the Employer or their nominated representative with access to such relevant financial or other information as may be required to provide evidence that the Overriding Principle is being applied and that the Overriding Objective is being met. This open book accounting regime will be applied to the Specified Subcontractors and the Specified Consultants therefore the Contractor should make all Specified Subcontractors and Specified Consultants aware of this requirement.

14. The open book regime referred to above will be achieved in three stages:

14.1 a detailed review on the valuation of the Contractor and the Specified Subcontractors and Specified Consultants processes, costing structures and accounts to ensure that systems are in place to enable the Contractor and the Specified Subcontractors and Specified Consultants to work within the Agreement.

14.2 ongoing financial audits to ensure that costs fall within the contractual definition of Defined Cost.

14.3 ongoing reviews of the procurement processes to ensure that all parties are operating systems for the delivery of the works in accordance with this agreement.

15. The Contractor shall throughout the period of the Agreement look for and seek to achieve in conjunction with the Supply Chain continuous improvement in the quality and functionality of the works while reducing low life costs, wastage, construction related accidents and the time taken to deliver the works. Innovation and best practice will be shared with the Employer.

16. To achieve the aim set out in Clause 16 the Contractor shall actively participate in the continuous improvement “learning sets” with the Project Manager and the Supply Chain in relation to the Agreement. This commitment is likely to involve meetings at least once every 3 months in relation to the works and meetings at least once every 6 months in relation to the lessons to be learned. The Contractor shall also use

Brookfield

This is Appendix 2 to the foregoing Agreement between Greater Glasgow and Clyde Health Board and [Contractor]

GREATER GLASGOW AND CLYDE HEALTH BOARD of Dalian House, 350 St Vincent Street, Glasgow G3 8YZ ("the Employer"); and _____

having its principal place of business at _____ (the "Contractor").

WHEREAS

1. The Employer and the Contractor entered into the Agreement dated [ ] whereby the Contractor is to Provide the Works in connection with the New South Glasgow Hospital Project.
2. The Employer wishes the Contractor to continue to Provide the Works by commencing and carrying out:

Stage 3	Design and Construct New Hospitals Building	Design and Construction of New Adult Acute and New Children's Hospitals and Energy Centre. Consecutive to Stage 2.

Now it is agreed that

1. The Employer hereby authorises the Contractor to commence and carry out Stage 3 of the works ie the Design and Construction of the New Adult Acute and New Children's Hospitals.
2. The Contractor will continue to Provide the Works in accordance with the Agreement.

   The Agreement is amended and modified to the following extent:-

   [Any amendments to Works Information and/or Contract Data which will have come about during Stage 2 including adjusted target/Maximum Price]

EXECUTED for and on behalf of the Employer at _____ on the _____ day of _____ 20____ as follows: -

(Authorised official)

Before this witness: -

Full name _____

Address _____

_____

EXECUTED for and on behalf of the Contractor at _____ day of _____ 200____ as follows: -

(Director/Authorised signatory)

Before this witness: -

Full name _____

Address _____

_____

Ceasa to be a vehicle for the involvement of members of its Supply Chain in such learning sets where considered appropriate.

Brookfield

This is Appendix 3 to the foregoing Agreement between Greater Glasgow and Clyde Health Board and [Contractor]

GREATER GLASGOW AND CLYDE HEALTH BOARD of Dalian House, 350 St Vincent Street, Glasgow G3 8YZ ("the Employer"); and _____ having its principal place of business at _____ (the "Contractor").

WHEREAS

1. The Employer and the Contractor entered into the Agreement dated _____ whereby the Contractor is to Provide the Works in connection with the New South Glasgow Hospital Project.
2. The Employer wishes the Contractor to continue to Provide the Works by commencing and carrying out:

Stage	Heading	Outline Activities
Stage 3A	Demolition of Surgery Block	Demolition of surgical block and associated buildings and completion of soft landscaping.

Now it is agreed that

3. The Employer hereby authorises the Contractor to commence and carry out Stage 3A of the works ie the Demolition of surgical block and associated buildings and completion of soft landscaping.
4. 4. The Contractor will continue to Provide the Works in accordance with the Agreement.
5. The Agreement is amended and modified to the following extent: -

   (Any amendments to Works Information and/or Contract Data which will have come about during Stage 2 including adjusted target/Maximum Price)

EXECUTED for and on behalf of the Employer at _____ 200_____ as follows: -

(Authorised official)

Before this witness: -

Full name _____

Address _____

_____

EXECUTED for and on behalf of the Contractor at _____ day of _____ 200____ as follows: -

(Director/Authorised signatory)

Before this witness: -

Full name _____

Address _____

_____

Contract Data Part One - Data Provided By The Employer

Contract Data Part one - Data provided by the Employer Statements given in all Contracts

1. General

- The conditions of contract are the core clauses and the clauses for main Option C, dispute resolution Option W2 and Secondary Options — X2, X4, X5, X7, X13, X16, X17, X18.5, Y(UK)2 and Z of the NEC3 Engineering and Construction Contract (June 2005).
- The works are Management and delivery of design and construction services for the New South Glasgow Hospital Project as the works are more specifically referred to in the Works Information
- The Employer is

  Name: Greater Glasgow and Clyde Health Board

  Address: Dalian House, 350 St Vincent Street, Glasgow G3 8YZ
- The Project Manager is

  Name: Currie & Brown Limited

  Address: 140 West Campbell Street, Glasgow, G2 4TZ
- The Supervisor is

  Name: [tba]

  Address: [tba]
- The Adjudicator is

  Name: [tba]

  Address: [tba]
- The Works Information is in:

  ITPD Volume One, Appendix C — The Contract Documents: Part 7
- The Site Information is in:

  ITPD Volume One, Appendix C — The Contract Documents: Part 8
- The boundaries of the site are set out in

  ITPD Volume One, Appendix C — The Contract Documents: Part 8
- The language of the contract is English.
- The law of the contract is the law of Scotland subject to the jurisdiction of the Courts of Scotland.
- The period for reply to a communication is
  - to Contractor's submission of particulars of design for acceptance (Clause 21.2)
    - Stages 1, 3 and 3A – Three (3) weeks
    - Stage 2 – two (2) weeks
  - Reply to a Contractor notification of a compensation event (clause 61.4, fourth paragraph, first bullet point) is four (4) weeks
  - Reply to all other communications unless otherwise stated in this contract two (2) weeks
- The Adjudicator nominating body is:

  The Scottish Branch of the Royal Institute of Chartered Surveyors
- The tribunal is the Scottish Courts
- The following matters will be included in the Risk Register:

  The Employer Risks not included in the total of the Prices/Maximum Price are as noted in the Risk Register reference [tba] issued with the ITSFB. All other risks are deemed to be included in the total of the Prices/Maximum Price

3. Time

- The starting date is 1 December 2009
- The access dates are [tba]

  Part of the Site _____ Date _____

  1.

  2.

  3.

  4.
- The Contractor submits revised programmes at intervals no longer than four (4) weeks alternatively calendar monthly

Brookfield

Contract Data Part One - Data Provided by the Employer

4. Testing and Defects

- The defects date is 104 Weeks after Completion of the relevant section of the works.
- The defect correction period is two (2) weeks except that:
  - the defect correction period for accommodation occupied by the NHS for patients on an operational basis is 2 days unless notified as an urgent repair requiring immediate attention
  - the defects correction period for works which are urgent requiring immediate attention and might affect the safe and secure running of the site eg security systems, fire alarm systems, building heating systems, building potable water supplies, sanitation, building mains electricity supply systems (excluding works to be carried out by utility providers) is 24 hours.

5. Payment

- The currency of this contract is the pound sterling (£)
- The assessment interval is four (4) weeks alternatively calendar monthly.
- The interest rate is 5% per annum
- The overhead percentage is _____%
- The agreed profit is:-

Stage	agreed profit
1	
2	
3	
3A	

Optional Statements for Clause 5

The Contractor's share percentages and the share ranges are

share range	Stage 1: Contractor's share percentage	Stage 2: Contractor's share percentage	Stage 3 and 3A: Contractor's share percentage
Less than total of Prices			
Between total of Prices and Maximum Price			
Greater than Maximum Price			

The Contractor prepares forecasts of Defined Cost for the works at intervals no longer than four (4) weeks alternatively calendar monthly.

6. Compensation Events

- The place where weather is to be recorded is: the Site
- The weather measurements to be recorded each month are
  - the cumulative rainfall (mm);
  - the number of days with rainfall more than 5mm;
  - the number of days with minimum air temperatures less than Zero degrees Celsius;
  - the number of days with snow lying at 09.00 hrs GMT;
  - and these measurements:
- The weather measurements are supplied by The Met Office.
- The weather data are the records of past weather measurements for each calendar month which were recorded at Glasgow Airport and which are available from The Met Office.
- Where no recorded data are available
- Assumed Value for ten years return weather data for each weather measurement for each calendar month are:

Brookfield

8. Risks and Insurance

The minimum limit of indemnity for insurance in respect of loss of or damage to property (except the works, Plant and Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the Contractor) caused by activity in connection with this contract for any one event is

£20,000,000.00 (twenty million pounds sterling)

The minimum limit of indemnity for insurance in respect of death or bodily injury to employees of the Contractor arising out of and in the course of their employment in connection with this contract for any one event is

£10,000,000.00 (ten million pounds sterling)

The amount of the minimum limit of indemnity for insurance (CAR) in respect of loss or damage to the works in connection with this contract is the replacement cost

And the amount for replacement of any Plant and Materials provided by the Employer is

£10,000,000.00 (ten million pounds sterling)

The amount of the minimum limit of indemnity for Professional Indemnity Insurance for design liability in connection with this contract for any one event is

(in any one event / in the aggregate) of £20,000,000 (twenty million pounds sterling)

Contractor to provide documentary evidence to which insurance option is being provided

The Contractor provides all other insurances required by the law of the contract

Optional Statements

If the Employer has decided the completion date for the whole of the works

The Completion date for the whole of the works is 30 August 2016

If no programme is identified in part two of the Contract Date

The Contractor is to submit a first programme for acceptance within four (4) weeks of the Contract Date

If the Employer has identified work which is to meet a stated condition by a key date

The key dates and conditions to be met are

Condition to be met	key date
Stage 2: Completion of Detailed design to allow FBC to be submitted to Scottish Government by 31 October 2010	31st October 2010

If there are additional Employer's risks

- These are the additional Employer's risks

1. Completion is delayed as a result of a Contractor's insurable event; insurable events include fire, lightening, explosion, storm, tempest, flood bursting or overflowing water tanks, apparatus or pipes, earthquake, aircraft and other aerial devices or articles dropped there from.
   Clarification - limit of the Employer's risk:
   Where there is delay as a result of the Contractor's insurable event the completion date is changed, but there is no effect on the Prices; cost incurred in remedy of the event is a Disallowed Cost. The Project Manager notifies a compensation event if timing or sequence of operations is to be changed to alleviate the effect of the delay.
2. Any variance in the rate of insurance due to market conditions, will form part of the project specific Maximum Price.
3. The works are delayed or suspended due to an act of terrorism
4. Any other Employer Risks noted in the Risk Register reference [tba] issued with the ITSFB. All other risks are deemed to be included in the total of the Prices/Maximum Price

If Option X5 is used

- The completion date for each section of the works is

Section	Description	completion date
1 - Stage 1	Laboratories	31st January 2012
2 - Stage 3	New Hospital	31st January 2015
3 - Stage 3A	Demolition of Surgical Block	30th August 2016

Brookfield

If Options X5 and X7 are used together

- ∑ Delay damages for the sections of the works

Section	Description	Amount per week or pro-rated part thereof
1 - Stage 1	Laboratories	£50,000
2 - Stage 3	New Hospital	£250,000 – provided that in the first 4 weeks after the completion date delay damages will be levied at 25% of £250,000; in weeks 5 – 8 inclusive after the completion date delay damages will be levied at 50% of £250,000; in weeks 9 – 12 inclusive after the completion date delay damages will be levied at 75% of £250,000; and from week 13 after the completion date delay damages will be levied at 100% of £250,000
3 - Stage 3A	Demolition of Surgical Block	£20,000

If Option X13 is used

The amount of the performance bond is:-

Stage 1 – 5% of the Maximum Price for Stage 1

Stage 3 – 5% of the Maximum Price for Stage 3

Stage 3A – 5% of the Maximum Price for Stage 3A

If Option X18 is used

The end of liability date is twelve (12) years after the Completion of the whole of the works.

If Option Z is used

The additional conditions of contract are

Amendments and additions to existing Clauses:

Z 1 Additions to Clause 11.2 - Identified and Defined Terms

11.2(34) "Collateral Warranty Agreement" is an agreement substantially in the relevant form attached as Appendix Parts 1 and 2 hereto to be granted in favour of the Employer by the Contractor and (i) each Specified Subcontractor and (ii) each Specified Consultant (any changes to the said form(s) having been approved by the Employer, which approval will not be unreasonably withheld or delayed).

11.2(35) The "Supply Chain Member (SCM)" is the individuals and organisations appointed by the Contractor and approved by the Employer who will be responsible for the majority of the management and delivery of design and construction (and where appropriate operation) in relation to the works.

11.2(36) "Documents" includes, without limitation, all technical information (whether or not stored in computer systems), drawings, models, calculations, specifications, schedules, details, plans, programs, budgets, reports or other documents, work or other things provided or to be provided by or on behalf of the Contractor in connection with the works

11.2(37) "Agreement" is the form of agreement entered into between the Employer and the Contractor in respect of the works forming part of this contract

11.2(38) "Full Business Case" is the Employer's submission to the Scottish Government for approval to proceed with Stage 3 and Stage 3A of the works.

11.2(39) "Laboratories" is the new laboratory block as the same is more particularly described in the Works Information

11.2(40) "Laboratory Consultant" is BMJ Architects Limited, 2 Central Quay, 89 Hydepark Street, Glasgow, G3 8BW.

11.2(41) "Novation Agreement" is an agreement in the relevant form set out in Appendix Part 3 hereto.

11.2(42) "Specified Subcontractors" is those Supply Chain Members specified as such in the Works Information.

11.2(43) "Specified Consultants" is those Supply Chain Members specified as such in the Works Information.

11.2(44) "Stage" has the meaning ascribed to it in the recital to the Agreement.

11.2(45) "conditions of contract" is the NEC Engineering and Construction Contract, Option C: Target contract with activity schedules, June 2005 (as the same are amended by the Contract Data)

Brookfield

11.2(46) “Stage Maximum Price” is the maximum price payable for each Stage of the works as set out in Clause 2 of the Agreement unless later changed in accordance with this contract and “Stage Maximum Prices” are construed accordingly.

11.2(47) “Project Maximum Price” is the total of the Stage Maximum Prices.

11.2(48) “Project Cost” is the sum of the Price for Work Done to Date for the whole of the works plus the agreed profit for the whole of the works, all adjusted by the Contractor’s share for each of the Stages.

11.2(49) “Design Deliverables” are those elements of design to be delivered by the Contractor to the Employer during Stage 2 as set out in [Bidders to propose deliverables which link to Retention release]

Z 2 Amendment to clause 11.2 (25) - Identified and Defined Terms

At end of first bullet point after ‘records’ add: ‘including amounts for invoices that the Contractor is liable to pay but has not paid within 28 days from having been included in the Project Manager’s assessment’.

Z3 Amendment to clause 11.2 (8) - Identified and Defined Terms

Delete and replace with “The Overhead is the sum of the amounts calculated by applying the overhead percentage to the Defined Cost of subcontracted and other work.”

Z4 Amendment to clause 11.2 (4) - Identified and Defined Terms

Delete and replace with “the Contract Date is the date of execution of this contract”

Z5 Amendment to clause 11.2 (29) - Identified and Defined Terms

Delete “plus the Fee” and replace with “plus the Overhead.”

Z6 Amendment to Clause 11.2(30) – Identified and Defined Terms

Delete and substitute “The Prices are the sum of (i) the lump sum prices for each of the activities in the Activity Schedule (unless later changed in accordance with this contract) plus (ii) the total of such lump sum prices multiplied by the overhead percentage”

Z7 Amendment to Clause 17.1 – Ambiguities and inconsistencies

Add the following sentence to the end of Clause 17.1

“Instructions issued under this clause do not necessarily give rise to a compensation event”

Z8 Addition to Clause 17 – Ambiguities and inconsistencies

“17.2 The Project Manager and the Contractor agree that inconsistencies and ambiguities between (a) the NHS Mandatory Documentation and NHS Guidance Documentation and building control or (b) between the NHS Mandatory Documentation and NHS Guidance Documentation and the Schedules of Accommodation or (c) between the NHS Mandatory Documentation and NHS Guidance Documentation and any information issues to the Contractor by the Employer, dealt with in accordance with the procedures set out in the Works Information.”

Z9 Amendment to Clause 19 – Prevention

Add new Clause 19.2

“Notwithstanding the provisions of Clause 60 and subject to Clause 19.4, the Contractor’s sole right to payment in respect of the occurrence of an event under Clause 19.1 is as provided in Clause 93.”

Add new Clause 19.3

“The Contractor and the Employer take all reasonable steps to mitigate the effect of the occurrence of an event under Clause 19.1.”

Add new Clause 19.4

“If the Project Manager instructs the Contractor to take steps to Provide the Works in a manner not prevented by the occurrence of an event under Clause 19.1, and such instruction changes the Works Information, the Contractor is entitled to notify a compensation event under clause 60.”

Z10 Amendment to Clause 21.1 - The Contractor’s design

At the end of the Clause add: “the Contractor designs the works using the degree of skill and care that would reasonably be expected of a competent professional designer experienced in carrying out design activities of a similar nature, scope and complexity to those comprised in the works.

Z11 Amendment to Clause 21.2 – The Contractor’s Design

After the first sentence add:- “The Project Manager either accepts the design or rejects it and notifies the Contractor of his reasons for doing so within the period of reply to the Contractor’s submission of particulars of his design for acceptance.”

After the second sentence add:- “A failure by the Project Manager to either accept the design or reject it and notify the Contractor of his reasons for doing so within the period of reply is treated as acceptance of the design by the Project Manager. Where the Project Manager rejects the design and notifies Contractor of his reasons for doing so, the Contractor amends the particulars of design

Brookfield

taking into account the reasons notified by the Project Manager and resubmits the particulars of design to the Project Manager for acceptance. Within one (1) week of the Contractor resubmitting such particulars of his design for acceptance the Project Manager either accepts the design or rejects it and notifies the Contractor of his reasons for doing so. A failure by the Project Manager to either accept the resubmitted design or reject it and notify the Contractor of his reasons for doing so within the period of one (1) weeks is treated as acceptance of the re-submitted design by the Project Manager. This process of re-submission is repeated until such time as the Project Manager has accepted or is treated to have accepted the design. "

In the third sentence, after "has accepted" add:- " or is treated to have accepted"

Z12 Amendment to Clause 22.1 – Using the Contractor's design

Delete and replace with: -

"22.1 The copyright and all intellectual property rights in the Documents remain vested in the Contractor or the person responsible for the production (as the case may be).

22.2 Where documentation (including drawings) is (or are) provided by the Employer copyright and such documentation and drawings remain vested in the Employer.

22.3 The Employer has an irrevocable, non-exclusive royalty free licence to copy and use the Documents and to reproduce the designs contained in them for any purpose relating to the works including (but without limitation) the construction, completion, maintenance, promotion, advertisement, reinstatement, repair, any extension of the works and for dissemination within the NHS as part of the feedback of information to better or enable the NHS to realise improvements in its methods and practice of construction and in the design and procurement of its construction.

22.4 The Contractor shall not be liable for any use of the Employer of the Documents for any purpose other than that for which the same is prepared and provided."

Z13 Addition to Clause 31 – The programme

31.5 A failure by the Project Manager to either accept the programme or notify the Contractor of his reasons for not accepting it within the two week period is treated as acceptance of the programme by the Project Manager. Where the Project Manager notifies the Contractor of his reasons for not accepting the programme, the Contractor amends the programme taking into account the reasons notified by the Project Manager and resubmits the programme to the Project Manager for acceptance. Within one (1) week of the Contractor resubmitting the programme for acceptance the Project Manager either accepts the programme or rejects it and notifies the Contractor of his reasons for doing so. A failure by the Project Manager to either accept the resubmitted programme or notify the Contractor of his reasons for not accepting the programme within the period of one (1) weeks is treated as acceptance of the programme by the Project Manager. This process of re-submission is repeated until such time as the Project Manager has accepted or is treated to have accepted the programme."

"31.6 The Contractor complies with section 6.8 of Volume 2/1 of the Employers Requirements Section of the Works Information in connection with commissioning and handover for the whole of the works. The Contractor accepts and agrees that the Project Manager is not under any obligation to certify Completion unless and until the Contractor fully complies with such requirements."

Z14 Amendment to Clause 43.2 – Correcting Defects

Add at the beginning:- "Unless a different period is agreed in writing between the Contractor and the Supervisor,"

Z15 Amendment to Clause 50.6 – Assessing the Amount Due

Delete "Fee" and replace with "Overhead".

Z16 Amendment to Clause 51 – Payment

In the first sentence of Clause 51.1 delete "one week" and replace with "two weeks".

In the first sentence of Clause 51.2 delete "three" and replace with "four"

Z 17 Addition to Clause 51 - Payment

51.5 If the Defined Cost plus the Overhead at an assessment date exceeds the amount for the assessment interval as shown in the Contractor's cash flow forecast, then the Project Manager certifies payment up to the amount forecast. Any amount exceeding the forecast is not certified but held over to the next assessment interval, where if the Defined Cost plus the Overhead at the next assessment date again exceeds the Contractor's cash flow forecast for the assessment interval the process is repeated. This clause does not apply where the Contractor provides a valid and acceptable reason for an exception to the limitation of the Project Manager's assessment certification.

51.6 If the Employer intends to withhold payment of any amount due under the contract he notifies the Contractor no later than 7 days before the final date for payment of the sum due specifying:

- the amount proposed to be withheld
- the ground for withholding payment or
- if there is more than one ground, each ground and the amount contributable to it

Brookfield

Z18 Amendment to Clause 52.1 – Defined Cost
Delete "Fee" and substitute "Overhead and agreed profit"

Z 19 Amendments to Clause 53 – The Contractor's share
Delete Clause 53.1 and substitute "The Project Manager assesses the Contractor's share of the difference between the total of the Prices and the Price for Work Done to Date for each Stage. "

In Clause 53.2, after "total of the Prices" where it appears twice, add "for the relevant Stage"

In Clause 53.3, delete "of the whole of the works" where it appears twice and substitute in each case "at the end of each Stage

In Clause 53.3 after "final total of the Prices", add "for each Stage"

In Clause 53.4 after "final total of the Prices", add "for each Stage"

Z20 Amendment to Clause 60.1(19)
Add new bullet point 6, "does not arise from a Sub-Contractor ceasing to trade or becoming insolvent (or other equivalent event)"

Add at the end, "provided that the occurrence of such event only entitles the Contractor to a change to the Completion Date or a change to a Key Date and not to a change in the Prices and Clauses 61 – 65 are interpreted accordingly."

Z 21 Amendment to Clause 61.4 - Notifying of Compensation events
In line 15 delete "two" and substitute "four"

Z22 Amendment to Clause 63.1 – Assessing Compensation Events
In the third bullet delete "Fee" and substitute "Overhead and agreed profit"

Z23 Amendment to clause 80.1 - Employer's Risks
Bullet point 3, sub-bullet 1 second line after 'power,' add 'terrorism (except to the extent insured by the Contractor in relation to the works at the time of any loss or damage),'

Z24 Addition to Clause 84.2 – Insurance cover
Add at the end of line 3 before the full stop, "except in the case of professional indemnity insurance which is in the name of the Contractor and runs from the starting date to the date twelve years after Completion of the whole of the works"

Add to the Insurance Table:

Liability for negligent management or design – professional indemnity insurance	The amount specified in the Contract Data for any one claim or series of claims arising out of one single incident during any period of insurance which shall not be more than 12 months from the date the Contractor starts to Provide the Works for a period of twelve years from Completion of the whole of the works, with insurers of good repute carrying on business in the European Union provided always that such insurance is available at rates and terms which are commercially reasonable to contractors of a similar size and standing in the UK In determining whether or not insurance is available as aforesaid, the financial characteristics and claims' record of the Sub-Contractor shall be ignored.

Z25 Amendment to Clause 91.7 – Reasons for Termination
Add at the end "notwithstanding that a delay to the Completion Date has previously been notified to the Contractor in respect of such event"

Z26 Addition to Clause 91 - Reasons for termination
91.8 The Employer may terminate the Contractor's obligations to Provide the Works for Stages 3 and 3A either (i) on completion of Stage 2 or (ii) if the Full Business Case is not approved by the Scottish Government (R22)

Z27 Addition to 92.2 - Procedures on termination
P5 The Contractor hands over to the Project Manager all hard copy and electronic data for the Contractor's design including material prepared by a subcontractor, the Works Information for the Contractor's design and Site Information obtained so far as prepared at termination. At such termination the Employer has the right to use such material for completion of the works.

Brookfield

Z28 Termination Table — additions

Terminating Party	Reason	Procedure	Amount Due
The Employer	R22	P1, P2 and P5	A1 (excluding principle bullet point 3) and A2

Z29 Amendment to Clause 93.1 – Payment on Termination
Delete the 3rd principal bullet and substitute "other Defined Cost reasonably incurred in expectation of completing the Stage during which termination occurs".

Z30 Amendment to Clause 93.2 – Payment on Termination
In A4 delete "direct fee percentage" and substitute "overhead percentage"

Z31 Amendment to Clause 93.7 - Payment on Termination
Add new Clause: - "Subject to any Defined Cost reasonably incurred in expectation of completing the Stage during which termination occurs (Clause 93.1), on termination the Employer shall not be liable to the Contractor for loss of profit, loss of expectation of profit, loss of use, loss of production or indirect and consequential damages."

Z32 Addition to Clause W2.1(1) – Dispute Resolution
Add at the end: - "The word "dispute" in this Clause W2 includes any difference under or in connection with this contract".

Z33 Addition to Clause W2.3(8) – the adjudication
After "reasons" add the words, "(which will be in writing)"

Z34 Addition to Clause W2.3(11) – The adjudication
Delete the first sentence and replace with, "The decision of the Adjudicator is binding until the dispute is finally determined by the tribunal or by agreement."

Z35 Amendment to Clause X13
Delete and substitute: "The Contractor gives the Employer performance bonds for each of Stages 1, 3 and 3A of the works, provided by a bank or insurer which the Project Manager has accepted, for the amounts stated in the Contract Data and in the form set out in the Appendix. A reason for not accepting the bank or insurer is that its commercial position is not strong enough to carry the bond. If the bond for Stage 1 is not given by the Contract Date, it is given to the Employer within four weeks of the Contract Date. If the bond for Stage 3 is not given when the Employer authorises the Contractor to commence and proceed with Stage 3, it is given to the Employer within four weeks of such authorisation. If the bond for Stage 3A is not given when the Employer authorises the Contractor to commence and proceed with Stage 3A, it is given to the Employer within four weeks of such authorisation."

Z36 Amendment to Option X16
Delete X16 and substitute:

"In respect of each of the Stages an amount is retained by the Employer in each amount due. The following applies to each of the Stages:-

Stage	Retention
1 - Design and Construct Laboratories	5% retained in each amount due until Completion of section 1. Amount retained is halved at Completion of section 1 and remains at this amount until the Defects Certificate for section 1 is issued. Amount retained released on issue of Defects Certificate for section 1 No amount retained after issue of Defects Certificate for section 1
2 – Design Development - New Hospitals Building	10% retained in each amount due and released on delivery of the Design Deliverables to the Employer No amount retained after all information for Full Business Case received from Contractor ie completion of Stage 2
3 - Design and Construct New Hospitals Building	The Employer retains 2% of the total of the Prices for Stage 3. No sums retained from each amount due until the final year of the Stage 3 works (or such other period as the Employer, acting reasonably, may determine) Amount retained released on issue of Defects Certificate for section 2 No amount retained after issue of Defects Certificate for section 2
3A - Demolition of Surgery Block	5% retained in each amount due until Completion of section 3. Amount retained is halved at Completion of section 3 and remains at this amount until the Defects Certificate for section 1 is issued. Amount retained released on issue of Defects Certificate for section 3 No amount retained after issue of Defects Certificate for section 3

Brookfield

Z 37 New Clause — Assignation

Z37.1 The Employer has the right to assign this contract to another NHS body without having to seek the Contractor's consent.

Z37.2 The Employer notifies the Contractor of the intention to assign the contract to another NHS body.

Z37.3 The Employer notifies the Contractor of the assignation of the contract to another NHS body.

Z38 New Clause - Confidentiality

Z38.1 The Contractor shall not append their name or give authority to the appending of their name to any publicity concerning this agreement or the works or indulge in any publicity concerning the works without the prior written consent of the Employer.

Z38.2 The Contractor warrants the accuracy of all information of a legal, commercial or financial nature provided by them to the Employer. Details must be provided by the Contractor to the Employer regarding any matter as and when they take place, which affects the legal, commercial or financial standing of the Contractor.

Z38.3 The Contractor undertakes to treat any information derived from or obtained in the course of the Agreement as confidential and to take all the necessary precautions to ensure that its employees and sub-contractors and their employees treat any information as confidential and in doing so the Contractor shall ensure that its employees and sub-contractors and their employees keep secret and do not disclose information of a confidential nature by him or them by reason of the Agreement.

Z39 New Clause – Data Protection

Z39.1 The Contractor warrants and will at all times comply with the provisions of the Data Protection Act 1998 ("the 1998 Act") and any other subordinate legislation enacted pursuant thereto.

Z39.2 The Contractor shall only undertake such processing of personal data as is reasonably required in connection with the performance of its obligations under pursuant to the Agreement. To the extent required by the 1998 Act the Contractor shall notify the Information Commissioner of any processing which is being carried out and maintain any such notification in full force and effect.

Z39.3 The Contractor in its role as Data Processor undertakes to comply with the obligations imposed on a Data Controller under the 7th Data Protection Principle as set out in Part 1 of Schedule 1 of the 1998 Act in respect of all personal data processed pursuant to this Contract.

Z39.4 The Contractor shall not, other than in accordance with the 1998 Act, transfer any personal data to any country or territory outside the European Economic Area.

Z39.5 Terms defined within the 1998 Act shall have the same meaning when used in this clause.

Z40 New Clause – Freedom of Information

The Contractor co-operates, facilitates, supports and assists the Employer to comply with the Freedom of Information (Scotland) Act 2002 and any codes of practice applicable from time to time relating to access to public authorities' information. In the event that the Employer is required to provide information to any person as a result of a request made to it under such Act and/or codes, the Employer shall adhere to the requirements of such Act and/or codes in disclosing information relating to this Agreement, the Project Documents and the Contractor.

Z41 New Clause: Collateral Warranty Agreements

Z41.1 Immediately following execution by each Specified Subcontractor of its subcontract the Contractor delivers to the Employer Collateral Warranty Agreements from each Specified Subcontractor in favour of the Employer together with a copy of the relevant subcontract.

Z41.2 Within 10 days of request by the Employer the Contractor delivers to the Employer Collateral Warranty Agreements from each Specified Consultant in favour of the Employer together with a copy of the relevant appointment.

Z42 New Clause – Novation Agreements

On execution of the Agreement, the Contractor enters into a Novation Agreement with the Employer and the Laboratory Consultant. At the same time, the Contractor delivers to the Employer a Collateral Warranty Agreement from the Laboratory Consultant generally in terms of the relevant Collateral Warranty Agreement.

Z43 New Clause – Failure to deliver Collateral Warranty Agreements and/or Novation Agreements

When any Collateral Warranty Agreement or Novation Agreement is not delivered as required pursuant to Clauses Z41 and Z42, one quarter of the Price for Work Done to Date plus agreed profit is retained in assessments of the amount due until the Contractor has delivered such Collateral Warranty Agreement or Novation Agreement to the Employer.

Brookfield

Z44 New Clause – Third Parties

The Contractor performs its obligations under this contract in such a manner and at such times that no act, omission or default of the Contractor in relation thereto constitutes, causes or contributes to any breach by the Employer of any third party agreement or any other obligation it may owe to a third party relating to the works, details of which the Contractor was made aware of prior to the Contract Date.

Z45 New Clause - Inconsistencies

In the case of any inconsistency between these additional conditions of contract and the other terms of the contract, the additional conditions of contract prevail. In the event of any inconsistency between the Core Clauses and any other term of this contract (except these additional conditions of contract) the Core Clauses prevail.

Z46 New Clause – Approval

No inspection, testing, approval or review nor any omission to inspect, test, approve or review on the part of the Employer diminishes any duty or liability under this contract of the Contractor.

Z47 New Clause – Set off

Without derogating from its rights under this contract or under the law of the contract, whenever any sum of money is recoverable by the Employer against the Contractor, such sum is deducted from any sum due or which may become due to the Contractor under this or any other contract with the Employer.

Z48 New Clause – Security

Z48.1 The Contractor acknowledges that the Site forms part of the larger Southern General Hospital site and that the Southern General Hospital is a live and functioning acute hospital. The Contractor takes measures to prevent its employees, Subcontractors and suppliers of the Contractor from entering into or otherwise interfering with the operation of the existing Southern General hospital, except for access to or egress from the Site.

Z48.2 The Project Manager may instruct the Contractor to take measures to prevent unauthorised persons being admitted on the Site. The instruction is a compensation event if the measures are additional to those required by the Works Information.

Z48.3 The Contractor does not take photographs of the Site or the works or any part of them unless he has obtained the approval of the Project Manager.

Z48.4 The Contractor takes the measures needed to prevent his and his Subcontractors' people taking, publishing or otherwise circulating such photographs.

Schedule of Cost Components

Delete the Schedule of Cost Components and replace with the Schedule of Cost Components in ITPD Volume One, The Contract Documents: Part 5.

This is the Appendix referred to in the foregoing Contract Data Part One

1. Form of Collateral Warranty Agreement from Specified Sub-Contractors
2. Form of Collateral Warranty Agreement from Specified Consultants
3. Form of Novation Agreement
4. Form of Performance Bond

Brookfield

Section 11.1.1: Amendments

As agreed with the Board, if Brookfield's bid is successful the terms of contract will be amended to incorporate the amendments contained within the document entitled "Bidder B Issues" which were issued by email dated 7 July 2009 and which, for the avoidance of doubt, comprise the following:

SHEPHERD+ WEDDERBURN

New South Glasgow Hospital

Bidder B Issues

Issues likely to be reflected in Contract Bidder B Appointed as Preferred Contractor

Clause Reference	Amendments Sought	Proposed Drafting
Appendix 1, Paragraph 9	Performance should only be monitored during the period that the works have been carried out, not throughout the period of the Agreement.	Clause to be amended to read "Until the later of the end of the defects date and the end of the last defects correction period, the performance of the Contractor shall, in relation to the works, be monitored against the key performance indicators defined in the Works Information".
Appendix 1, Paragraph 10	Amendments to the KPI should only be made during the period when the KPIs are measurable (see paragraph 9 above).	Until the later of the end of the defects date and the end of the last defects correction period, amendments to be made….".
Appendix 1, Paragraph 11	Formal review should only take place during the carrying out of the works.	Amended to read "At two month intervals or at such intervals as the parties may agree during the performance of the work, the Employer and the Contractor shall…"
Appendix 1, Paragraph 14	The Open Book Regime should only apply during the period of the contract only up to the date the final payment is made.	Amended to read "throughout the period of the Agreement and up to the date final payment is made in accordance with Clause 50.1, the Contractor will be required to operate…"
Appendix 1, Paragraph 16	Achievement of continuous improvement should be measured until Completion. There is no incentive for this to tip over into the Defects period.	Amended to read "Until Completion the Contractor shall look for and achieve in conjunction with the Supply Chain…."
Contract Data Part 1, Section 4	Bidder suggesting that the defects correction period of 2 weeks can be pushed out where the defect requires it.	Amended to read "The defects correction period is two (2) weeks (or such longer period as may be agreed between the Employer and the Contractor, having regard to the nature of the Defect, the Employer's operational requirements or any period for procurement of necessary Plant and Materials)…"

Brookfield

Clause Reference	Amendments Sought	Proposed Drafting
Contract Data Part 1, Section 4	In relation to defects correction period for urgent work which may affect the safe and secure running of the Site, Bidder proposing that the 24 hour period is extended where replacement parts will take longer than this period to order.	Amended to read “The defects correction period for works which are urgent… is 24 hours provided that where replacement parts are required in order to fully rectify the Defect and procurement of such parts will take longer than 24 hours, the Contractor will, for the purposes of assessing compliance with this obligation, only be obliged to remove all risks to safety caused by the Defect and ensure the resumption of the Employer’s operations within the 24 hour period and the replacement of the defective part(s) will be carried out within a period to be agreed with the Employer”.
Contract Data Part 1, Section 8	Rather than the Bidder providing evidence of which insurance option is being used, the Bidder will provide documentary evidence to establish that it has discharged its obligations with respect to insurance.	“The Contractor to provide documentary evidence to establish that it has discharged its obligations under this contract with respect to insurance”.
Contract Data Part 1 – Optional Statement – Key Dates	The requirement to reach this Key Date should be predicated on the assumed Contract Award Date. Thus if the Contract Award Date is pushed out, the date of 31 October 2010 may require to be pushed out.	To be agreed depending upon when the contract is signed.
NEC Clause 11.2	The Bidder wishes to add definitions of “Key Subcontract” and “Key Subcontractors” who are those subcontractors to whom they will pass down the NEC Contract. The Bidder clarifying that they envisage that this category of subcontractors will be wider than the list from whom warranties will be required.Noted that the Bidder agreed that the subcontractors will include listed subconsultants e.g. principal design consultants.	“Key Subcontract” means those subcontracts entered into with the Key Subcontractors.“Key Subcontractors” means those subcontractors specified as being a Key Subcontractor in the Works Information.
Clause 21.1	Bidder seeking to amend the duty of care to bring it into line with its insurable risks.	“The Contractor designs the parts of the works which the Works Information states he is to design using the degree of skill and care that would reasonably be expected of a competent professional design and build contractor experienced in carrying out projects of a similar nature, scope and complexity to those comprised in the works”.
NEC Clause 24.2	Bidder seeking to provide some flexibility into the period for removal of an unwanted employee.	“The Project Manager may, having stated his reasons, instruct the Contractor to remove an employee. The Contractor then arranges that after one day (or such other period as may be agreed between the parties in writing) the employee has no further connection with the works included in this contract”.
NEC Clause 40.3	Given that the supervisor can watch test carried out by the Bidder, the Bidder is asking for this to be reciprocal.	“The Contractor and the Supervisor each notifies… The Supervisor may watch any test done by the Contractor. The Contractor may watch any test done by the Supervisor”.

Brookfield

Clause Reference	Amendments Sought	Proposed Drafting
NEC Clause 52.2	The payment records should only be kept until the final payment is made.	"The Contractor keeps those records until the later of the issue of the Defects Certificate or the final payment being made under this contract pursuant to Clause 50.1".
NEC Clause 54.3	Given that the Prices can be changes in accordance with the contract, this should be acknowledged within the clause.	The third bullet to read "the total of the Prices has changed other than in accordance with this contract".
NEC Clause 60.3	If there is an ambiguity within the Site Information, the Bidder is assumed to have taken into account the physical conditions most favourable on doing the work. This does not recognise the compensation event stated at Clause 60.1(12).	"If there is an ambiguity around consistency within the Site Information (including the information referred to in it) the Contractor is subject to Clause 60.1(12) assumed to have taken into account the physical conditions more favourable to doing the work".
NEC Clause 91.2	The provision relating to appointment of a subcontractor without acceptance by the Employer should relate only to Key Subcontractors.	Third bullet to read "appointed a Key Subcontractor for substantial work…"
NEC Z27.2	The Bidder accepts the principal of this, however the details should only be provided where the issues affect the ability of the Bidder to perform the works.	"The Contractor warrants the access of all information… Details must be provided by the Contractor to the Employer regarding any matter which affects the ability of the Contractor to perform the works as and when they take place, which affects the legal, commercial and financial standing of the Contractor".
NEC New Clause Z27.4	The bidder wants the Employer to treat any legal, financial etc information as confidential.	"Subject to Clause Z29, the Employer undertakes to treat any information obtained by it concerning the legal, financial or commercial standing of the Contractor as confidential and to take all necessary precautions to ensure that its employees do the same".
Z30.1	Bidder requires some flexibility. While it is their intention to get warranties signed on the same date as the subcontract, this sometimes is not possible.	"As soon as possible and in any event within 14 days following execution…"
Z32	The designer may fail to execute the Novation Agreement which would be outwith the control of Bidder.	Board to consider either removing reference to Novation Agreement or including the words "save where the reason for the non provision of the Novation Agreement is the refusal or delay on the part of the Laboratory Consultant to execute such an agreement".
NEC X7.4	Bidder wants to ensure that Delay Damages are the only remedy for delay to completion.	New Clause X7.4 "the Employer's right to deduct Delay Damages pursuant to this Clause X7 are the Employer's sole and exclusive remedy in respect of delay to completion of the works".

Brookfield

Brookfield

Submission Reference:

11.2 Contract Amendments

Submission Response:

As a result of the Commercial Dialogue meetings held and subsequent revisions made by NHS GG&C and Brookfield the Contract Conditions as set out in Section 11.1 are generally acceptable to Brookfield save for one minor clarification which we understand to be uncontroversial.

This issue relates to the adjustment of “agreed profit” in the event that a Compensation Event occurs. It is our understanding that should a Compensation Event arise then the Contractor is entitled under Clause 63.1 to assess changes to the Price which may include adjustment to the agreed profit element. In other words, the Contractor is entitled to profit in relation to additional work that is instructed to be carried out. Brookfield believe this was what was intended by NHS GG&C and its advisors, as confirmed by Shepperd + Wedderburn by email, however as presently drafted the contract appears to be inconsistent with such an approach because Clause 63.4 stipulates that the only rights the Contractor has in relation to a Compensation Event are to change the Prices (which excludes the agreed profit), the Completion Date and the Key Date.

Brookfield would propose that in order to clarify this matter Clause 63.4 be amended to include the words “, the agreed profit,” after the words “the Prices”.

We also note that there appears to be a typographical error in the second bullet point in clause Z36 in the paragraph relating to “Stage 3A – Demolition of surgery block” in that it refers to “section 1”. We believe that this should be a reference to section 3.

Finally, in relation to Option X5 in the Contract Data which sets out the Completion Date, Brookfield would draw attention to the earlier proposed dates for Stage 3 Hospitals and Stage 3a Demolition of Surgical Block contained in Volume 9, Sections 9.4 and 9.5 of this bid submission. If successful, we would propose amendments to the dates currently set out in Option X5 accordingly.

Brookfield

Submission Reference:

11.3 Insurance

Submission Response:

Brookfield are pleased to include in this section the following documents as required by the bid deliverables.

- Copy of a letter of support from our insurance brokers;
- Copy of Insurance certificate confirming Employer's Liability cover;
- Copy of Insurance certificate confirming Pubic and Products Liability cover;
- Copy of Insurance certificate confirming Professional Indemnity cover.

Subguard®

We also take this opportunity to remind NHS GG&C and its advisors of the discussions held during the Commercial Dialogue meetings relating to the potential provision of Subguard®, a unique insurance product provided by Zurich Insurance. Brookfield are in the advanced stages of procuring this innovative and product beneficial insurance product.

By way of summary we set out the key highlights of this policy.

- Subguard® is a Zurich Insurance product that protects projects against the risks and costs arising from a sub-contractor / supplier default (including insolvency).
- It is specifically designed to provide the fast access to security needed to keep projects on programme and within budget despite sub-contractor / supplier default.
- It covers direct costs (performance related, payment related, quality related, consultants' fees, legal fees, defence costs) as well as indirect costs (extended overheads, acceleration, mitigation costs, replacing sub-contractor or supplier).
- Whilst it is a group-wide product for the Main Contractor, project-specific risks can be identified and covered by bespoke endorsement.
- As an extra, for client security purposes, coverage can be extended to a project owner in the event of Main Contractor insolvency. We will procure this for the NSGH Employer.

Comparison with Performance Bonds

- Covers 100% of loss; not just up to 10% sub-contract value (subject to policy limits).
- Remains in place for 6 years after practical completion, and not just until the Notice of Completion of Making Good Defects, which is traditionally when a performance bond expires.
- Designed for fast payout, rather than "as established and ascertained" cover through non-on-demand bonds, after adjudication etc. Less adversarial.
- One party to deal with (Zurich) over all sub-contractor defaults, rather than all the players in the bond market with no customer loyalty.
- Insolvency coverage is often not available through bonds, whereas sub-contractor insolvency is the central focus of Subguard. A very important distinction in the current economic climate.

Benefits to the Project

- Relieving sub-contractors of the cost and working capital burden of providing performance bonds brings savings on sub-contract pricing.
- The total exposure to sub-contractor failure is built into the cost of every project whether self-insurance, bonds or Subguard is used. Subguard is a risk management tool that clearly defines the exact cost of this exposure up front.
- Subguard provides an owner/lender/consortium comfort that their balance sheet is protected against a large sub-contractor default / insolvency.
- Subguard promotes on-time and on-budget project delivery with a quick cash injection when corrective measures are needed, rather than a long after-the-event reimbursement through bonds, other securities or legal actions. With the Main Contractor promptly receiving funds to keep the project on track, Employer's can rest more easily about sub-contractor default / insolvency.
- Subguard offers more control over the sub-contractor selection process, allowing the best sub-contractor for the specific sub-contract works to be selected, rather than merely those with the best surety/banking relationship for access to bonds.

Brookfield

JLT

Jardine Lloyd Thompson Limited
6 Crutched Friars
London EC3N 2PH

Tel 020 7528 4000
Direct 020 7558 3321
Fax 020 7528 4784

www.jltgroup.com

1 September 2009

To Whom It May Concern

Dear Sirs

Our Clients: Brookfield Construction (UK) Limited - New South Glasgow Hospital Project

We have examined the obligations on the part of the successful Contractor for the new South Glasgow Hospital tender, and note that we have had discussions with the UK insurance market regarding the arrangement (where insurance is not already in place) and maintenance by our clients, Brookfield, of the insurances for this project, at the levels and for the durations required by the building contract.

We confirm Brookfield is well able to satisfy all of its obligations with regards to the insurances required for the project.

[redacted]

Partner

JARDINE LLOYD THOMPSON
Limited

6 Crutched Friars
London EC3N 2PH
Telephone 020 7528 4000
Facsimile 020 7528 4784

31 March 2009

TO WHOM IT MAY CONCERN

Dear Sirs,

Brookfield Construction (UK) Limited and/or subsidiary companies and/or others as defined in the policy

UK Employers Liability Insurance

We act as Insurance Brokers to the above and confirm that this insurance has been effected for the period 1 April 2009 British Summer Time to 31 March 2010 British Summer Time both days inclusive. Brief details of this insurance are as follows:

Cover:	The Policy will provide an indemnity in respect of the Insured's Legal Liability to employees for death bodily injury sickness or disease arising from and in the course of their employment with the Insured, subject to Policy Terms and Conditions.
Territorial Limits:	Anywhere in the United Kingdom and elsewhere in the World for staff under United Kingdom contracts of service.
Indemnity Limit:	GBP10,000,000 any one occurrence or series of occurrences resulting from one originating cause.
Insurers:	AIG UK Limited
Policy No.	20003794

These statements have been made in good faith and are a resume of the insurance cover in force as at the date of this letter (which remains subject to the full terms and conditions of the policy issued by insurer(s)). Should the insurance cover be cancelled, assigned or changed in any way during the period of the insurance, neither we, nor the insurer(s) accept any obligation to notify any recipient of this letter. Notwithstanding the issuance of this letter, we are and remain solely the agent of Brookfield Construction (UK) Ltd and/or subsidiary companies and/or other as defined in the policy in this matter and owe no duties to any recipient of this letter.

Yours faithfully

For and on behalf of Jardine Lloyd Thompson Limited

[redacted]

Authorised Signatory

Brookfield

JARDINE LLOYD THOMPSON

1 June 2009

Jardine Lloyd Thompson Pty Ltd
ABN 69 009 098 864
Level 11, 66 Clarence Street
Sydney NSW 2000
PO Box H25
Australia Square NSW 1215
DX 10136
Sydney Stock Exchange
http://www.jlta.com.au
Telephone (02) 9290 8000
Facsimile (02) 9299 7287
Direct Dial [redacted]
Email Anthony.Antonas[redacted]

To Whom It May Concern

Certificate of Currency – Public & Products Liability

This is to certify that the following policy reference is current, as at the date stated above.

This Certificate provides a summary of the policy cover and is not intended to amend, extend, replace or override the policy terms and conditions contained in the actual policy document.

Insurance Class	Public & Products Liability (including Completed Operations and Financial Loss).
Insured Name	1) Brookfield Europe LP and the following subsidiaries: Brookfield Holdings (Luxembourg) S.A. Brookfield European Developments Limited Brookfield Europe (Gibraltar) Limited Multiplex Middle East Management Company Limited 2) Brookfield Europe Holding Limited, related or subsidiary Firms or Companies now or hereafter constituted, including but not limited to: Brookfield Construction (UK) Limited Brookfield Infrastructure (Europe) Limited Brookfield Services (UK) Limited Brookfield Europe Corporate Services Limited Brookfield Developments (UK) Limited Brookfield Facility Management Limited Brookfield Europe Asset Management Limited
Policy Expiry Date	31st March 2010 at 4.00pm A.E.S.T
Territorial Limits	Worldwide
Interest	Legal liability to third parties for injury and/or Damage to Property caused by an occurrence in connection with the Insured's business.
Limit of Indemnity	£20,000,000 any one occurrence or series of occurrences arising out of one event unlimited during any one period, but £20,000,000 any one occurrence and in the aggregate during each 12 month period of insurance in respect to Products Liability, Completed Operations, Financial Loss.

F:\NRC\Clients\M\MULTIP\Multiplex\09-10 Renewal\Certificates of Currency\Generic\TPL\UK\TPL_GBP20M.doc

JARDINE LLOYD THOMPSON

1 June 2009

Jardine Lloyd Thompson Pty Ltd
ABN 69 009 098 864
Level 11, 66 Clarence Street
Sydney NSW 2000
PO Box H25
Australia Square NSW 1215
DX 10136
Sydney Stock Exchange
http://www.jlta.com.au
Telephone (02) 9290 8000
Facsimile (02) 9299 7287
Direct Dial [redacted]
Email Anthony.Antonas[redacted]

To Whom It May Concern

Certificate of Currency – Professional Indemnity

This is to certify that the following policy reference is current, as at the date stated above.

This Certificate provides a summary of the policy cover and is not intended to amend, extend, replace or override the policy terms and conditions contained in the actual policy document.

Insurance Class	Professional Indemnity
Insured Name	1) Brookfield Europe LP and the following subsidiaries: Brookfield Holdings (Luxembourg) S.A. Brookfield European Developments Limited Brookfield Europe (Gibraltar) Limited Multiplex Middle East Management Company Limited 2) Brookfield Europe Holding Limited, and/or their Subsidiaries or Companies Associated by Shareholding not specifically excluded, including but not limited to: Brookfield Construction (UK) Limited Brookfield Infrastructure (Europe) Limited Brookfield Services (UK) Limited Brookfield Europe Corporate Services Limited Brookfield Developments (UK) Limited Brookfield Facility Management Limited Brookfield Europe Asset Management Limited
Policy Expiry Date	31st March 2010 at 4:00pm A.E.S.T.
Geographical Scope	Worldwide excluding USA and Canada
Interest	Legal liability for breach of duty owed in a professional capacity arising out of the Insured's business activities.
Limit of Indemnity	£20,000,000 each and every claim or series of claims arising from one single incident and in the aggregate during the period of insurance. Reinstatements of GBP £20,000,000 are unlimited in the aggregate after exhaustion of the first automatic reinstatement

F:\NRC\Clients\M\MULTIP\Multiplex\09-10 Renewal\Certificates of Currency\Generic\PI\UK\PI_GBP20M_unlimited reinstatements.doc

Brookfield

Submission Reference:

Section 11.4 Performance Bond

Submission Response:

In relation to the Performance Bond Brookfield refer to the discussions held with NHS GG&C and its advisors at the Commercial Dialogue meetings and in particular refer to meeting No 3 held on 15th July 2009 where the Board confirmed the following requirements:

a 5% Performance Bond for each the following stages:

- Stage 1
- Stage 3
- Stage 3a

with each bond to expire upon Completion of each Stage. (Action notes item 1-11 from that meeting also refers. It was also confirmed that no Bond is required for Stage 2).

With regard to the form of the Bond, Brookfield's proposal is to use a standard ABI Bond. The bond was reviewed and commented on by Shepherd and Wedderburn (S&W) who proposed a number of amendments. Following a series of productive discussions and email correspondence between Brookfield, our Bond providers and Shepherd and Wedderburn, we were able to accommodate many of the proposed amendments however there remains one outstanding issue in respect of which our Bond providers are adamant that the amendments being sought are "off market".

The issue has arisen because S+W have amended the standard ABI wording to require immediate payment by the surety in the event of a favorable adjudication decision. Our bond provider is willing to accept this however understandably, given the quick and interim nature of the adjudication procedure, they are insisting upon the right to challenge such a decision if they believe it is incorrect. They recognise of course that they will have to make payment in the interim period pending a final determination however they want the ability to have payments reimbursed to them in the event that an adjudicator's decision is subsequently overturned. As our Bond provider correctly asserts, the purpose of the bond as form of security is simply to provide credit enhancement, giving protection to the Employer in circumstances where the Contractor defaults on its obligations (ie. it operates as a guarantee). It is not intended to provide a windfall to an Employer where it would otherwise have no contractual right to payment.

Brookfield would liked to have concluded this issue to the parties' collective satisfaction prior to issuing this submission however it has not been possible due to time constraints. For the purposes of this submission we include the current proposed drafting with our Bond provider's amendments incorporated and highlighted in yellow. We believe that such wording represents a reasonable and bankable compromise of the parties' various positions.

This GUARANTEE BOND is made BETWEEN the following parties whose names and registered office addresses are set out in the Schedule to this Bond (the "Schedule")

BETWEEN

1. The "Contractor" as principal,
2. The "Guarantor" as guarantor, and
3. The 'Employer"

WHEREAS

1. By a contract (the "Contract") entered into or to be entered into between the Employer and the Contractor particulars of which are set out in the Schedule the Contractor has agreed with the Employer to execute works (the "Works') upon and subject to the terms and conditions therein set out
2. The Guarantor has agreed with the Employer at the request of the Contractor to guarantee the performance of the obligations of the Contractor under the Contract upon the terms and conditions of this Guarantee Bond subject to the limitation set out in clause 2

NOW IT IS AGREED as follows:-

1. The Guarantor guarantees to the Employer that in the event of a breach by the Contractor of its obligations under and/or arising out of the Contract or in the event of termination of the Contractor's obligation to Provide the Works (as defined in the Contract) by reason of the Contractor being affected by one or more of the events set out in Clause 91.1 of the Contract, the Guarantor shall subject to the provisions of this Guarantee Bond pay all losses, damages, expenses claims and costs of proceedings sustained by the Employer as a result of such breach or termination as aforesaid. Subject to Clause 1A(2), such losses, damages, claims and costs shall be as agreed between the parties or determined by an adjudicator or a court provided that any payment made against a certificate issued by an adjudicator shall not prejudice the right of the Contractor and the Guarantor or, following the Insolvency (as defined in the Contract) of the Contractor, the Guarantor acting alone shall be entitled to refer any decision of an adjudicator, or any of the matters giving rise to such a decision, for further or final determination by any court having competent jurisdiction (a "Referral")

Brookfield

1(a) In the event that it is subsequently so determined whether or not prior to Expiry as a result of any Referral either:d

(i) that the Contractor and/or the Guarantor is not liable to pay the Employer where a previous Certificate found it was liable to pay the Employer; or

(ii) that the Guarantor made an over payment as a consequence of a previous Certificate, then the amount so paid or the excess (as the case may be) (the "Over Payment") shall be refunded to the Guarantor by the Employer together with interest from the date of the Over Payment at a rate equal to [specify rate] or, if greater, any interest in relation to such Over Payment awarded in accordance with such Referral.

1(b) If it is subsequently so determined whether or not prior to Expiry as a result of any Referral either:

(i) that the Contractor and/or the Guarantor is liable where the previous Certificate to which the Referral relates has determined that the Contractor or the Guarantor was not liable and therefore the Guarantor made no payment; or

(ii)) that the Guarantor made an underpayment as a consequence of the previous Certificate to which the Referral relates, then upon receipt of a claim in respect thereof an amount equal to the amount so determined (including interest if awarded in the relevant Decision) or the shortfall (as the case may be) shall be paid to the Employer by the Guarantor subject always to clause 2

1A. For the purposes of this Guarantee Bond:-

1. no estimate forecast or assessment of the Project Manager (as defined in the Contract) shall be binding and conclusive against the Guarantor and
2. the damages due and payable under clause 1 of this Guarantee Bond to the Employer following termination of the Contractor's employment under condition Clause 91.1 of the Contract shall be such amounts as shall represent the difference between:-

   (i) the amounts actually paid by the Employer to complete the whole of the works' together with all direct loss and expense caused to the Employer by reason of such termination and

   (ii) the amount that would have been payable to the Contractor in respect thereof but for such termination and so that the Employer shall be placed in the same position (no better and no worse) that would have been obtained if the Contractor had duly performed and discharged its obligations under the Contract.

2. The maximum aggregate liability of the Guarantor and the Contractor under this Guarantee Bond shall not exceed the sum set out in the Schedule (the "Bond Amount") but subject to such limitation and to clause 4 the liability of the Guarantor shall be co-extensive with the liability of the Contractor under the Contract.

3. The Guarantor's obligation to make payment under this Guarantee Bond shall be an independent and absolute obligation and the Guarantor shall not be entitled to delay or withhold payment for any reason. The Guarantor's obligation hereunder shall not be affected by any act, omission, matter or thing which, but for this provision, might operate to release or otherwise exonerate the Guarantor from the obligations hereunder in whole or in part, including without limitation and whether or not known to the Guarantor or to the Employer:

   - any time or waiver granted to the Guarantor or to the Contractor;
   - any variation, compromise or release of or neglect to enforce any rights or remedies against the Guarantor or the Contractor;
   - any legal limitation, disability or incapacity relating to the Guarantor or the Contractor;
   - any variation of or amendment to the terms, conditions and provisions of the Contract, the Contract price or the extent or nature of the Works;
   - any unenforceability, invalidity or frustration of any rights or obligations of the Employer or the Contractor under the Contract or any other document or security;
   - any other fact, circumstance, provision of statute or rule of law which might entitle the Guarantor to be released or discharged in whole or in part from its undertaking.

4. Whether or not this Guarantee Bond shall be returned to the Guarantor the obligations of the Guarantor under this Guarantee Bond shall be released and discharged absolutely upon Expiry (as defined in the Schedule) save in respect of any breach of the Contract which has occurred and in respect of which a claim in writing containing particulars of such breach has been made upon the Guarantor before Expiry.

5. The Contractor having requested the execution of this Guarantee Bond by the Guarantor undertakes with the Guarantor (without limitation of any other rights and remedies of the Employer or the Guarantor against the Contractor) to perform and discharge the obligations on its part set out in the Contract.

6. This Guarantee Bond and the benefit thereof shall not be assigned by the Guarantor without the prior written consent of the Employer, such consent not to be unreasonably delayed or withheld. Subject to any assignee accepting the repayment obligation of the Employer in clause 1(a) the Employer may assign its interest in this Guarantee Bond to any party to whom it may assign its interest under the Contract.

Brookfield

7. No party who is not a party to this Guarantee Bond shall be entitled to enforce any of its terms for his own benefit and the application of the ius quaesitum tertio to the terms of this Guarantee Bond are hereby expressly excluded.

8. This Guarantee Bond shall be governed by and construed in accordance with the laws of Scotland and only the courts of Scotland shall have jurisdiction hereunder.

IN WITNESS WHEREOF these presents consisting of this, the preceding page and the Schedule are executed as follows:-

By the Guarantor at _____

on the _____ day of _____ 200_____

Signature of Director/Authorised signatory

_____

Full name

_____

Signature of Director/Authorised signatory

_____

Full name

_____

By the Contractor at _____

on the _____ day of _____ 200_____

Signature of Director/Authorised signatory

_____

Full name

_____

Signature of Director/Authorised signatory

_____

Full name

_____

Brookfield

By the Employer at _____
on the _____ day of _____200_____

Signature of Director/Authorised signatory

_____

Full name

_____

Signature of Director/Authorised signatory

_____

Full name

_____

This is the Schedule referred to in the foregoing Guarantee Bond between [Guarantor], [Contractor] and Greater Glasgow and Clyde Health Board

The Contractor: _____

whose address registered office is at _____

_____

The Guarantor: _____

whose address registered office is at _____

_____

The Employer: Greater Glasgow and Clyde Health Board

Dalian House, 350 St Vincent Street, Glasgow G3 8YZ

The Contract: A contract (dated the _____day of _____ between the Employer and the Contractor for the design and construction of the New South Glasgow Hospital Project

The Bond Amount: The sum of £ _____Pounds)

Expiry: Completion of the Works which shall be conclusive for the purposes of this Guarantee Bond save in respect of any breach of the Contract which has occurred and in respect of which a claim in writing containing particulars of such breach has been made upon the Guarantor before Expiry.

Brookfield

Submission Reference:

Section 11.5 Performance Damages

Submission Response:

It was confirmed during Commercial Dialogue meeting No 3 held on 15th July 2009 that following internal discussions between NHS GG&C and its advisors it was not the intention that Performance Damages would be included in the Contract.

Brookfield note the action list issued following the above meeting with particular refer to item 1-146 which states

“15/7/9 Update: Board confirmed proposals (to be ratified by Executive Board and included in final draft contract.) No performance damages. Any building performance failures will be defects and remedies sought under the contract terms.”

Brookfield

Submission Reference:

Section 11.6 Collateral Warranties

Submission Response:

During the Commercial Dialogue meetings in relation to the provision of collateral warranties it was discussed which elements/parties the NHS GG & C would require collateral warranties from. In particular, during Meeting No 2 (4th June 2009) Brookfield tabled a comprehensive list of those Key Sub-Contracts and Design Team Consultants which it believed would be appropriate to provide such warranties. We therefore reaffirm in this submission our proposal in relation to the provision of collateral warranties in favour of NHS GG&C as follows.

Key Design Consultants:

Traditionally we would expect to procure the following warranties from:

Architect: Nightingale Associates

Structural and Civil Engineering: WSP (UK) Ltd

Mechanical and Electrical Engineering: Zisman Bowyer & Partners/Mercury Engineering:

Landscape Architects: Gillespies

Key Sub-Contracts

In relation to our supply chain, Brookfield produce a defined list of key packages ("the Key Sub-Contracts"), identified by reference to cost plan elements, which experience has taught us traditionally benefit from specialist sub-contractor input and where we believe that responsibility for specific elements of the design are best placed.

Specified Sub-Contractors

As a further subset to the list of Key Sub-Contractors, it is also necessary to identify the list of Specified Sub-Contractors (pursuant to Clause Z30) that will also be providing collateral warranties. In general terms, this will be limited to those sub-contractors whose works include a responsibility in respect of design together with the Design Consultants.

We have given consideration to the allocation of design responsibility as between the Design Consultants and specialist sub-contractors and assessed the optimal placement of design responsibility.

Sub-contractors are likely to fall into one of three categories:

i. those with full sub-contract design responsibility included in their scope of works (ie, the "Specified Subcontractors").

ii. those with a responsibility to contribute to the development of the design without bearing overall design responsibility, which will be retained by the Contractor and its consultants; and

iii. those without any design responsibility at all (principally large volume commodities packages).

Our proposal is that the trade packages would be divided into the following categories:

i. Specified Sub-Contractors

Suggested packages carrying full design responsibility from whom collateral warranties may be obtained would include[1]:

- EHV and PH
  - Mechanical & Electrical, including LV systems, IT and Comms infrastructures (MercuryZBP)
  - Lifts (Schindler)
- Sub-Structures
  - Piling
  - Specialist Ground Engineering
- Superstructure
  - Any steel structures (depending on agreed design scope, full or connections only)
- Building Envelope
  - Roof Coverings (all systems utilised).
  - Curtain Walling (Structal).
  - Solid Cladding Elements.
  - Windows.
  - Independent Structures (e.g. canopies, atria structures, etc).

[1]As the detailed design is developed these elements may be better grouped together or split down further, depending on the particular expertise available in the market and the commercial options available for specialisation.

Brookfield

ii. Sub-Contractors with design development responsibility

Suggested packages carrying a responsibility for design development but in respect of which design responsibility remains with the Design Consultants from whom we do not intend to obtain Collateral Warranties would include:

- Sub-Structures
  - Drainage
  - Foundations
  - External Works
  - Hard and Soft Landscaping
  - Other non specialist Civils
- Superstructures
  - Concrete Frame
- Fit Out
  - Partitions
  - Ceilings
  - Doors and Ironmongery (Single package)
  - Screeds and Floor Coverings
  - HTM Furniture
  - Laboratory fit out
  - Architectural Metalwork (Feature and back of house stairs, balustrade etc)
  - Cold Rooms
  - Mortuary fit out
  - Clean Rooms and Aseptic Suites
  - Audiology Rooms
  - CSSD
  - Catering Equipment
  - Specialist Joinery (Desks and work stations)
  - Magnetic Resonance and Radiation Protection
  - Wayfinding
  - Wall Protection
  - Mobile Racking
  - Support Structures for Group 1, 2 and 3 equipment

iii. Sub-Contractors with no design responsibility

- Other FF&E packages not included above (can be further defined)

Brookfield

Submission Reference:

Section 11.7 Extended Defects Requirements

Submision Response:

Brookfield's aim is to deliver all of its projects with zero defects. This strategy is implemented by applying our Quality Assurance Policies and Procedures, using sound construction expertise and management and by employing dedicated experts with attention to detail and pride in their work.

We and our supply chain are committed to creating a culture of excellence and we live by the motto "do it right the first time, don't cut corners". Brookfield prides itself on the delivery of quality assets for the long term. Building quality facilities for our clients is what we do well, and we stand behind our performance. Should defects arise then we and our supply chain have failed to achieve our stated aim and we act to fix problems quickly and without fuss.

The reality of construction is, however, that even the very best work can occasionally give rise to defects which is why the traditional one year defect rectification period has long been a feature of construction contracts. This provision rightly exists to provide Employers with the comfort of knowing that they are able to have corrective action taken where necessary in order to obtain fault free use of the completed building.

Within the ITPD documents (volume 2/1 section 5.5) and during the dialogue stage, NHS GG&C Health Board (the "Board") has made clear its intention to extend the defects period for several reasons, not the least of which is the fact that this is a very complex project and such complexity itself makes it appropriate for the Employer to obtain added protection.

This section sets out the following issues that were discussed and subsequently agreed as an appropriate way forward during our Commercial Dialogue meetings. In summary it covers:

- Extended Defects Period (EDP)
- Defect Correction Periods
- Options for discussion

Extended Defects Period

In the first Commercial Dialogue meeting, our initial discussions revolved around a 2 year extended defects period for the fabric and a 3 year period for services and plant. Brookfield and its Supply Chain partner Mercury Engineering were comfortable that these periods were acceptable. Indeed, Brookfield has recent experience of adhering to EDP's of similar duration (for example the Wembley Stadium Project, which was also a project of considerable complexity, required a 24 month EDP).

At Commercial Dialogue meeting number 2, Brookfield and the Board explored in greater detail the Board's requirements particularly in the light of the fact that an EDP for all trades might have a financial impact due to the linkage between extended warranties and bond facilities and delays to retention release. With that in mind, it was agreed that an EDP for such trades as piling, groundworks, concrete structure and decoration were unlikely to create any material benefit to the Board but would instead add unnecessary cost.

At the same meeting, Brookfield explained to the Board that it was in the process of procuring an insurance product known as Subguard, which would act in lieu of traditional subcontractor securities but provide a level of cover many times greater. The Board indicated that it was interested in hearing more about this product and Brookfield took away an action to provide further details. (Refer to Volume 11 Section 11.3 for further details.)

At a further interim meeting held on 9th June 2009 Brookfield was advised that the Board were considering all bidders comments and that the EDP would be likely to be 24 months in the final agreement.

Notwithstanding what was discussed during the previous meetings, the Board confirmed at Commercial Dialogue meeting no 3 that the EDP would be 24 months for all elements. The Board also confirmed that Bond securities would expire at Completion of each Stage.

Brookfield confirms it is therefore entirely comfortable with an EDP of 24 months and this requirement has been included without amendment in the contract included within this submission (Volume 11 Section 11.1 of this submission.)

Defect Correction Periods

During the dialogue meetings Brookfield made reference to the correction periods being unusually tight, albeit that the general principles and overall period of the EDP was acceptable. We indicated that we were uncomfortable with having such tight correction periods without any flexibility or regard for the need to procure an item of plant or materials with a long lead in period, concerns which were recognised and addressed by the Board in agreed amendments.

The Contract as included in Volume 11 Section 11.1 of this submission includes the defect correction period for two weeks with 2 exceptions:

- Accommodation occupied by NHS for patients on an operational basis is 2 days unless notified as urgent in which case immediate attention will be given;
- Urgent, requiring immediate attention which might effect the safe and secure running of the site is 24 hours

Brookfield

In recognition of our concerns regarding materials procurement the Board and Brookfield also agreed as follows:

Clause Z14 sets out the following amendment to Clause 43.2 and currently states:

Drafting at the beginning of the clause reads:

"Unless a different period is agreed in writing between the Contractor and the Supervisor"

Options for further discussion

Brookfield is very much committed to promoting a collaborative approach between the parties beyond the completion date. As stated above, we stand by our performance and "fix it" if it is not right.

To that end, we would like to explore with you the idea of creating a "post completion project team" comprising personnel from each party and co-located with the Board for the duration of the EDP, so as to enhance response times and the transfer of knowledge to the Board's onsite teams.

During the dialogue meetings, Brookfield also discussed with the Board the possibility of linking this issue to some of the Community Benefit matters that we have proposed (Volume 10, Section 10.1 refers). We believe that this presents an opportunity for providing long term sustainable employment.

During the period of construction (due to the length of the Project), local apprentices (New Entrants) employed by Mercury Engineering will become "Qualified Tradesman. We would like to develop with you a programme for identifying and mentoring talented apprentices who at the conclusion of the construction project will have valuable experience of the hospitals and be fully conversant with the systems that operate within them. Working in partnership with the Board (Alex McIntyre's team), we believe that there may be an opportunity for some of these tradesmen to become FM Estates department employees.

Alternatively, we see locally sourced Small to Medium Enterprises, who have been involved in the Project, as being appropriate for some outsourcing of FM operations that the Board may wish to procure.

Brookfield look forward to further discussions on the above options should we be successful.

Index

1. Introduction

This text has been compiled at the request of Currie and Brown to provide a composite document of the information issued during the evaluation period.

The various items include comments on the elements of the building services and cross referencing has been included to assist the overall evaluation.

2. Review of Commercial Clarifications with Building Services Comments

12S.2.1.3 Equipment	Building Services Comments
1. Within the first 2 months of Stage 2 a detailed programme (to form part of the Accepted Programme) will be developed between the Contractor and the Employer to determine the necessary dates by which, in respect of the Group 2 Equipment, the Group 3 Equipment and the Group 4 Equipment, the Employer shall:	As below
2. provide to the Contractor key dimensions, service supplies, loads and the like required to install structure partitions and services adjacent to and/or serving those items of equipment;	Unlikely to be available, Contractor to schedule assumptions for discussion with the Board and agree information release program
3. provide to the Contractor dimensions, service supplies, commissioning information, fixing details, loads and the like for those items of equipment; and	Unlikely to be available, Contractor to schedule assumptions for discussion with the Board and agree information release program
4. Notify the Contractor of the precise locations within the relevant rooms and the nature of all wall, ceiling and/or floor fixings.	Unlikely to be available, Contractor to schedule assumptions for discussion with the Board
5. This programme will be developed in accordance with the principle of best fit with the Contractor's overall programme. The Employer will provide the necessary information in accordance with this programme.	As above
6. The parties will agree during Stage 2s detailed programme (to form part of the Accepted Programme) to determine the necessary dates by which the Employer at its own cost will procure and make available to the Contractor:	As below
7. each item of and/or pertaining to the first fix, second fix and/or third fix (as applicable) for each item of Group 2 Equipment;	Will a worst case matrix be applied for items which cannot be detailed to suit LOR
8. the Group 2 Equipment	
9. for installation and commissioning by the Contractor. The Employer will provide the necessary items in accordance with this programme.	
1 0.When delivered to the Site, Group 2 Equipment will be compliant with:	As below
11 .the information supplied by the Employer;	In line with the information release program
12.the Room Data Sheets;	The room data sheets are being provided by the Contractor
1 3.the requirements of Others and of law and the requirements of the Works Information;	As below

12S.2.1.3 Equipment (Contd)	Building Services Comments
14.and be accompanied by current electrical testing certification (where not new) and generally be in such state and condition as will not constitute grounds for concluding that Completion has not occurred. As part of the exercise in paragraph 1 above the parties will agree a procedure for delivery and inspection of Group 2 equipment and replacement of any damaged Group 2 equipment by the Employer if necessary) and the parties will comply with such procedure.	LOR to confirm that this relates to standard PAT tests.
15.All installation and commissioning of the Employer's ICT equipment and the Group 3 Equipment and the Group 4 Equipment will be part of the Employer's Post Completion Commissioning (and the Final Commissioning Programme will be developed on this basis, notwithstanding the terms of paragraph 6.8 of Volume 2/1 of the ITPD) except by prior agreement.	The Contractors shall provide all network equipment to ensure that their systems, BMS, CCTV, Access Control, Asset tagging Automatic material handling are all installed tested and commissioned within the Contractors PC date/s.
1 6.The Employer is responsible for procuring and complying with all permissions, consents, approvals, certificates, permits, licenses, statutory agreements and authorisations, required by law, and all necessary consents and agreements from Others needed to install and commission the Group 2 Equipment, the Group 3 Equipment and the Group 4 Equipment.	The Contractor shall design the infrastructure to allow interconnection of all specialist medical equipment and include all statutory authority and Utility Company approvals,
1 7.Where any supplier selected by the Contractor and agreed with the Employer requires as a condition of supply (for example ISDN lines) that there is maintenance and service contract in place, the Employer will enter into such maintenance and service contract.	The Contractor shall integrate all ISDN line requirements within the ICT distribution system. All remote links shall require to meet the Board's ICT security requirements.
12S.2.1 .4 Access and Phasing	Building Services Comments
1. The Site will be deemed to include those areas ("Temporary Access Areas") that are shown on the site phasing diagrams numbered into 4 contained in Contractor's Tender Return Submission Section 10.1.5 (Logistics) together with such other areas as the Contractor may reasonably require to Provide the Works for the duration of the Contractor's activities on such areas in connection with the Works	The retained estate interconnection positions shall require to be agreed.
2. Without prejudice to the requirements of Clause 33.1, the Employer will also provide access to those areas outside the Site which are within the hospital campus to the Contractor and its Subcontractors and any statutory undertakers on reasonable notice from the Contractor, where such access is required for the provision of the Works. The parties will agree further phasing drawings during the course of the works as may be necessary to allow the Contractor to Provide the Works.	The retained estate links and VIE interconnections require to be agreed
3. The Employer will grant such servitudes and wayleaves to Others as may be necessary to allow the Contractor to Provide the Works in accordance with the Accepted Programme.	No comment

12S.2.1 .4 Access and Phasing (Contd)	Building Services Comments
4. Where the Contractor requires access to any Temporary Access Area, it shall notify the Employer not less than 4 weeks before it first needs access to such Temporary Access Area specifying:	As below
5. the area or areas within the Temporary Access Area affected and the extent to which such access is to be exclusive	Unlikely to be exclusive, retained estate links and VIE interconnections will be live
6. the period of access required	No comment
7. the date on which work is expected to commence	No comment
8. outline details of the works	Full details, risk assessments etc to estates dept
9. the requirement for there to be any interruption or diminution of supplies of any utility to the campus arising from the carrying out of the works	Full details, risk assessments etc to estates dept
1 0.arrangements for hand back of the relevant areas to the Employer following completion of the work	No comment
11 .and the date notified by the Contractor is the access date.	No comment
1 2.While exercising its rights of access to Temporary Access Areas, the Contractor will be responsible for the safety of all personnel in and security of the Temporary Access Areas to the extent that its access is exclusive; but any claims, proceedings, compensation and costs payable in respect of any reach of rights of privacy or dignity or confidentiality of patients, visitors and staff will be an Employer's risk.	No comment
12S.2.1.5 Design Development Procedure	Building Services Comments
1 The design referred to in Core Clause 21.2 is the design information specified in the Contractor's response to Appendix K which is included in Section 9.5 ("the Relevant Design Information").	No comment
2. In relation to each item of Relevant Design Information submitted, the Project Manager responds within the period for reply by returning one copy of the relevant submitted item to the Contractor endorsed:	Assume ER's procedures to be adopted
3. "Level A – accepted" (in which case such design information has been accepted):	
4. "Level B – proceed subject to amendment as noted"; or	
5. "Level C – subject to amendment as noted",	
6. as appropriate.	
7. If the Project Manager responds other than by endorsing "Level A— accepted" he shall state the grounds and the evidence or other information necessary to substantiate those grounds.	

12S.2.1.5 Design Development Procedure (Contd)	Building Services Comments
8. Where the Project Manager has endorsed the item "Level B – proceed subject to amendment as noted", the Contractor shall proceed and, where such comments are made for a reason not stated in the contract, the Project Manager's actions shall be deemed to be a compensation event in accordance with Clause 60.1(0)	Assume ER's procedures to be adopted
9, Where the Project Manager has endorsed the Submitted Item "Level C - subject to amendment as noted", the Project Manager is deemed to have withheld acceptance of the item and, without prejudice to any entitlement to a compensation event arising as a result of such withheld acceptance, the Contractor will amends the hem in accordance with the Project Manager's comments and re-submit the item to the Project Manager.	Assume ER's procedures to be adopted
10. Subject to Clause 5 of the Agreement, the Contractor can proceed with any part of the works for which:	
11 .the Relevant Design Information has been accepted or deemed to be accepted by the Project Manager; or	
12.there is no Relevant Design Information.	
13. Design documents will be submitted to the Project Manager for information or approval in electronic format only. It is assumed that responses, including drawing mark up and comments and/or approval will also be in electronic format.	
14.Section 9 also describes the proposed process for the clinical design engagement during Stage 2 and the obligations and timeframes by which the Employer is required to observe,	

3. Review of Technical and Genera Assumptions with Building Services Comments

12.S.2.2 Technical and Genera Assumptions	Building Services Comments
1. The following General Assumptions are provided to give the Board clarity on our Tender Return Submission and demonstrate our desire to be open and transparent.	As below
2. Contractor's Tender Return Submission section 3.14 (Communications systems), defines the Wireless Network coverage, and the anticipated extent of the wireless access point / network cabling provision. Detail design work to date has suggested to Lang O'Rourke that a lower density of Wireless Access points (than was stipulated by the Board clarification to Bidders on Wireless Networks) is likely to be capable of supporting the bandwidth required by the new facilities. As a consequence, and in order to ensure our proposal is both affordable and value for money, our price has been based on a density of 1 AP/per 120m2. Design dialogue is requested with the Board to establish if the Board see additional requirements for bandwidth not clearly described in the ITPD documents.	The Contractors shall provide all network equipment to ensure that their systems, BMS, CCTV, Access Control, Asset tagging Automatic material handling are all installed tested and commissioned within the Contractors PC date/s. (confirmation not received bidder providing passive equipment only) Board have rejected 1 AP/per 120m2, costs to be reconciled for ER compliance
3. Sensor Taps allowed as per quantity in ERM 2,336no.	Quantity to be that required to provide a fully functioning facility
4. Pneumatic Tube - quantity allowed as 92 no. as per ER's no quantity in ERM	Quantity to be that required to provide a fully functioning facility
5. With reference to the employers' requirements ref 8.3,4.25, the fire alarm system shall be wired out in Soft Skin Enhanced sheathed cable, in full compliance with BS5839 Part 1 Clause 26, in lieu of MICC.	Costs to be reconciled for ER compliance
6. Mepla pipework will be utilised on domestic pipework in lieu of stainless steel (various ER clauses), which has been assessed to have slightly lower environmental impact, without any reduction on product specification.	See query issued re sterilization of multiple interconnected pipework types, SS, Mepla and plastic. (Response is all pipes can be sterilised with Peracitic acid. Board to advise if alternative to SS is acceptable)
7. AHU's designed to take future Carbon filtration, odour mitigation strategy as per Contractor's proposal 3.9 (Ventilation & Air Treatment Strategy).	LOR to provide a narrative on indicating relative, motor size, inverter size, and circuitry including downtime required for retrofit.
8. Employer's Requirements text on N+1, spare capacity and maintenance redundancy / resiliency is as described in Contractor's Proposal 3,23	Refer to separate notes
9. Hardware for ICT data and telecommunications (i.e. hubs, equipment room servers, switches, routers etc) is defined in the Employer's Requirements as being provided by the Board. It is assumed therefore that all network switches associated with the Wireless system will also be provided by the Board and co-ordinated and included within their overall Network hardware provision	The Contractors shall provide all network equipment to ensure that their systems, BMS, CCTV, Access Control, Asset tagging Automatic material handling are all installed tested and commissioned within the Contractors PC date/s. (confirmation not received bidder providing passive equipment only)

12.S.2.2 Technical and Genera Assumptions (Contd)	Building Services Comments
10. Contractor's Tender Return Submission 3.14 (Communications systems), defines the Wireless Network coverage, and the anticipated extent of the wireless access point / network cabling provision. Detail design work to date has allowed Laing O'Rourke to assume a lower density of Wireless Access points and structured cabling than was suggested by the Board clarification to Bidders on Wireless Networks	Board have rejected 1 AP/per 120m2, costs to be reconciled for ER compliance
11 .Contractor's Tender Return Submission 3.14 (Communications systems), clarifies that the BMS engineering network will share the Facility TCP/IP converged communications network	The Contractors shall provide all network equipment to ensure that their systems, BMS, CCTV, Access Control, Asset tagging Automatic material handling are all installed tested and commissioned within the Contractors PC date/s. (confirmation not received bidder providing passive equipment only)
12. Contractor's Tender Return Submission 4,44 (BMS & Asset Management system), clarifies that Individual occupant set point adjustment, as required to achieve BREEAM credit HW, will be provided by room thermostat	Costs to be reconciled for ER compliance
1 3.With reference to ER 8.3.31.3; the generator PLC control system will monitor the Scottish Power Feeders for the potential failure of both supplies. Following the recognition of this failure the first generator sets on both Side A and Side B will be on load within 15 seconds of the initiation of the generator start sequence.	LOR to confirm that load management firmware and hardware is provided to ensure that all lighting is reinstated within 15 sec or Costs to be reconciled for ER compliance
14.During Stage 2, the above transfer times will be developed further to minimise disruption to the facilities.	Costs to be reconciled for ER compliance
15. ER's stipulate that small power requirement for critical care areas will be provide by ceiling mounted supply units. Laing O'Rourke has assumed these pendants are to be included on the Board's list of Equipment.	Is this as per proposed equipment lists if not Costs to be reconciled for ER compliance
16.With reference to ER section 8.3.2.2.4 to 8.3.2.2.7, the central power monitoring system will form part of the standby generator PLC system, and will actively monitor all main HV circuit breakers and downstream LV distribution ACBs	LOR to confirm that load management firmware and hardware is provided to ensure that all lighting is reinstated within 15 sec or Costs to be reconciled for ER compliance
17. Laing O'Rourke assume that 'provided throughout' as used in ER clause 8.3.2.10 refers to the Critical Care department	Costs to be reconciled for ER compliance i.e. light fitting dimming throughout not just in CC
18. Notwithstanding ER 8.3.4.19, Localised auto fire suppression to switch rooms and HV transformer rooms will not be provided. This is in line with advice contained in SHTM 2007 clause refs 12.4 and 12.17 (i.e. due to SF6 HV switchgear and air cooled cast resin transformer solution).	Costs to be reconciled for ER compliance i.e. auto fire suppression to switch rooms and HV transformer rooms

12.S.2.2 Technical and Genera Assumptions (Contd)	Building Services Comments
19.Meigan requirement / quantity of equipment supplies has not been fully defined in Board provided ERM. Price allowance based on 200 points	Quantity to be that required to provide a fully functioning compliant facility
20.It is assumed that the public address system described in ER 8.3.13.1 is not utilised as a life safety system	Agreed
21 The Employer's Requirements contains text about configuring systems to cater for retained estate and new build areas. Energy Centre proposals contained within the Tender Return Submission illustrate that space provision, and easy hook-up, has been designed in to accommodate for an additional:	Costs to be reconciled for ER compliance i.e. plant for retained/future estate.
22.1 x 7MW Boiler; 23.1 x 3MW CHP (and associated cooling plant and absorption chiller) 24.1 x 2MVa Standby Generator.	LOR to indicate how this space allocation meets the ER requirements (refer to Commercial Clarification: 3 8 October 2009)
25.Space and rack provision has been made on internal systems with potential to support additional buildings (e.g. Pneumatic tube central hub in Acute will be provisioned with space to allow the future addition of lines and air blower plant etc.)	LOR to demonstrate at next stage
26. It is assumed that VIE provision is by the Board. An additional compound has been included in the Bid to cater for this installation, and Laing O'Rourke have made provision for the infrastructure to support this and to connect into existing site Oxygen ring main.	Costs to be reconciled for ER compliance. VIE pipework and interconnections to be designed by LOR with two new compounds and ring pipework
27.Employer's Requirements in Volume 2/1 refer to the potential provision for the following Medical gases:	As below
28.Oxygen / Nitrous Oxide mixture	Noted in ER's from generic specification, Board to advise if these are required
29.Carbon Dioxide	
30.Helium / Oxygen	
31 .These gases are not indicated to have any use within the Main Acute facilities and no infrastructure to support these gases is envisaged or allowed for.	As above
32.Laing O'Rourke have relied on the Board's Equipment List provided to evaluate the quantities and infrastructure associated with Engineering systems e.g. Medical gas points, power/ data outlets, nurse call components, sanitary ware etc. Any alteration to these quantities would be viewed as a Compensation event.	No comment
33.ER 8.1.27.2 states that the performance of engineering services to be demonstrated within every room. Laing O'Rourke envisage that test and commissioning documentation will be provided for engineering services in every room, demonstration will be carried out on a percentage of the rooms or sampling basis to be agreed with Board.	Rejected by Board. Costs to be reconciled for ER compliance i.e. all rooms to be proved.

12.S.2.2 Technical and General Assumptions (Contd)	Building Services Comments
34.We note in the Employers Requirements section 2.1 item 5.3.2 states various design life requirements, Laing O'Rourke are offering to achieve a good industry practice design life commensurate with the investment we have made in the building and services elements in support of the boards agenda for a building of high quality with favourable life cycle cost performance	LOR to clarify proposals
35.As part of our bid submission under Section 12,8, we carried out a life-cycle analysis on a range of options for certain components to inform our choice. We would anticipate that this process will continue through Stage 2 of the project to arrive at an agreed detailed specification for FBC.	Sect 12 not available
36. We have priced for the Renal Media Panels PANO69 with the ERM. We have made no allowance for the Renal Dialysis Machines DIAOll which we assume will be supplied by the Board. We hays included for the associated water treatment system.	This item is of particular interest to the Board, LOR to provide Media panel catalogue info. Renal Dialysis Machines by the Board
37. We have not made any allowance for work that may be required as a result of the recent URS Ecological Report or any future report that is undertaken.	No comment
38. Temporary Utilities in the interests of keeping costs down for the Board, we propose that the temporary service connections for the site establishment utilities are derived from the Board's private mains. In addition to our low carbon approach to the main hospital building design, a low carbon approach will also be identified for what will be a significant site establishment, with considerable carbon reduction potential. The project accommodation will be heated from a natural gas source using a wet heating distribution system, and gas fired comfort cooling for the offices will also be investigated and adopted. This will increase energy efficiency and reduce both utility consumption and instantaneous demand on the existing 11kV system. We propose extending the Board's existing 11kV ring, providing a new ring main unit with protection and additional switching as required (removing any risk of our impacting on the Board). This infrastructure will be then handed back to the Board (on energisation of alternative supplies via the new 33kV primary intake sub-station unit) and can then be used as an additional asset as part of the existing 11kV infrastructure.	Rejected by the Board LOR to establish supplies for site from outwith the Board's supplies

12.S.2.2 Technical and Genera Assumptions (Contd)	Building Services Comments
3.8 contd. The benefit of this approach is that the Board will retain the asset for their future use, the site based carbon emissions are significantly reduced, the site consumed electricity is minimised, and with the benefit of the Board's advantageous tariff ratings and central buying power (with respect to standard Main Contractor temporary supply tariffs) temporary site utilities costs are minimised and therefore the cost of the Project to the Board is substantially reduced. In addition, we would propose a metered water supply from the private main available inside the boundary of the site and strict water consumption benchmarks satin order to minimise water to waste ratios during the construction period.	Rejected by the Board LOR to establish supplies for site from outwith the Board's supplies
39. In order to provide a suitable solution for the provision of permanent supplies to the Laboratory, our building Services solution relies on the completion of the Energy Centre to provide mains supplies to the Laboratory. Our Laboratory proposals outline the strategy that can be adopted to provide temporary or semi permanent solutions should the energy centre be unable to provide the supplies in accordance with the anticipated Programme.	LOR to respond to item 21-24 as Energy Centre appears to be undersized. (refer to Commercial Clarification: 3 8 October 2009)
40.We have assumed clinical clean will be carried out at the Board's cost before occupation by the Board following their fit out and equipping works,	Refer to ER 8.1.4.3 All ICT rooms to be clinically cleaned prior to the installation of active equipment, this deep clean shall be carried out by the Contractor's specialist cleaners to an agreed Board specification by the relevant Board Representative and a certificate issued
41 We have not included for any works in conjunction with the Japanese Knotweed Eradication programme.	No comment
42. We have assumed that all live and existing services within the boundary of the site will have been made redundant as part of the Board's enabling works in accordance with ERs volume 2/1 item 2.3.1. We have included for the works in connection with the culvert diversions.	Costs to be reconciled for ER compliance i.e. requirement to relocate 11kV cable.
43. We have assumed that the site will be handed over to the contractor in accordance with ERs volunie2/1 item 2.3.1. We have assumed that the	As below
Sites will be provided generally level and free from spoil, arising and contaminated material.	Is site generally level?
44. We would like to discuss and agree the methodology and most coat effective solution in establishing practical room area tolerances.	No comment

12.S.2.2 Technical and Genera Assumptions (Contd)	Building Services Comments
45. For those areas in the Schedule of Accommodation for which detailed room numbers and sizes have not been provided, we have based our cost allowance on typical departmental layouts, norms and equipment requirement derived from previous projects. We have taken it that the internal circulation apace assumed in the schedule will be achievable within the departmental area as the detailed design is developed and will not materially impact on other areas or the building fabric.	LOR to advise associate plant space allowance
46. The Board is responsible for the provision and management of all signage and way-finding in the existing facilities should it require to be changed for what ever reason during the construction period of the Project.	No comment
47. Laing O'Rourke will provide all way-finding required within the new facilities for the completed scheme.	No comment
48.No allowance has been made for any highway or works outside the boundary of the site, or infrastructure works or for specific requirements related to the Board's Green Travel P an or Section 75 requirements	No comment
49. We have not included for any works in connection with retail accommodation with the exception of service tails to the perimeter.	LOR to include for all fire safety systems required to meet the finalised fire engineering solution
50. Any 3D visuals in the Bid submission are to illustrate aspirations only. Actual design and construction will be as the detailed drawings.	LOR to confirm that they have an allocation for feature lighting to reconcile the sample standard lighting layouts and the lighting indicated in the visualisations.
51 Our current design proposals avoid the need to utilise the Scottish Water land that the Board are considering purchasing. This has been achieved as we are only providing the dedicated Fast link Route via the new Govan entrance. This may well provide an opportunity for the Board to reconsider and avoid the purchase and transaction costs.	LOR to advise proposed route for new Utility services incomers. Costs to be reconciled for new lighting and CCTV to the existing entrance which will presumably still be used.
52. No allowances are included for Art or for the additional cost associated with the incorporation of Art within the project. In our Art Strategy we have detailed how our design and approach will facilitate in the incorporation of Art info the facilities.	LOR to confirm that lighting will be provided to enhance the artworks
53.No specialist drainage has been included for special laboratory discharges (other than provision of chemical resistant drainage pipework and seals to the extent as specified by BMJ), radioactive discharges, and silver recovery etc.	No comment

12.S.2.2 Technical and Genera Assumptions (Contd)	Building Services Comments
54. HTM 2007: Validation and Verification document Clauses 6.4 and 6.6 imply that cable armour should not be relied upon as the only earth fault path; We interpret these clauses as referring to the connection to equipment earth bars to the cable armour not being reliant on the gland only. In this respect	Costs to be reconciled for ER compliance i.e. requirement for separate CPC conductors
We have included for a separate connection between each sub-main cable armour and the earth bar? frame of all equipment.	No comment
55. Buildings decanted and decommissioned by the Board including the services will be deemed to comply with any HSE requirements, and will be isolated, decontaminated and made safe without health or environmental risk.	No comment
56. Throughout the commissioning process, Laing O'Rourke will progress the necessary cleaning operations, in order that at handover, all surfaces are visibly clean and free from dust, dirt & debris. Certain specified commissioning processes such as Theatre ventilation systems will require more stringent sterile cleaning in order to satisfy bacteriological testing requirements.	No comment
57. Predicted energy levels are based on the lighting levels identified within the design parameters matrix and the RDS. Similarly energy levels are based on the commissioned set-points of the control systems, and deviations? Enhancements from this for occupier preferences are excluded from the energy targets. For example theatre and humidity set-points which are subsequently changed from the commissioned position. Similarly, changes to the radiant panel thermostats from the commissioned and locked off setting.	Concern that radiant panel solution will meet the ER's. Suggest Costs reconciliation to mitigate risk of non performance.
58. The passenger traffic analysis at the main entrances accounts for the new build area only. Visitor numbers for establishing lift traffic flows have been assumed for the current submission. These are to be confirmed by the Board.	LOR to provide lifts to meet the flow requirements which shall be fully established during detailed design
59. Board patient care and life support equipment will incorporate its own integral UPS provision provided by the Board.	Costs to be reconciled for ER compliance i.e. UPS for life support equipment
60.Commissioning of Group 1 Clinical Equipment — our offer includes for manufacturers commissioning only, and we have assumed that all clinical commissioning will be carried out by the Board after Completion	No comment
61 Commissioning of medical gas pipework — it is assumed that gases will be made available free of charge to Laing O'Rourke by the Board for the purpose of purging the medical gas pipework	Board to advise

12.S.2.2 Technical and Genera Assumptions (Contd)	Building Services Comments
62.Laing O'Rourke has not included for dealing with or resolving any restrictive covenants, rights of way, easements and the like which affect the sites.	No comment
63. Laing O'Rourke's design will only provide drainage for the Project Master plan development and not necessarily that required by any expansion strategy.	No comment
64. Laing O'Rourke has not included for any infrastructure charge that may be requested from the utility providers due to increased flows from the new facilities. Such charge, should it arise, would require to be covered by a Compensation Event.	No comment
65.The Board will, in a timely manner, provide all necessary information on any specified or transferred equipment to enable the Contractor to:	As below
66.Determine any unusual room heat loads for design purposes	LOR to use their experience to ensure that suitable heat and cooling loads are included at initial design stage
67 Determine connections required in sufficient time to incorporate into the first issue of Construction status drawings	LOR to use their experience to ensure that suitable connections are included at initial design stage
68.The Board will work with the Contractor to provide adequate space for construction of all mock ups required	No comment
69. Working Areas: it will be necessary to establish Working Areas off site for the purpose of storage of material and manufacture of components. It is assumed that the lease cost for these areas will be recoverable via the Schedule of Cost Components.	No comment
70Seven Tower cranes will be required for the construction of the Hospitals. In the main, tower crane jibs are contained within the identified site area however there will be limited over-sailing of the road around the site and of the eastern elevation of the maternity building. It is assumed that the Board will grant over-sailing rights for the duration that these cranes are on site.	No comment
71 .Two Cranes are required for the construction of the Laboratory and the Energy Centre. As tower cranes would over-sail adjacent properties to the North and West of the site it is planned to use two Comedil CTL 250 Luffer cranes which are able to operate without over-sailing the adjacent properties. Should these prove not to be a workable solution it may be necessary to procure over-sailing licences from the owners of the adjoining properties. No allowance has been made for these.	No comment
72.Where the names of any specific manufacturers, suppliers or products appear in the specification it is assumed that equal or equivalent alternatives are also acceptable	The suppliers list was requested to ensure a quality manufacturer. Changes to the list should be agreed equal and approved

4. Schedule of M&E queries

	General	LOR response	WW update
	Please indicate any deviations from M&E elements of the ER's.	Specific deviations from the ER's are contained within Volume 12S.2 of our Submission. Any additional clarification points are contained within Volumes 3 and Volume 4.	See previous detailed response

	Email 22 Sept 2009	LOR response	WW update
1a	Please advise access locations to services trenches.	Is response available	Is response available
1b	Please advise services trench cover proposals.	Is response available	
1c	Please advise building services proposals for trenches, i.e. lighting and drainage.	Is response available	
2	Please indicate base load for CHP and advise proposed run hours.	Response received	See item 11 below
3	Please indicate percentage capacity of all water service pipework mains from the energy centre to the main buildings for resilience.	Response received	See item 12 below
4	Please advise how Renal & Specialist Departments water temperature requirements will be achieved.	Response received	See item 13 below
5	Please advise sterilizations proposals for the various types of pipework which make up the hot and cold water systems.	Response received	See item 14 below

	Email 24 Sept 2009	LOR response	WW update
1	Confirmation that boilers will be provided with all necessary gas boosters if required to operate burners.	Our solution includes for a medium pressure gas supply onto the LTHW burners; which does not necessitate the requirement for gas booster equipment, thereby removing any element of failure within the gas train and increasing the resiliency of the LTHW system	If SGN cannot provide this then boosters will be required
2	Main building distribution pipework please confirm that isolation valves will be provided within the pipework (ref. 2.26)	We confirm that isolation valves will be provided within the pipework. Final positions and quantities of isolation valves, commissioning orifice plates, main line flushing bypasses, quick fills, drain offs etc. will be developed during detailed design Stage 2	Noted
3	Advise the strategy for water supply temperatures to serve the chilled beams, zonal heater batteries, radiant panel/radiators.	Chilled water to chilled beams will be based on 14/17DegC flow and return, from either the dedicated free cooling chillers on the podium roof, or through an injection circuit from the Energy Centre circuit, for resilience (as per schematic in Volume 2.47). LPHW to chilled beams will be via tertiary mixed circuits, fed from the secondary circuit. Zonal heater batteries will be fed directly from the 90/65 DegC secondary circuit (the schematic in Volume 2.26 contains two typographical errors and attributes the supply to zonal heater batteries from the reduced temperature LTHW compensated heating circuit. The attached schematic DSS-S(56.1)X-XX-901 REV 1 corrects these errors). Heating temperatures to the tower, where no chilled beams are planned for will be 80/60DegC to all radiant panels and radiators (radiators, if utilised, will be limited to stairwells and potentially some ancillary/unoccupied spaces). To hydraulically separate the tower system, PHE's have been included. However, further detailed design during Stage 2 may allow the removal of these to serve the Ward roof AHU's from the secondary system.	Noted
4	DHWS calorifier indicated on the pipework schematic, are these plate heat exchangers with buffer vessels.	Plate Heat Exchangers and Semi-Storage Buffer Vessels are planned for throughout.	Noted
5	Confirm analogue temperature gauges will be provided at all pumpsets.	Confirmed.	Noted

	Email 24 Sept 2009	LOR response	WW update
6	Please clarify reference to Summer Boiler and confirm boiler quantities are as per schematic	Our solution includes 6No. 7MW Boilers as per the schematic in Volume 2.24, one of which fulfils the N+1 strategy. One of these (on rotation) will be utilised as a 'summer' boiler utilising its turndown capacity in conjunction with the 'lead CHP boiler'; although during Stage 2, this 'Summer' boiler may be able to reduce in size once the detailed calculations are provided for summer hot water and reheat use. At present however we have included a 'Winter' sizing for resilience.	Noted
7	Please clarify use of CHP low temperature output, text indicates direct use in under floor heating, not shown on the pipework schematic.	It is intended to recover as much low grade heat as possible from the CHP system. Our intention is to supply underfloor heating in large open plan areas such as the main Atrium, with separate heating circuits run from the energy centre, which will be developed during Stage 2.	Noted
8	Please provide specification for all space heating equipment, e.g. radiators, active chilled beams, fan coil units etc.	Specifications for radiant panels, active beams and fan coils are included in Volumes 4.31.1, 4.24.6.1 and 4.32.2.1 respectively.	Noted
9	With regards to the heating pipework and fittings push fit/press fit, do they comply with a BS standard.	Our proposed Pipework system for heating and chilled water is accredited to BS EN 10305.	Please advise what is meant by "accredited" (See item 7 below)
10	Please provide proposed manufacture for all space heating equipment.	Please refer to our resubmission of Volume 5, which has been augmented with three additional sections to include Chilled Beams, Fan Coil Units and Radiant Panels.	Received
11	Regarding the air handling units attenuators, if not close coupled is there an alternative strategy to cope with the duct noise breakout to the plant rooms.	Where motors are external to the AHU, all of the major noise sources are already in the plantroom space, and not embedded within the unit itself. De-coupling the silencers from the AHU assists with space planning of shorter AHUs, improves maintenance space provision and allows a much more efficient/appropriate and higher performance silencer selection than those offered as an integral part of the AHU. It also allows the silencers to be located at the extremities of the plantroom, which caters for any additional inward noise transfer from the plantroom into the duct prior to it leaving the plantroom. Noise transmission through the plantroom walls and floors would be dealt with separately, however the heavyweight nature of our proposed structure will assist significantly with the prevention on break-out noise from the plantroom.	Noted.

	25 September 2009	LOR response	WW update
12	Please confirm that all services comply with HAI – SCRIBE	HAI-Scribe principles will be applied to all elements of the design and building construction sequence.	Noted
13	Please confirm that ICT cooling has been included and provide details	ICT cooling will be provided to both Main Server Rooms on a duty/standby basis. These will be separate refrigerant based systems with wall or floor mounted indoor units, and no wet services located directly above active IT equipment. IT Node Rooms will be also be provided with comfort cooling where required, via the most appropriate/efficient method of local cooling provision, depending on location.	Refer to commercial. Wall mounted units are unlikely to meet cooling demand (Bidder has also reduced Client rack allocation)
14	Please confirm that specialist drainage has been included.	Specialist chemical resistant drainage materials and Helipad fluid discharge pipework will be provided where required as per Volume 3.7.2.4 and 3.22.7 respectively. No specific below ground storage for radioactivity depletion has been provided for, and direct connection to the main sewerage system is assumed.	Noted
15	Please confirm that leak detection has been included.	Water leak detection has been included in line with the ER's, Volume 2/1, 8.2.30.2	Bidder to confirm that all leak detection has been included not just this specific paragraph (See item 8 below)
16	Please provide entertainment system details	Allowance has been made as per the ERM for a fully operational Patient Entertainment System in the Children's Hospital (as per items ECS010 and ECS012). In line with ER Volume 2/1, 8.3.19.1, we have included backbone cabling and containment systems only for the Adult Hospital.	Noted

5. Additional Items for PQS

17		12 hour water storage in lieu of 24 hour.	
18		Minimum smoke detection in ceiling voids.	
19		Isolation rooms fed from common AHU in lieu of individual units	
20		No cooling in bedrooms	
21		No two way voice link to nurse base in isolation units	
22		Mobile panic attack facility excluded	
23		Central steam plant excluded	
24		Cooling for Board equipment excluded (Scanners etc.)	
25		Δt on primary heating mains is 5oC less than the ER's, the resultant increased flow rates may require larger pipe sizes.	
26		Cooling in mains comms room will require further	

		discussion	
27		Gas boosters may be required if SGN cannot provide the indicated pressure at the Boilers.	

6. Update response to Clarifications (not re-issued as time limited)

	Item	Bidder 2 response	Comment	Update
6.0	Please confirm that the ward tower has a dedicated general extract system serving areas out with toilets to supplement the foul extract.	In line with HTM 03-01 and the new SHTM 03-01, the 2 extract systems will be combined in order to maximise heat recovery efficiency, reduce consumed fan power, improve maintainability due to easier corridor void sections, reduce smoke damper inspection regimes (2 vs 3 for every barrier penetrated) and reduce further life cycle aspects such as ductwork cleaning and inspections, fan replacements etc. This is also in line with the Board's brief for lower life cycle costs and reduced energy consumption/carbon emissions, without detriment to Infection Control/Haiscribe; as the higher air change rates have been used which also result in much higher en-suite air changes as a balance. Refer to the ECM in Section 8.1 of the Bid submission for individual room air change rates.	Please indicate section in SHTM 03-01 which allows general and foul extracts to be combined.	Review with HFS prior to detail design and agree way forward
7.0	With regard to your previous clarification response: "Our proposed Pipework system for heating and chilled water is accredited to BS EN 10305." Please advise what is meant by "accredited" to BS EN 10305.	The manufacturing process for the pipework system follows the specification requirement laid down in BS EN 10305, and complies with same. The use of the term 'accredited' was erroneous in this sense.	Bidder to provide substantiation of material selection to allow Board to review use of non BS tested materials.	Review with Board prior to detail design and agree way forward

	Item	Bidder 2 response	Comment	Update
8.0	Please confirm that all leak detection has been included not just the specific paragraph noted in your previous clarification response (i.e. ER's, Volume 2/1, 8.2.30.2).	Our intention is to provide leak detection systems as required / defined by the Employer's Requirements document i.e. as per Clauses 8.1.4 (Server / IT Rooms), 8.2.30 (External water mains / transfer pipework in basements), and 8.3.36. (Service Tunnels). If there is any additional requirement, we have been unable to identify this within the ITPD documents	Please refer to section 1 of M&E 3 "Special consideration shall be given to the location of water services and drainage to minimise the risk of flooding to Theatres Suites, Imaging, Critical Care areas, support areas, ICT server rooms and ICT Node rooms. Where water and drainage services require to be located on floors directly above these areas they require to be carefully routed to minimise the risk of flooding and non porous floors shall be provided, Penetrations shall be located at the perimeters with integrated up-stands provided at risers locations, leak detection shall also be provided."	Review with Contractor and cost leak detection at penetration up stands
9.0	Please confirm that the base lighting layout drawing will be supplemented by feature lighting.	Confirmed. We have allowed a premium within our Cost Plan to supplement the base lighting allowance. The line item is referred to as 'Entrance Areas – Feature Lighting Allowance' and totals £ 391,623. This Item is visible within Section 5H 'Electrical Installations' of the BCIS Elemental Cost Plan breakdown.	Noted. PQS to evaluate	

	Item	Bidder 2 response	Comment	Update
10.0	Please confirm that a fully operational network is included for BEMS, CCTV and Security.	We can confirm that we have allowed for a fully operational Passive Network infrastructure which would include Passive Network capacity for Integration with BEMS, CCTV and Security applications. All LAN Active Network components are envisaged to be provided by the Board in line with the guidance provided in ER clauses 8.3.6.3 and 8.3.6.6.	Not agreed. PQS to evaluate 8.3.6.3 and 8.3.6.6 do not exclude contractor from supplying an operational system	Review with Contractor and cost active equipment
11.0	Please indicate base load for CHP and advise proposed run hours.	We have undertaken a preliminary assessment of the base load / run hours based on the size of the new facility, detailed knowledge of live hospital electrical consumption and max demand patterns (including the current SGH max demand day/night turndown ratios and those of other similar major acute hospitals). etc This appraisal and modelling will also take into account the O & M contract form & cost (i.e. charge per hour run or kWh basis) offered by the various CHP suppliers in order that the final selection is financially sound over the life cycle of the CHP scheme. CHP suppliers generally offer a guaranteed uptime of 92% in their O & M contracts to accommodate servicing & the like; however, we would seek to improve on this figure if possible. It is advised to agree the O & M terms & conditions at the time of placing the capital CHP order, and we would propose to work in conjunction with the Board in this regard.	Response unclear What is base load? What are proposed run hours 8059? Is reference to charge per kWh offered by third party relevant? Assume cost of CHP is included in bid	Review with Contractor and cost modular equipment
12.0	Please indicate percentage capacity of all water service pipework mains from the energy centre to the main buildings for resilience.	Each “half” of the ring mains will be capable of taking the peak design load of the service provided, plus any spare capacity allowance stated in the ‘Defined Services Capacity Reserve Allowances & Resiliency Matrix’ included at Bid Volume 3.23 Etc.	Unclear response. Please provide percentage capacity of all water service pipework mains from the energy centre to the main buildings for resilience.	Review with Contractor and agree N+1 pipework scheme

	Item	Bidder 2 response	Comment	
13.0	Please advise how renal and specialist departmental water temperature requirements will be achieved.	In relation to the Renal department and R.O. water temperature, the temperature in the distribution ring during heat disinfection will not be less than 85°C throughout the system. This is achieved by means of the Central Plant heat sanitization system, and the temperature is maintained uniformly throughout the ring main by means of in line water heaters (where required by design), typically at max 125m intervals. In relation to the chilled domestic water ring main to be provided to the specialist departments noted in the Board's Technical Clarification during the Bid Period (to SGH Adult/Children's :- Adult Haem Onc Area, Children's BMTU/Haem Onc, Renal Wards and Transplant Unit). Cooled domestic cold water is maintained between 5-12DegC, and circulated in a closed insulated loop to sanitary fitments designated as drinking water outlets within the relevant dept. The method proposed to be utilised to achieve temperature will be instantaneous plate heat exchangers.	Use of instantaneous plate heat exchangers noted. Unclear reference to drinking water.	Review with Contractor and agree chilled domestic water ring main requirements
14.0	Please advise sterilization proposals for the various types of pipework which make up the hot and cold water systems.	The domestic water pipe work systems will be sterilized in accordance with BS 6700 and take into account the guidance offered in SHTN 2, SHTM 2027 and SHTM 2040. The medium utilised to carry out this sterilisation would be chemical disinfection with Peracitic acid being used on all pipe systems as a cleaning agent.	Noted.	Contractor to provide full details in due course.

7. Comments on Retained Plant Clarification

		Comments on Retained Plant Clarification	
13	Section 12S.2.2 Item 21 notes that only space has been allowed for additional plant to meet the requirement of servicing the retained estate. Can you confirm the cost implication of providing this plant and associated connections to meet the ITPD Requirements of servicing the Retained Estate	Please find below details of heating plant and generator plant capacities for our solution, including load substantiation and the increase in the estimate of defined cost for the electricity generation plant. Current Heating Plant Requirements • Space Heating Allowance = 6.4MW • Hot Water Generation = 6MW □□Air Treatment = 12.5MW (excluding any significant heat recovery contribution) Total (undiversified) Heating Demand = 24.9MW • 25% Spare Capacity = 6.2MW • Laboratories/Future Estate allowance = 5.7MW (from ITPD) Maximum (undiversified) Heating Demand = 36.8MW (excluding any heat recovery contribution) Connected Load = 5No x 7MW = 35MW, plus 3.2MWth from CCHP = 38.2MW N+1 Plant arrangement = 6 x 7MW Boilers as show on schematic (plus the CCHP contribution of 3.2MWth) Heating Plant Proposal including Retained Estate • Base Load = 36.8MW as above, covering Main Hospital, Labs/Future Estate • Retained Estate allowance from ITPD = 5.67MW Revised Total (undiversified) Heating Demand = 42.47MW • Potential Heat Recovery contribution from Ventilation Plant = 12.5 * 0.35 = 4.4MW (from energy calculations) Corrected Total (undiversified) Heating Demand = 42.47 – 4.4 = 38.07MW (including heat recovery contribution) Connected Load = 5No x 7MW = 35MW, plus 3.2MWth from CCHP = 38.2MW N+1 Plant arrangement = 6 x 7MW Boilers as show on schematic (plus the CCHP contribution of 3.2MWth) Heating Plant Summary – The boiler capacity remains the same as detailed within our Bid Submission. The above figures also assume no diversity of individual peaks of hot water and space heating/air treatment, when in practice there will be time lags between these individual peaks, effectively increasing the potential spare capacity of our solution. This also still allows space for an additional future boiler if ever required. Current Electrical Generation Plant Requirements Total Electrical Max Demand of current development, including 25% spare capacity/N+1 resiliency = 12MVA N+1 plant arrangement = 6 x 2MVA as shown on schematic in Volume 2.43 (as opposed to the 7 sets stated erroneously within Volume 3.10.3.3 text).	Reduction from ER's ER's include 36.37MW base load heating + resilience

		NB: This does not take into account the potential on-site	
		Comments on Retained Plant Clarification	
13	Section 12S.2.2 Item 21 (contd.)	electricity generation via the CCHP Plant, which is equivalent to 3MWe. Electrical Generation Plant Proposal including Retained Estate • Base Load = 10MVA as above covering Main Hospitals • Current Site wide Max Demand from existing Utility Bills – 2.7MVA (excluding any property disposal after the main hospitals are complete) □□Known additional provision for Neo-Natal and Cook/Freeze/Central Dining Projects = 0.6MVA Revised total Max Demand = 13.3MVA Electrical Generation Plant Summary - A revised N+1 plant arrangement taking account of the Retained Estate would therefore require 7No. x 2MVA Standby Generators, plus the use of the 3MWe on-site CCHP plant. This would provide an additional 0.7MVA of unallocated spare capacity within the 14MVA connected load; and still provide spare 3MWe standby (N+1) capacity via the CCHP Plant. This also still allows space for an additional future generator and future CHP plant if ever required. The additional cost of an additional 2MVA generation set, including all necessary infrastructure is £548,198.00	Reduction from ER's ER's include 20.5MW base load electrical + resilience

8. Comments on Volume 7

Ref	Doc	Services Item	Comment
1	SHTM 81	Concealed ceiling/floor voids greater than 800mm will be the subject of a risk assessment process to determine the necessity for smoke detection.	
		Void detection minimised	Confirm risk with LOR
		Suppression excluded from substations	Cost to be reconciled by C&B
		Concealed ceiling/floor voids greater than 800mm will not have sprinkler protection and a list of areas without protection has been provided.	Is this acceptable to fire specialist?
		Stair pressurisation not mentioned in bid	Bidder to include for all items required to allow building occupation
2	SHTM 82 suppA	Automatic fire control systems and voice alarm systems	The recommendations will generally be incorporated where applicable
3	HTM05-01	Fire Code	As SHTM 81
4	HTM05-02	Fire Code	As SHTM 81
5	HTM05-03	Fire Code	As SHTM 81
6	SFPN	Commercial enterprises on hospital premises	LOR to include for retail units within fire strategy
7	SHPN 4	Isolation Facilities	Cost to be reconciled for lack of dedicated AHU's
			Single temperature sensor not acceptable for multiple isolation rooms
			Volume control dampers not to be used for balancing
			Fire specialist to comment on lack of fire compartments at each isolation room
			LOR to confirm that deletion of extract terminal in isolation room is compliant with SHPN04
			Air tight dampers not acceptable at isolation rooms
			Cooling to be provided in isolation rooms
			Cost to be reconciled for general lack of compliance items, e.g. space for HEPA filters and DOP injection, SHPN4 validation tests etc.
8	SHTM 2005	bms	LOR to confirm compliance with ER's
9	HTM 06-01	Parts A & B Elec Services Supply and distribution	The recommendations will generally be incorporated where applicable

Ref	Doc	Services Item	Comment
10	SHTM06-01	Parts A & B Elec Services Supply and distribution	The recommendations will generally be incorporated where applicable
11	SHTM 2007	Validation and verification Electrical services: supply and distribution all parts	The recommendations will generally be incorporated where applicable
12	SHTM 2009	Pneumatic Tube Systems Parts 1 – 2	Board to advise if Guidance Document only comment acceptable
13	SHTM 2010	Sterilization Parts 1 & 2	Cost to be reconciled for lack of energy efficient solution
14	SHTM 2011	Emergency Electrical Services All Parts	Cost to be reconciled for lack of mobile connection, lack of load control to meet 15 second requirement
15	SHTM 2014	Abatement of Electrical Interference All Parts	LOR to confirm that “CE” conformity labels will be supplied with all equipment
16	SHTM 2015	Bedhead Services All Parts	Cost to be reconciled for general lack of ER compliance items, Entertainment system infrastructure, transfer links and central alarm station etc.
17	SHTM 2020	Electrical safety code for low voltage systems	LOR to confirm that all systems shall be installed and documented to allow implementation during the extended warranty period
18	SHTM 2021	Electrical safety code for high voltage systems all parts	LOR to confirm that all systems shall be installed and documented to allow implementation during the extended warranty period
19	SHTM 02-01	Medical gas pipeline systems Part A	The recommendations will generally be incorporated where applicable, insofar as the Board issued clarification on 22/6/09.
		Medical gas pipeline systems : Part B	LOR to confirm that all systems shall be installed and documented to allow implementation during the extended warranty period
20	SHTM 2022	Dental compressed air and vacuum systems	The recommendations will generally be incorporated where applicable
21	SHTM 2023	Access and accommodation for engineering services All parts	Cost to be reconciled for general lack of ER compliance with clearances
22	SHTM 2024	Lifts All Parts	Open ended clause not acceptable, Cost to be reconciled for compliance with ER's
23	SHTM 03-01	Specialised Ventilation for Healthcare Premises Part A	Any Non compliance items indicated in LOR volume 8 not acceptable
		Specialised Ventilation for Healthcare Premises Part B	LOR to confirm that all systems shall be installed and documented to allow implementation during the extended warranty period

Ref	Doc	Services Item	Comment
24	SHTM 2027	Hot and cold water supply, storage and mains services	LOR to comply with SHTM 04
25	SHTM 04-01	Control of Legionella...drinking systems Part B	LOR to confirm that all systems shall be installed and documented to allow implementation during the extended warranty period
26	SHTM 2030	Washer disinfectors Part 1	Cost to be reconciled for lack of energy efficient solution
		Washer disinfectors Part 2	LOR to confirm that all systems shall be installed and documented to allow implementation during the extended warranty period
		Washer disinfectors Part 3	The recommendations will generally be incorporated where applicable
27	SHTM 2035	Mains signaling	Unlikely that technology will be used
28	SHTM 2040	The control of legionella in healthcare premises part 1	LOR to confirm that all systems shall be installed and documented to allow implementation during the extended warranty period
		The control of legionella in healthcare premises other parts	The recommendations will generally be incorporated where applicable
29	MEIGaN	Medical Electrical Installation Guidance Notes	Cost to be reconciled for general lack of compliance items, list to be discussed
30	SHTM 2054	User Manual	LOR to confirm that user manual will be provided at the appropriate time
31	SHGN	Magnetic Resonance Imaging	Cost to be reconciled for lack of compliance with ER's
		Safe hot water and surface temperatures	LOR to advise on anomaly (Is radiant panel feed reduced to 70 deg C ? System is 90 deg C.)
		Structured cabling for IT systems	Cost to be reconciled for general reduced outlets for wireless LAN
		Planning Notes (All as list in ER's)	LOR to confirm compliance with the services elements of the planning notes
32	SHGN	Particular element of HBN 12	Cost to be reconciled for lack of compliance with ER's e.g.
			Background music and video
			UPS to CDC
			Next Patient call systems to be provided.
			Low level background music and/or video systems to be provided in the waiting areas.
			Board to confirm if gas scavenging is required

Ref	Doc	Services Item	Comment
33	SHGN	Particular element of HBN 22	Cost to be reconciled for lack of compliance with ER's e.g. UPS to be provided for A&E
34	SHGN	Particular element of HBN 26	Cost to be reconciled for lack of compliance with ER's e.g. Integral music system to be provided
35	SHGN	Particular element of HBN 29	Cost to be reconciled for lack of compliance with ER's e.g.
			Personal alarm transmitters are to be provided in the pharmacy.
			LOR to ensure that no services are routed through ceiling voids insecure rooms.
36	SHGN	Particular element of HBN 57	Cost to be reconciled for Environmental design criteria as HBN

New South Glasgow Hospitals

Presentation to YMSA

24th November 2009

A52825963

New Children's Hospital – the story so far

- ✓**Outline Business Case - Spring 2008**
  - o **Treasury Funded**
  - o **240 beds**

- ✓**Invitation to Tender - April 2009**
  - o **Clinical Output Specifications**
  - o **Schedule of Accommodation**
  - o **Exemplar Design**
  - o **Employer's Requirements**
    - ➢ **Design and Build Hospitals**
    - ➢ **Build Laboratories**

New Children's Hospital – the story so far

- ✓Competitive Dialogue - May to Sept. 2009
  - 3 Bidders
  - 6 Meetings per Bidder
  - Bids Submitted 11th September
- ✓Bid Evaluation
  - Pre-agreed Criteria and Weightings
  - 4 Components
  - Design; Logistics; Laboratories; Commercial
  - Commercial Confidentiality
  - Most Economically Advantageous Tender
- ✓NHSGGC Board decision - November 3rd
  - Preferred Bidder – Brookfield Europe LP
  - 256 Beds
  - Final Business Case for Laboratories

Brookfield Europe LP

Brookfield Project Team have extensive experience of delivering Hospital projects spanning 25 years

Project Director **Ross Ballingall**

Project Experience:

Peterborough Hospital PFI	**£350m**
Oxford Churchill	**£130m**
Stoke Mandeville hospital	**£56m**
Addenbrookes Hospital	**£80m**
Middlesex Hospital BeCAD	**£70m**
Newham Hospital	**£27m**
Newcastle Hospitals	**£300m**
Norfolk & Norwich Hospital	**£220m**

The Staff included in the Bidding Team will be retained for the duration of the Project

Commercial Director **Paul Serkis**

Project Experience:

Peterborough Hospital PFI	**£350m**
Chelsea & Westminster Hospital	**£200**
National Physical Laboratories	**£87m**

Construction Director **Alan Keeley**

Project Experience:

Peterborough Hospital PFI	**£350m**
Norfolk & Norwich Hospital	**£220m**
Medical training school	**£100m**

NHS Greater Glasgow and Clyde

New Children's Hospital – Bed Model

o Emergency Department Observation Ward	20
o Short Stay (23hr) / Day Surgery	30
o Medical Day Unit	10
o Neonatal Surgical ICU	12
o Cardiology	14
o Schiehallion (inc TCT and day care)	30
o Critical Care	22
o Acute Receiving Unit (inc burns)	40
o "Elective Wards" (3x24)	72
o Psychiatry	6

NHS Greater Glasgow and Clyde

New Children's Hospital – Next Steps

- Finalise and Sign Contract
- Commence Laboratory Build January 2010
- Detailed Design Stage for New Hospitals Jan – Sept 2010
- Final Business Case for New Hospitals November 2010
- Commence Hospital Build January 2011
- Complete Hospital Build and Commission 2015

New Children's Hospital – Next Steps

Detailed Design Stage

- "Contractual" process with firm timelines
- Role of users critical – must represent their specialty and make decisions
- Departmental layouts (1:200)
  - completed by May/June
  - 2 or 3 iterations of drawings
- Room layouts (1:50)
  - completed by September
- Final Business Case – November

- P Parking
- Disabled Parking
- Car drop off
- Taxi rank
- Bus stop

1. Turf Mound
2. Bike Shelter
3. Canopy Walkway
4. Potential Park Cafe
5. Potential Community Garden
6. Potential 5-a-side Football Pitch
7. Play Area
8. Informal Sport / Play Area
9. Trim Trail/ Running Track
10. Formal Garden
11. Children's Discovery Area
12. Fast Link Stop
13. Arrival Square
14. Children's Park
15. Central Park
16. Ambulance & Emergency Entrance Area
17. Children's DCFP Roof Garden
18. Children's Roof Garden
19. Reed Beds

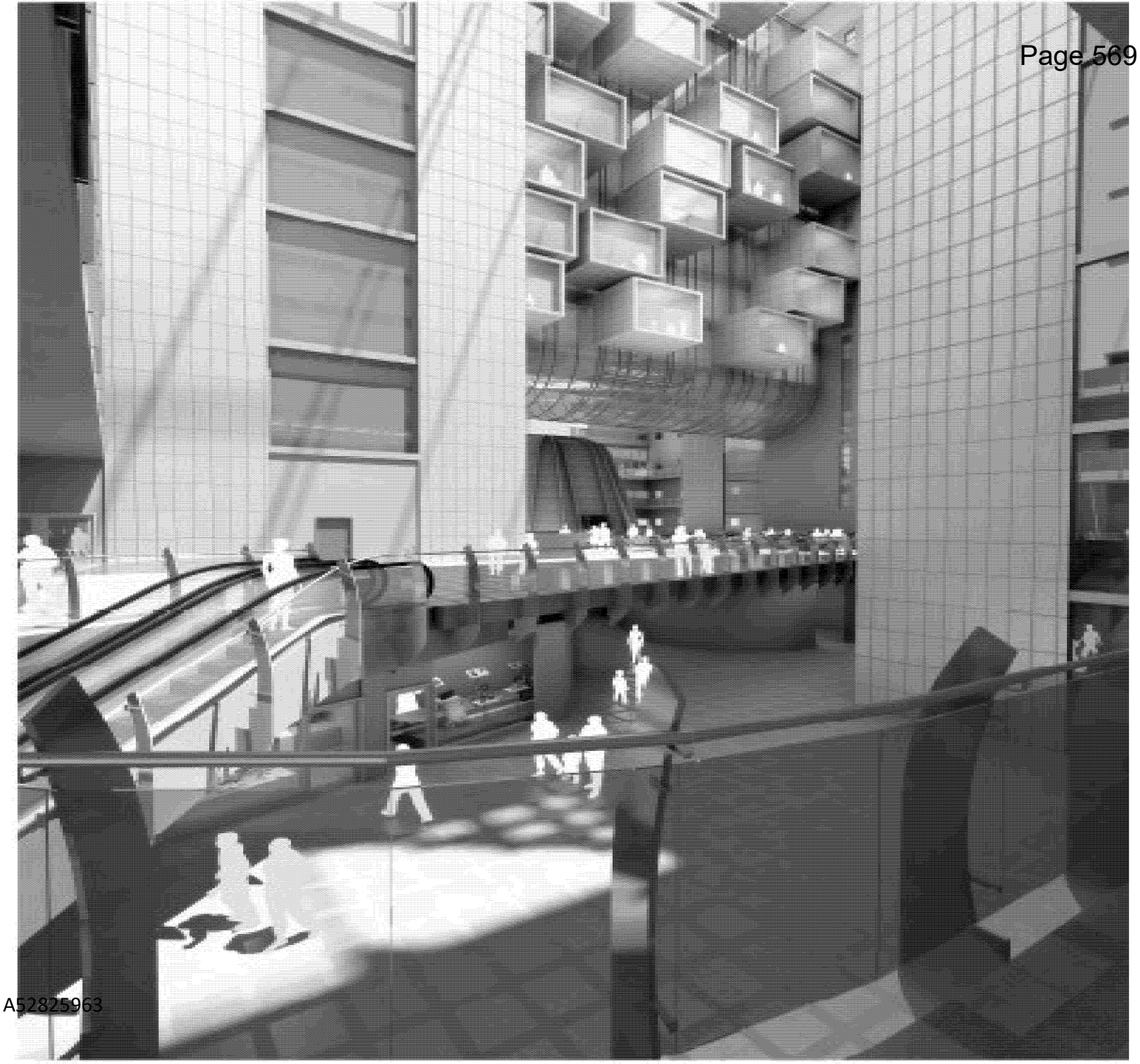
10 30 50 70 90
0 20 40 60 80 100

A52825963

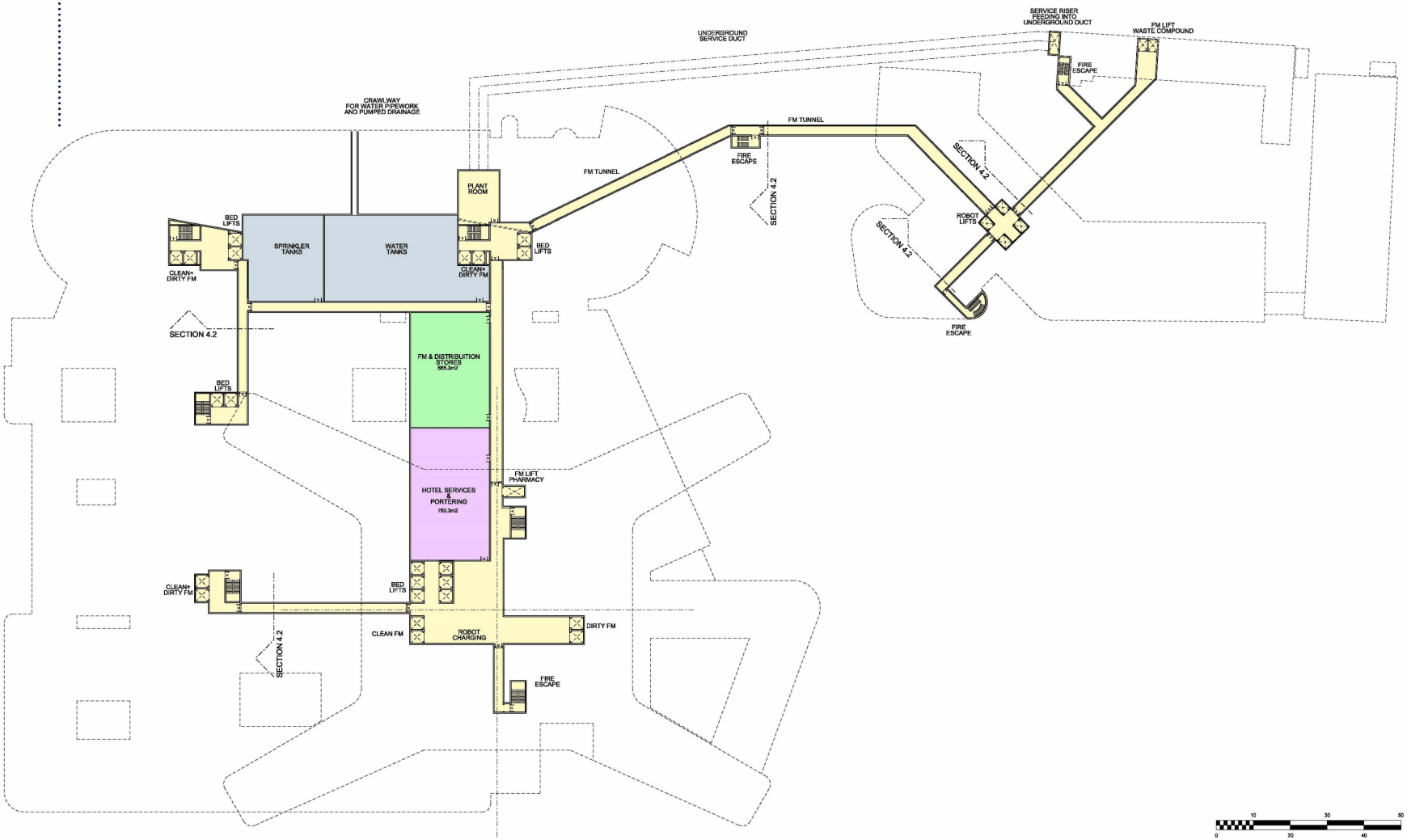
A52825963

A52825963

A52825963



A52825963



ITPD Reference:
VOLUME 2.0
Section 2.2

BASEMENT FLOOR PLAN - DEPARTMENTAL ADJACENCIES

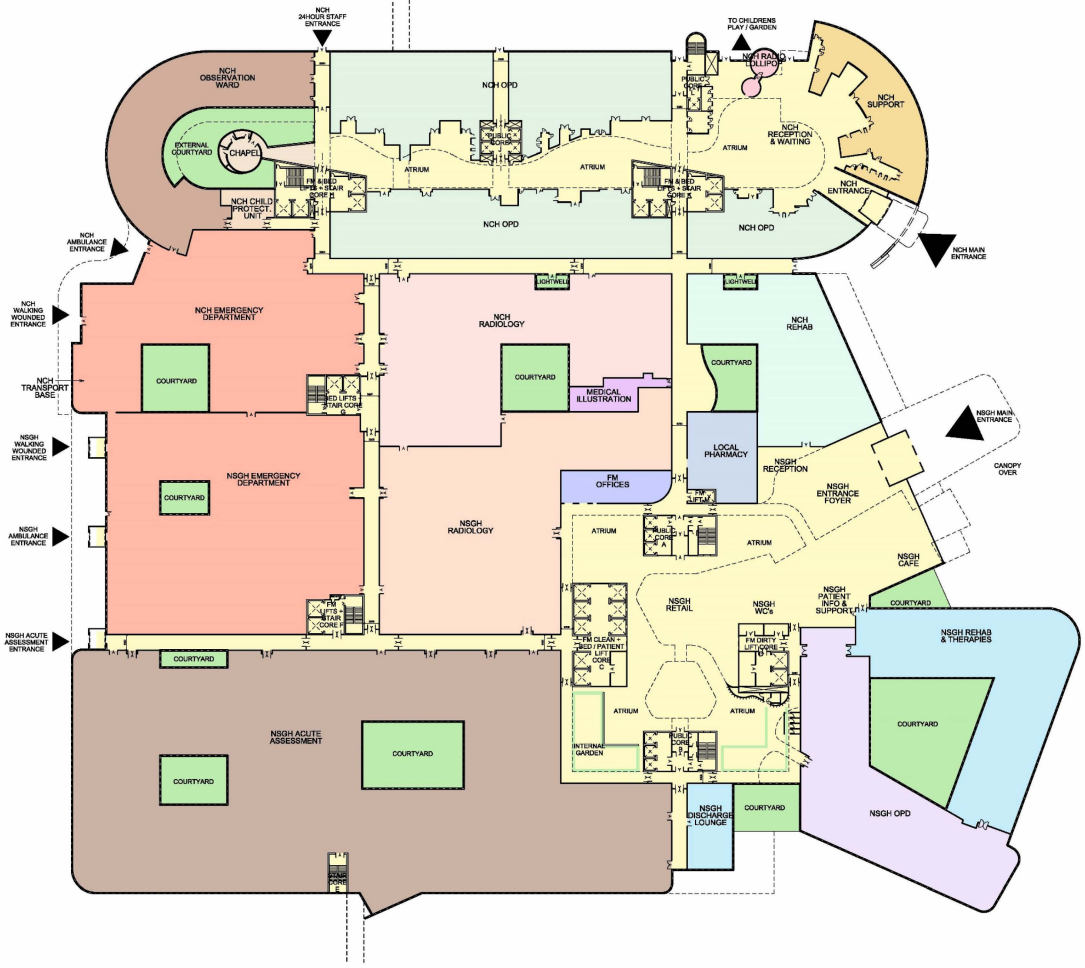
New South Glasgow Hospitals (NSGH) Project ITPD

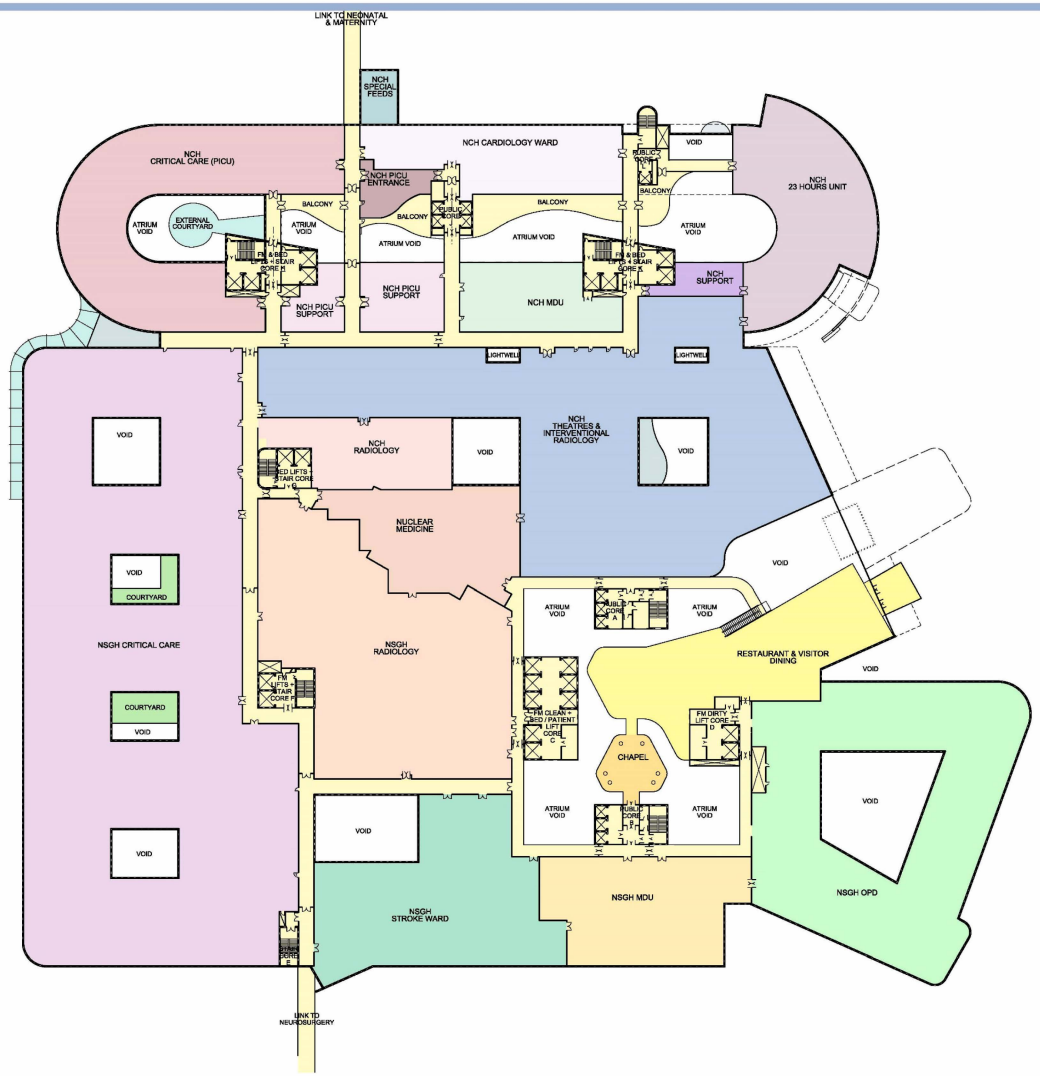
Date: 30.07.09
Scale @A1: 1:500
Drawing Number: NA-xx-B1-PL-252-010
Revision: Tender

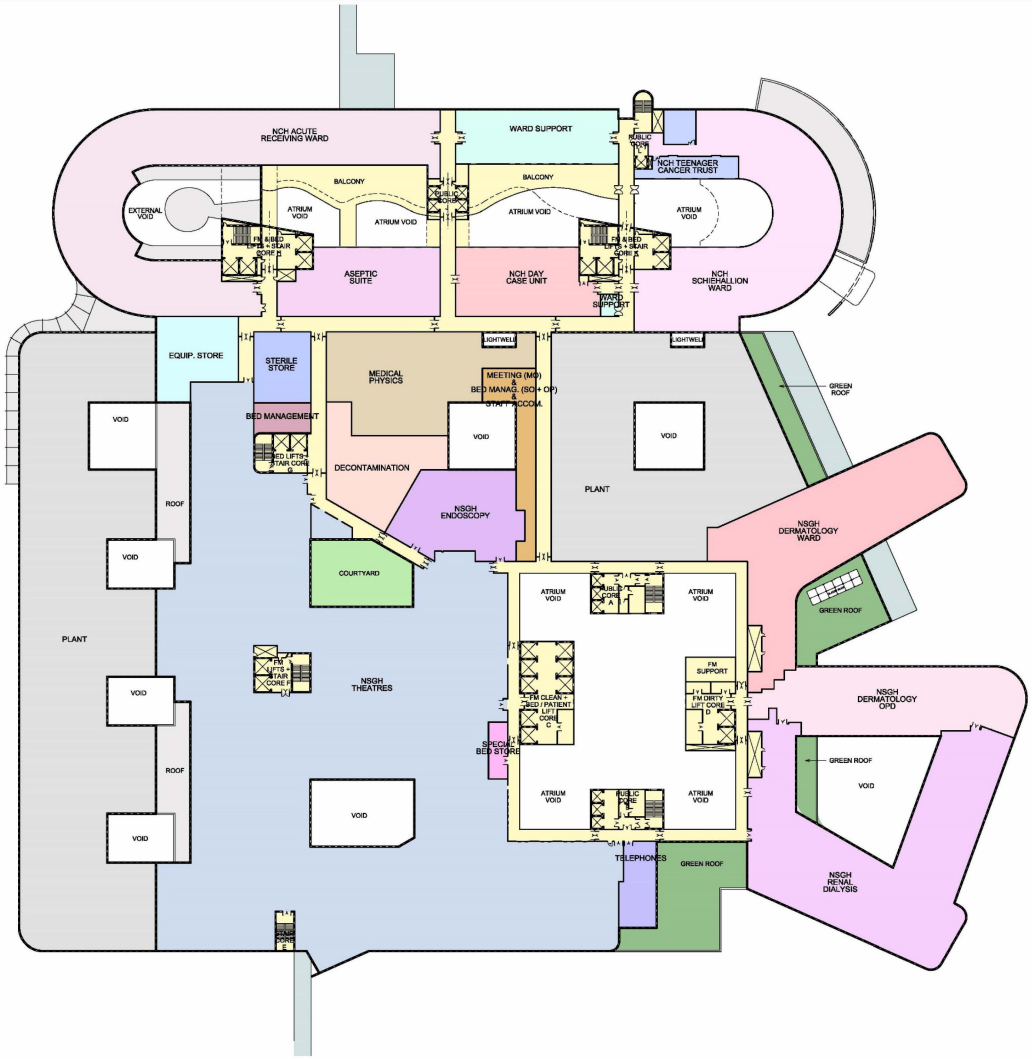
A52825963

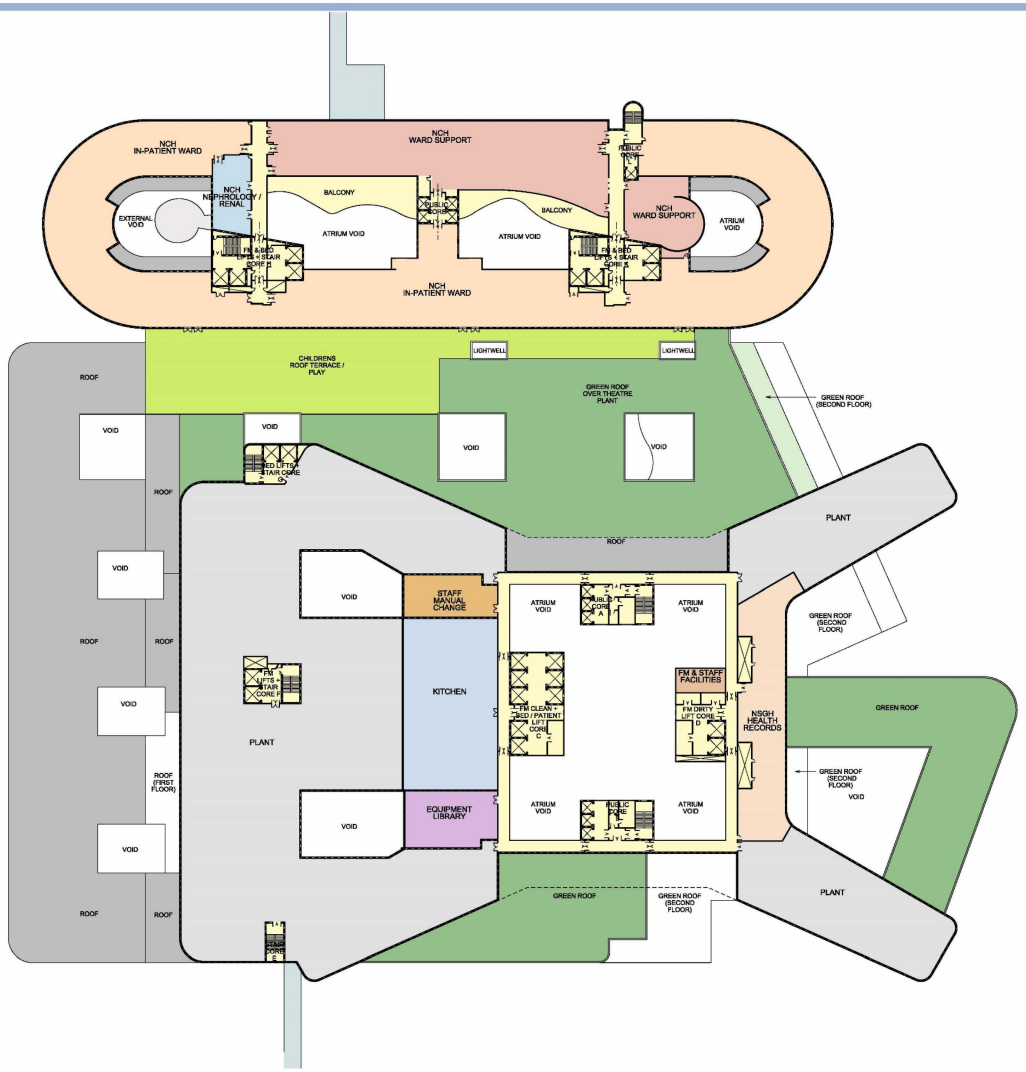
NHS Greater Glasgow and Clyde

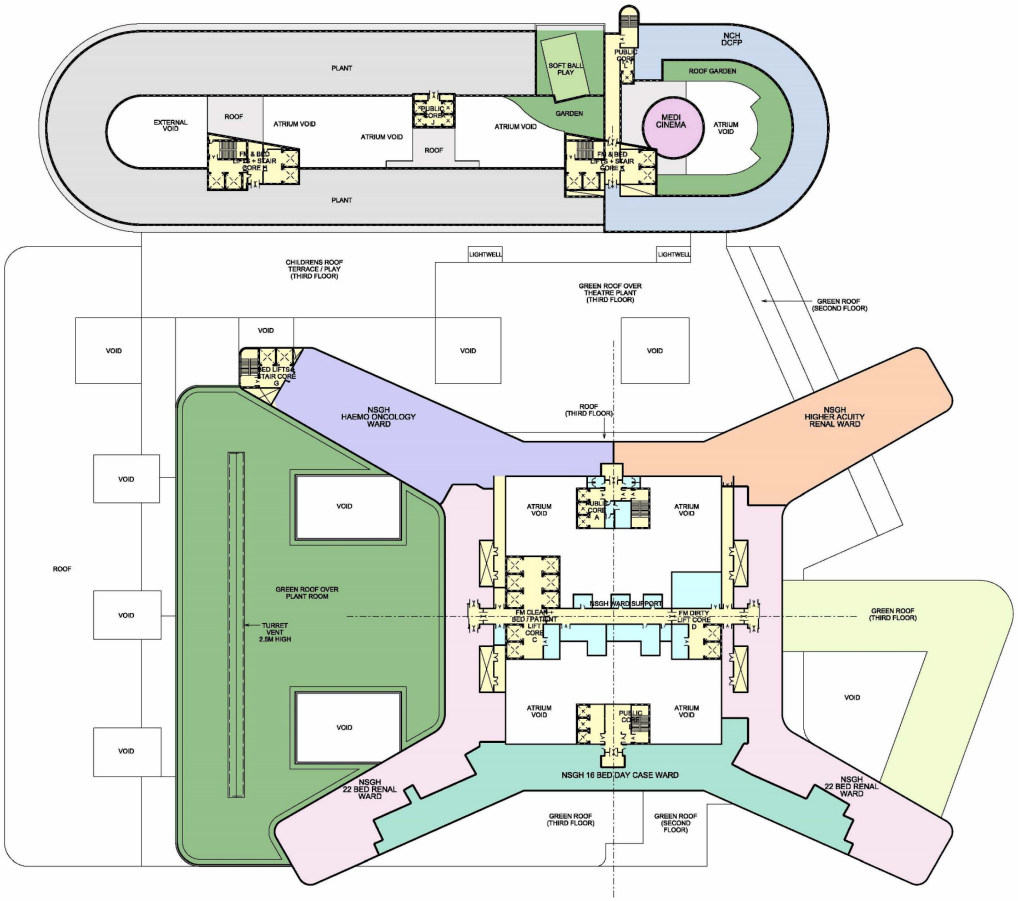
Brookfield




LINK TO NEONATAL & MATERNITY
NCH SPECIAL FEEDS
NCH CRITICAL CARE (PICU)
NCH CARDIOLOGY WARD
NCH PICU ENTRANCE
NCH 23 HOURS UNIT
ATRIUM VOID
EXTERNAL COURTYARD
BALCONY
PUBLIC CORE
FM & BED LIFTS + STAIR CORE F
NCH PICU SUPPORT
NCH MDU
NCH SUPPORT
LIGHTWELL
VOID
NCH RADIOLOGY
NCH THEATRES & INTERVENTIONAL RADIOLOGY
BED LIFTS + STAIR CORE G
NUCLEAR MEDICINE
COURTYARD
NSGH CRITICAL CARE
NSGH RADIOLOGY
FM LIFTS + STAIR CORE
RESTAURANT & VISITOR DINING
FM CLEAN / BED / PATIENT LIFT CORE C
FM DIRTY LIFT CORE D
CHAPEL
NSGH STROKE WARD
NSGH MDU
NSGH OPD
LINK TO NEUROSURGERY


NCH ACUTE RECEIVING WARD
WARD SUPPORT
NCH TEENAGER CANCER TRUST
BALCONY
BALCONY
EXTERNAL VOID
ATRIUM VOID
ATRIUM VOID
ATRIUM VOID
ATRIUM VOID
ASEPTIC SUITE
NCH DAY CASE UNIT
NCH SCHIEHALLION WARD
EQUIP. STORE
STERILE STORE
MEDICAL PHYSICS
MEETING (MD)
BED MANAG. (SCN + OP)
STAFF ACCOM.
BED MANAGEMENT
DECONTAMINATION
NSGH ENDOSCOPY
COURTYARD
PLANT
GREEN ROOF
NSGH DERMATOLOGY WARD
NSGH DERMATOLOGY OPD
NSGH THEATRES
SPECIAL BED STORE
FM SUPPORT
TELEPHONES
GREEN ROOF
NSGH RENAL DIALYSIS
VOID
ROOF
PLANT
ROOF


NCH IN-PATIENT WARD
NCH WARD SUPPORT
NCH NEPHROLOGY / RENAL
BALCONY
ATRIUM VOID
PUBLIC CORE
EXTERNAL VOID
NCH IN-PATIENT WARD
CHILDRENS ROOF TERRACE / PLAY
LIGHTWELL
GREEN ROOF OVER THEATRE PLANT
GREEN ROOF (SECOND FLOOR)
ROOF
VOID
STAFF MANUAL CHANGE
KITCHEN
EQUIPMENT LIBRARY
PLANT
FM & STAFF FACILITIES
NSGH HEALTH RECORDS
GREEN ROOF
ROOF (FIRST FLOOR)



ITPD Reference:
VOLUME 2.0
Section 2.2

FOURTH FLOOR PLAN - DEPARTMENTAL ADJACENCIES

New South Glasgow Hospitals (NSGH) Project ITPD

Date: 06.07.09
Scale @A1: 1:500
Drawing Number: NA-xx-04-PL-252-010
Revision: Tender

A52825963

New South Glasgow Hospitals - Fly Through

From: Seabourne, Alan
To: Frew, Shiona
Subject: FW: BIW Log
Date: 03 December 2009 09:31:06
Attachments: copyofbiwlogforcontract(boardtobrookfield)tab-RB Version 2-12-09.xls

---

From: Ross Ballingall [redacted]
Sent: 02 December 2009 23:28
To: David.Hal[redacted] Mark.Baird[redacted] Tim Bicknell; Seabourne, Alan; Seabourne, Alan
Subject: BIW Log

Guys

Attached is my update of the log following todays meeting. I have added comments as I think agreed and added in drawings references where relevant. There are a few where I have noted agreement (Board want it) and put an action for my guys just to check we are ok with it. Bit to do but getting there.

Any comments, we can pick up tomorrow.

Mark, can you issue out the latest RFI log for us to square off your latest comments.

cheers
Ross

NSGH - BIW Log for Contract
Issued to Brookfield 23 November 2009 - Due for return to the Board by 5pm 30 November 2009

Generally
This workbook contains the BIW log utilised in the ITSFB document, and has been adapted in order that every item is addressed and identified as included in the contract requirement (the ER s) or omitted (due to one of several reasons, e.g. that the information/document was provided to bidders for info only but does not feature as an output requirement of the Board).

The BIW Log requires to be read in conjunction with other documents to provide the overall contract requirement with regard to technical information.

Contract Data (Part 1) therefore includes:

The original ER Volume 2/1 and 2/2, supplemented by:

This BIW Log
The RFI Log
The Drawing Logs
The Bid Clarification Log
The Design Dialogue Minute Log
The Laboratories Log
The under noted 'Additional' Log (that may be added to prior to contract signature)

Direction to Brookfield
The Log has been arranged with a common approach through the BIW volumes with an 'Add' or Omit/Info' selection against each item. The 'Add' reference notes that the statement/document/drawing is included in Contract Data (Part 1) - the ERs - and as such is an output requirement of the Board that Contractor is to achieve.

The 'Status' column has been completed as 'Agreed' for each entry, Brookfield to return the Log to the Board shading the status box 'GREEN' where the items is agreed and changing the status to 'Not Agreed' and shading 'YELLOW' with a relevant and clear statement in the 'Brookfield Comment' box to allow review and assessment by the Board.

Information relating to the Laboratories is shaded 'GREY' on the attached Volume worksheets. The Laboratories Log will be issued under separate cover to Brookfield for assessment and conclusion.

Additional Log
Supplemental to the information provided in the Logs noted above, the following is also included in the ER requirement:

Item	Reference	Board Comment	Status	Brookfield Comment
	A52825963			

1.0	ITSFB Clarification Document issued [check]	Items 6d, 7 and 9 are ER requirements.	Agreed	On checking the references identified it is not clear as to what item the Board comment refers.

File Name	Iss.	Rev.	Title	Issue Date	Add	Info/Omit	Board Comment	Status	Brookfield Comment
NSGACL ITPD Volume 1	1	1	Project Scope & Commercial Doc	01/05/2009	-	Omit	Bid period document, superseded by Contract for signature to be issued by S+W	Agreed	
NSGACL Contract Bond ITSFB Issue - Vol 1	1	1	NSGACL Contract Bond ITSFB Issue - Vol 1.pdf	14/08/2009	-	Omit	Bid period document, superseded by Contract for signature to be issued by S+W	Agreed	
NSGACL Contract Form of Agreement	1		The Contract : Form of Agreement	04/06/2009	-	Omit	Bid period document, superseded by Contract for signature to be issued by S+W	Agreed	
NSGACL Form of Consultant Collateral Warranty	1		The Contract : Consultant's Collateral Warranty	04/06/2009	-	Omit	Bid period document, superseded by Contract for signature to be issued by S+W	Agreed	
NSGACL Form of Novation Agreement	1		The Contract : Novation Agreement	04/06/2009	-	Omit	Bid period document, superseded by Contract for signature to be issued by S+W	Agreed	
NSGACL Form of novation agreement ITSFB Issue - Vol 1	1	1	NSGACL Form of novation agreement ITSFB Issue - Vol 1.pdf	14/08/2009	-	Omit	Bid period document, superseded by Contract for signature to be issued by S+W	Agreed	
NSGACL Form of sub-consultant warranty ITSFB Issue - Vol 1	1	1	NSGACL Form of sub-consultant warranty ITSFB Issue - Vol 1.pdf	14/08/2009	-	Omit	Bid period document, superseded by Contract for signature to be issued by S+W	Agreed	
NSGACL Form of Sub-Contractor Collateral Warranty	1		The Contract : Sub-Contractor's Collateral Warranty	04/06/2009	-	Omit	Bid period document, superseded by Contract for signature to be issued by S+W	Agreed	
NSGACL Form of subcontractor warranty ITSFB Issue - Vol 1	1	1	NSGACL Form of subcontractor warranty ITSFB Issue - Vol 1.pdf	14/08/2009	-	Omit	Bid period document, superseded by Contract for signature to be issued by S+W	Agreed	
NSGACL NEC Contract Document ITSFB Issue - Vol 1	1	1	NSGACL NEC Contract Document ITSFB Issue - Vol 1.pdf	14/08/2009	-	Omit	Bid period document, superseded by Contract for signature to be issued by S+W	Agreed	
NSGACL Vol 1 - Appendix C Rev 3	1	3	NSGACL Vol 1 - Appendix C Rev 3.pdf	14/08/2009	-	Omit	Bid period document, superseded by Contract for signature to be issued by S+W	Agreed	
0401	1	.	PROPOSED SHEAR WALL LAYOUT	30/06/2009					
0404	1	.	PROPOSED SUPERSTRUCTURE	03/07/2009					
0406	1	.	PROPOSED ROOF STRUCTURE	30/06/2009					
SK-0010	1	.	DETAIL OF 2 PILE PILECAP	19/06/2009					
SK-0011	1	.	DETAIL OF 3 PILE PILECAP	19/06/2009					
SK-0012	1	.	SECTION INDICATING PILECAP LOCATION BELOW PLANT SLAB / BASEMENT	19/06/2009					
SK-0013	1	.	SECTION INDICATING PILECAP LOCATION BELOW LABRATORY / OFFICES	19/06/2009					
SK-0014	1	.	DETAIL OF 1 PILE PILECAP	19/06/2009					
SK-0015	1	.	DETAIL OF 4 PILE PILECAP	19/06/2009					
SK-0017	1	.	SECTION X-X	19/06/2009					
SK-0018	1	.	SECTION Y-Y	19/06/2009					
SK-0019	1	.	SECTION Z-Z	19/06/2009					
SK-0020	1	.	PROPOSED PILE AND GROUND BEAM LAYOUT	19/06/2009					
SK-0030	1	.	PART PLAN SHOWING TRANSFER STRUCTURE OVER SERVICE YARD ACCESS ROAD	30/06/2009					
SK-016	1	.	DETAILS OF TEMPORARY RETENTION	19/06/2009					

File Name	Iss.	Rev.	Title	Issue Date	Add	Info/Omit	Board Comment	Status	Brookfield Comment
NSGACL PD-HLM-L(00)X-XX-001 - Existing Site Plan	1	1	Existing Site Plan	01/05/2009	-	Omit	Superseded by Issue2	Agreed	
NSGACL PD-HLM-L(00)X-XX-001 - Existing Site Plan	2	1	Existing Site Plan	21/05/2009	Y	-	To remain as relevant baseline detail.	Agreed	
NSGACL-PD-HLM-S(00)X-XX-005 - Phased Construction Site Plan	1	1	Phased Construction Site Plan	06/05/2009	-	Omit	To be superseded by outcome/agreement from Logistics meeting 26 November 2009	Agreed	
NSGAC OPD Activity NCH	1		NSGAC OPD Activity NCH	08/05/2009	Y	-	Remains output for Ers.	Agreed*	*Brookfield agree with Board position that Clinical Output Specs should remain as being the core ER on the basis that the Board confirm that they accept the Acommodation Shcedules included within the Bid Submission Volume 1 can satisfy the Clinical Output Specifications.
NSGACL AAU NSG	1		Clinical Output Specification	05/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Adult and Childrens Hospital Combined Bioengineering NSG NCH	1		CLINICAL OUTPUT SPECIFICATION	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL ADULT AND CHILDRENS HOSPITAL Med illus NSG NCH	1		CLINICAL OUTPUT SPECIFICATION	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL ADULT AND CHILDRENS PHARMACY NSG NCH	1		CLINICAL OUTPUT SPECIFICATION	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Anticoagulation NSG	1		Clinical Output Specification	05/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Audiology NCH	1		NSGACL Audiology NCH	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Cardiac Rehab NSG	1		NSGACL Cardiac Rehab NSG	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Cardiac Services NCH	1		NSGACL Cardiac Services NCH	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Cardiology NSG	1		Clinical Output Specification	05/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Care of Elderly NSG	1		NSGACL Care of Elderly NSG	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Chaplaincy NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Chaplaincy Spiritual Care NSG	1		NSGACL Chaplaincy Spiritual Care NSG	30/04/2009	Y	-	Remains output for Ers.	Agreed	Ditto above
NSGACL Child Protection NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Clinical Psychology NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Community paediatrics NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Continence Service NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Critical Care NSG	1		Clinical Output Specification	05/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Day Medical NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Dental NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Departmental Adjacency Matrix NCH	1		New Children's Hospital Departmental Adjacency Matrix	21/05/2009	Y	-	Adjacency matrix remains output, clinical functionality sign-off will create agreed settlement of adjacencies	Not Agreed	To be replaced by BE 1:500 plans
NSGACL Departmental Adjacnecy Matrix NSG	1		NSGACL Departmental Adjacnecy Matrix NSG	15/05/2009	Y	-	Adjacency matrix remains output, clinical functionality sign-off will create agreed settlement of adjacencies	Not Agreed	To be replaced by BE 1:500 plans
NSGACL Dermatology NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed*	*Brookfield agree with Board position that Clinical Output Specs should remain as being the core ER on the basis that the Board confirm that they accept the Acommodation Shcedules included within the Bid Submission Volume 1 can satisfy the Clinical Output Specifications.
NSGACL Dermatology NSG	1		Clinical Output Specification	05/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Diabetes Endocrinology NSG	1		Clinical Output Specification	05/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Diabetes NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above

NSGACL Dietetic NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Dietetic NSG	1		Clinical Output Specification	05/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Discharge Lounge NSG	1		NSGACL Discharge Lounge NSG	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL ECLS NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL EMERGENCY DEPARTMENT NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Emergency Department NSG	1		Clinical Output Specification	05/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Endocrinology NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Endoscopy NSG	1		NSGACL Endoscopy NSG	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL ENT Audiology NSG	1		NSGACL ENT Audiology NSG	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL ENT NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Entrance Hall NSG	1		Clinical Output Specification	05/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Gastro NCH	1		NSGACL Gastro NCH	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Gastroenterology NSG	1		NSGACL Gastroenterology NSG	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Gen Outpatients NSG	1		NSGACL Gen Outpatients NSG	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Gen Surg NCH	1		NSGACL Gen Surg NCH	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL General Surgery NSG	1		NSGACL General Surgery NSG	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL General Surgery NSG	2		NSGACL General Surgery NSG	01/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Generic Ward Matrix NCH	1		New Children's Hospital Patient/Public/Staff - Pathways/Adjacencies	21/05/2009	-	Omit	Superseded by Vol4 document	Agreed	Ditto above
NSGACL GENERIC WARD NCH	1		CLINICAL OUTPUT SPECIFICATION	01/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL GENERIC WARD NCH	2		CLINICAL OUTPUT SPECIFICATION	21/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Generic Wards NSG	1		Clinical Output Specification	05/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Haemato Oncology NSG	1		NSGACL Haemato Oncology NSG	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Haemat-Oncology NCH	1		NSGACL Haemat-Oncology NCH	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL HaN NCH	1		NSGACL HaN NCH	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Health Records NSG	1		NSGACL Health Records NSG	30/04/2009	Y	-	Remains output for Ers.	Agreed	Ditto above
NSGACL Imaging NCH	1		NSGACL Imaging NCH	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL IMMUNOLOGY NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Laboratory Medicine NSG	1		Clinical Output Specification	05/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Liaison Psychiatry NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Mat_Neonate Psychology NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Medical Day Unit NSG	1		NSGACL Medical Day Unit NSG	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Medical Paediatric NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL METABOLIC MEDICINE NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Neurology NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Neurology NCH	2		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Neurophysiology NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above

NSGACL Neurophysiology NCH	2		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL NEUROSURGRY NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Nuclear Medicine NSG	1		Clinical Output Specification	05/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL OCCUPATIONAL THERAPY NCH	1		CLINICAL OUTPUT SPECIFICATION	01/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Operational Procedure Domestic Services NSG	1		Operational Procedure	07/05/2009	Y	-	Remains output for Ers.	Agreed	Ditto above
NSGACL Operational Procedure Linen NSG	1		Operational Procedure	07/05/2009	Y	-	Remains output for Ers.	Agreed	Ditto above
NSGACL Operational Procedure Portering NSG	1		Operational Procedure	07/05/2009	Y	-	Remains output for Ers.	Agreed	Ditto above
NSGACL Operational Procedure Waste NSG	1		Operational Procedure	07/05/2009	Y	-	Remains output for Ers.	Agreed	Ditto above
NSGACL Ophthalmology NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Ophthalmology NCH	2		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Ophthalmology NSG	1		NSGACL Ophthalmology NSG	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Ophthalmology NSG	2		NSGACL Ophthalmology NSG	01/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Orthopaedic NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Orthopaedic NCH	2		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Orthopaedics NSG	1		NSGACL Orthopaedics NSG	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Orthotics NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Orthotics NCH	2		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL OT Orthotics NSG	1		Clinical Output Specification	05/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Out of Hours NSG	1		Clinical Output Specification	05/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL OUTPATIENTS DEPARTMENT NCH	1		CLINICAL OUTPUT SPECIFICATION	01/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Pain NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Pain NCH	2		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Physiotherapy NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Physiotherapy NCH	2		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Physiotherapy NSG	1		Clinical Output Specification	05/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL PICU NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL PICU NCH	2		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL PLASTICS NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Play Service NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Play Service NCH	2		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Psychiatric Inpatients NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Psychiatric Inpatients NCH	2		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Radiology NSG	1		Clinical Output Specification	05/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Renal Dialysis NSG	1		Clinical Output Specification	05/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Renal NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Renal NCH	2		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above

NSGACL Renal NSG	1		Clinical Output Specification	05/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL RESPIRATORY NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Respiratory NSG	1		Clinical Output Specification	05/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Rheumatology NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Rheumatology NCH	2		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Rheumatology NSG	1		Clinical Output Specification	05/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL SPEECH AND LANGUAGE THERAPY NCH	1		CLINICAL OUTPUT SPECIFICATION	01/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Speech Language Therapy NSG	1		Clinical Output Specification	05/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Stroke NSG	1		Clinical Output Specification	05/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL THEATRES NCH	1		CLINICAL OUTPUT SPECS	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Theatres NSG	1		Clinical Output Specification	05/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL TRANSPORT NCH	1		CLINICAL OUTPUT SPECIFICATION	01/05/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Urology NSG	1		NSGACL Urology NSG	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Vascular NSG	1		NSGACL Vascular NSG	30/04/2009	Y	-	CoS remains core ER output.	Agreed	Ditto above
NSGACL Schedule of Accommodation - Excel format - NCH	1		New Children's Hospital Schedule of Accommodation For ER's in Excel format	12/05/2009	-	Omit	Superseded version	Agreed	
NSGACL Schedule of Accommodation - Excel format - NSG	1		New Adult Hospital Schedule of Accommodation for ER's - Excel format	12/05/2009	-	Omit	Superseded version	Agreed	
NSGACL Schedule of Accommodation NCH	1		Schedule of Accommodation NCH	05/05/2009	-	Omit	Superseded version	Agreed	
NSGACL Schedule of Accommodation NSG	1		Schedule of Accommodation for Adult Hospital	06/05/2009	-	Omit	Superseded version	Agreed*	*To be replaced by agreed SoA
NSGACL D.1 Outline Planning Conditions	1	1	App D (1 of 2) Outline Planning	01/05/2009	Y	-	Remains output for ERs.	Agreed*	*Planning risk is allowed within Brookfield submission although timing of response to Planning Submissions is a Board risk.
NSGACL D.2 Planning Matrix	1	1	App D (Part 2 of 2) Planning Matrix	01/05/2009	Y	-	Remains output for ERs.	Agreed*	*Planning risk is allowed within Brookfield submission although timing of response to Planning Submissions is a Board risk.
NSGACL-Generic ADB Room Data Sheets	1	1	Board Exemplar ADB Room Data Sheets	06/05/2009	-	Omit	Superseded version	Agreed	
NSGACL-Generic ADB Room Data Sheets	2	1	Board Exemplar ADB Room Data Sheets	22/05/2009	Y	-	Remains output for ERs.	Agreed	
NSGACL 1149-03A	1	A	Landscape Masterplan	06/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Exemplar Masterplan to be replaced with drawing log of BE Masterplan drawings
NSGACL - 3D Image 1 - View from new entrance boulevard	1	1	3D Image 1 - View from new entrance boulevard	01/05/2009	-	Omit	Superseded by bidder proposals.	Agreed	3Ds to be replaced by the following drawings;
NSGACL - 3D Image 2 - View of childrens entrance	1	1	3D Image 2 - View of childrens entrance	01/05/2009	-	Omit	Superseded by bidder proposals.	Agreed	NA-XX-XX-3D-251-001
NSGACL - 3D Image 3 - View of emergency entrances	1	1	3D Image 3 - View of emergency entrances	01/05/2009	-	Omit	Superseded by bidder proposals.	Agreed	NA-XX-XX-3D-251-002
NSGACL - 3D Image 4 - View of new tower across parkland	1	1	3D Image 4 - View of new tower across parkland	01/05/2009	-	Omit	Superseded by bidder proposals.	Agreed	NA-XX-XX-3D-251-003
									NA-XX-XX-3D-251-004
									NA-XX-XX-3D-251-005
									NA-XX-XX-3D-251-006
									NA-XX-XX-3D-251-007
									NA-XX-XX-3D-251-008
									NA-XX-XX-3D-251-009
									NA-XX-XX-3D-252-001
									NA-XX-XX-3D-252-002
									NA-XX-XX-3D-252-003
NSGACL PD-HLM-L(00)X-XX-002 - Proposed Site Plan	1	1	Proposed Site Plan	01/05/2009	-	Omit	Superseded version	Agreed	

NSGACL PD-HLM-L(00)X-XX-002 - Proposed Site Plan	2	1	Proposed Site Plan	21/05/2009	Y	-	Remain ER requirement - to be omitted once design development concluded	Not Agreed	Exemplar Site Plan to be replaced with BE Proposed Site Plan
NSGACL App H -Board Exemplar Layouts 1 to 500 Cover	1	1	Cover Sheet	07/05/2009	-	Omit		Agreed	
NSGACL PD-HLM-L(00)00-x-XX-001-Dept Adj Level 0	1	1	Departmental Adjacencies Level 0	07/05/2009	-	Omit	Superseded version	Agreed	
NSGACL PD-HLM-L(00)00-x-XX-001-Dept Adj Level 0	2	1	Departmental Adjacencies Level 0	13/05/2009	Y	-	Remain ER requirement - to be omitted once design development concluded	Not Agreed	To be replaced by BE 1:500 plans Replace with NA-XX-00-PL-252-010
NSGACL PD-HLM-L(00)-01-X-XX-001-Dept Adj Level -1	1	1	Departmental Adjacencies Level -1	07/05/2009	-	Omit	Superseded version	Agreed	
NSGACL PD-HLM-L(00)-01-X-XX-001-Dept Adj Level -1	2	1	Departmental Adjacencies Level -1	13/05/2009	Y	-	Remain ER requirement - to be omitted once design development concluded	Not Agreed	To be replaced by BE 1:500 plans Replace with NA-XX-B1-PL-252-010
NSGACL PD-HLM-L(00)01-X-XX-001-Dept Adj Level 1	1	1	Departmental Adjacencies Level 1	07/05/2009	-	Omit	Superseded version	Agreed	
NSGACL PD-HLM-L(00)01-X-XX-001-Dept Adj Level 1	2	2	Departmental Adjacencies Level 1	08/05/2009	-	Omit	Superseded version	Agreed	
NSGACL PD-HLM-L(00)01-X-XX-001-Dept Adj Level 1	3	2	Departmental Adjacencies Level 1	13/05/2009	Y	-	Remain ER requirement - to be omitted once design development concluded	Not Agreed	To be replaced by BE 1:500 plans Replace with NA-XX-01-PL-252-010
NSGACL PD-HLM-L(00)02-X-XX-001-Dept Adj Level 2	1	1	Departmental Adjacencies Level 2	07/05/2009	-	Omit	Superseded version	Agreed	
NSGACL PD-HLM-L(00)02-X-XX-001-Dept Adj Level 2	2	2	Departmental Adjacencies Level 2	08/05/2009	-	Omit	Superseded version	Agreed	
NSGACL PD-HLM-L(00)02-X-XX-001-Dept Adj Level 2	3	2	Departmental Adjacencies Level 2	13/05/2009	Y	-	Remain ER requirement - to be omitted once design development concluded	Not Agreed	To be replaced by BE 1:500 plans Replace with NA-XX-02-PL-252-010
NSGACL PD-HLM-L(00)03-x-XX-001-Dept Adj Level 3	1	1	Departmental Adjacencies Level 3	07/05/2009	-	Omit	Superseded version	Agreed	
NSGACL PD-HLM-L(00)03-x-XX-001-Dept Adj Level 3	2	1	Departmental Adjacencies Level 3	13/05/2009	-	Omit	Superseded version	Agreed	
NSGACL PD-HLM-L(00)03-x-XX-001-Dept Adj Level 3	3	A	Departmental Adjacencies Level 3	12/06/2009	-	Omit	Superseded version	Agreed	
NSGACL PD-HLM-L(00)03-x-XX-001-Dept Adj Level 3	4	A	Departmental Adjacencies Level 3	17/07/2009	Y	-	Remain ER requirement - to be omitted once design development concluded	Not Agreed	To be replaced by BE 1:500 plans Replace with NA-XX-03-PL-252-010
NSGACL PD-HLM-L(00)04-X-XX-001-Dept Adj Level 4	1	1	Departmental Adjacencies Level 4	07/05/2009	-	Omit	Superseded version	Agreed	
NSGACL PD-HLM-L(00)04-X-XX-001-Dept Adj Level 4	2	1	Departmental Adjacencies Level 4	13/05/2009	-	Omit	Superseded version	Agreed	
NSGACL PD-HLM-L(00)04-X-XX-001-Dept Adj Level 4	3	A	Departmental Adjacencies Level 4	12/06/2009	-	Omit	Superseded version	Agreed	
NSGACL PD-HLM-L(00)04-X-XX-001-Dept Adj Level 4	4	A	Departmental Adjacencies Level 4	17/07/2009	Y	-	Remain ER requirement - to be omitted once design development concluded	Not Agreed	To be replaced by BE 1:500 plans Replace with NA-XX-04-PL-252-010 Include NA-XX-05-PL-252-010 Include NA-XX-06-PL-252-010 Include NA-XX-07-PL-252-010 Include NA-XX-08-PL-252-010 Include NA-XX-09-PL-252-010 Include NA-XX-10-PL-252-010 Include NA-XX-11-PL-252-010 Include NA-XX-12-PL-252-010 Include NA-XX-13-PL-252-010 Include NA-XX-14-PL-252-010
NSGACL-PD-HLM-L(00)00-X-OP-001 - Outpatient Adults Clinic Adj Level 0	1		Board Exemplar Layout - Outpatient (Adults) Clinic Adjacencies, Level 0 - 1:500	03/06/2009	Y	-	Remain ER requirement - to be omitted once design development concluded	Not Agreed	To be replaced by BE 1:500 plans Replace with NA-XX-00-PL-252-010
NSGACL-PD-HLM-L(00)01-X-OP-001 - Outpatient Adults Clinic Adj Level 1	1		Board Exemplar Layout - Outpatient (Adult) Clinic Adjacencies, Level 1 - 1:500	03/06/2009	Y	-	Remain ER requirement - to be omitted once design development concluded	Not Agreed	To be replaced by BE 1:500 plans Replace with NA-XX-01-PL-252-010
NSGACL-PD-HLM-L(00)02-X-OP-001 - Outpatient Adults Clinic Adj Level 2	1		Board Exemplar Layout - Outpatient (Adult) Clinic Adjacencies, Level 2 - 1:500	03/06/2009	Y	-		Not Agreed	To be replaced by BE 1:500 plans Replace with NA-XX-02-PL-252-010
2447 AL (00)22 Emergency Department flow diagram	1	1	NSGACL Emergency Department (Children) Flow Diagram	09/07/2009	Y	-	Remain ER requirement - to be omitted once design development concluded	Not Agreed	Replace with NA-XX-00-PL-252-304

2447 AL(00)20P - Theatre flow diagram	1	1	NSGACL Theatre (Children) Flow Diagram	09/07/2009	Y	-	Remain ER requirement - to be omitted once design development concluded	Agreed	Replace if NA drawings amended to reflect comments prior to contract sign
2447 AL(00)23 Radiology flow diagram	1	1	NSGACL Radiology (Children) Flow Diagram	09/07/2009	Y	-	Remain ER requirement - to be omitted once design development concluded	Not Agreed	Replace with NA-XX-00-PL-252-308 Replace with NA-XX-01-PL-252-308
NSGACL - PD-HLM-L(00)00-X-AA-001 - Acute Assessment Adults	1	1	Board Exemplar Layout - Acute Assessment Adults - 1:200	06/05/2009	-	Omit	Superseded version	Agreed	
NSGACL - PD-HLM-L(00)00-X-AA-001 - Acute Assessment Adults	2	2	Board Exemplar Layout - Acute Assessment Adults - 1:200	12/05/2009	-	Omit	Superseded version	Agreed	
NSGACL - PD-HLM-L(00)00-X-AA-001 - Acute Assessment Adults	3	2	Board Exemplar Layout - Acute Assessment Adults - 1:200	13/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Agreed	Replace if NA drawings amended to reflect comments prior to contract sign
NSGACL - PD-HLM-L(00)00-X-ED-001 - Emergency Department Adults	1	1	Board Exemplar Layout - Emergency Department Adults - 1:200	06/05/2009	-	Omit	Superseded version	Agreed	
NSGACL - PD-HLM-L(00)00-X-ED-001 - Emergency Department Adults	2	2	Board Exemplar Layout - Emergency Department Adults - 1:200	12/05/2009	-	Omit	Superseded version	Agreed	
NSGACL - PD-HLM-L(00)00-X-ED-001 - Emergency Department Adults	3	2	Board Exemplar Layout - Emergency Department Adults - 1:200	13/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Replace with NA-XX-00-PL-252-205
NSGACL - PD-HLM-L(00)00-X-RA-001 - Radiology Adults	1	1	Board Exemplar Layout - Radiology Adults - Ground Floor - 1:200	06/05/2009	-	Omit	Superseded version	Agreed	
NSGACL - PD-HLM-L(00)00-X-RA-001 - Radiology Adults	2	2	Board Exemplar Layout - Radiology Adults - Ground Floor - 1:200	12/05/2009	-	Omit	Superseded version	Agreed	
NSGACL - PD-HLM-L(00)00-X-RA-001 - Radiology Adults	3	2	Board Exemplar Layout - Radiology Adults - Ground Floor - 1:200	13/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Replace with NA-XX-00-PL-252-207
NSGACL - PD-HLM-L(00)01-X-CC-001 - Critical Care Facility Adults	1	1	Board Exemplar Layout - Critical Care Facility Adults - 1:200	06/05/2009	-	Omit	Superseded version	Agreed	
NSGACL - PD-HLM-L(00)01-X-CC-001 - Critical Care Facility Adults	2	2	Board Exemplar Layout - Critical Care Facility Adults - 1:200	12/05/2009	-	Omit	Superseded version	Agreed	
NSGACL - PD-HLM-L(00)01-X-CC-001 - Critical Care Facility Adults	3	2	Board Exemplar Layout - Critical Care Facility Adults - 1:200	13/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Agreed	Replace if NA drawings amended to reflect comments prior to contract sign
NSGACL - PD-HLM-L(00)01-X-RA-001 - Radiology Adults	1	1	Board Exemplar Layout - Radiology Adults - 1st Floor - 1:200	06/05/2009	-	Omit	Superseded version	Agreed	
NSGACL - PD-HLM-L(00)01-X-RA-001 - Radiology Adults	2	2	Board Exemplar Layout - Radiology Adults - 1st Floor - 1:200	12/05/2009	-	Omit	Superseded version	Agreed	
NSGACL - PD-HLM-L(00)01-X-RA-001 - Radiology Adults	3	2	Board Exemplar Layout - Radiology Adults - 1st Floor - 1:200	13/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Replace with NA-XX-01-PL-252-207
NSGACL - PD-HLM-L(00)04-X-WA-001 - Generic Ward Floor (Adults)	1	1	Board Exemplar Layout - Generic Ward Floor Adults - 1:200	06/05/2009	-	Omit	Superseded version	Agreed	
NSGACL - PD-HLM-L(00)04-X-WA-001 - Generic Ward Floor (Adults)	2	2	Board Exemplar Layout - Generic Ward Floor Adults - 1:200	12/05/2009	-	Omit	Superseded version	Agreed	
NSGACL - PD-HLM-L(00)04-X-WA-001 - Generic Ward Floor (Adults)	3	2	Board Exemplar Layout - Generic Ward Floor Adults - 1:200	13/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Replace with NA-XX-05-PL-252-201
NSGACL-PD-BMJ-L(00)00-X-ED-001 - Emergency Department Childrens	1	1	Board Exemplar Layout - Emergency Department Childrens - 1:200	08/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Replace with NA-XX-00-PL-252-204
NSGACL-PD-BMJ-L(00)00-X-OW-001 - Observation Ward Childrens	1	1	Board Exemplar Layout - Observation Wards Children - 1:200	08/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Replace with NA-XX-00-PL-252-203
NSGACL-PD-HLM-L(00)00-X-AA-002 - Acute Assessment (adult) Flow	1		NSGACL-PD-HLM-L(00)00-X-AA-002 - Acute Assessment (adult) Flow	08/06/2009	Y	-	Remain ER requirement - to be omitted once design development concluded	Agreed	Replace if NA drawings amended to reflect comments prior to contract sign
NSGACL-PD-HLM-L(00)00-X-ED-002 - Emergency Department Adult Flow Diagram	1		NSGACL-PD-HLM-L(00)00-X-ED-002 - Emergency Department (adult) Flow Diagram	08/06/2009	Y	-	Remain ER requirement - to be omitted once design development concluded	Not Agreed	Replace with NA-XX-00-PL-252-305
NSGACL-PD-HLM-L(00)00-X-OP-002 - Outpatient (adults) Flow	1		NSGACL-PD-HLM-L(00)00-X-OP-002 - Outpatient (adult) Flow Diagram	08/06/2009	Y	-	Remain ER requirement - to be omitted once design development concluded	Not Agreed	
NSGACL-PD-HLM-L(00)00-X-RA-002 - Radiology (adult) Flow	1		NSGAL-PD-HLM-L(00)00-X-RA-002 - Radiology (adult) Flow Diagram	08/06/2009	Y	-	Remain ER requirement - to be omitted once design development concluded	Not Agreed	Replace with NA-XX-00-PL-252-307
NSGACL-PD-HLM-L(00)01-X-CC-002 - Critical Care Facility (adult) Flow	1		NSGACL-PD-HLM-L(00)01-X-CC-002 - Critical Care Facility (adult) Flow Diagram	08/06/2009	Y	-	Remain ER requirement - to be omitted once design development concluded	Agreed	Replace if NA drawings amended to reflect comments prior to contract sign
NSGACL-PD-HLM-L(00)01-X-OP-002 - Outpatients (Adults) Flow	1		NSGACL-PD-HLM-L(00)01-X-OP-002 - Outpatients (adult) Flow Diagram	08/06/2009	Y	-	Remain ER requirement - to be omitted once design development concluded	Not Agreed	
NSGACL-PD-HLM-L(00)01-X-RA-002 - Radiology (adult) Flow	1		NSGACL-PD-HLM-L-(00)01-X-RA-002-Radiology (adult) Flow Diagram	08/06/2009	Y	-	Remain ER requirement - to be omitted once design development concluded	Not Agreed	Replace with NA-XX-01-PL-252-307
NSGACL-PD-HLM-L(00)02-X-OP-002 - Outpatient (adults) Flow	1		NSGACL-PD-HLM-L(00)02-X-OP-002 - Outpatient (adults) Flow Diagram	08/06/2009	Y	-	Remain ER requirement - to be omitted once design development concluded	Not Agreed	
NSGACL-PD-HLM-L(00)02-X-OT-002 - Operating Theatres (adult) Flow	1		NSGACL-PD-HLM-L(00)02-X-OT-002 - Operating Theatres (adult) Flow Diagram	08/06/2009	Y	-	Remain ER requirement - to be omitted once design development concluded	Not Agreed	Omit - superseded by rev 2 below
NSGACL-PD-HLM-L(00)02-X-OT-002 - Operating Theatres (adult) Flow	2	A	NSGACL-PD-HLM-L(00)02-X-OT-002 - Operating Theatres (adult) Flow Diagram	21/07/2009	Y	-	Remain ER requirement - to be omitted once design development concluded	Agreed	Replace if NA drawings amended to reflect comments prior to contract sign
NSGACL-PD-HLM-L(00)04-X-WA-002 - Generic Ward (adult) Flow	1		NSGACL-PD-HLM-L(00)04-X-WA-002 - Generic Ward (adult) FLow Diagram)	08/06/2009	Y	-	Remain ER requirement - to be omitted once design development concluded	Not Agreed	Replace with NA-XX-05-PL-252-301

NSGACL - PD-HLM-L(00)02-X-OT-001 - Operating Theatres Adults	1		Board Exemplar Layout - Operating Theatres Adults - 1:200	03/06/2009
NSGACL-Generic ADB Room Layouts	1	1	Board Exemplar ADB Room Layouts	06/05/2009

Tbc - addressed under drawings listing to be issued to Brookfield	Agreed	Replace if NA drawings amended to reflect comments prior to contract sign
Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Replace with the following: Refer to NA-XX-XX-AS-400-000 Refer to NA-XX-XX-AS-400-001 Refer to NA-XX-XX-AS-400-002 Refer to NA-XX-XX-AS-400-003 Refer to NA-XX-XX-AS-400-004 Refer to NA-XX-XX-AS-400-005 Refer to NA-XX-XX-AS-400-006 Refer to NA-XX-XX-AS-400-007 Refer to NA-XX-XX-AS-400-008 Refer to NA-XX-XX-AS-400-009 Refer to NA-XX-XX-AS-400-010 Refer to NA-XX-XX-AS-400-011 Refer to NA-XX-XX-AS-400-012 Refer to NA-XX-XX-AS-400-013 Refer to NA-XX-XX-AS-400-014 Refer to NA-XX-XX-AS-400-016 Refer to NA-XX-XX-AS-400-017 Refer to NA-XX-XX-AS-400-018 Refer to NA-XX-XX-AS-400-019.1 Refer to NA-XX-XX-AS-400-019.2 Refer to NA-XX-XX-AS-400-019.3 Refer to NA-XX-XX-AS-400-019.4 Refer to NA-XX-XX-AS-400-020 Refer to NA-XX-XX-AS-400-021 Refer to NA-XX-XX-AS-400-022 Refer to NA-XX-XX-AS-400-023 Refer to NA-XX-XX-AS-400-024 Refer to NA-XX-XX-AS-400-025 Refer to NA-XX-XX-AS-400-026 Refer to NA-XX-XX-AS-400-027 Refer to NA-XX-XX-AS-400-028 Refer to NA-XX-XX-AS-400-029 Refer to NA-XX-XX-AS-400-030 Refer to NA-XX-XX-AS-400-031 Refer to NA-XX-XX-AS-400-032 Refer to NA-XX-XX-AS-400-033 Refer to NA-XX-XX-AS-400-034 Refer to NA-XX-XX-AS-400-035 Refer to NA-XX-XX-AS-400-036 Refer to NA-XX-XX-AS-400-037 Refer to NA-XX-XX-AS-400-038 Refer to NA-XX-XX-AS-400-039 Refer to NA-XX-XX-AS-400-040 Refer to NA-XX-XX-AS-400-041 Refer to NA-XX-XX-AS-400-042 Refer to NA-XX-XX-AS-400-043 Refer to NA-XX-XX-AS-400-044 Refer to NA-XX-XX-AS-400-045 Refer to NA-XX-XX-AS-400-046 Refer to NA-XX-XX-AS-400-047 Refer to NA-XX-XX-AS-400-048 Refer to NA-XX-XX-AS-400-049 Refer to NA-XX-XX-AS-400-050 Refer to NA-XX-XX-AS-400-051

								Refer to NA-XX-XX-AS-400-052	
								Refer to NA-XX-XX-AS-400-053	
								Refer to NA-XX-XX-AS-400-054	
								Refer to NA-XX-XX-AS-400-055	
								Refer to NA-XX-XX-AS-400-056	
								Refer to NA-XX-XX-AS-400-057	
								Refer to NA-XX-XX-AS-400-058	
								Refer to NA-XX-XX-AS-400-059	
								Refer to NA-XX-XX-AS-400-060	
								Refer to NA-XX-XX-AS-400-061	
								Refer to NA-XX-XX-AS-400-062	
								Refer to NA-XX-XX-AS-400-063	
								Refer to NA-XX-XX-AS-400-064	
								Refer to NA-XX-XX-AS-400-065	
								Refer to NA-XX-XX-AS-400-066	
								Refer to NA-XX-XX-AS-400-067	
								Refer to NA-XX-XX-AS-400-068	
								Refer to NA-XX-XX-AS-400-069	
								Refer to NA-XX-XX-AS-400-070	
								Refer to NA-XX-XX-AS-400-071	
								Refer to NA-XX-XX-AS-400-072.1	
								Refer to NA-XX-XX-AS-400-072.2	
								Refer to NA-XX-XX-AS-400-072.3	
								Refer to NA-XX-XX-AS-400-073	
								Refer to NA-XX-XX-AS-400-074	
								Refer to NA-XX-XX-AS-400-075	
								Refer to NA-XX-XX-AS-400-076	
NSGACL Appendix K - Design Development	1	1	App K Design Development	29/04/2009	-	Omit	Superseded by updated version (see Volume 4 tab)	Agreed	
NSGACL 5001	2	B	EXEMPLER MASTERPLAN ROADS LAYOUT	29/04/2009	-	Omit	Superseded version	Agreed	
NSGACL 5001	3	C	EXEMPLER MASTERPLAN ROADS LAYOUT	01/05/2009	-	Omit	Superseded version	Agreed	
NSGACL 5001	4	C	EXEMPLER MASTERPLAN ROADS LAYOUT	11/06/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Replaced with WSP drawing CD-WS-00-PL-711-01
NSGACL 5001 PDF	1	C	EXEMPLAR MASTERPLAN ROADS LAYOUT	11/06/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Replaced with WSP drawing CD-WS-00-PL-711-01
NSGACL 5002	2	-	CONSTRUCTION AND REFURBISHMENT REQUIREMENTS	29/04/2009	-	Omit	Superseded version	Agreed	
NSGACL 5002	3	A	CONSTRUCTION AND REFURBISHMENT REQUIREMENTS	01/05/2009	-	Omit	Superseded version	Agreed	
NSGACL 5002	4	A	CONSTRUCTION AND REFURBISHMENT REQUIREMENTS	11/06/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Check whether this can be replaced with WSP drawing CD-WS-00-PL-711-01
NSGACL 5002 PDF	1	a	EXEMPLAR CONSTRUCTION & REFURBISHMENT REQUIREMENTS	11/06/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Repeat of above
NSGACL GLRP0012 Substructure Options Report	1	-	NSGACL SUBSTRUCTURE OPTIONS REPORT	17/06/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Omit
NSGACL NHS Greater Glasgow & Clyde - NSGH Drainage Strategy Report	1	-	NSGH Drainage Strategy Report	28/04/2009	-	Omit	Superseded version	Agreed	
NSGACL NHS Greater Glasgow & Clyde - NSGH Drainage Strategy Report	2	A	NSGH Drainage Strategy Report	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Agreed*	*C&B to check with Raymond if report can be omitted. (post meeting note by BE - Report still relevant and should be read in conjunction with WSP drainage drawings - CD-P1-00-PL-140-01 to 013
Scottish Water DIA Response Letter 090609	1		Scottish Water DIA response	24/06/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Agreed*	*Correspondence still relevant and should be read in conjunction with WSP draiange drawings - CD-P1-00-PL-140-01 to 013
sk-0200	1		proposed underground building drainage schematic sheet 1 o 2	19/06/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	BE Drawings were not submitted however sketches to clarify proposals can be provided if necessary

sk-0201	1		proposed off site drainage works schematic sheet 2 of 2	19/06/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	BE Drawings were not submitted however sketches to clarify proposals can be provided if necessary
NSGACL Adult Isolation Rooms	1		Update on the Isolation Rooms for the New South Glasgow (Adult) Hospital	05/06/2009	-	Omit	Superseded version	Agreed	
NSGACL Update - Infection Control Feedback NSG	1		Update on Infection Control Feedback re Critical Care, Day Areas & Dialysis Unit for New South Glasg	18/06/2009	Y	-	Remains output for Ers.	Agreed*	*relates to provision of WHB's
NSGACL G1274_E(60)01-A1	1		Main Power Schematic	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	To be reviewed at M&E meeting to be arranged
NSGACL G1274_E(60)02-A1	1		Power Distribution Schematic	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Ditto above
NSGACL G1274_E(67)01-A1	1		Fire Alarm Schematic	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Ditto above
NSGACL G1274_E(68)01-A0	1		CCTV/Staff Attack & intruder Schematic	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Ditto above
NSGACL G1274_E(68)02-A1	1		Nurse Call Schematic	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Ditto above
NSGACL G1274_E(68)03-A1	1		Data Schematic Diagram	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Ditto above
NSGACL G1274_M(54)01-A1	1		Medical Gas Pipeline Schematic	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Ditto above
NSGACL G1274_M(54)02-A3	1		Natural Gas Schematic	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Ditto above
NSGACL G1274_M(55)01-A1	1		Chilled Water Distribution Schematic	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Ditto above
NSGACL-Appendix M&E1	1		New Hospital Building Services and Utility Connections	01/05/2009	Y	-	Remains output for ERs.	Not Agreed	Derogations to be agreed against these
NSGACL-Appendix M&E2	1		New Hospital Base Building Loads	01/05/2009	Y	-	Remains output for ERs.	Not Agreed	Ditto above
NSGACL-Appendix M&E3	1		Plant Strategy and Design Criteria	01/05/2009	Y	-	Remains output for ERs.	Not Agreed	Ditto above
NSGACL-Appendix M&E4	1		Sustainable Design Consideration	01/05/2009	Y	-	Remains output for ERs.	Not Agreed	Ditto above
NSGACL-Appendix M&E5	1		Integrated Building Management System	01/05/2009	Y	-	Remains output for ERs.	Not Agreed	Ditto above
NSGACL-Appendix M&E6	1		Renal Water	01/05/2009	Y	-	Remains output for ERs.	Not Agreed	Ditto above
NSGACL-Appendix M&E7	1		Pneumatic and Automated Material Transfer	01/05/2009	Y	-	Remains output for ERs.	Not Agreed	Ditto above
NSGACL-G1274_M(56)01-A1	1		MTHW Distribution Schematic	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	To be reviewed at M&E meeting to be arranged
NSGACL-G1274_M(56)02-A0	1		LTHW Distribution Schematic	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Ditto above
NSGACL-G1274_M(56)03-A0	1		Indicative Heating Distribution Route	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Ditto above
NSGACL-G1274_M(57)01-A3	1		Isolation Suites Plant Room Adjacent Ventilation System	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Ditto above
NSGACL-G1274_M(57)02-A4	1		Isolation Suite Vent System With Plant Room Above	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Ditto above

NSGACL-G1274_M(57)03-A1	1		Typical Adult Ward Tower Ventilation Schematic	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Ditto above
NSGACL-G1274_M(57)04-A1	1		Operating Theatre Ventilation Outline Plan and Schematic	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Ditto above
NSGACL-G1274_ME(60)01-A1	1		Proposed Energy Centre Plant Room Layout mthw solution	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Ditto above
NSGACL-G1274_ME(60)02-A3	1		Indicative Primary Sub Station Layout	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Ditto above
NSGACL-G1274_ME(60)03-A3	1		Indicative Layout of Main Services Tunnel	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Ditto above
NSGACL-G1274_P(53)01-A0	1		Typical CWS Distribution Layout	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Ditto above
NSGACL-G1274_P(67)01-A1	1		Sprinkler Installation Schematic	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Ditto above
NSGACL-G1274_P(67)02-A1	1		Wet Riser Distribution Schematic	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Ditto above
NSGACL-G1274_U(96)01-A0	1		Water, Gas and Electric Site Incoming Services	01/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	Ditto above
NSGACL GLRP0010 ASR2 Southern General Geo-env Report Draft	1	-	Southern General Geo-env Report Draft	30/04/2009	Y	-	Note: updated version issued (uplifted from C&B offices) is ER requirement (was too large for BIW)	Agreed	Outstanding info relating to aquifer survey awaited
NSGACL 6834 Chapter 01_Introduction	1	1	Chapter 1 Introduction	28/04/2009	Y	-	Remains output for ERs.	Agreed	BE note - check that these are not aspirational
NSGACL 6834 Chapter 02_Approach and Methodology	1	1	Chapter 2 Approach & Methology	28/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL 6834 Chapter 03_Need for the Project	1	1	Chapter 3 Need for the Project	28/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL 6834 Chapter 04 Consideration of Alternatives	1	1	Chapter 4 Consideration of Alternatives	28/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL 6834 Chapter 05_Proposed Development	1	1	Chapter 5 Proposed Development	28/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL 6834 Chapter 06_Land Use	1	1	Chapter 6 Land Use	28/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL 6834 Chapter 07_Ground Conditions	1	1	Chapter 7 Ground Conditions	28/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL 6834 Chapter 08 Policies and Plans	1	1	Chapter 8 Policies & Plans	28/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL 6834 Chapter 09_Community, Pedestrians and Cyclists	1	1	Chapter 9 Community Pedestrians and Cyclists	28/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL 6834 Chapter 10_Townscape and Visual	1	1	Chapter 10 Townscape and Visual	28/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL 6834 Chapter 11_Water Quality and Drainage	1	1	Chapter 11 - Water Quality and Drainage	28/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL 6834 Chapter 12_Noise	1	1	Chapter 12 Noise	28/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL 6834 Chapter 13_Air Quality	1	1	Chapter 13 Air Quality	28/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL 6834 Chapter 14_Cultural Heritage	1	1	Chapter 14 Cultural Heritage	28/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL 6834 Chapter 15_Ecology, Nature Conservn and Biodivy	1	1	Chapter 15 Ecology Nature Convservation and Biodiversity	28/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL 6834 Chapter 16_Sustainable Development	1	1	Chapter 16 Sustainable Development	28/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL 6834 Chapter 17_Disruption Due to Construction	1	1	Chapter 17 Disruption due to Construction	29/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL 6834 Chapter 18_Cumulative Impacts	1	1	Chapter 18 Cumulative Impacts	29/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL 6834 Chapter 19_Schedule of Environmental Commitments	1	1	Chapter 19 Schedule of Environmental Commitments	29/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL 6834 Contents Pages	1	1	Contents pages	29/04/2009	Y	-	Remains output for ERs.	Agreed*	* Outline Planning Consent Documents
NSGACL 6834 Front Page	1	1	Appendix O Front page	29/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above

NSGACL 6834 Info Sheet	1	1	Appendix O Information sheet	29/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL 6834 Part 1	1	1	Appendix O Fly sheet part 1	29/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL 6834 Part 2	1	1	Appendix O Fly Sheet part 2	29/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL 6834 Part 3	1	1	Appendix O Fly Sheet part 3	29/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL 6834 Part 4	1	1	Appendix O Fly Sheet part 4	29/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL 6834 Part 5	1	1	Appendix O Fly Sheet part 5	29/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL Appendix O - Environmental Assessment Cover	1	1	Appendix O Cover Page	29/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL - P.3 Draft Operational Procedure - Domestic Services	1	1	Appendix P.3 Draft Op Procedures (Domestic Linen)	01/05/2009	Y	-	Remains output for ERs.	Not Agreed	Post meet note. These appear to be repeats of docs issued on 7/5/09 on page 1?
NSGACL - P.3 Draft Operational Procedure - Linen	1	1	Appendix P.3 Draft Op Procedures (Linen)	01/05/2009	Y	-	Remains output for ERs.	Not Agreed	Ditto above
NSGACL - P.3 Draft Operational Procedure - Waste	1	1	Appendix P.3 Draft Op Procedures (Waste)	01/05/2009	Y	-	Remains output for ERs.	Not Agreed	Ditto above
NSGACL P.1 Lists of Board Policies	1	1	App P List of Board Policies	29/04/2009	Y	-	Remains output for ERs.	Not Agreed	Ditto above
NSGACL P.2 Board Carbon Management Plan	1	1	App P Board Carbon Management Plan	29/04/2009	Y	-	Remains output for ERs.	Agreed	
NSGACL A Policy on Design Quality for NHSScotland	1	1	App Q Policy on Design for NHS Scotland	29/04/2009	Y	-	Remains output for ERs.	Agreed	
NSGACL Appendix Q - Related Design Information cover	1	1	App Q Related Design Info Cover	29/04/2009	Y	-	Remains output for ERs.	Agreed	
NSGACL NHSGG&C Design Action Plan	1	1	App Q Design Action Plan	29/04/2009	Y	-	Remains output for ERs.	Agreed*	Document to be checked to ensure nothing aspirational that cannot be measured
NSGACL NHSGG&C Design Action Plan (Supp Guidance Handbook)	1	1	App Q NHSGG&C Design Action Plan (Supp Guidance Handbook)	29/04/2009	Y	-	Remains output for ERs.	Agreed	Ditto above
NSGACL Planning Advice Note 84 - Reducing Carbon	1	1	App Q Planning Advice Note 84 Reducing Carbon	29/04/2009	Y	-	Remains output for ERs.	Agreed	
NSGACL Scottish Planning Policy SPP6 - Renewable Energy	1	1	App Q Scottish Planning Policy SPP6 Renewable Energy	29/04/2009	Y	-	Remains output for ERs.	Agreed	
NSGACL Appendix R - Fire Strategy	1	1	App R Fire strategy	01/05/2009	Y	-	Remains output for ERs.	Not Agreed	If documents are strategies then omit. If they are requirements for strategies to be produced then leave
NSGACL Appendix S - Acoustic Requirements	1	1	App S Acoustic requirements	01/05/2009	Y	-	Remains output for ERs.	Not Agreed	Ditto above
NSGACL Southern General PCI Issue 1	1		NSGACL Pre - Construction Information Pack	06/05/2009	Y	-	Remains output for ERs.	Agreed	
NSGACL Appendix U - BREEAM Design Guide	1	1	Breeam design Guide	05/05/2009	Y	-	Remains output for ERs.	Agreed	
NSGACL BREEAM Initial Score Potential Main Development	1		Main Development Initial Score Potential	30/06/2009	Y	-	Remains output for ERs.	Agreed	
NSGACL Whole Site and Planning Issues related to BREEAM June 2009	1		Schedule of collated documents and planning issues relating to BREEAM	30/06/2009	Y	-	Remains output for ERs.	Agreed	
NSGACL Appendix V -Community Benefits	1	1	Appendix V	06/05/2009	Y	-	Remains output for ERs.	Not Agreed	Mark McA to confirm that BE proposals can replace this resposibilities to be agreed
NSGACL Appendix W - Travel Plan	1	1	Travel Plan	30/04/2009	Y	-	Remains output for ERs.	Agreed*	
NSGACL Appendix X - Critical Failures	1	1	App X Critical Failures	01/05/2009	Y	-	Remains output for ERs.	Agreed	BE note - check compliance as needs to stay
NSGACL - ITPD Volume 2	1	1	Employers Requirements (Hospital)	01/05/2009	Y	-	Remains output for ERs.	Agreed*	Needs to be accepted that where BE information accepted, relevant part of ER's is s/s
NSGACL-PD-HLM-SK(00)X-XX-001 - Illustration Of 10 Bed Unit HDU	1	1	3D Illustration of 10 Bed Unit HDU	05/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Agreed	Replace if NA drawings amended to reflect comments prior to contract sign
NSGACL-PD-HLM-SK(00)X-XX-002 - Illustration Of 10 Bed Unit ICU	1	1	3D Illustration of 10 Bed Unit ICU	05/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Agreed	Replace if NA drawings amended to reflect comments prior to contract sign
NSGACL-PD-HLM-SK(00)X-XX-003 - Illustration Of Ward Circulation	1	1	3D Illustration of Ward Circulation	05/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	
NSGACL-PD-HLM-SK(00)X-XX-004 - Illustration Of Ward Nurse Station	1	1	3D Illustration of Ward Nurse Station	05/05/2009			Tbc - addressed under drawings listing to be issued to Brookfield	Not Agreed	

File Name	Iss.	Rev.	Title	Issue Date	Add	Info/Omit	Board Comment	Status	Brookfield Comment
NSGACL Appendix A1	1	1	V2.2 Appendix A Part 1	29/04/2009				Agreed	
NSGACL Appendix A2.1	1	1	V2.2 Appenix A Pt 2 Arch Location Drwgs (1 of 2)	29/04/2009				Agreed	
NSGACL Appendix A2.2	1	1	V2.2 Appendix A Pt 2 Arch Location Drwgs (2 of 2)	29/04/2009				Agreed	
2475 AL(05)20	1	-	South Elevation	22/06/2009				Agreed	
2475 AL(05)21	1	-	East Elevation	22/06/2009				Agreed	
2475 AL(05)22	1	-	View Throgh Service Courtyard	22/06/2009				Agreed	
2475 AL(05)23	1	-	View Through Service Courtyard 2	22/06/2009				Agreed	
2475 AL(05)24	1	-	North Elevation	22/06/2009				Agreed	
2475 AL(05)25	1	-	West Elevation	22/06/2009				Agreed	
2475 AL(05)26	1	-	View Through Service Courtyard 3	22/06/2009				Agreed	
NSGACL Appendix A3.1	1	1	Outline Design Layouts (1 of 6)	29/04/2009				Agreed	
NSGACL Appendix A3.2	1	1	Outline Design layouts (2 of 6)	29/04/2009				Agreed	
NSGACL Appendix A3.3	1	1	Outline Design Layouts (3 of 6)	29/04/2009				Agreed	
NSGACL Appendix A3.4	1	1	Outline Design layouts (4 of 6)	29/04/2009				Agreed	
NSGACL Appendix A3.5	1	1	Outline Design Layouts (5 of 6)	29/04/2009				Agreed	
NSGACL Appendix A3.6	1	1	Outline Design Layouts (6 of 6)	29/04/2009				Agreed	
NSGACL Appendix A4	1	1	Typical Rm Data Sheets	29/04/2009				Agreed	
NSGACL Appendix A5	1	1	Outline Design Elevations	29/04/2009				Agreed	
NSGACL Appendix A6.1	1	1	Outline Description M&E Services (1 of 2)	29/04/2009				Agreed	
NSGACL Appendix A6.2	1	1	Outline Description of M&E Services (2 of 2)	29/04/2009				Agreed	
NSGACL Appendix A7	1	1	Outline Structural Proposals	29/04/2009				Agreed	
NSGACL Appendix A8	1	1	Glasgow City Mortuary	29/04/2009				Agreed	
NSGACL Appendix A9	1	1	Massing 3D Views	29/04/2009				Agreed	
NSGACL Appendix B1	1	1	Outline Brief Facilities Management	29/04/2009				Agreed	
NSGACL Appendix B2	1	1	Outline Brief Mortuary	29/04/2009				Agreed	
NSGACL Appendix B3	1	1	Outline Brief Blood Sciences	29/04/2009				Agreed	
NSGACL Appendix B4	1	1	Outline Brief Genetics	29/04/2009				Agreed	
NSGACL Appendix B5	1	1	Outline Brief Pathology	29/04/2009				Agreed	
NSGACL Appendix B6	1	1	Outline Brief Microbiology	29/04/2009				Agreed	
NSGACL Appendix C1	1	1	Outline Architectural Specs	29/04/2009				Agreed	

NSGACL Appendix C2	1	1	Outline Structural Specs	29/04/2009		Agreed
NSGACL Employers Requirements	1	1	V2.2 Employers Requirments Main Doc (Labs)	29/04/2009		Agreed

File Name	Iss.	Rev.	Title	Issue Date	Add	Info/Omit	Board Comment	Status	Brookfield Comment
NSGACL Cashflow	1	1	NSGACL Cashflow Template (Appendix to Vol 3)	07/05/2009	-	Omit	Bid period document, superseded by Contract for signature to be issued by S+W	Agreed	
NSGACL MPTC Calculator Blank	1	1	MPTC Calculator Template (Appendix to Vol 3)	07/05/2009	-	Omit	Bid period document, superseded by Contract for signature to be issued by S+W	Agreed	
NSGACL SCM Standard Fee Workbook	1	1	SCM Standard Fee Workbook Template (Appendix to Vol 3)	07/05/2009	-	Omit	Bid period document, superseded by Contract for signature to be issued by S+W	Agreed	
NSGACL SCM Standard Fee Workbook	2	2	SCM Standard Fee Workbook Template (Appendix to Vol 3)	22/06/2009	-	Omit	Bid period document, superseded by Contract for signature to be issued by S+W	Agreed	
NSGACL SCP_Workbook_Issue	1	1	SCP Workbook Issue Template (Appendix to Vol 3)	07/05/2009	-	Omit	Bid period document, superseded by Contract for signature to be issued by S+W	Agreed	
NSGACL SCP_Workbook_Issue	2	2	SCP Workbook Issue Template (Appendix to Vol 3)	22/06/2009	-	Omit	Bid period document, superseded by Contract for signature to be issued by S+W	Agreed	
NSGH - ITPD Vol3	1		NSGACL ITPD Volume 3 Bid Deliverables & Evaluation	01/05/2009	-	Omit	Bid period document, not forming part of the Contract	Agreed	
NSGACL - ITPD Vol3 - Contractor Issue Rev 1	1	1	NSGACL - ITPD Vol3 - Contractor Issue Rev 1.pdf	14/08/2009	-	Omit	Bid period document, not forming part of the Contract	Agreed	
NSGACL Commercial CD Session Nr 1	1		PRESENTATION	22/05/2009	-	Omit	Bid period document, not forming part of the Contract	Agreed	
NSGACL Labs Bidders Presentation 2	1		PRESENTATION	22/05/2009	-	Omit	Bid period document, not forming part of the Contract	Agreed	
NSGACL Labs CD Session Nr 1	1		PRESENTATION	22/05/2009	-	Omit	Bid period document, not forming part of the Contract	Agreed	
NSGACL Presentation Logistics CD no 1	1		PRESENTATION	22/05/2009	-	Omit	Bid period document, not forming part of the Contract	Agreed	
NSGACL SCM_Eng Workbook_Issue	1		Engineering and Construction SCM Workbook	14/08/2009	-	Omit	Bid period document, superseded by Contract for signature to be issued by S+W	Agreed	

File Name	Iss.	Rev.	Title	Issue Date	Add	Info/Omit	Board Comment	Status	Brookfield Comment
01 Employers Requirements Stage D	1	-	01 Employers Requirements Stage D	02/07/2009				Agreed	
A1 Master Plan	1	-	A1 Master Plan	02/07/2009				Agreed	
A10 BREEAM	1	-	A10 BREEAM	02/07/2009				Agreed	
A13 Risk	1	-	A13 Risk	02/07/2009				Agreed	
A2 Architectural Location	1		A2 Architectural Location	02/07/2009				Agreed	
A3 Stage D Plans 1	1	-	A3 Stage D Plans 1	02/07/2009				Agreed	
A3 Stage D Plans 1	2	A	A3 Stage D Plans 1	09/07/2009				Agreed	
A3 Stage D Plans 2	1	-	A3 Stage D Plans 2	02/07/2009				Agreed	
A4 Elevations	1	-	A4 Elevations	02/07/2009				Agreed	
A4 Elevations	2	A	A4 Elevations	08/07/2009				Agreed	
A5 Builderswork Plans 1	1	-	A5 Builderswork Plans 1	02/07/2009				Agreed	
A5 Builderswork Plans 2	1	-	A5 Builderswork Plans 2	02/07/2009				Agreed	
A6 Fitment Plans 1	1	-	A6 Fitment Plans 1	02/07/2009				Agreed	
A6 Fitment Plans 2	1	-	A6 Fitment Plans 2	02/07/2009				Agreed	
A6 Fitment Plans 3	1	-	A6 Fitment Plans 3	02/07/2009				Agreed	
A6 Fitment Plans 4	1	-	A6 Fitment Plans 4	02/07/2009				Agreed	
A7 Fire Strategy	1	-	Fire Compartmentation Plans	03/07/2009				Agreed	
A7.2 Fire Strategy Report	1		Fire Strategy Report	03/07/2009				Agreed	
A8 Visuals 1	1	-	A8 Visuals 1	02/07/2009				Agreed	
A8 Visuals 2	1	-	A8 Visuals 2	02/07/2009				Agreed	
A8 Visuals 3	1	-	A8 Visuals 3	02/07/2009				Agreed	
A9 Planning Application 1	1	-	A9 Planning Application 1	02/07/2009				Agreed	
A9 Planning Application 1	2	A	A9 Planning Application 1	21/07/2009				Agreed	
A9 Planning Application 2	1	-	A9 Planning Application 2	02/07/2009				Agreed	
A9 Planning Application 2	2	A	A9 Planning Application 2	21/07/2009				Agreed	
A9 Planning Application 3	1	-	A9 Planning Application 3	02/07/2009				Agreed	
A9 Planning Application 3	2	A	A9 Planning Application 3	21/07/2009				Agreed	
A9 Planning Application 4	1	-	A9 Planning Application 4	21/07/2009				Agreed	
A9 Planning Application 5	1	-	A9 Planning Application 5	21/07/2009				Agreed	
A9 Planning Application 6	1	-	A9 Planning Application 6	21/07/2009				Agreed	
A9 Planning Application 7	1	-	A9 Planning Application 7	21/07/2009				Agreed	

AL(00)01	1	-	Level -1	02/07/2009		Agreed
AL(00)02	1	-	Level 0	02/07/2009		Agreed
AL(00)03	1	-	Level 1	02/07/2009		Agreed
AL(00)04	1	-	Level 2	02/07/2009		Agreed
AL(00)05	1	-	Level 3	02/07/2009		Agreed
AL(00)06	1	-	Level 4	02/07/2009		Agreed
AL(00)07	1	-	Level 5	02/07/2009		Agreed
AL(05)01	1	-	Elevation 1	02/07/2009		Agreed
AL(05)02	1	-	Elevation 2	02/07/2009		Agreed
AL(05)03	1	-	Elevation 3	02/07/2009		Agreed
AL(05)04	1	-	Elevation 4	02/07/2009		Agreed
AL(05)05	1	-	Elevation 5	02/07/2009		Agreed
AL(05)06	1	-	Elevation 6	02/07/2009		Agreed
AL(05)07	1	-	Elevation 7	02/07/2009		Agreed
AL(20)01	1	-	Section AA	28/07/2009		Agreed
AL(20)02	1	-	Section BB	28/07/2009		Agreed
AL(20)03	1	-	Section CC	28/07/2009		Agreed
B2A Mortuary	1	-	Outline Brief Mortuary	03/07/2009		Agreed
B3A Blood Sciences	1	-	Outline Brief Blood Sciences	03/07/2009		Agreed
B4A Genetics	1	-	Outline Brief Genetics	03/07/2009		Agreed
B5A Pathology	1	-	Outline Brief Pathology	03/07/2009		Agreed
B6A Micro-Biology	1	-	Outline Brief Micro Biology	03/07/2009		Agreed
C Outline Specification rev A	1	-	Outline Specifications	03/07/2009		Agreed
C Outline Specification rev A	2	B	Outline Specifications	08/07/2009		Agreed
Site & Setting Out	1	-	A9 Site & Setting Out DWG	21/07/2009		Agreed
NSGACL B of approx Q	1	1	Labs BW B of Approx Quants	22/07/2009		Agreed
NSGACL Labs M&E Pricing Sch	1	1	M&E Pricing Sch for Labs	22/07/2009		Agreed
NSGACL 17-07m-16 mes stage d rev 01	1		Update - Appendix A11, Outline Description of Mechanical & Electrical Engineering Services & Outline	22/07/2009		Agreed
NSGACL 2475 Letter	1		Glasgow City Council Letter to BMJ re Labs Planning Submission 09/01676/DC	31/07/2009		Agreed
NSGACL G1313_ M(54)SK01-A3	1		Natural Gas Schematic	11/08/2009		Agreed
NSGACL G1313_ U(96)SK01 Z (A1)	1		Site Utility Routes	11/08/2009		Agreed

NSGACL Laboratories BREEAM	1		Labs initial workshop template write up	02/07/2009		Agreed
NSGACL Laboratory Block Con App Docs Final Draft	1		Laboratory block - Draft Consultants Appointment Document - 26 June 2009	17/07/2009		Agreed
NSGACL Labs M&E Spec	1		Laboratory Development, Stage D Appendix 2, Mechanical & Electrical Services Specification 12th July	14/07/2009		Agreed
NSGACL Lift Schedule Revision 3 07 08 09 Stage D	1		New Laboratory Facility, Lift Schedule Rev 03, 7 Aug '09 : Stage D	10/08/2009		Agreed
NSGACL Main M&E Plant Schedule - Labs	1		Labs Building - Main M&E Plant Schedule, 14/7/09	16/07/2009		Agreed
NSGACL-G1313_ E(61)SK03	1		LEVEL 0 PLAN - MAIN ELECTRICAL CONTAINMENT ROUTES	17/07/2009		Agreed
NSGACL-G1313_ E(61)(-)SK01	1		Power Connections Prior to Energy Centre	03/07/2009		Agreed
NSGACL-G1313_ E(61)SK02	1		LEVEL -1 PLAN - MAIN ELECTRICAL CONTAINMENT ROUTES	16/07/2009		Agreed
NSGACL-G1313_ E(63)(-)SK01	1		Schematic Layout of Emergency Lighting Installation	03/07/2009		Agreed
NSGACL-G1313_ E(64)(-)SK01	1		Schematic Layout of CCTV & Intruder Alarm Installation	03/07/2009		Agreed
NSGACL-G1313_ E(65)(-)SK01	1		Schematic Layout of Data/Comms Installation	03/07/2009		Agreed
NSGACL-G1313_ E(67)(-)SK01	1		Schematic Layout of Fire Detection and Alarm System	03/07/2009		Agreed
NSGACL-G1313_ E(68)(-)SK01	1		Data/Comms Schematic Site Distribution	03/07/2009		Agreed
NSGACL-G1313_ M(50)(-)SK01	1		Schematic Layout of Domestic Water Services	03/07/2009		Agreed
NSGACL-G1313_ M(50)(-)SK02	1		Schematic Layout of Main Cooling Services	03/07/2009		Agreed
NSGACL-G1313_ M(50)(-)SK03	1		Schematic Layout of Main Heating Services	03/07/2009		Agreed
NSGACL-G1313_E(62)(1)SK01	1		LEVEL 1 - INDICATIVE LAYOUT OF POWER SERVICES	16/07/2009		Agreed
NSGACL-G1313_E(62)(1)SK01	2		LEVEL 1 - INDICATIVE LAYOUT OF POWER SERVICES	17/07/2009		Agreed
NSGACL-G1313_E(63)(1)SK02	1		LEVEL 1 - INDICATIVE LAYOUT OF LIGHTING & EMERGENCY LIGHTING	16/07/2009		Agreed
NSGACL-G1313_E(63)(1)SK02	2		LEVEL 1 - INDICATIVE LAYOUT OF LIGHTING & EMERGENCY LIGHTING	17/07/2009		Agreed
NSGACL-G1313_E(67)(1)SK02	1		LEVEL 1 - INDICATIVE LAYOUT OF FIRE DETECTION & ALARM SYSTEM	16/07/2009		Agreed
NSGACL-G1313_E(67)(1)SK02	2		LEVEL 1 - INDICATIVE LAYOUT OF FIRE DETECTION & ALARM SYSTEM	17/07/2009		Agreed
NSGACL-G1313_M(50)SK04	1		LEVEL -1 PLAN - MORTUARY - TYPICAL MECHANICAL SERVICES	16/07/2009		Agreed
NSGACL-G1313_M(50)SK04	2		LEVEL -1 PLAN - MORTUARY - TYPICAL MECHANICAL SERVICES	17/07/2009		Agreed
NSGACL-G1313_M(50)SK05	1		LEVEL 0 PLAN - SHEET 1 of 3 - TYPICAL MECHANICAL SERVICES	16/07/2009		Agreed
NSGACL-G1313_M(50)SK05	2		LEVEL 0 PLAN - SHEET 1 of 3 - TYPICAL MECHANICAL SERVICES	17/07/2009		Agreed
NSGACL-G1313_M(50)SK06	1		LEVEL 0 PLAN - SHEET 2 of 3 - TYPICAL MECHANICAL SERVICES	16/07/2009		Agreed
NSGACL-G1313_M(50)SK06	2		LEVEL 0 PLAN - SHEET 2 of 3 - TYPICAL MECHANICAL SERVICES	17/07/2009		Agreed
NSGACL-G1313_M(50)SK07	1		LEVEL 0 PLAN - SHEET 3 of 3 - TYPICAL MECHANICAL SERVICES	16/07/2009		Agreed
NSGACL-G1313_M(50)SK07	2		LEVEL 0 PLAN - SHEET 3 of 3 - TYPICAL MECHANICAL SERVICES	17/07/2009		Agreed
NSGACL-G1313_M(56)(1)SK01	1		LEVEL 1 - INDICATIVE LAYOUT OF SPACE HEATING SERVICES	16/07/2009		Agreed

NSGACL-G1313_M(56)(1)SK01	2		LEVEL 1 - INDICATIVE LAYOUT OF SPACE HEATING SERVICES	17/07/2009		Agreed
NSGACL-G1313_M(57)(1)SK01	1		LEVEL 1 - INDICATIVE LAYOUT OF VENTILATION SERVICES	16/07/2009		Agreed
NSGACL-G1313_M(57)(1)SK01	2		LEVEL 1 - INDICATIVE LAYOUT OF VENTILATION SERVICES	17/07/2009		Agreed
NSGACL-G1313_ME(50)SK01	1		FRONT OFFICE BLOCK - FIRST, SECOND, THIRD & ROOF PLANS - TYPICAL M&E SERVICES	16/07/2009		Agreed
NSGACL-G1313_ME(50)SK01	2		FRONT OFFICE BLOCK - FIRST, SECOND, THIRD & ROOF PLANS - TYPICAL M&E SERVICES	17/07/2009		Agreed

File Name	Iss.	Rev.	Title	Issue Date	Add	Info/Omit	Board Comment	Status	Brookfield Comment
NSGACL PD-HLM-SK(00)X-XX-005 - General Section Illustrating Bridge Links To Exisitng Buildings	1	1	General Section Illustrating Bridge Links To Exisiting Buildings	02/07/2009	-	Omit	Superseded by later revision.	Agreed	
NSGACL PD-HLM-SK(00)X-XX-005 - General Section Illustrating Bridge Links To Exisitng Buildings	2	A	General Section Illustrating Bridge Links To Exisiting Buildings	23/07/2009	Y	-	Remains ER output, aspect to be signed off under design development.	Agreed	
(AL0) Ground floor	1		Stage 3A Demolition Info	14/07/2009	Y	-	Remains ER output as identifies area for demolition.	Agreed	
(AL1) First floor	1		Stage 3A Demolition Info	14/07/2009	Y	-	Remains ER output as identifies area for demolition.	Agreed	
(AL2) Second floor	1		Stage 3A Demolitions Info	14/07/2009	Y	-	Remains ER output as identifies area for demolition.	Agreed	
(AN) Biochemistry	1		Stage 3A Demolition Info	14/07/2009	Y	-	Remains ER output as identifies area for demolition.	Agreed	
(DC) HDU & SITU	1		Stage 3A Demolition Info	14/07/2009	Y	-	Remains ER output as identifies area for demolition.	Agreed	
(DG) Orthopaedic Theatres	1		Stage 3A Demolition Info	14/07/2009	Y	-	Remains ER output as identifies area for demolition.	Agreed	
2291 AL(00)	1		Maternity Offices - updated general arrangement ground floor plan	22/06/2009	Y	-	Remains ER output as identifies area for demolition.	Agreed	
A&E Orthopaedics - type 2 summary	1		Stage 3A Demolition Info	14/07/2009	Y	-	Remains ER output as identifies area for demolition.	Agreed	
A&E-Therapy-General OPD PH3A	1		Stage 3A Demolition Info	14/07/2009	Y	-	Remains ER output as identifies area for demolition.	Agreed	
Biochemistry - type 2 summary	1		Stage 3A Demolition Info	14/07/2009	Y	-	Remains ER output as identifies area for demolition.	Agreed	
DRAFT - Southern General Hospital Travel Plan 3Comp121207	1		NSGACL - Draft Travel Plan	10/06/2009	Y	-	Remains relevant output document, transportation and Planning issued to be agreed with GCC by the Contractor at Contractor risk.	Not Agreed	Repeat
HDU SITU - type 2 summary	1		Stage 3A Demolition Info	14/07/2009	Y	-	Remains ER output as identifies area for demolition.	Agreed	
NSGACL - Agreed Contract Changes 20090611	1		Agreed Contract Changes - All Bidders - 11th June 2009	12/06/2009	-	Omit	Bid period document, superseded by Contract for signature to be issued by S+W	Agreed	
NSGACL - Appendix K - updateRev 1 - Vol 4	1	1	NSGACL - Appendix K - updateRev 1 - Vol 4.pdf	14/08/2009	Y	-	Remains ER output to be met by design development and deliverables planning and implementation.	*Agreed	Extent of info required for FBC to be agreed
NSGACL - Detailed Employers Requirements & Procedures for Radiation Protection Advisors (Health Physics) Input into Project V3	1		Radiation Protection Advisers' Input Into New Adult Hospital and New Children's Hospital	24/07/2009	Y	-	Relevant ER output/requirement.	Agreed	BE note - Do we comply as required
NSGACL - Indicative Demolition Dates	1		NSGACL - Indicative Demolition Dates	22/07/2009	-	Omit	Superseded by discussions with the Board and outcome package for demolitons.	Agreed	
NSGACL - Labs - L0	1		NSGACL - Labs - L0.dwg	10/06/2009				Agreed	
NSGACL - Labs - L1	1		NSGACL - Labs - L1.dwg	10/06/2009				Agreed	
NSGACL - Labs - L-1	1		NSGACL - Labs - L-1.dwg	10/06/2009				Agreed	
NSGACL - Labs - L2	1		NSGACL - Labs - L2.dwg	10/06/2009				Agreed	
NSGACL - Labs - L3	1		NSGACL - Labs - L3.dwg	10/06/2009				Agreed	
NSGACL - Labs - L4	1		NSGACL - Labs - L4.dwg	10/06/2009				Agreed	
NSGACL - NSGH Existing Site Services	1		NSGACL - NSGH Existing Site Services.dwg	10/06/2009	Y	-	Relevant ER document.	Agreed	
NSGACL - Supersede of Radiation Protection MRI References - Vol2 1 ITPD Section	1		Supercede of Radiation Protection & MRI References - Vol 2/1 ITPD : Sections 7.5.5, 7.9.6 & 8.1.1	24/07/2009	Y	-	Relevant ER output/requirement.	Agreed	BE note - Do we comply as required
NSGacl - Vol 4 - Lift Analysis Information	1		NSGacl - Vol 4 - Lift Analysis Information.pdf	10/06/2009	-	Omit	Background bid information to bidders.	Agreed	
NSGACL - Vol4 - Energy Guidance	1		NSGACL - Vol4 - Energy Guidance.pdf	14/08/2009	Y	-	Relevant ER document.	Agreed	BE note - Do we comply as required
NSGACL - Vol4 - Technical _various_ 19nr	1	1	NSGACL - Vol4 - Technical _various_ 19nr.pdf	14/08/2009	Y	-	All are relevant ER requirements, with the exception of items 7, 8, 13, 14 and 16 which can be discarded (provided information relevant to bid period only).	Agreed	BE Note - check inclusions and omissions
NSGACL 090330 AGREED List of Key Rooms NCH Rev1	1		Updated agreed list of key rooms - New Children's Hospital	11/08/2009	-	Omit	Information relevant to bid period only.	Agreed	
NSGACL 090330 AGREED List of Key Rooms NSGH Rev1	1		Updated agreed list of key rooms - New Adult Hospital	11/08/2009	-	Omit	Information relevant to bid period only.	Agreed	
NSGACL 20090330 AGREED List of Key Rooms NCH	1		Agreed List of Key Rooms re New Children's Hospital	23/07/2009	-	Omit	Superseded by updated list.	Agreed	
NSGACL 20090330 AGREED List of Key Rooms NSGH	1		Agreed List of Key Rooms re New Adult Hospital	23/07/2009	-	Omit	Superseded by updated list.	Agreed	
NSGACL 20090615 Equipment List	1		NSGH Equipment List (Adult & Children)	09/07/2009	Y	-	Remains until bid submission list is ratified and adopted.	Not Agreed	BE Equipment list to replace

NSGACL 3T MRI REQUIREMENTS	1		Siting Requirements For 3T MRI Systems	17/07/2009	Y	-	Relevant ER output/requirement.	Agreed	
NSGACL AitkenLaboratoriesSiteInvestigation	1		Geotechnical Historical Information - Aitken Laboratories Ltd	15/06/2009	-	Omit	Background bid information to bidders.	Not Agreed	To be included
NSGACL ARUPBoreholes	1		Geotechnical Historical Information from Arup - Boreholes	15/06/2009	-	Omit	Background bid information to bidders.	Not Agreed	To be included
NSGACL Clarification Wireless LAN Density Vol 2 1 Sect 8 3 8	1		Clarification to Bidders re Wireless LAN Density Allowance	31/07/2009	Y	-	Remains ER output	Agreed	
NSGACL Commercial CD Session Nr 1	2		PRESENTATION	22/05/2009	-	Omit	Background bid information to bidders.	Agreed	
NSGACL Cover Note re Drawing 2291 AL	1		Additional Note re Drawing 2291 AL (Maternity Offices)	22/06/2009	Y	-	Relevant ER document.	Agreed	
NSGACL December1989SiteInvestigationReport	1		Geotechnical Historical Information - 1989 site investigation	15/06/2009	-	Omit	Background bid information to bidders.	Not Agreed	To be included
NSGACL Design Report Final Version	1		Report on patient & carer input to design process for New South Glasgow Hospitals - April 2009	20/07/2009	-	Omt	Background bid information to bidders.	Agreed	
NSGACL Draft Labs Fire Strategy	1		Draft Laboratory Fire Strategy	12/06/2009				Agreed	
NSGACL Draft Section 75	1		Minute of Agreement - Draft Section 75	01/06/2009	Y	-	Remains ER output	Agreed	To be replaced with Actual S75 Agreement. Brookfield agree with Board comment but would note for clarity that risk of complying with Section 75 Agreements remains with the Board as per Board accepted Risk Register
NSGACL Drainage and Sewerage Impact Assessment Report 2007	1		Southern General Hospital, Drainage & Sewerage Impact Assessment - June 2007	05/06/2009	-	Omit	Background bid information to bidders.	Agreed	
NSGACL FUGROSoilsInvestigationReport	1		Geotechnical Historical Information - Soil Investigation 1985	15/06/2009	-	Omit	Background bid information to bidders.	Not Agreed	To be included
NSGACL Generic Ward Matrix NCH	2		New Children's Hospital Patient/Public/Staff - Pathways/Adjacencies	12/06/2009	Y	-	Remains ER output.	Not Agreed	To be omitted
NSGACL Geotechnical&ContaminationReport	1		Geotechnical Historical Information - Geotechnical and Contamination Report 1998	15/06/2009	-	Omit	Background bid information to bidders.	Not Agreed	To be included
NSGACL Halcrow Flood Risk 2005	1		Southern General Hospital, Flood Risk Assessment - April 2005	05/06/2009	-	Omit	Background bid information to bidders.	Not Agreed	To be included
NSGACL Hoists	1		Clarification re Ceiling Mounted Tracking Hoists	20/07/2009	Y	-	Remains ER output	Agreed	BE note - to check
NSGACL ITPCD Clarification - Decontamination Equipment Services	1		Competitive Dialogue Clarification Note re Decontamination Equipment Services	31/07/2009	Y	-	Remains ER output	Agreed	BE note - to check
NSGACL ITPCD Clarification - Vol2.1 ME7 Food Waste Systems	1		Competitive Dialogue Clarification Note re Food Waste Systems	31/07/2009	Y	-	Remains ER output	Agreed	BE note - to check
NSGACL Labs Area Schedules	1		New Laboratory Area Schedules	12/06/2009				Agreed	
NSGACL Labs Bidders Presentation 2	2		PRESENTATION	22/05/2009	-	Omit	Background bid information to bidders.	Agreed	
NSGACL Labs CD Session Nr 1	2		PRESENTATION	22/05/2009	-	Omit	Background bid information to bidders.	Agreed	
NSGACL Lev 0 compartmentation	1		New Laboratory Draft Fire Strategy - Level 0 compartmentation	12/06/2009				Agreed	
NSGACL Lev 1 compartmentation	1		New Laboratory Draft Fire Strategy - Level 1 compartmentation	12/06/2009				Agreed	
NSGACL Lev -1 compartmentation	1		New Laboratory Draft Fire Strategy, Level -1 compartmentation	12/06/2009				Agreed	
NSGACL Lev 2 compartmentation	1		New Laboratory Draft Fire Strategy - Level 2 compartmentation	12/06/2009				Agreed	
NSGACL Lev 3 compartmentation	1		New Laboratory Draft Fire Strategy - Level 3 compartmentation	12/06/2009				Agreed	
NSGACL Lev 4 compartmentation	1		New Laboratory Draft Fire Stategy - Level 4 compartmentation	12/06/2009				Agreed	
NSGACL low carbon design trackerER version rev A inc CA comments	1		Low Carbon Design Tracker - Ecoteric Ltd	06/07/2009	Y	-	ER document subject to development and use during design development process	Agreed	
NSGACL main tender scoring matrix	1		Scoring Matrix for New South Glasgow Hospitals Sustainability BREEAM and Low Carbon	06/07/2009	-	Omit	Bid submission information/clarification	Agreed	
NSGACL Masterplan Final 240709 small	1		New South Glasgow Hospitals Masterplan 2009	06/08/2009	-	Omit	Replaced by drawing [NA reference]	Agreed	
NSGACL Outline Planning Consent Certificate - 07-01158-DC	1		Outline Planning Consent 07/01158/DC	31/07/2009	Y	-	Remains ER output for achievement by the Contractor.	Agreed*	Planning risk is allowed within Brookfield submission although timing of response to Planning Submissions is a Board risk.
NSGACL Patient Catering - Vol 4	1	1	NSGACL Patient Catering - Vol 4.pdf	14/08/2009	Y	-	Remains ER output	Agreed*	Refer previous comments re relevance of operational specs

NSGACL Presentation Logistics CD no 1	2		PRESENTATION	22/05/2009	-	Omit	Background bid information to bidders.	Agreed	
NSGACL Removal of Maximum Temperature Variant	1		Removal of Maximum Temperature Variant	20/07/2009	Y	-	Remains ER output for achievement by the Contractor.	Agreed	
NSGACL Report Demand Analysis 2007	1		Southern General Current and Future Demand Analysis (Water) - March 2007	05/06/2009	-	Omit	Background bid information to bidders.	Agreed	BE Note - check
NSGACL RocksoilSiteInvestigation1998	1		Geotechnical Historical Information - Site Investigation 1998	15/06/2009	-	Omit	Background bid information to bidders.	Not Agreed	To be included
NSGACL Schedule of Accommodation - ERrev1 -Vol 4	1	1	NSGACL Schedule of Accommodation - ERrev1 - Vol 4.pdf	14/08/2009	-	Omit	Replaced by updated SoA to be agreed between the Board and the Contractor before contract signature.	Agreed	
NSGACL SHTM 02-01	1		SHTM 02-01, Medical Gases : Summary of Changes	02/06/2009	Y	-	Remains ER output	Agreed*	Uploaded as not available on market. Requirements of Schedule 7 duplicated here
NSGACL SHTM 03-01 Part A	1		SHTM 03-01, Ventilation for Healthcare Premises, Part A - Design & Validation	02/06/2009	Y	-	Remains ER output	Agreed	Ditto above
NSGACL SHTM 03-01 Part B	1		SHTM 03-01, Ventilation for Healthcare Premises, Part B - Operational Management & Performance Verif	02/06/2009	Y	-	Remains ER output	Agreed	Ditto above
NSGACL SHTM 04-01 Part A	1		SHTM 04-01, The Control of Legionella, Hygiene, "Safe" Hot Water, Cold Water and Drinking Water Syst	02/06/2009	Y	-	Remains ER output	Agreed	Ditto above
NSGACL SHTM 04-01 Part B	1		SHTM 04-01, The Control of Legionella, Hygiene, "Safe" Hot Water, Cold Water and Drinking Water Syst	02/06/2009	Y	-	Remains ER output	Agreed	Ditto above
NSGACL SHTM 06-01 Part A	1		SHTM 06-01, Electrical Services Supply and Distribution, Part A - Design Considerations	03/06/2009	Y	-	Remains ER output	Agreed	Ditto above
NSGACL Southern General Hospital Ecology Report	1		Southern General Hospital Ecological Appraisal (URS, July 2009)	27/07/2009	Y	-	Remains ER output	Agreed	
NSGACL Staff and Hospitality Catering - Vol 4	1	1	NSGACL Staff and Hospitality Catering - Vol 4.pdf	14/08/2009	Y	-	Relevant ER output/requirement.	Agreed*	Refer previous comments re relevance of operational specs
NSGACL Technical Clarification (various)	1		Technical Clarifications arising from ongoing reviews and considerations of the Board	20/07/2009	Y	-	All are relevant ER requirements, with the exception of item 19 which can be discarded (provided information relevant to bid period only).	Agreed	BE Note - check inclusions and omissions
NSGACL Thorburn&PartnersGeotechnicalStudy	1		Geotechnical Historical Information - Geotechnical Study 1978	15/06/2009	-	Omit	Background bid information to bidders.	Not Agreed	To be included
NSGACL Updated Appendix R - Fire Strategy	1		Updated Appendix R - Fire Strategy	22/07/2009	Y	-	Relevant ER output/requirement.	Not Agreed	check whether requirement relates to provision of a fire strategy (accept) or is a fire strategy for the exemplar (omit). Remove previous fire strategy comments from sch 2.1.
NSGACL WimpeyHealthCareSeptember1994	1		Geotechnical Historical Information - Wimpey Healthcare Ltd 1994	15/06/2009	-	Omit	Background bid information to bidders.	Not Agreed	To be included
NSGH Construction and Title Boundaries	1		Drawing showing the extent of the Board's land & proposed construction site boundary	25/06/2009	-	Omit	Replace by updated boundary, phasing and logistics drawing to be agreed between the Board and the Contractor before contract signature.	Agreed	
NSGH SGH Topographical Survey 2D	1		NSGH SGH Topographical Survey 2D	14/05/2009	Y	-	Relevant ER information	Agreed	
NSGH SGH Topographical Survey 3D	1		NSGH SGH Topographical Survey 3D	14/05/2009	Y	-	Relevant ER information	Agreed	
Scottish Power Southern General Connection agreement	1		Scottish Power Energy Networks - Agreement for Connection to Distribution System	25/06/2009	Y	-	Relevant to ER until updated quote and work to be carried out is developed and taken forwards.	Not Agreed	Discussions re responsibility for concluding elec connections to be concluded
Scottish Power Southern General quotation	1		Scottish Power Energy Networks quotation for the 33kv sub station	25/06/2009	Y	-	Relevant to ER until updated quote and work to be carried out is developed and taken forwards.	Not Agreed	Discussions re responsibility for concluding elec connections to be concluded
SGH Block BC 2nd Floor Ward 62	1		Southern General Hospital, Neurosciences Building - 2nd Floor Plans	04/06/2009	-	Omit	Was for bid period information only.	Agreed	
SGH Block BC 4th Floor	1		Southern General Hospital, Neurosciences Building - 4th Floor Plans	04/06/2009	-	Omit	Was for bid period information only.	Agreed	
SGH Block BC 6th Floor	1		Southern General Hospital, Neurosciences Building - 6th Floor Plans	04/06/2009	-	Omit	Was for bid period information only.	Agreed	
SGH Block BC elevations 1	1		Southern General Hospital, Neurosciences Building - Elevations Drawing 1	04/06/2009	-	Omit	Was for bid period information only.	Agreed	
SGH Block BC elevations 2	1		Southern General Hospital, Neurosciences Building - Elevations Drawing 2	04/06/2009	-	Omit	Was for bid period information only.	Agreed	
SGH Block BC Ground Floor	1		Southern General Hospital, Neurosciences Building - Ground Floor Plans	04/06/2009	-	Omit	Was for bid period information only.	Agreed	
SGH Neurology 1st Floor	1		Southern General Hospital, Neurosciences Building - 1st Floor Plans	04/06/2009	-	Omit	Was for bid period information only.	Agreed	
Surgical Block- type 2 summary	1		Stage 3A Demolition Info	14/07/2009	-	Omit	Bid period info, demolitions and condition of buildings Contractor risk.	Agreed	
Surgical Link Bridge - type 2 summary	1		Stage 3A Demolition Info	14/07/2009	-	Omit	Bid period info, demolitions and condition of buildings Contractor risk.	Agreed	

Type 2 sheet- Biochemistry	1		Stage 3A Demolition Info	14/07/2009	-	Omit	Bid period info, demolitions and condition of buildings Contractor risk.	Agreed
Type 2 sheets - Surgical	1		Stage 3A Demolition Info	14/07/2009	-	Omit	Bid period info, demolitions and condition of buildings Contractor risk.	Agreed
Type 2 sheets A&E	1		Stage 3A Demolition Info	14/07/2009	-	Omit	Bid period info, demolitions and condition of buildings Contractor risk.	Agreed
Type 2 Table Report - AE-Ortho	1		Stage 3A Demolition Info	14/07/2009	-	Omit	Bid period info, demolitions and condition of buildings Contractor risk.	Agreed
Type 2 Table Report - Biochemistry	1		Stage 3A Demolition Info	14/07/2009	-	Omit	Bid period info, demolitions and condition of buildings Contractor risk.	Agreed
Type 2 Table Report - situ	1		Stage 3A Demolition Info	14/07/2009	-	Omit	Bid period info, demolitions and condition of buildings Contractor risk.	Agreed
Type 2 Table Report - Surg link	1		Stage 3A Demolition Info	14/07/2009	-	Omit	Bid period info, demolitions and condition of buildings Contractor risk.	Agreed
Type 2 Table Report - Surgical	1		Stage 3A Demolition Info	14/07/2009	-	Omit	Bid period info, demolitions and condition of buildings Contractor risk.	Agreed
2007 04 05 TA Figures Document Final	1		New South Glasgow Hospitals Transport Assessment Figures Document April 2007	25/06/2009	Y	-	Relevant ER information	Agreed
2007 04 05 TA Final	1		New South Glasgow Hospitals Glasgow - Transport Assessment April 2007	25/06/2009	Y	-	Relevant ER information	Agreed

New South Glasgow Hospitals

Presentation to Surgery & Anaesthetics Lead Nurses

A52825963

15th December 2009

Brookfield Europe LP

Southern General Project Team

NHS Greater Glasgow and Clyde

Brookfield Project Team have extensive experience of delivering Hospital projects spanning 25 years

Project Director **Ross Ballingall**

Project Experience:

Peterborough Hospital PFI	**£350m**
Oxford Churchill	**£130m**
Stoke Mandeville hospital	**£56m**
Addenbrookes Hospital	**£80m**
Middlesex Hospital BeCAD	**£70m**
Newham Hospital	**£27m**
Newcastle Hospitals	**£300m**
Norfolk & Norwich Hospital	**£220m**

The Staff included in the Bidding Team will be retained for the duration of the Project

Commercial Director **Paul Serkis**

Project Experience:

Peterborough Hospital PFI	**£350m**
Chelsea & Westminster Hospital	**£200**
National Physical Laboratories	**£87m**

Construction Director **Alan Keeley**

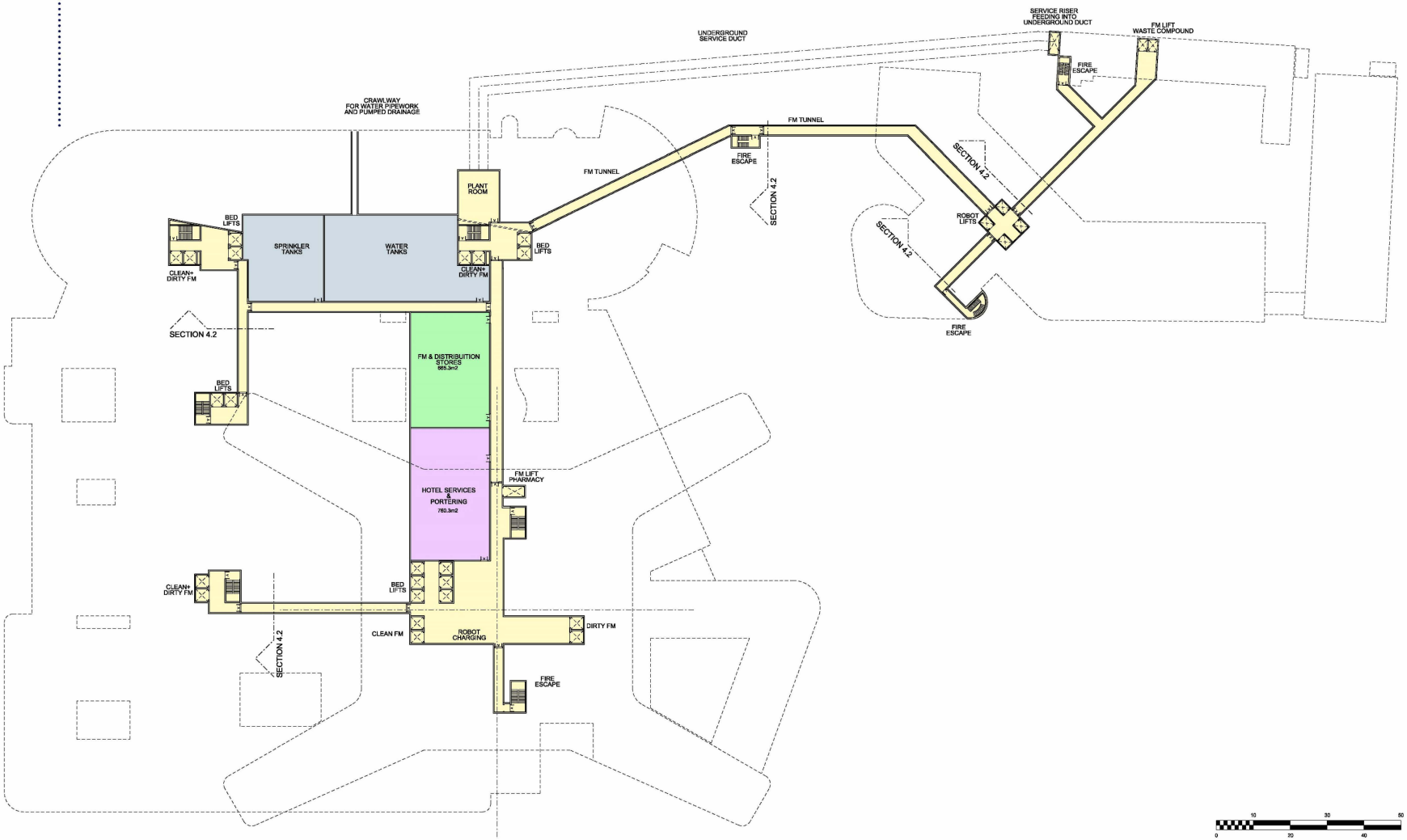
Project Experience:

Peterborough Hospital PFI	**£350m**
Norfolk & Norwich Hospital	**£220m**
Medical training school	**£100m**

- P Parking
- Disabled Parking
- Car drop off
- Taxi rank
- Bus stop

1. Turf Mound
2. Bike Shelter
3. Canopy Walkway
4. Potential Park Cafe
5. Potential Community Garden
6. Potential 5-a-side Football Pitch
7. Play Area
8. Informal Sport / Play Area
9. Trim Trail/ Running Track
10. Formal Garden
11. Children's Discovery Area
12. Fast Link Stop
13. Arrival Square
14. Children's Park
15. Central Park
16. Ambulance & Emergency Entrance Area
17. Children's DCFP Roof Garden
18. Children's Roof Garden
19. Reed Beds

10 30 50 70 90
0 20 40 60 80 100



ITPD Reference:
VOLUME 2.0
Section 2.2

BASEMENT FLOOR PLAN - DEPARTMENTAL ADJACENCIES

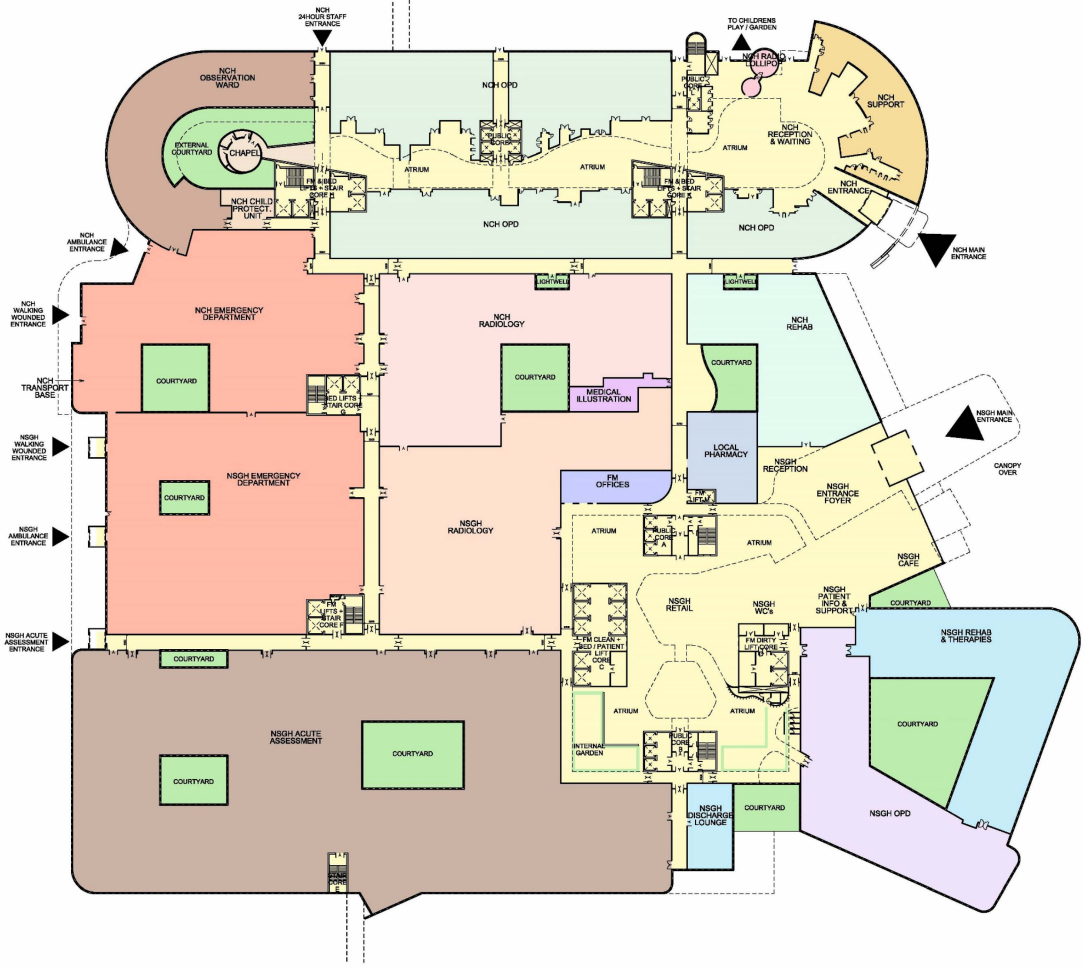
New South Glasgow Hospitals (NSGH) Project ITPD

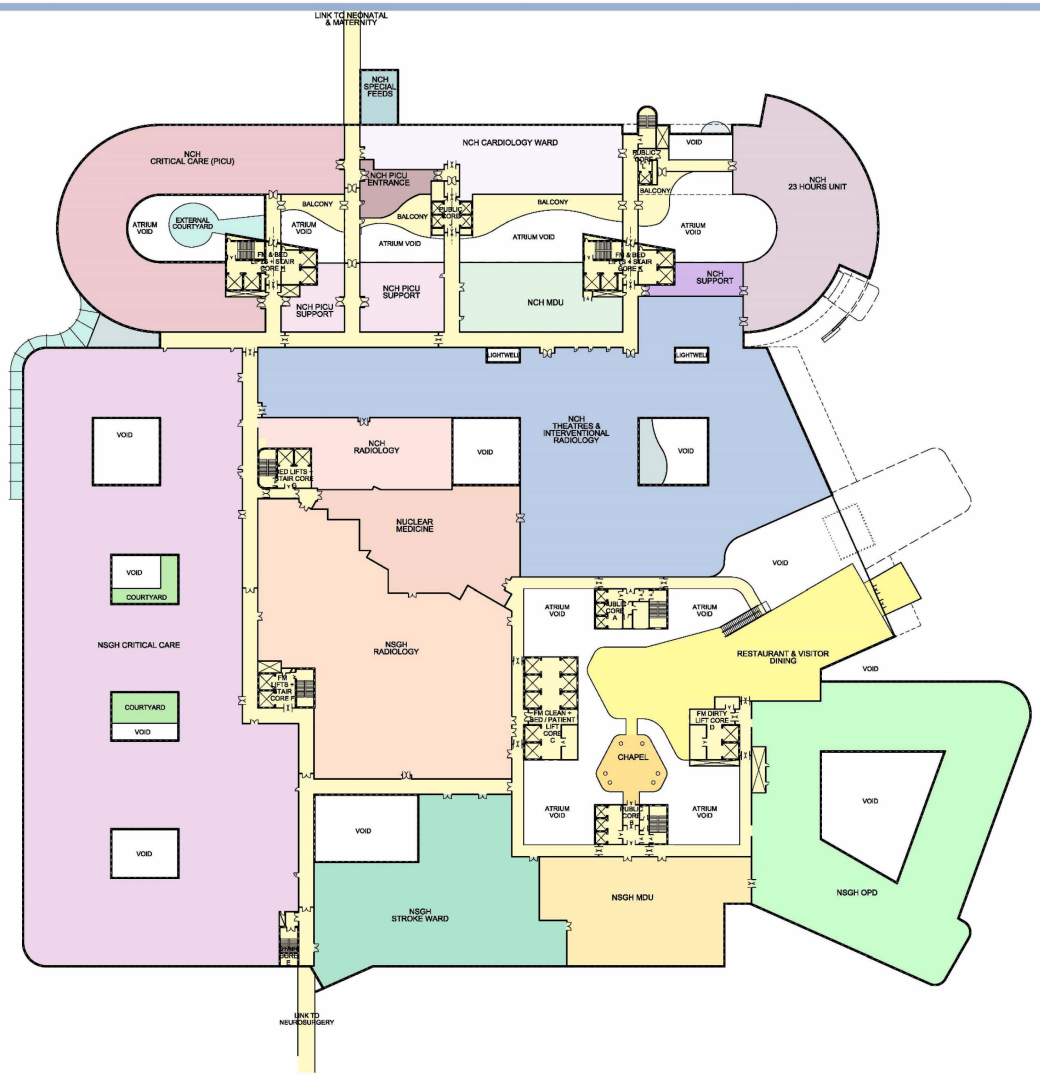
Date: 30.07.09
Scale @A1: 1:500
Drawing Number: NA-xx-B1-PL-252-010
Revision: Tender

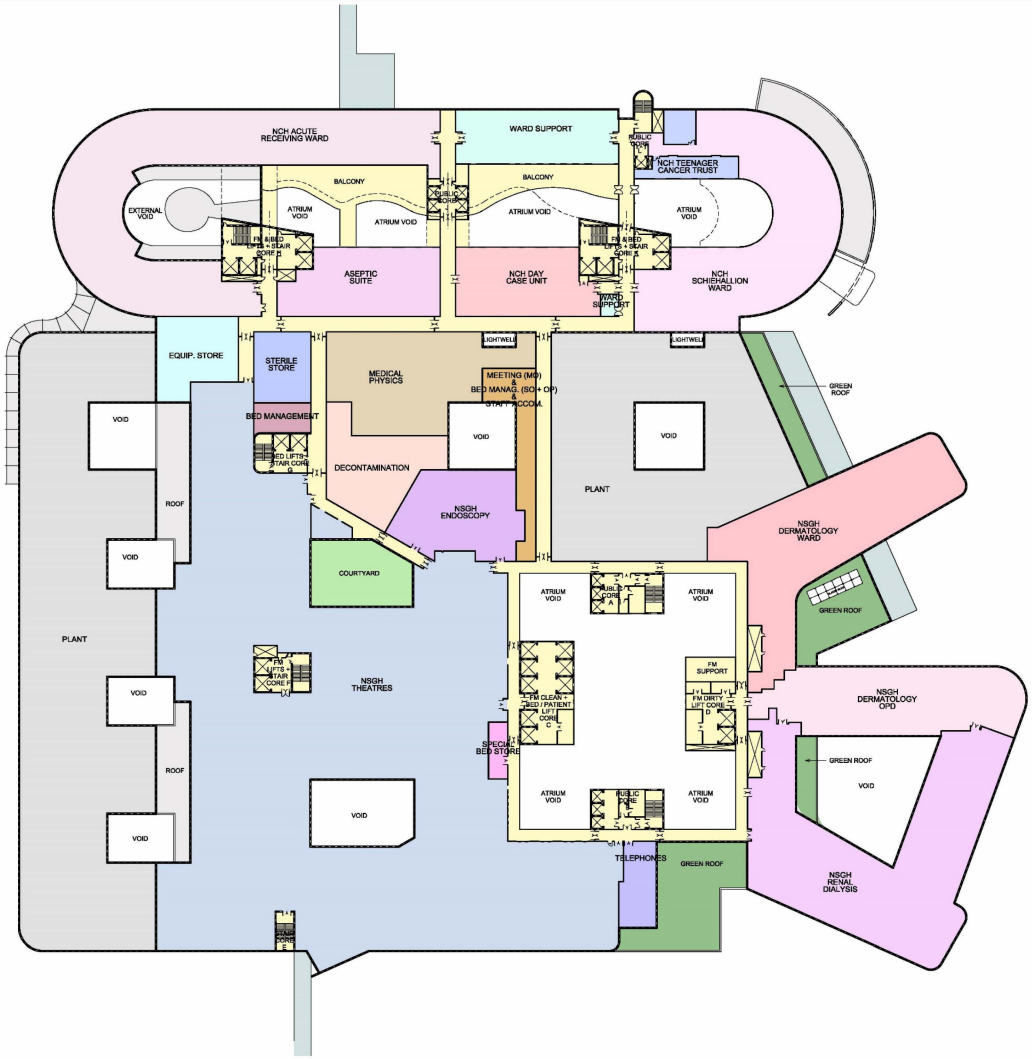
A52825963

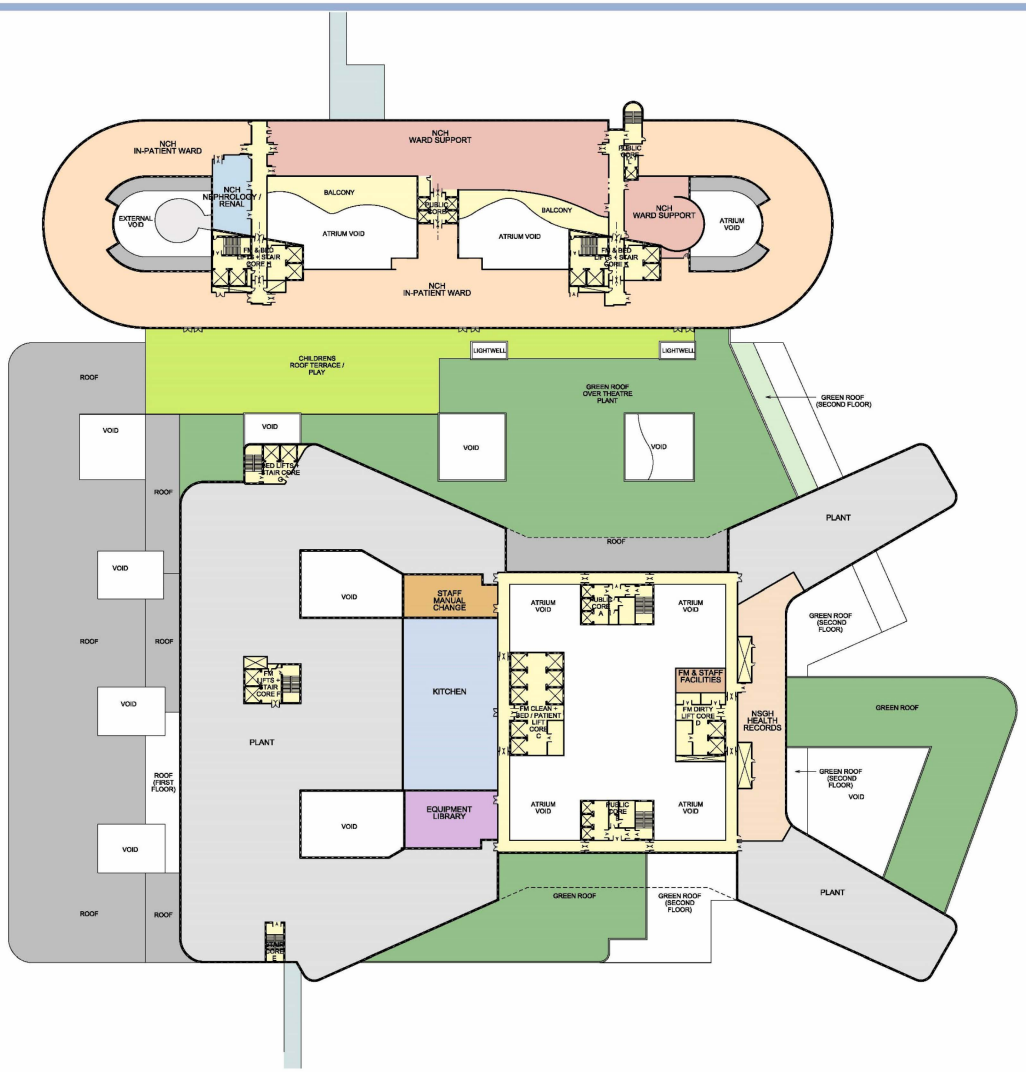
NHS Greater Glasgow and Clyde

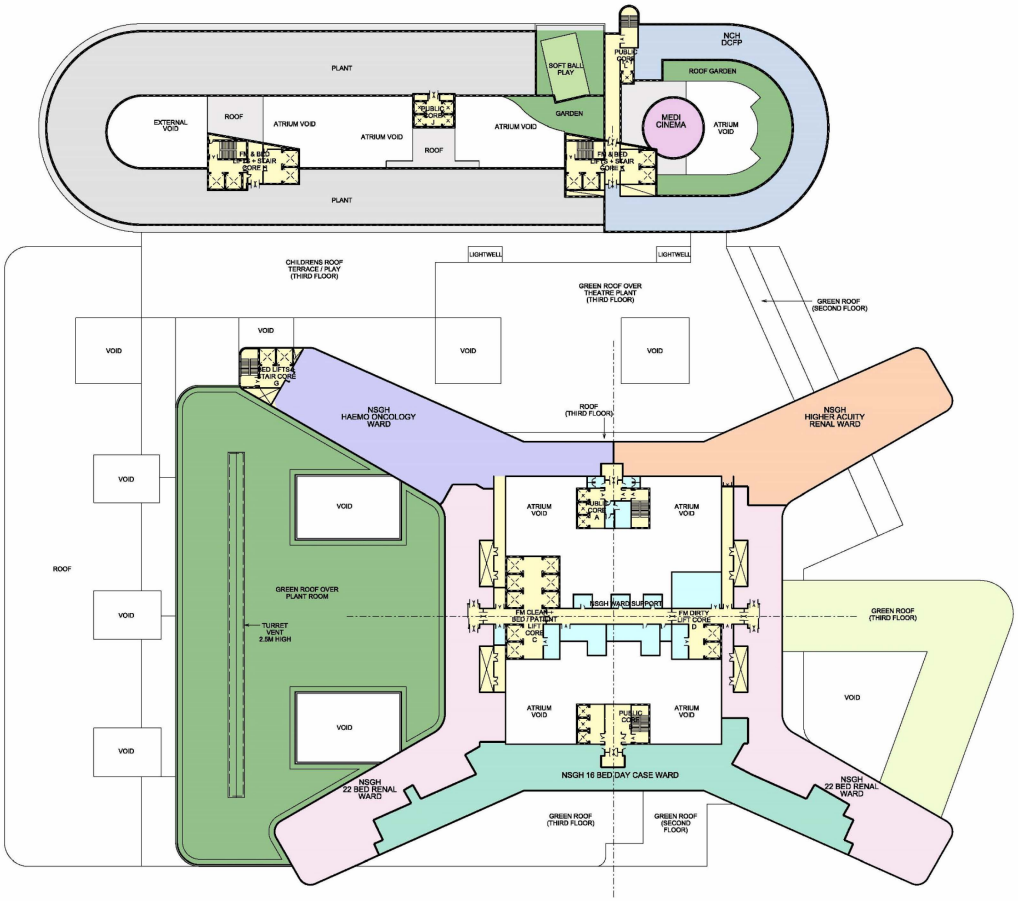
Brookfield

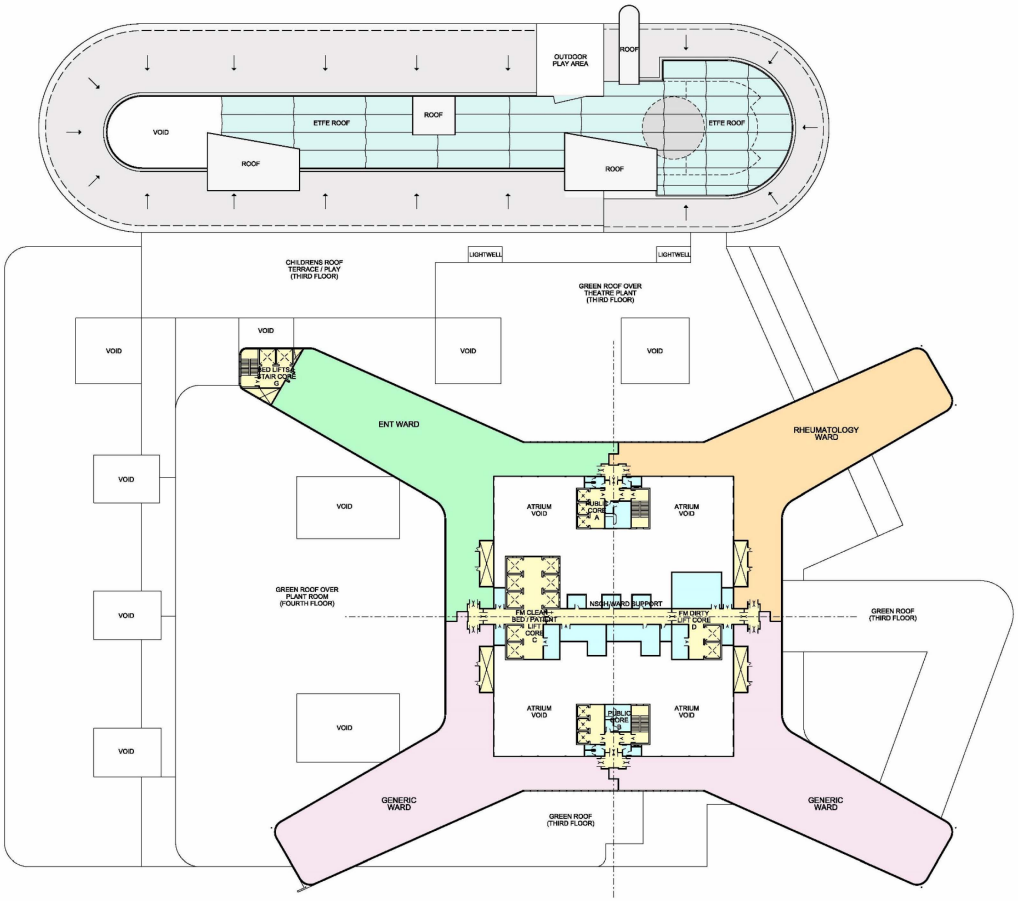



LINK TO NEONATAL & MATERNITY
NCH SPECIAL FEEDS
NCH CRITICAL CARE (PICU)
NCH CARDIOLOGY WARD
NCH PICU ENTRANCE
NCH 23 HOURS UNIT
ATRIUM VOID
EXTERNAL COURTYARD
BALCONY
PUBLIC CORE
FM & BED LIFTS + STAIR CORE F
NCH PICU SUPPORT
NCH MDU
NCH SUPPORT
LIGHTWELL
VOID
NCH RADIOLOGY
NCH THEATRES & INTERVENTIONAL RADIOLOGY
BED LIFTS + STAIR CORE G
NUCLEAR MEDICINE
COURTYARD
NSGH CRITICAL CARE
NSGH RADIOLOGY
FM LIFTS + STAIR CORE
RESTAURANT & VISITOR DINING
FM CLEAN / BED / PATIENT LIFT CORE C
FM DIRTY LIFT CORE D
CHAPEL
NSGH STROKE WARD
NSGH MDU
NSGH OPD
LINK TO NEUROSURGERY


NCH ACUTE RECEIVING WARD
WARD SUPPORT
NCH TEENAGER CANCER TRUST
BALCONY
BALCONY
EXTERNAL VOID
ATRIUM VOID
ATRIUM VOID
ATRIUM VOID
ATRIUM VOID
ASEPTIC SUITE
NCH DAY CASE UNIT
NCH SCHIEHALLION WARD
EQUIP. STORE
STERILE STORE
MEDICAL PHYSICS
MEETING (MD) & BED MANAG. (SCN + OP) STAFF ACCOM.
BED MANAGEMENT
DECONTAMINATION
NSGH ENDOSCOPY
COURTYARD
PLANT
PLANT
GREEN ROOF
NSGH DERMATOLOGY WARD
GREEN ROOF
NSGH DERMATOLOGY OPD
NSGH THEATRES
SPECIAL BED STORE
FM SUPPORT
GREEN ROOF
VOID
NSGH RENAL DIALYSIS
TELEPHONES
GREEN ROOF
ROOF
ROOF
VOID
VOID
VOID
VOID
VOID
VOID
VOID
VOID


NCH IN-PATIENT WARD
NCH WARD SUPPORT
NCH NEPHROLOGY / RENAL
BALCONY
ATRIUM VOID
PUBLIC CORE
EXTERNAL VOID
NCH IN-PATIENT WARD
CHILDRENS ROOF TERRACE / PLAY
LIGHTWELL
ROOF
VOID
GREEN ROOF OVER THEATRE PLANT
GREEN ROOF (SECOND FLOOR)
PLANT
STAFF MANUAL CHANGE
KITCHEN
EQUIPMENT LIBRARY
FM & STAFF FACILITIES
NSGH HEALTH RECORDS
GREEN ROOF
ROOF (FIRST FLOOR)


PLANT
SOFT BALL PLAY
PUBLIC CORE
NCH DCFP
ROOF GARDEN
EXTERNAL VOID
ROOF
ATRIUM VOID
ATRIUM VOID
GARDEN
ATRIUM VOID
MEDI CINEMA
ATRIUM VOID
ROOF
PLANT
CHILDRENS ROOF TERRACE / PLAY (THIRD FLOOR)
LIGHTWELL
LIGHTWELL
GREEN ROOF OVER THEATRE PLANT (THIRD FLOOR)
GREEN ROOF (SECOND FLOOR)
VOID
VOID
VOID
VOID
NSGH HAEMO ONCOLOGY WARD
ROOF (THIRD FLOOR)
NSGH HIGHER ACUITY RENAL WARD
VOID
VOID
ATRIUM VOID
ATRIUM VOID
ROOF
GREEN ROOF OVER PLANT ROOM
TURRET VENT 2.0M HIGH
NSGH WARD SUPPORT
GREEN ROOF (THIRD FLOOR)
VOID
VOID
VOID
ATRIUM VOID
ATRIUM VOID
VOID
VOID
NSGH 22 BED RENAL WARD
NSGH 16 BED DAY CASE WARD
NSGH 22 BED RENAL WARD
GREEN ROOF (THIRD FLOOR)
GREEN ROOF (SECOND FLOOR)



ITPD Reference:
VOLUME 2.0
Section 2.2

FIFTH FLOOR PLAN - DEPARTMENTAL ADJACENCIES

New South Glasgow Hospitals (NSGH) Project ITPD

Date: 06.07.09
Scale @A1: 1:500
Drawing Number: NA-xx-05-PL-252-010
Revision: Tender

A52825963

A52825963

A52825963

A52825963

A52825963

New South Glasgow Hospitals - Fly Through

Timetable

January 2010	Anticipated start of Labs construction Start Design Programme for Hospitals
November 2010	Submission of Full Business Case
January 2011	Anticipated commencement of new hospital builds
January 2012	Anticipated completion of Labs build
January 2015	Anticipated completion of hospital builds, commissioning thereafter

Design Programme Development

- 1:500 Clinical Adjacencies December 2009
- 1:200 Departmental layouts May 2010
- 1:50 room layouts June 2010
- User group Involvement
- PFPI Involvement
- ‘Mock up’ rooms

New South Glasgow Hospitals

Presentation to Heads of Nursing

16th December 2009

A52825963

NHS Greater Glasgow and Clyde

Brookfield Europe LP

Southern General Project Team

NHS Greater Glasgow and Clyde

Brookfield Project Team have extensive experience of delivering Hospital projects spanning 25 years

Project Director **Ross Ballingall**

Project Experience:

Peterborough Hospital PFI	**£350m**
Oxford Churchill	**£130m**
Stoke Mandeville hospital	**£56m**
Addenbrookes Hospital	**£80m**
Middlesex Hospital BeCAD	**£70m**
Newham Hospital	**£27m**
Newcastle Hospitals	**£300m**
Norfolk & Norwich Hospital	**£220m**

The Staff included in the Bidding Team will be retained for the duration of the Project

Commercial Director **Paul Serkis**

Project Experience:

Peterborough Hospital PFI	**£350m**
Chelsea & Westminster Hospital	**£200**
National Physical Laboratories	**£87m**

Construction Director **Alan Keeley**

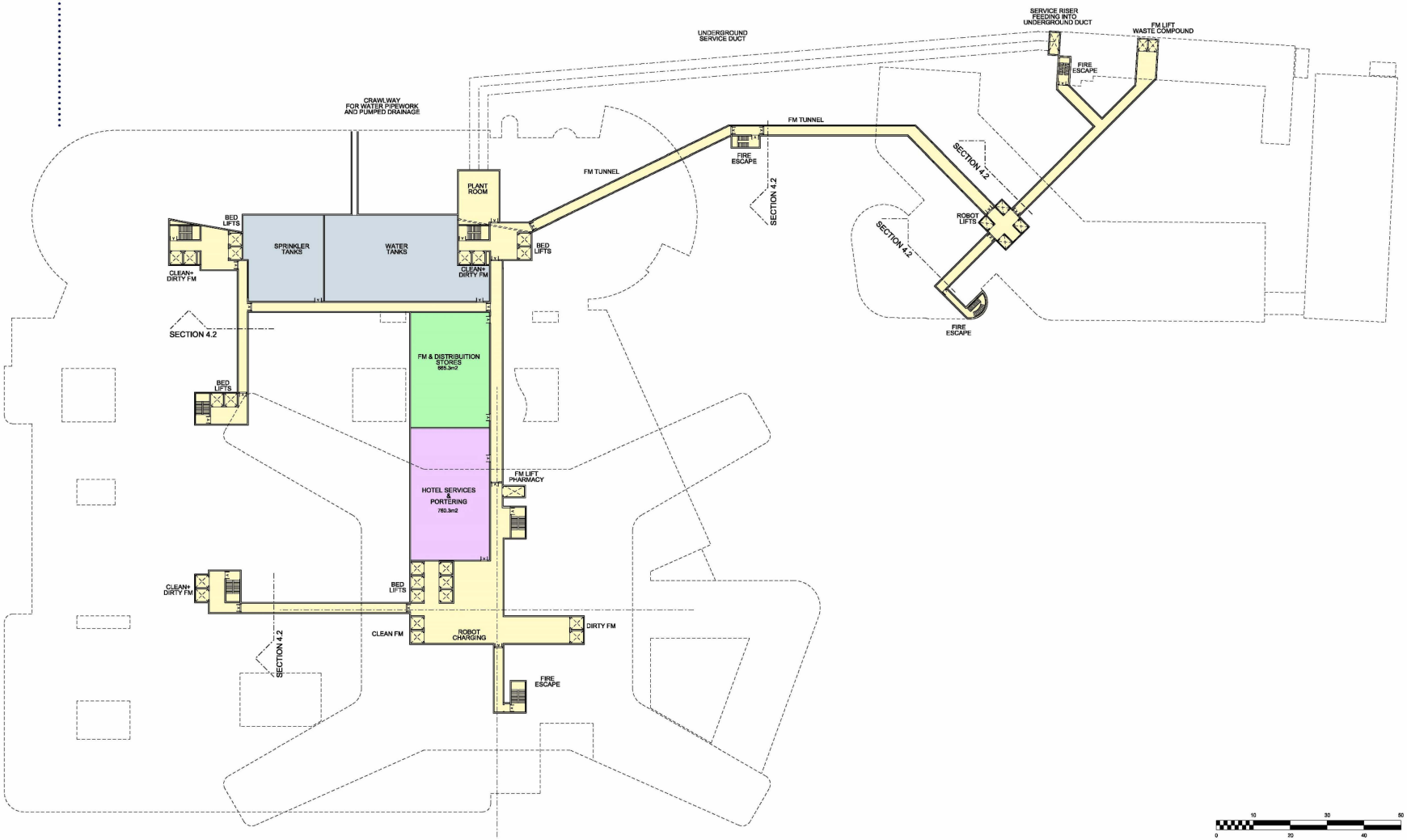
Project Experience:

Peterborough Hospital PFI	**£350m**
Norfolk & Norwich Hospital	**£220m**
Medical training school	**£100m**

- P Parking
- Disabled Parking
- Car drop off
- Taxi rank
- Bus stop

1. Turf Mound
2. Bike Shelter
3. Canopy Walkway
4. Potential Park Cafe
5. Potential Community Garden
6. Potential 5-a-side Football Pitch
7. Play Area
8. Informal Sport / Play Area
9. Trim Trail/ Running Track
10. Formal Garden
11. Children's Discovery Area
12. Fast Link Stop
13. Arrival Square
14. Children's Park
15. Central Park
16. Ambulance & Emergency Entrance Area
17. Children's DCFP Roof Garden
18. Children's Roof Garden
19. Reed Beds

10 30 50 70 90
0 20 40 60 80 100



ITPD Reference:
VOLUME 2.0
Section 2.2

BASEMENT FLOOR PLAN - DEPARTMENTAL ADJACENCIES

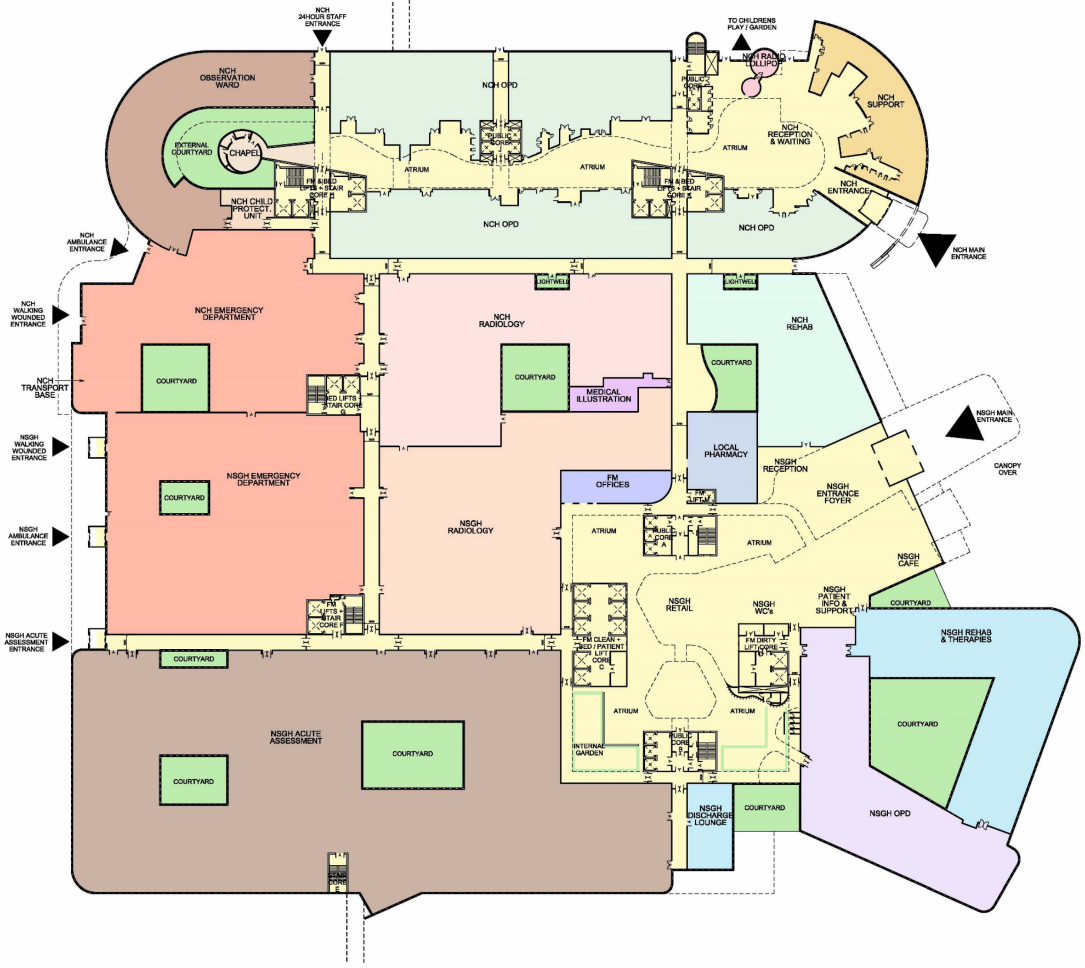
New South Glasgow Hospitals (NSGH) Project ITPD

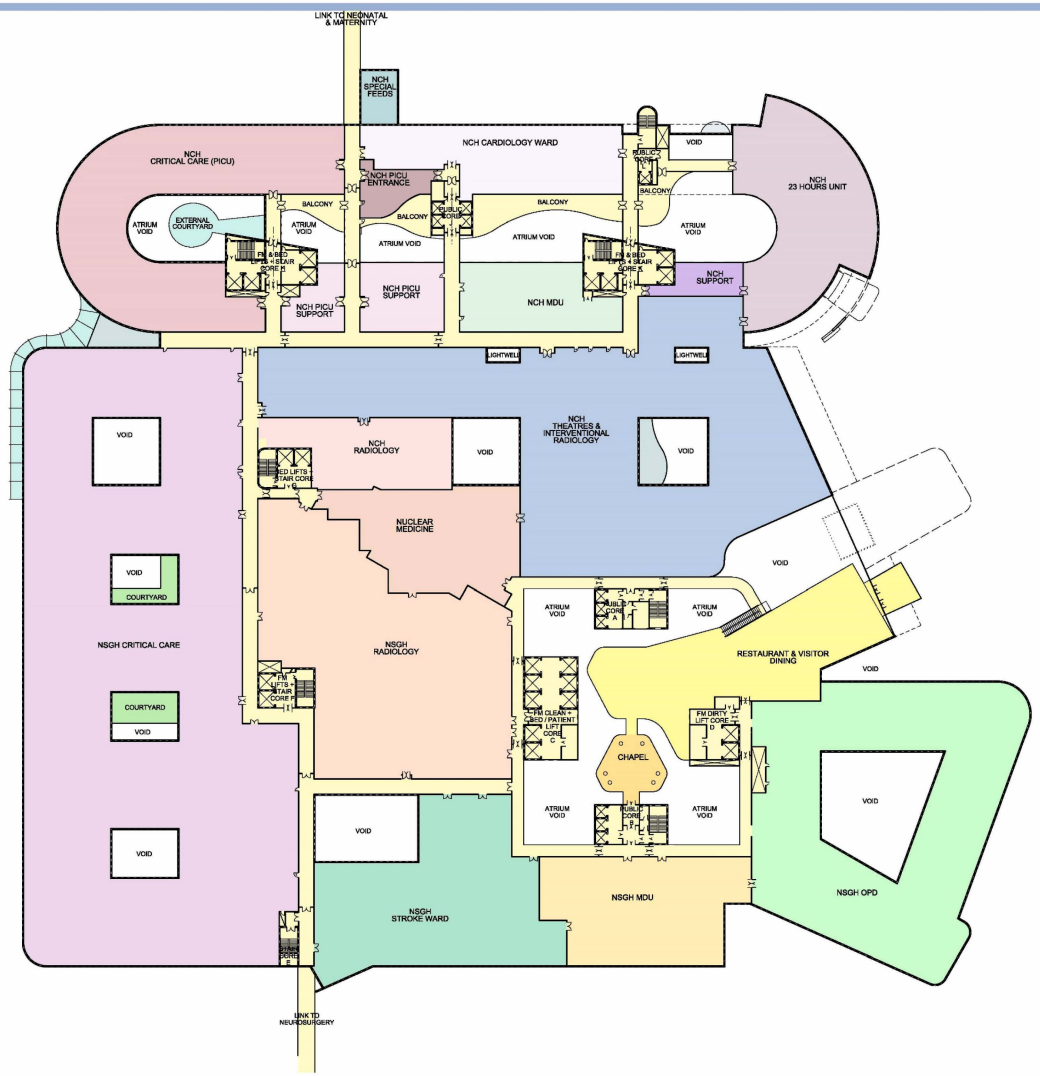
Date: 30.07.09
Scale @A1: 1:500
Drawing Number: NA-xx-B1-PL-252-010
Revision: Tender

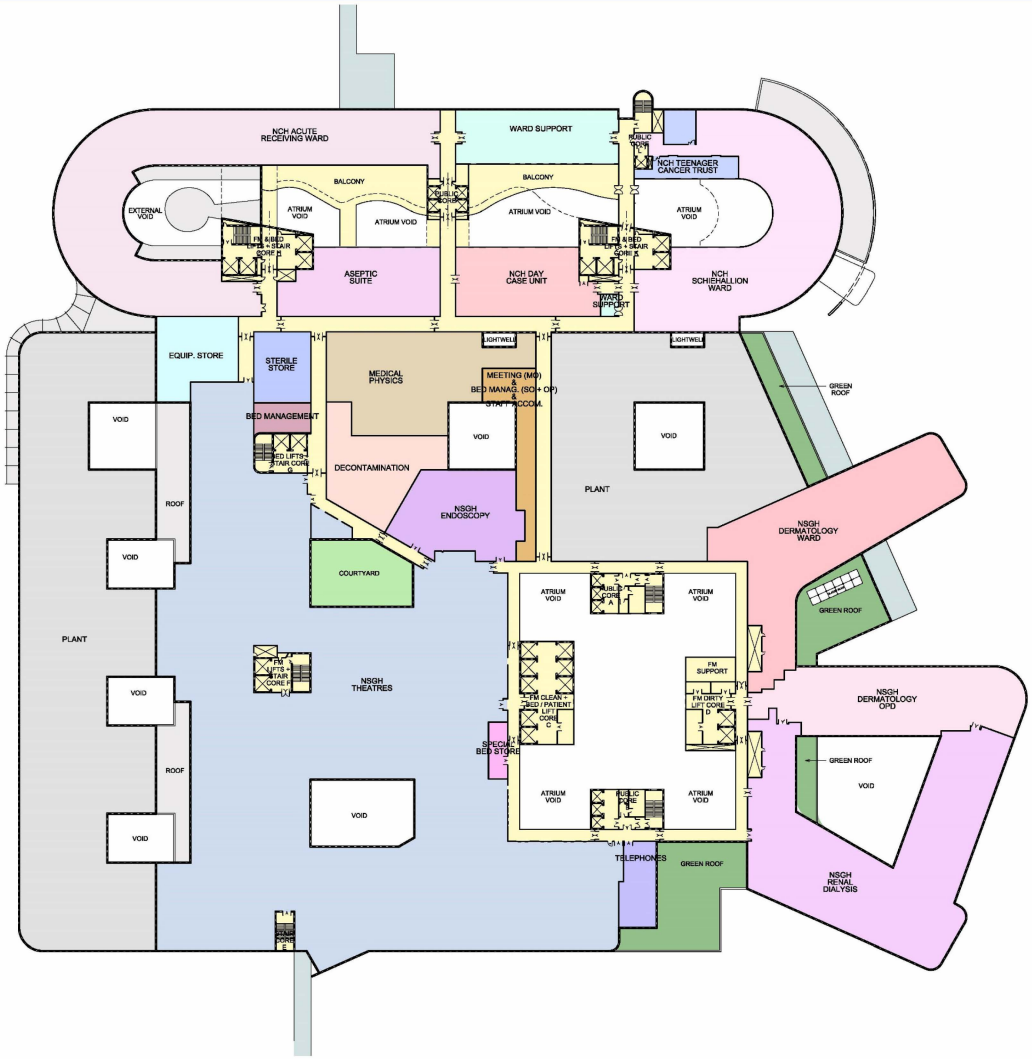
A52825963

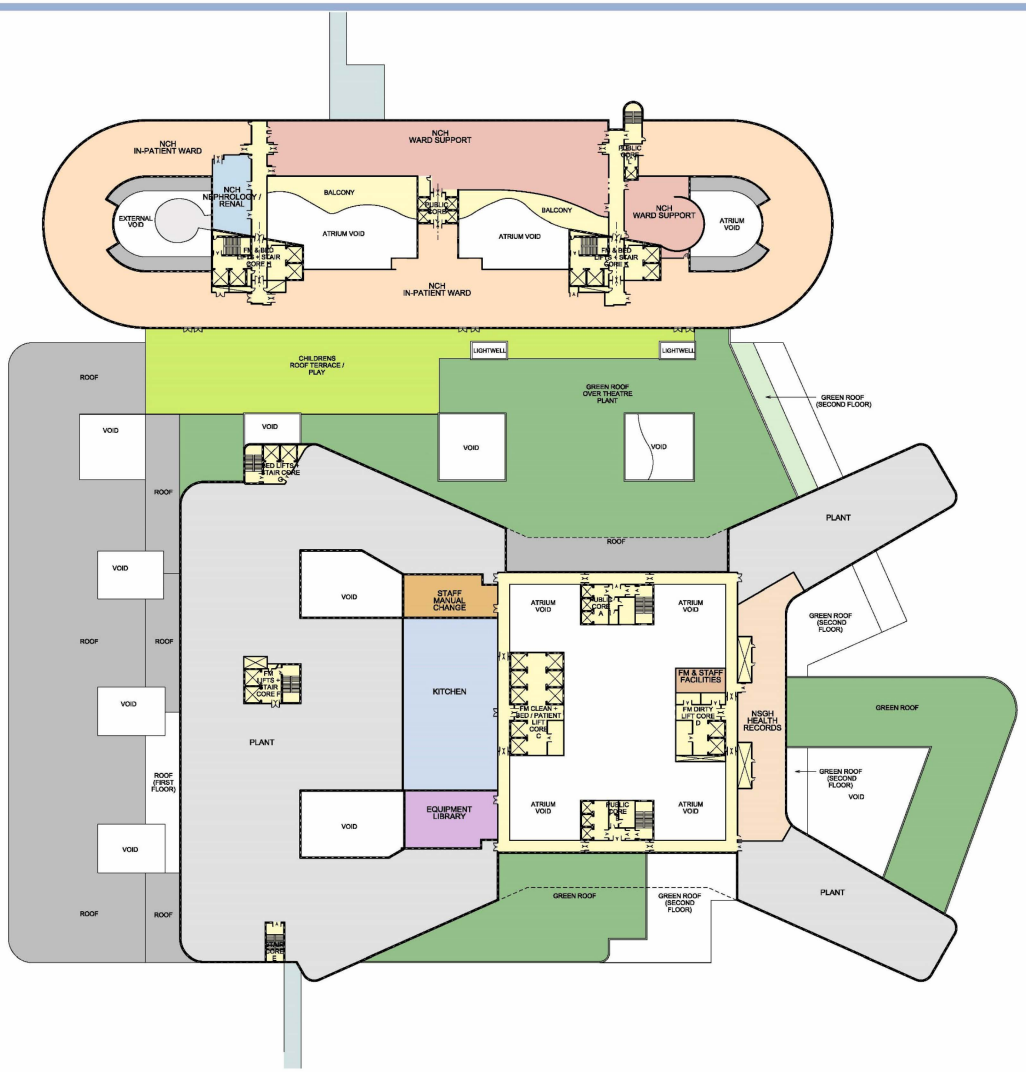
NHS Greater Glasgow and Clyde

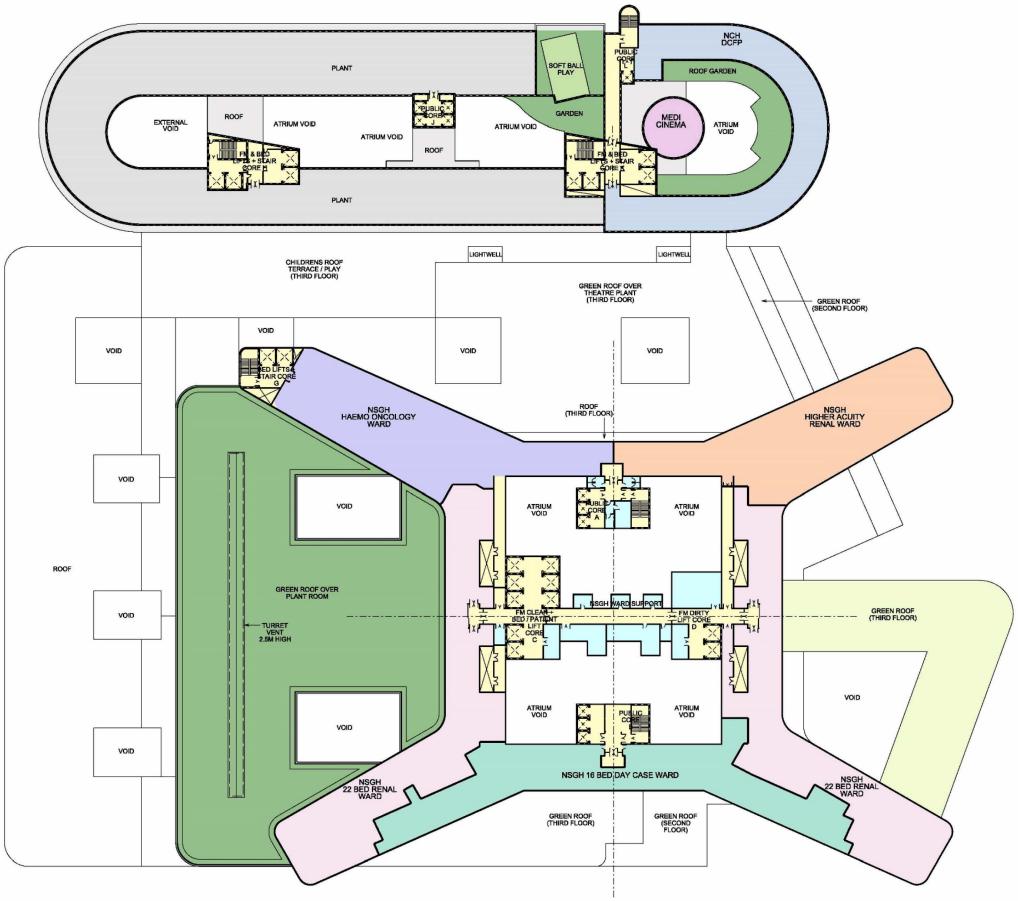
Brookfield




LINK TO NEONATAL & MATERNITY
NCH SPECIAL FEEDS
NCH CRITICAL CARE (PICU)
NCH CARDIOLOGY WARD
NCH PICU ENTRANCE
NCH 23 HOURS UNIT
BALCONY
ATRIUM VOID
EXTERNAL COURTYARD
NCH PICU SUPPORT
NCH MDU
NCH SUPPORT
LIGHTWELL
NCH THEATRES & INTERVENTIONAL RADIOLOGY
NCH RADIOLOGY
VOID
NUCLEAR MEDICINE
COURTYARD
NSGH CRITICAL CARE
NSGH RADIOLOGY
RESTAURANT & VISITOR DINING
CHAPEL
NSGH STROKE WARD
NSGH MDU
NSGH OPD
LINK TO NEUROSURGERY


NCH ACUTE RECEIVING WARD
WARD SUPPORT
NCH TEENAGER CANCER TRUST
BALCONY
BALCONY
EXTERNAL VOID
ATRIUM VOID
ATRIUM VOID
ATRIUM VOID
ATRIUM VOID
ASEPTIC SUITE
NCH DAY CASE UNIT
NCH SCHIEHALLION WARD
WARD SUPPORT
EQUIP. STORE
STERILE STORE
MEDICAL PHYSICS
MEETING (MD) & BED MANAG. (SCN + OP) STAFF ACCOM.
LIGHTWELL
LIGHTWELL
GREEN ROOF
VOID
BED MANAGEMENT
VOID
VOID
DECONTAMINATION
ROOF
NSGH ENDOSCOPY
PLANT
NSGH DERMATOLOGY WARD
VOID
COURTYARD
ATRIUM VOID
ATRIUM VOID
GREEN ROOF
PLANT
NSGH THEATRES
FM SUPPORT
NSGH DERMATOLOGY OPD
SPECIAL BED STORE
GREEN ROOF
VOID
ATRIUM VOID
ATRIUM VOID
VOID
VOID
TELEPHONES
GREEN ROOF
NSGH RENAL DIALYSIS


NCH IN-PATIENT WARD
NCH WARD SUPPORT
NCH NEPHROLOGY / RENAL
BALCONY
ATRIUM VOID
PUBLIC CORE
EXTERNAL VOID
NCH IN-PATIENT WARD
CHILDRENS ROOF TERRACE / PLAY
LIGHTWELL
ROOF
VOID
GREEN ROOF OVER THEATRE PLANT
GREEN ROOF (SECOND FLOOR)
STAFF MANUAL CHANGE
KITCHEN
EQUIPMENT LIBRARY
PLANT
FM & STAFF FACILITIES
NSGH HEALTH RECORDS
GREEN ROOF
ROOF (FIRST FLOOR)



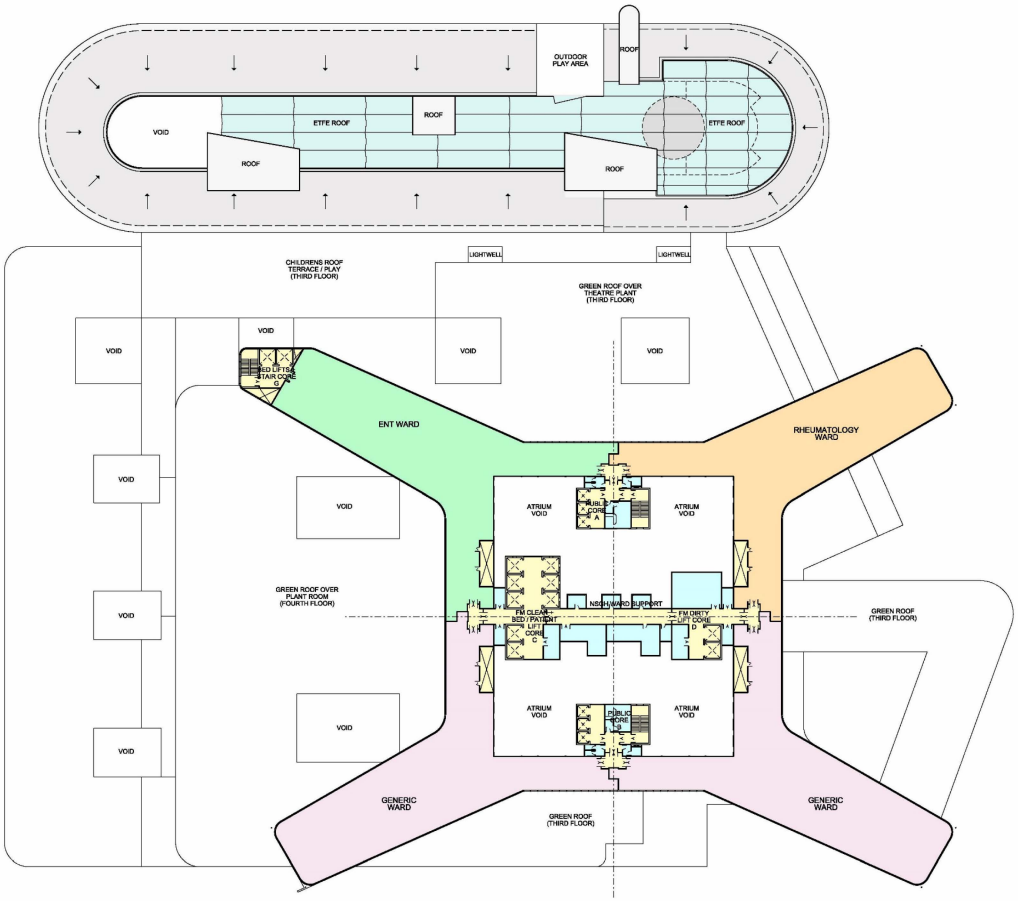
ITPD Reference:
VOLUME 2.0
Section 2.2

FOURTH FLOOR PLAN - DEPARTMENTAL ADJACENCIES

New South Glasgow Hospitals (NSGH) Project ITPD

Date: 06.07.09
Scale @A1: 1:500
Drawing Number: NA-xx-04-PL-252-010
Revision: Tender

A52825963


OUTDOOR PLAY AREA
ROOF
VOID
ETFE ROOF
ROOF
ROOF
ETFE ROOF
CHILDRENS ROOF TERRACE / PLAY (THIRD FLOOR)
LIGHTWELL
LIGHTWELL
GREEN ROOF OVER THEATRE PLANT (THIRD FLOOR)
VOID
VOID
VOID
VOID
BED LIFTS & STAIR CORE C
ENT WARD
RHEUMATOLOGY WARD
VOID
VOID
ATRIUM VOID
PUBLIC CORE A
ATRIUM VOID
GREEN ROOF OVER PLANT ROOM (FOURTH FLOOR)
NSGH WARD SUPPORT
FM CLEAN BED / PATIENT LIFT CORE C
FM DIRTY LIFT CORE D
GREEN ROOF (THIRD FLOOR)
VOID
VOID
ATRIUM VOID
PUBLIC CORE B
ATRIUM VOID
GENERIC WARD
GREEN ROOF (THIRD FLOOR)
GENERIC WARD

A52825963

A52825963

A52825963

A52825963

New South Glasgow Hospitals - Fly Through

Timetable

January 2010	Anticipated start of Labs construction Start Design Programme for Hospitals
November 2010	Submission of Full Business Case
January 2011	Anticipated commencement of new hospital builds
January 2012	Anticipated completion of Labs build
January 2015	Anticipated completion of hospital builds, commissioning thereafter

Design Programme Development

- 1:500 Clinical Adjacencies December 2009
- 1:200 Departmental layouts May 2010
- 1:50 room layouts June 2010
- User group Involvement
- PFPI Involvement
- ‘Mock up’ rooms

Water distribution systems

CIBSE Commissioning Code W: 2010

CIBSE

BSRIA

A52825963

Water distribution systems

CIBSE Commissioning Code W: 2010

A52825963

Registered charity number 278104

ISBN 978-1-906846-15-2

Typeset and production project managed by The Charlesworth Group

Printed in Great Britain by The Charlesworth Group

Note from the publisher

This publication is primarily intended to provide guidance to those responsible for the design, installation, commissioning, operation and maintenance of building services. It is not intended to be exhaustive or definitive and it will be necessary for users of the guidance given to exercise their own professional judgement when deciding whether to abide by or depart from it.

Any commercial products depicted or described within this publication are included for the purposes of illustration only and their inclusion does not constitute endorsement or recommendation by the Institution.

Foreword

Commissioning is of paramount importance as the ultimate test for proving the design and installation of building engineering services in practice and is a requirement of Part L of the Building Regulations.

Commissioning is critical in achieving the safe, energy and carbon efficient and effective operation of hydraulic systems through correct circuit balancing of the distributions and components.

Proper commissioning enables engineering systems to operate at optimum performance providing the building users with good quality internal environments.

As set out in Approved Document L2A, effective from 1st October 2010, The Building Regulations require that 'notice of completion should be given to the relevant Building Control Body (BCB) confirming that:-

a. A commissioning plan has been followed so that every system has been inspected and commissioned in an appropriate sequence and to a reasonable standard; and

b. The results of tests confirm that the performance is reasonably in accordance with the actual building design, including written commentaries where excursions are proposed to be accepted.'

Furthermore 'until BCB receives the commissioning notice it may not be able to be reasonably satisfied that Part L has been complied with and consequently is unlikely to be able to give a completion/final certificate for the project.'

Designers and clients are encouraged to consider the requirements for commissioning at an early stage of the design of a project to ensure the statically completed installations may be fully checked and proved.

This Code has been revised to ensure the most recent knowledge and experience for commissioning building engineering services is made available to practicing engineers.

The decision to revise the code resulted from meeting of commissioning practitioners to consider whether this and the related BSRIA application guide should be updated. Key issues identified were:

- Difficulties in commissioning heating systems with low flow rates, particularly fan coil units.
- The need to review and clarify the tolerance tables in the light of recent experiences.

The revision has been based on Commissioning Code W: 2003 and recognises the need to preserve much of the current format and arrangement enabling it to be used for new and ongoing projects without the need to modify the existing contract documents or procedures.

The code describes the requirements for commissioning building engineering services and compliments the BSRIA Application Guide BG2/2010 which describes how the commissioning is to be carried out.

It is not intended practicing engineers should necessarily refer in specifications to the documents as a whole but that particular references from the Codes may be incorporated in the contract documents thereby providing bespoke definitions applicable to the functional content of the project.

The preparation of this Code has been the responsibility of a Joint Steering Committee enabling the content of the CIBSE and BSRIA documents to be fully co-ordinated and integrated.

This Code is intended to be used in conjunction with BSRIA's *Commissioning water systems* Application Guide BG2/2010 procedures for buildings.

CIBSE acknowledges the support and contribution by members of the Joint Steering Committee and employers who have voluntarily given their time and expertise to the preparation of this Code.

Bryan Franklin
Chairman, Joint CIBSE/BSRIA Steering Committee

Author

Chris Parsloe (Parsloe Consulting)

Steering Committee

Bryan Franklin (Chairman)
Mike Campbell (AECOM)
Roger Carlin (Ashford Environmental Services Ltd.)
Luke Collier (Belimo Automation UK Ltd.)
John Coppin (Commissioning Specialists Association)
Peter Davey (Balfour Beatty Engineering Services)
Terry Dix (Arup)
Terry Dodge (Raxcrest Valves Ltd.)
Chris Driscoll (SES Ltd.)
Matthew Dunk (Frese Ltd.)
Lars Fabricius (SAV UK Ltd.)
Lee Hansard (Wates Interiors)
Andy Lucas (Crane)
Bill McCluskey (Sutton Group)
Gerry McGilley (Siemens Building Technologies)
Peter McMahon (Barfield Services Limited)
Malcolm Moorby (Crown House Ltd.)
George Moss (Burgess Group)
Peter Rees (Tour and Andersson Ltd.)
Nick Till (Banyard Group)
Brian Townsend (End Systems Ltd.)
Nick Ward (Commtech Ltd.)
Paul Wightman (Danfoss Ltd.)

Project coordinated by

Hywel Davies (CIBSE)
Anne King (BSRIA)
Claire Ruston (CIBSE)

CIBSE Director of Information

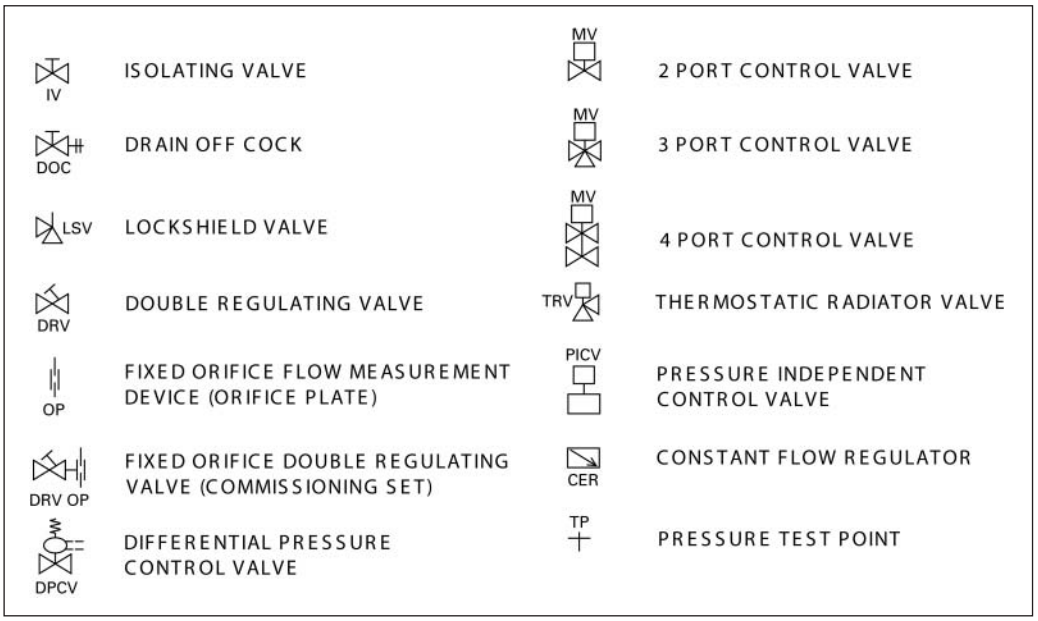
Jacqueline Balian

Acknowledgement

This publication is based on the previous edition of Commissioning Code W, written by Reginald Brown of BSRIA.

Contents

Symbols



Water distribution systems

W0 Introduction

W0.1 Scope

This Code deals with the work involved in proportionally balancing and regulating water flow rates in water distribution systems. All allied mechanical and electrical services and devices must be thoroughly checked and proved to enable this to be carried out. This whole procedure is known as commissioning. This Code represents standards of good practice which are presented in the form of recommendations and guidance generally accepted within the building engineering services industry.

The emphasis of the Code is on building heating and cooling systems though it may also be applied to other types of water distribution systems in buildings and industry. The Code is equally applicable to new-build and retrofit applications and is independent of the scale of the system.

The Code sets out the general requirements for balancing and commissioning water distribution systems to meet the requirements of the designer. BSRIA Guide BG2/2010: *Commissioning water systems*[1] provides a more detailed description of the practical aspects of commissioning procedures in a step-by-step format.

Unless adequate provision has been made by both the designer and the installer of a water distribution system, it may not be possible to balance and commission the system in accordance with this Code. Appendix sections WA1 and WA2 therefore draw the attention of the system designer and installer to the requirements that will help to ensure that a water distribution system can be effectively balanced and commissioned.

The Code includes guidance on the witnessing and evaluation of commissioned systems. It does not include issues relating to the planning and management of the commissioning process within the overall construction project. For these issues, readers should refer to Code M: *Commissioning management*[2].

Compliance with the Code does not confer immunity from relevant statutory and legal requirements.

W0.2 Purpose

The Code is intended to be used as:

— a guide to good practice for the commissioning of water distribution systems

— a tool to assist the definition of commissioning procedures to be performed

— a basis for the preparation of commissioning specifications.

It is not intended that contracts or specifications should refer to the Code in its entirety, rather that direct references may be made to specific sections of the Code when specifying requirements for water distribution systems commissioning. Commissioning specification issues are addressed in section W3.

W0.3 Summary of commissioning requirements

The following summarises the key requirements for a successfully commissioned water distribution system:

— The water distribution system should be inherently commissionable. This is most likely to be achieved if the commissioning requirement is in the brief from the outset, and specialist commissioning input sought early in the design process.

— The contractor and client need to allow sufficient time within the contract programme for the complete commissioning process.

— The adoption of thorough commissioning procedures being detailed in a method statement.

— Formation of a commissioning management team and independent verification of commissioning results.

W0.4 Building Regulations

Commissioning is now an explicit requirement of the Building Regulations[3], and is referred to directly in both Part F and Part L. The 2010 amendments to the Regulations have introduced a new paragraph (A1) into Regulation 20C, which states that, 'This regulation applies to building work in relation to which paragraph F1(2) of Schedule 1 imposes a requirement, but does not apply to the provision or extension of any fixed system for mechanical ventilation or any associated controls where testing and adjustment is not possible.'

Paragraph F1(2) refers to a new paragraph within Part F of Schedule 1, which is the part of the Building Regulations which sets out the requirements for 'Means of Ventilation'. With the new paragraph F1(2), Part F now reads as follows:

F1(1). There shall be adequate means of ventilation provided for people in the building.

F1(2). Fixed systems for mechanical ventilation and any associated controls must be commissioned by testing and adjusting as necessary to secure that the objective referred to in sub-paragraph (1) is met.

Note: paragraph F1(1) is identical to paragraph F1 in the 2006 version of Part F.

Requirement L1 of Part L of the Building Regulations in England and Wales requires that 'reasonable provision shall be made for the conservation of fuel and power in buildings'. This requirement has also been amended in the 2010 revision, so that paragraph L1b now incorporates three specific sub-paragraphs. The third sets out the requirement to commission 'fixed building services ... by testing and adjusting as necessary to ensure that they use no more fuel and power than is reasonable in the circumstances'.

The overall effect of these references is to make commissioning of heating, ventilation and air conditioning systems a requirement of the Building Regulations. These changes are reflected in the corresponding Approved Documents[4,5].

Regulation 20C also requires that where the requirement to commission applies, then the person carrying out the commissioning must give the local authority notice that the commissioning has taken place, and requires that it is carried out according to 'a procedure approved by the Secretary of State'. This procedure is stated to be CIBSE Commissioning Code M in the notice of approval issued by Communities and Local Government and available from the planning portal website at the url http://www.planningportal.gov.uk/uploads/br/noticeofapproval_regs2000_regulation20c.pdf.

Commissioning Code M explicitly refers to CIBSE Code W and to the BSRIA Commissioning Guides, and so compliance with this Commissioning Code, as part of a commissioning process undertaken as set out in Code M should satisfy building control officers that the requirements of Parts F and L and Regulation 20C of the Building Regulations in England and Wales, and parallel requirements in the Regulations and Building Standards in force in Northern Ireland and Scotland respectively, in respect of the commissioning of the water distribution elements of fixed building services systems have been met.

W0.5 Other guidance

Guidance concerning the procedures required for the effective commissioning of building services systems is contained in the following CIBSE commissioning Codes:

— Commissioning Code A: *Air distribution systems*[6]

— Commissioning Code B: *Boilers*[7]

— Commissioning Code C: *Automatic controls*[8]

— Commissioning Code M: *Commissioning management*[2]

— Commissioning Code R: *Refrigeration systems*[9].

Further guidance on carrying out the commissioning procedures is provided in the following BSRIA publications:

— BG2/2010: *Commissioning water systems*[1]

— AG16/2002: *Variable flow water systems*[10]

— AG 3/89.3: *The commissioning of air systems in buildings*[11]

— AG 5/2002: *Commissioning management*[12]

— BG11/2010: *Commissioning Job Book*[13].

W0.6 Definitions

For the purpose of this Code, the following definitions apply.

Cavitation

The localised vaporisation of a liquid caused when the absolute pressure of the liquid falls to a value approaching its vapour pressure.

Chemical cleaning

The removal of deposits such as scale, corrosion and biofilm from the internal surfaces of pipework by treatment with chemicals and in accordance with a formal procedure.

Commissionable system

A system designed, installed and prepared to specified requirements in such a manner as to enable commissioning to be carried out.

Commissionability

The ability of a system to be commissioned satisfactorily.

Commissioning

The advancement of an installation from the state of static completion to full working order to specified requirements. For pipework distribution systems, it includes the setting to work of an installation and the regulation of flow rates.

Commissioning management

The planning, organisation, co-ordination and control of commissioning activities.

Commissioning management organisation

The firm (or person) appointed to manage the commissioning process, being responsible for overall planning, supervision and witnessing of the results of the integrated commissioning of all installed building services systems.

Commissioning specialist

The firm (or person) appointed to carry out specified duties in connection with the commissioning of the engineering services.

Commissioning specification

The document (or sub-section of the design specification) that prescribes the detailed objectives and requirements for commissioning.

Note: the specification must refer to drawings, schedules and relevant parts of the codes, manuals, guides and other standards.

Design criteria

The specified performance of the system expressed as a numerical quantity together with allowable tolerances.

Designer

The organisation (firm or persons) responsible for the design of the water services systems that are to be commissioned. Depending on the method of procurement, this may be one or more organisation. In many instances, the design intent of the water services systems may be set out by one organisation, with the final selection of some, or all, of the individual components (main plant, pumps, terminal equipment, control and regulating valves, etc.) by another organisation. Where this is the case, the flow rates of the final system should be provided by the organisation that has selected the components, however this responsibility should be clearly set out in the contract documents.

Diversity

The ratio between the anticipated peak heating or cooling load demand from a system, and the summation of maximum heating or cooling capacities of the installed equipment.

Flushing

The washing out of an installation with water to a specified procedure to remove manufacturing and construction debris (as per BSRIA AG 1/2001[14]).

Installation

A system placed in position as required by the design or specification.

Pre-commissioning

Specified systematic checking of a completed installation to confirm its state of readiness for commissioning.

Note: pre-commissioning is a post-installation completion activity.

Pressure and leakage testing

The measurement and recording of a specified pressure retention or loss within a system or system component.

Proportional balancing

The process of bringing the fluid flow rates throughout a distribution system into balance with one another, in their correct proportions and within tolerances specified by the designer.

Note: proportional balancing applies to systems or circuits with manually operated regulating valves.

Regulating

The process of adjusting the flow rates of a fluid in a distribution system to achieve the design flow rates within the tolerances specified by the designer.

Setting to work

The process of setting a static system into operation.

Static completion

The state of a system when it is installed in accordance with the drawings and specification, i.e. clean and ready for setting to work. In the case of water systems, this includes filling, venting, pressure or leakage testing, flushing and chemical cleaning.

System

A set of connected components for heating, cooling, ventilation or air conditioning consisting of plant, distribution ducting, piping and terminal units and arrangements to control their operation.

Tolerance

The permissible range of variation from the specified design value.

Note: unless otherwise stated, acceptable tolerances should be those set out in Appendix section WA1.3 of this Code).

Water treatment specialist

The firm (or person) appointed to carry out specified duties in connection with the flushing, chemical cleaning and water treatment of pipework systems.

Witnessing authority

The firm or person sometimes appointed to witness the results of commissioning, and to verify that results obtained comply with the requirements of the design criteria and commissioning specification.

W0.7 Specification

This Code assumes that the system is complete and properly constructed to an agreed specification that shall state the tolerances within which the installation should operate, and to which the fluid flow rates should be balanced and regulated.

W0.8 Inspection

The requirements of this Code do not replace the need for inspection during construction as part of normal good engineering practice. Records of manufacturers' tests must be included in documentation, copies of which should be available for the commissioning specialist before commencement of commissioning.

W0.9 Commissioning records

It is essential that the results of all checks and measurements are recorded in writing at the time they are made. Breaks in the continuity of commissioning operations are likely and proper records will show the state of progress at any stage. It is most important that commissioning records are provided as part of the 'hand-over' information. It is therefore recommended that a standardised format be compiled from this Code for a particular project (see sections W5.5, W6.6, W7.10 and W8.4).

W0.10 Responsibility

The commissioning of a system is only one aspect of building engineering services provision. The responsibility for commissioning is a contractual matter, outside the scope of this document. Nevertheless, it is recommended that the whole commissioning procedure be under the guidance and control of a single authority. Total commissioning management should be considered; this begins at the design stage and continues through installation, commissioning and evaluation, embracing the specialised commissioning of associated equipment.

Further guidance on commissioning responsibilities can be found in:

— CIBSE Commissioning Code M: *Commissioning management*[2]

— BSRIA Guide BG11/2010 *Commissioning Job Book*[13].

W1 Safety issues

W1.1 Legislation

The commissioning of building services is a complex issue that could expose operatives and other personnel to a variety of potentially hazardous situations. These hazards often include working with:

— pressurised systems

— electrical installations

— chemicals

— high temperature fluids

— rotating machinery

— asbestos.

There is also the frequent need to work at height. It is essential that all operatives involved with commissioning are adequately trained to work in this environment and that they are aware of their responsibilities under health and safety legislation.

All hazards must be identified in risk assessments.

W1.2 Good practice

The minimum requirements for good practice safety procedures are as follows:

— Commissioning issues should be considered within the principal contractor's health and safety plan.

— Method statements should be produced.

— Risk assessments must be carried out.

— Personnel must receive adequate training in safety matters before working on site.

— Site personnel must be issued with, and be trained to use, appropriate safety equipment.

— A safe means of access, e.g. scaffolding or mobile work platforms, must be provided for working at height.

— Remotely controlled plant or equipment must be clearly labelled and made safe during testing.

— A 'permit to work' system must be used where the risk assessment indicates this to be required.

— Under certain conditions, two-person working should be mandatory to mitigate health and safety risks, e.g. working on live equipment and working outside of normal working hours.

— A responsible person on site must be aware of the location of the commissioning personnel and the nature of their work.

W2 Design for commissionability

Unless adequate provision has been made by both the designer and the installer of a water distribution system, it may not be possible to commission the system in accordance with this Code.

It is therefore essential that the designer is aware of the fundamental requirements to ensure a commissionable system.

Appendix WA1 describes the main commissionability issues that should be addressed by the designer. The requirements for system commissioning, as detailed in this Code, are made in the presumption that systems are designed in accordance with these recommendations. For more detailed guidance in support of these recommendations, designers should consult BSRIA Guide BG2/2010: *Commissioning water systems*[1].

The involvement of a commissioning specialist at the design stage should be considered to ensure that these design requirements are complied with.

W3 Specification issues

In order to commission a water distribution system properly, the commissioning specialist should be provided with comprehensive details relating to the design/specification of the system. In addition, commissioning should be clearly specified and the needs of the commissioning process addressed during initial design to ensure that the commissioning of the system can be performed correctly. Specialist commissioning input at the design stage will be beneficial to the process.

CIBSE Commissioning Code M: *Commissioning management*[2] describes the recommended scope and content of a commissioning specification. Appendix section WA1.2 of this Code describes the typical specification content appropriate for pipework systems.

W4 Commissioning project management

CIBSE Commissioning Code M: *Commissioning management*[2] provides an overview of the management arrangements required to ensure that building services systems are commissioned to meet the objectives of the Building Regulations. The requirements of Code W should therefore be interpreted within the overall commissioning management framework explained in Code M.

For large or complex projects, it will be beneficial to appoint a commissioning management organisation to co-ordinate and oversee the commissioning process. For all projects, communication between the various parties is vital and it is important that the installer, designer, controls sub-contractor, commissioning specialist and project management team meet on a regular basis. This will enable all parties to programme their work and co-ordinate with other work activities.

W5 Pre-commissioning checks

W5.1 Objective

The purpose of pre-commissioning is to ensure that the system is in a satisfactory and safe condition before final filling and setting to work. Pre-commissioning is normally the responsibility of the installer. On large complicated projects, it may be advantageous to involve the commissioning specialist in pre-commissioning checking procedures.

W5.2 State of the system

The installer should carry out progress inspections in the course of installation to ensure that:

(a) all plant items are being installed in accordance with the design drawings, specifications and, where applicable, the manufacturers' instructions

(b) correct installation procedures are being followed

(c) standards of installation and site cleanliness are acceptable.

Particular attention is drawn to Appendix section WA2 and to the particular requirements for the positioning of pipeline devices with a commissioning function. With regard to these items, the installation should be checked to ensure that:

(a) Valves and flow measurement devices are installed where required to facilitate commissioning.

(b) There is adequate access around valves such that they can be set and that setting indicators are easily visible.

(c) There is adequate access around flow measurement devices to enable the attachment of pressure tubes and the insertion of temperature probes (a minimum clearance of 200 mm is recommended).

(d) Fixed orifice double regulating valves and variable orifice double regulating valves are installed in accordance with the manufacturer's recommendations. This typically requires them to have at least a 5 diameter length of straight pipe at their inlet and at least a 2 diameter length of straight pipe at their outlet.

(e) Fixed orifice flow measurement devices (such as orifice plates or venturis) when installed alone or close coupled to a full bore isolating valve, are installed in accordance with the manufacturer's recommendations. This typically requires them to have at least a 10 diameter length of straight pipe at their inlet and at least a 5 diameter length of straight pipe at their outlet.

(f) The pipe size at the inlet to flow measurement devices is equivalent to that of medium grade mild steel pipe to BS EN 10255[15] or a pipe with an approximately equal internal diameter (note that connecting pipes with internal diameters that are significantly different from those of medium grade steel may cause flow measurement inaccuracy as explained in WA2.4.1).

(h) There are no constrictive pipe fittings at the entry to flow measurement devices. Fittings that constrict flow may cause a high velocity onto the centre of the flow measurement device resulting in a flow measurement error.

(h) Pressure tappings are located at the required locations for commissioning as described in Appendix section WA1.8.

W5.3 Checks before filling

The installer's final inspection should aim to ensure that the system is complete, correctly installed and ready for the commencement of commissioning. This will avoid abortive time on behalf of the commissioning specialist. On large or complex projects, it may be beneficial to involve a commissioning specialist during the inspection process.

BSRIA Guide BG2/2010: *Commissioning water systems*[1] provides final inspection checklists for use by installers. The requirements of this Code presume that pipework installations have been inspected and found to comply with all of the checklist items listed in the BSRIA Guide.

W5.4 System filling and venting

The system should be filled with water (treated, where specified) in accordance with an agreed method statement, prepared by the installing contractor. All filling procedures must comply with HVCA TR/6: *Site pressure testing of pipework*[16].

Filling shall also comply with the requirements of the Water Supply (Water Fittings) Regulations 1999[17] for the prevention of backflow. This usually requires a break tank with a suitable air gap for indirect filling or a double check valve for direct filling.

To ensure effective venting, fill slowly from the bottom upward thus forcing the air to high points for venting to atmosphere. Careful consideration should be given to the setting of valves and air vents before and during filling to avoid airlocks and excessive spillage, particularly where the fill water is treated. Care should be taken not to exceed the working pressure of the system when filling from a high pressure source. When the whole system is filled, disconnect the filling source, open the permanent supply connections and adjust the feed tank water levels.

Additional advice on system venting is provided in BSRIA Guide BG2/2010: *Commissioning water systems*[1].

Safety warning: do not attempt to fill the system via a pressurisation set. A pressurisation set should only be used for final system top-up and pressurisation. A quick-fill bypass should be provided where appropriate to fill the system.

Further venting may be required after the pumps have been operated.

If there is to be a delay of more than 48 hours between the initial system fill and the start of flushing and chemical cleaning, additional precautions should be taken to protect the system from corrosion and bacterial growth, as detailed in BSRIA Guide AG1/2001.1: *Pre-commission cleaning of water systems*[14].

W5.4.1 Pressure testing

On completion of filling and venting, the system shall be checked for leaks at the test pressure specified by the designer. This will require the temporary isolation or removal of components that could be damaged by the applied pressure. The system shall be pressure tested in accordance with HVCA TR/6: *Site pressure testing of pipework*[16].

W5.4.2 Frost precautions

Where the filling, venting and pressure testing work are being carried out in cold weather, it is essential that any equipment susceptible to frost damage be protected by heating the system water, by local space heating, or if necessary, by draining down the system during prolonged non-working periods. Draining down should be avoided, as damp internal surfaces can be a primary cause of corrosion.

W5.5 Static completion records

Great importance is attached to the provision of static completion records to ensure that all defects have been rectified before setting to work, balancing and regulating. It is recommended that the results of all checks and any required remedial works be documented fully (see sections W6.6 and W8.4).

W6 Setting pumps to work

Once the installation checks are all completed, it is incumbent on the installer to provide the relevant operative with adequate instruction to enable him/her to operate the plant safely.

To meet the requirements of the Health and Safety at Work etc. Act 1974[18], warning notices must be posted and appropriate guarding arrangements provided for all plant and equipment which is to be set to work.

W6.1 Pressurisation sets

If the system is designed to be pressurised by a pressurisation set then this will need to be commissioned and the system brought up to normal operating pressure and vented before circulating pumps are commissioned. The manufacturer's detailed guidance for commissioning the pressurisation set and setting pressure limit switches shall be followed.

W6.2 Checks before pump start

A setting to work checklist should be prepared by the installer and checked for compliance before starting the pumps. BSRIA Guide BG2/2010: *Commissioning water systems*[1] provides an example checklist for the setting to work of pumps which is deemed to satisfy this requirement.

The minimum requirements are as follows. With the system filled, check that:

(a) there is a strainer in the pump inlet pipework and that this strainer contains a clean basket

(b) there are strainers in the pipework inlets to all major plant items and that these contain clean baskets

(c) all central plant items are isolated to prevent the ingress of debris

(d) all terminal units are isolated to prevent the ingress of debris

(e) all flushing bypasses are fully open to provide a low resistance flow path

(f) the pump suction and return valves are fully open on the selected pump

(g) the pump casing is vented of air.

W6.3 Initial run

The pumps must be 'run in' in accordance with the manufacturer's instructions.

A checklist should be prepared by the installer covering items to be checked during the initial run and during the running in period. BSRIA Guide BG2/2010: *Commissioning water systems*[1] provides example checklists which are deemed to satisfy this requirement.

The minimum requirements are to check that:

(*a*) the motor running current is balanced between phases and does not exceed the motor nameplate stated rating

(*b*) the direction and speed of rotation of the motor shaft are correct

(*c*) the motor, pump and drive are free from vibration and undue noise

(*d*) the pump inlet pressure is greater than the minimum net positive suction head (NPSH) value recommended by the manufacturer.

W6.4 System flushing and cleaning

W6.4.1 General

Care should be taken during construction to keep the internal surfaces of pipework as clean as possible. Blockages in equipment may prove difficult to locate and expensive to rectify. It is therefore most important that the system is thoroughly cleaned of all detritus. In order to minimise the risk of corrosion and biofilm development, flushing and cleaning should commence as soon as possible after the initial system fill, ideally within 48 hours.

The design features recommended in BSRIA AG 1/2001.1: *Pre-commission cleaning of water systems*[14] should be incorporated in the system design to facilitate the flushing process. In particular, an adequate supply of mains water should be made available for flushing, and drain off points should be located at the base of risers and large mains to facilitate system draining during the flushing process.

If, with the manufacturer's (and client's) agreement, system pumps are to be used for flushing and chemical cleaning, these should be protected by a strainer at the inlet to the pumps throughout the flushing process. Replacement of pump seals is recommended after completion of the flushing process.

W6.4.2 Flushing and cleaning procedure

Pre-commission cleaning (comprising flushing and chemical cleaning) of water systems should be undertaken by an approved water treatment specialist in accordance with BSRIA AG 1/2001.1: *Pre-commission cleaning of water systems*[14].

A specific method statement for each individual project should be prepared by the water treatment specialist. Throughout the cleaning and flushing process, adherence to the BSRIA requirements and method statement should be verified by the installing contractor and inspected by the relevant witnessing authority.

Attention is drawn to the Health and Safety at Work etc. Act[18], the Environmental Protection Act[19], Control of Substances Hazardous to Health Regulations[20] (COSHH Regulations) and other legislation that may apply, on the storage and disposal of all chemicals and associated treated water.

Approval must be obtained from the local water authority for disposal of flushing effluent, particularly for the disposal of water containing cleaning chemicals. If approval for the disposal of effluent to the foul drain cannot be obtained then the installing contractor must make arrangements for removal of the effluent by other means.

Evidence of the completion of successful pre-commission cleaning should be presented in the form of flushing records, verified by a witnessing authority, and associated certification. Copies of these certificates should be passed to the commissioning specialist before the system is balanced.

W6.4.3 Water treatment

Following the completion of flushing and cleaning processes, the system must be filled and dosed with water treatment chemicals to inhibit corrosion and suppress bacteria. Additional water treatment chemicals should be retained on site for top-up dosing. Responsibility for ongoing maintenance of water quality should be passed to a water treatment specialist.

The storage and handling of water treatment chemicals on site is also subject to the COSHH Regulations[20] and will require a risk assessment to be undertaken by or on behalf of the responsible person.

W6.5 Further venting

Following water treatment, final venting of the system should be undertaken in accordance with section W5.4.

Note that the venting process is critical to commissioning. Systems with entrained air or static air pockets may suffer poor repeatability of flow measurements rendering them uncommissionable. Methods for removing entrained air and static air pockets from the system include:

(*a*) running of pumps (to circulate air towards vent positions) followed by re-venting of the system; it may be necessary to repeat this a number of times

(*b*) applying heat to the system to encourage dissolved air bubbles to come out of solution

(*c*) the installation of de-aerators on a permanent or temporary basis.

Whichever method is selected, adequate time should be allowed for the process to be successful.

Further advice on system venting is provided in BSRIA Guide BG2/2010: *Commissioning water systems*[1].

W6.6 Completion certification

On the satisfactory compliance with the provisions of sections W5 and W6, the installation contractor should complete a certificate to that effect. The witnessing authority or his/her representative should countersign the certificate. Certification should include the documents pertaining to flushing and chemical cleaning. Copies of these certificates should be passed to the commissioning specialist before the system is balanced (see section W8.4).

W7 Balancing and regulating water flow rates

W7.1 Objective

Commissioning of re-circulating pipework systems comprises the setting to work of the system pumps and the regulation (or proportional balancing) of system flow rates.

The appropriate regulating or balancing procedure will depend on the system design and choice of commissioning devices. Alternative pipeline devices for flow measurement, flow regulation and differential pressure control are described in Appendix WA2. Sections W7.6 and W7.7 provide example regulating procedures for typical systems incorporating each of these alternatives.

Safety warning: balancing a system requires the coupling of manometer probes into pressure test points. The water temperature should ideally be below 43 °C when this is done. Alternatively, protective clothing should be worn to prevent water at higher temperatures from coming into contact with skin. A medium or high temperature system (i.e. with circulating temperatures greater than 100 °C) must not, under any circumstances, be commissioned at operating temperature as a serious injury may result.

In medium and high temperature systems, self-sealing pressure or temperature measuring points on valves or orifices must be preceded by a manually operated isolating device (see BS 7350[21]).

W7.2 Flow rate measurement tolerances

Tolerances are discussed in detail in Appendix WA1, section WA1.3. Tables WA1.1 and WA1.2 indicate normally acceptable tolerance ranges for different system types.

The tolerances set out in Tables WA1.1 and WA1.2 may be considered to be default target values. They provide a level of accuracy that should be achieved when commissioning the majority of building services installations.

However, it is possible that following a thorough balancing and regulation procedure, the results may fall outside the limits set out in these tables. In such cases, the commissioning specialist shall report these exceptions to the designer, together with the reasons why the tolerances cannot be met. On receipt of the results and consideration of the reasons for any deviations, the designer may relax the tolerances set out in the tables, or propose changes to the system that allow the tolerances to be met.

Further advice on determining acceptable flow measurement tolerances is provided in BSRIA Guide BG2/2010: *Commissioning water systems*[1].

W7.3 Method statement

Before regulating the flow rates in a system, the commissioning specialist should produce a written method statement detailing the intended regulating procedures. This method statement should be formally agreed with the principal contractor and system designer and form part of the overall commissioning plan.

W7.4 Pump shut-off head test

To verify the operational performance of a pump, it is necessary to check the measured performance against test data provided by the manufacturer.

The performance test should be carried out as follows:

(1) Connect a suitable differential pressure gauge across the suction and discharge pressure test points of the pump.

(2) With the pump running, slowly close the discharge valve. Do not run in this condition for longer than 15 minutes (check manufacturer's guidance) or the pump will overheat and may be damaged.

(3) Determine the shut-off pressure differential, check against the manufacturer's data for zero flow then slowly re-open the discharge valve.

(4) Where the test result coincides with the manufacturer's test data, proceed to the next step. Otherwise draw a curve parallel to that shown on the published data, starting at the shut-off head pressure.

(5) Record the total pressure with the differential pressure gauge at full flow rate and read the actual flow from the manufacturer's data, or from the corrected graph curve as appropriate.

(6) If the performance is inadequate, refer back to the installer and designer.

W7.5 Preliminary flow rate check

With all 'normally open' valves fully open, and all control valves set to full flow through terminal units, measure and record the total flow rate from the pump and compare this with the total system design flow rate.

Where the initial measured flow rate is less than 100% of the design flow rate, this indicates that there may be a problem with the pump and/or system, and the installing contractor and designer should be formally advised. The reason for the low flow rate condition should be investigated and, where possible, corrective measures implemented before regulating system flow rates.

W7.6 Constant flow systems

Constant flow systems are systems for which the design flow rates through each branch, once set, are maintained under all operating conditions. Design flow rates are established either by proportional balancing of the system using manually operated regulating valves, or by the action of constant flow regulators that hold flow rates constant under all operating conditions.

The following sections W7.6.1 and W7.6.2 explain the regulating procedure for two types of constant flow circuit.

W7.6.1 Regulating flows in circuits with fixed orifice double regulating valves

Fixed orifice double regulating valves enable single point flow measurement and flow regulation.

For these systems, the main requirement of the regulating process is to undertake a proportional balance whereby regulating valves are adjusted until all branches receive the same percentage of their design flow rate (%DFR) within the specified tolerances.

When proportional balancing a system with manually operated regulating valves, it must be remembered that the adjustment of each regulating valve will cause a change in flow rates through all other branches, and therefore, the balancing process must follow a prescribed procedure.

In each case, it is essential to remember that the adjustment of any regulating valve will cause a change in the flow balance between upstream branches, whereas it will cause no disturbance to the flow balance established between downstream branches. As a consequence, the balancing procedure must always start at system extremities and work its way back towards the pump. Furthermore, for each group of sub-branches to be balanced, the end (i.e. most remote) sub-branch must be made the least favoured to begin with.

A more detailed explanation of proportional balancing is provided in BG2/2010: *Commissioning water systems*[1].

For the circuit shown in Figure 1, the proportional balancing procedure should be as follows:

(1) Open all isolating and double regulating valves on the terminal unit branches (apart from flushing bypass valves which should remain closed).

(2) Set all control valves to full circuit flow (i.e. bypasses closed and full flow through terminal units). Note that systems should not be balanced with control valves in bypass mode since bypass resistances may differ from terminal unit resistances.

(3) Start the pump.

(4) Measure the total flow rate in the branch pipe leading to the sub-branches to be balanced. Adjust this flow rate until it is approximately 110% of its design flow rate value. To achieve this, it may be necessary to vary the pump speed (if the pump is a variable speed pump) or close valves elsewhere in the system.

(5) With all regulating valves still fully open, measure the flow rate through each of the terminal unit branches.

(6) Identify the least favoured terminal branch, i.e. the branch receiving the lowest percentage of its design flow rate (%DFR). This is referred to as the 'index branch'. The index branch is usually either the branch furthest from the pump or the one with the highest resistance terminal unit. If neither of these is the index, investigate why this should be the case.

(7) If the end branch is not the index, then it must be made into an artificial index. To do this, throttle the regulating valve in the end branch until its %DFR is equal to that of the true index. Proportional balancing can now commence from the end branch.

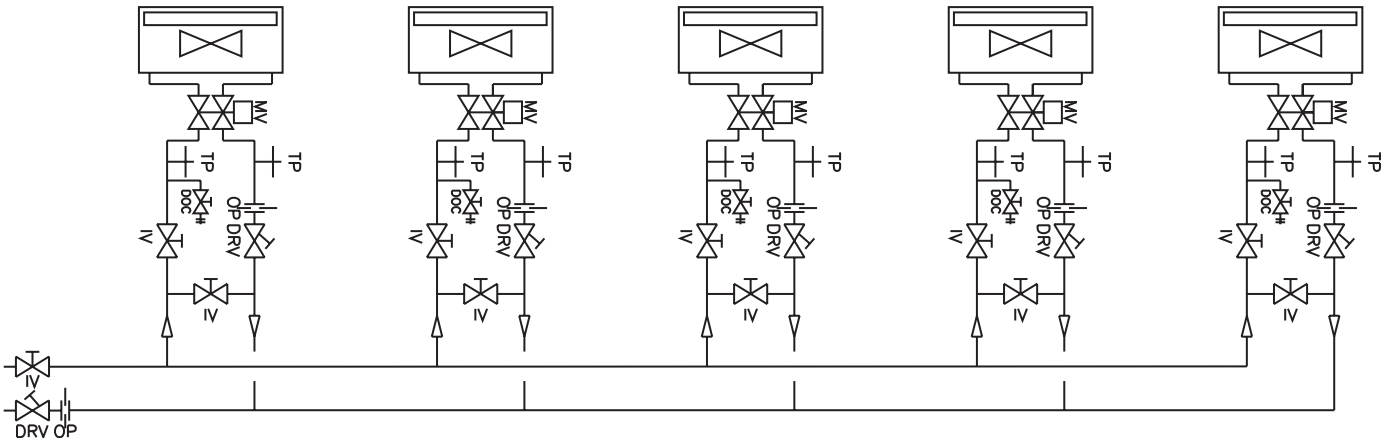
(8) Adjust the regulating valve in the second from end branch until its %DFR is equal to that in the end branch. The %DFR at the end branch will probably change as the upstream branch valve is adjusted. It is therefore important to measure the flow in the end branch simultaneously as the upstream valve is adjusted.

(9) Repeat the previous step for the next upstream branch, always comparing its flow rate with that in the end branch.

(10) Continue balancing upstream branches in turn, moving towards the pump, and using the same end branch as the reference for comparison of %DFR values, until all terminals on the branch are balanced.

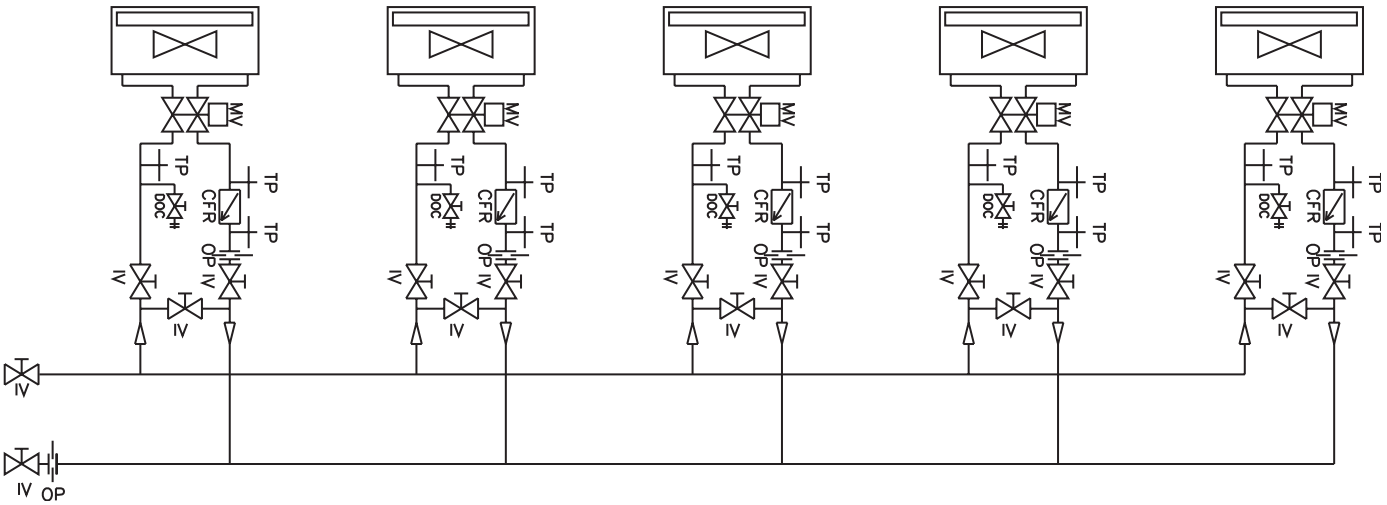
(11) Measure the flow rate in the main branch and adjust its flow to 100% of its design flow rate.

(12) Measure the flow rates through each of the sub-branches and confirm their %DFR values are within the required tolerance range, and that the summation of these flow rates is approximately equal to the flow rate measured in the main branch.



Note: Four-port control valves divert flow through an integral bypass when load is satisfied. Three-port valves may replace 4-port valves for larger coils

Figure 1 Constant flow circuit serving branches with fixed orifice double regulating valves. See page vi for key to symbols.



Note: Flow measurement devices in the same branches as constant flow regulators are optional and are only required if the designer deems it necessary.
In large circuits, an end of run bypass might be included to ensure circulation of water treatment chemicals.

Figure 2 Constant flow circuit serving branches with constant flow regulators. See page vi for key to symbols.

(13) Record the flow measurements, %DFR values and valve settings for all branches and lock the regulating valves in their set positions.

W7.6.2 Regulating flows in circuits with constant flow regulators

Constant flow regulators (CFRs) hold the flow rate in a pipe at a constant value thereby avoiding the need for proportional balancing. They are typically installed on branches serving terminal units.

For the circuit shown in Figure 2, the regulating procedure should be as follows:

(1) Open all isolating valves in the sub-branches (apart from flushing bypass valves which should remain closed).

(2) Using the built-in pressure tappings, measure the pressure differential across the CFR installed in the index terminal branch. The index branch is usually either the branch furthest from the pump or the one with the highest resistance terminal unit. If in doubt, measurements should be taken in both of these locations.

(3) Check that the value measured is within the manufacturer's stated pressure differential operating range. If not, change the pump speed or close valves elsewhere in the system until the measured pressure differential is within the stated operating range.

(4) If the terminal branches containing CFRs also have flow measurement devices installed, measure the flow rates at each of these points to confirm that the set design flow rate for each terminal is being achieved within acceptable tolerance limits.

(5) If the terminal branches containing CFRs do not have flow measurement devices installed, measure the total flow rate in the branch. Isolate each terminal branch in turn, each time recording the drop in flow through the branch. Confirm that in each case, the drop in flow is equal to the set design flow rate through the isolated branch within the required tolerance range.

(6) Confirm that the flow rate measured at the branch flow measurement device is equal to the sum of downstream CFR settings. If this is not the case, investigate the cause and, if necessary, report to the designer.

W7.7 Variable flow systems

Variable flow systems are systems for which the design flow rates through each branch are only achieved under maximum load conditions (i.e. all control valves fully open). Under all part load conditions, system flow rates will reduce making it possible to reduce the speed and hence energy consumption of the pump.

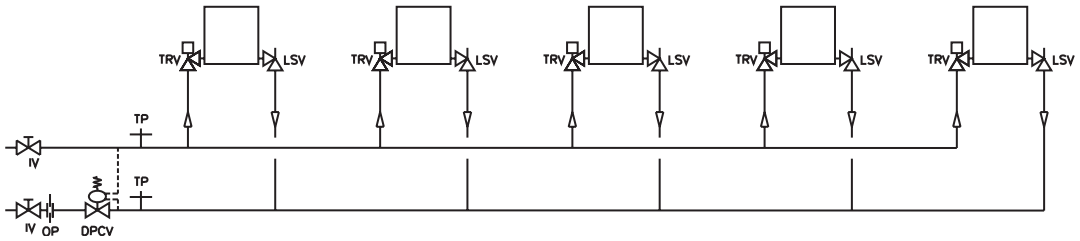
To ensure that design flow rates are achievable under maximum load conditions, full load flow rates should still be achieved and verified.

Hence, as for constant flow systems, regulation of flow rates may require the adjustment of the valves until each branch receives its design flow rate value within the specified tolerances. If manually operated regulating valves are installed then a proportional balancing procedure should be applied, as described for constant flow systems (section 7.6.1). However, if the valves are self-acting, the exercise may be one of flow setting and there may be no need to follow a specific balancing sequence.

The following sections W7.7.1 and W7.7.2 explain the regulating procedure for different types of variable flow circuit.

W7.7.1 Regulating flows through radiators and natural convectors controlled by differential pressure control valves

The simplest variable flow systems are those serving radiators or natural convectors (such as trench heaters or radiant panels). The heat output of these systems is usually controlled by either thermostatic radiator valves (TRVs) located in the same space as the terminals, or 2-port on/off control valves connected to temperature sensors



Note: In large circuits, an end of run bypass might be included to improve speed of response, and ensure circulation of water treatment chemicals.

Figure 3 Variable flow circuit serving branches with lockshield valves and thermostatic radiator valves. See page vi for key to symbols.

located in the occupied space. In large systems, differential pressure control valves are installed to protect TRVs from excessive pressures.

The heating outputs of radiators and natural convectors are not very responsive to changes in water flow rate. Therefore, it is seldom economic to install flow measurement devices in every terminal branch. In these cases, a temperature balance method can be adopted using a recently calibrated contact thermometer. The temperature balance method should be confined to low temperature hot water heating systems where the same design temperature differential is required across each terminal unit.

For the circuit shown in Figure 3, the regulating procedure should be as follows:

(1) Remove TRV heads and fully open all lockshield valves in radiator sub-branches.

(2) Measure the total flow rate in the branch pipe leading to the sub-branches to be balanced. Adjust this flow rate until it is approximately 110% of its design flow rate value. To achieve this, it may be necessary to vary the pump speed or close valves elsewhere in the system.

(3) Operate the system at a flow temperature as close as possible to the operating temperature. If the water temperature is controlled by a weather compensated controller, this should be temporarily disabled.

(4) Measure the return temperature from the end radiator and record the result.

(5) Move to the next upstream radiator branch. Adjust the regulating valve (i.e. either the lockshield valve or, if fitted, a settable TRV) until the return temperature is equal to that for the end radiator. The return temperature at the end radiator will probably change as the upstream branch valve is adjusted. It is therefore important to measure the return temperature simultaneously from the end radiator as the upstream valve is adjusted. Note that for each adjustment of the regulating valve, it will be necessary to allow time for the contact temperature of the return pipe to stabilise. This may take several minutes.

(6) Repeat the previous steps 4 and 5 for each of the upstream radiator branches in turn.

(7) Measure the flow rate in the main branch downstream of the differential pressure control valve (DPCV). Adjust the DPCV until the indicated flow rate is equal to the design value, within the specified tolerance limits.

(8) Measure and record the pressure differential between the pressure tappings adjacent to each of the DPCV capillary tube connections. This is the pressure being held constant by the DPCV across the entire branch.

(9) On completion, confirm that the measured branch flow rate and all radiator return temperature values are within the required tolerance limits (as suggested in Table WA1.1).

W7.7.2 Regulating flows in circuits controlled by differential pressure control valves

Flow rates in systems serving forced convection (i.e. fan driven) units such as fan coil units and active chilled beams, must be proportionally balanced. Differential pressure control valves (DPCVs) are commonly installed to control pressure constant across sub-branches serving multiple terminal units with 2-port control valves. These improve the authority of modulating control valves and protect them from excessive pressures.

For the circuit shown in Figure 4, the regulating procedure should be as follows:

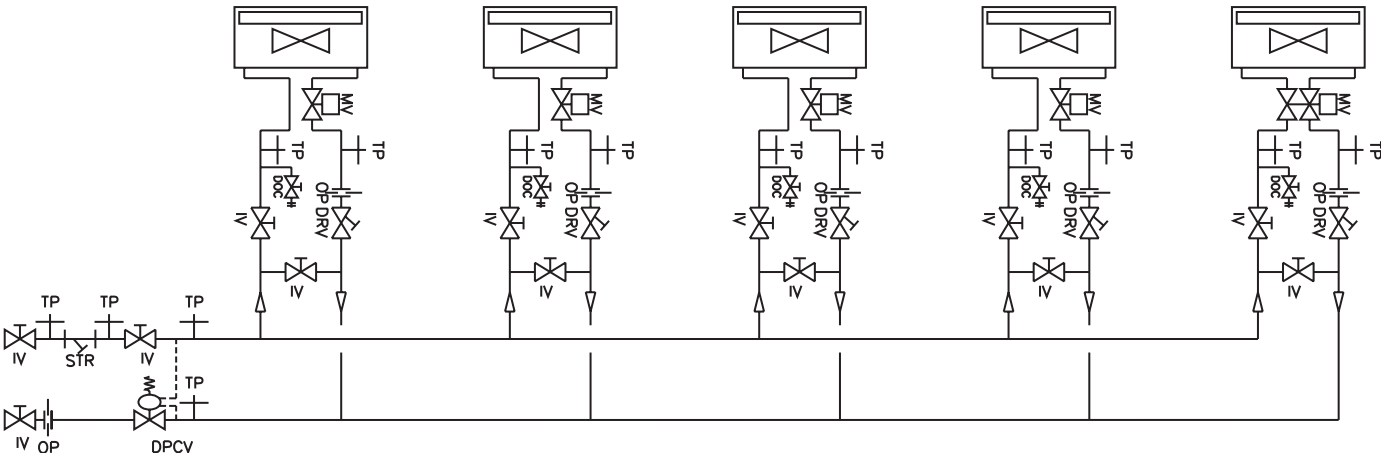
(1) Proportionally balance the flow rates through the terminal branches downstream of the DPCV following the procedure outlined in section W7.6.1.2.

(2) With the DPCV set to the full open position, measure the total sub-branch flow rate at the flow measurement device adjacent to the DPCV. Throttle flows in other circuits or adjust the pump speed until the indicated total flow rate through the DPCV is 110% of the design value.

(3) Measure the pressure differential across the DPCV using either its own built-in pressure tappings or across the tappings provided on either side of the valve. Check to ensure that the measured pressure differential is approximately equal to its specified design value and in all cases is within the manufacturer's stated operating range. If this is not the case, throttle flows in other circuits or adjust the pump speed until the pressure differential across the valve is within its operating range.

(4) Measure the flow rate in the main branch downstream of the DPCV. Adjust the DPCV until the indicated flow rate is equal to the design value, within the specified tolerance limits.

(5) Re-measure the flow rates through all downstream terminal units and record the results and valve



Note: The end terminal has a 4-port control valve to improve speed of response, and ensure continuous circulation of water treatment chemicals. Other forms of system bypass are possible.

Figure 4 Variable flow circuit serving branches with fixed orifice double regulating valves. See page vi for key to symbols.

settings. The results should indicate that flows are proportionally balanced and are within the specified tolerance range.

(6) Measure and record the pressure differential between the pressure tappings adjacent to each of the DPCV capillary tube connections. This is the pressure being held constant by the DPCV across the entire branch.

W7.7.3 Regulating flows in circuits with pressure independent control valves

Pressure independent control valves (PICVs) are typically installed on branches serving terminal units.

For the circuit shown in Figure 5, the regulating procedure should be as follows:

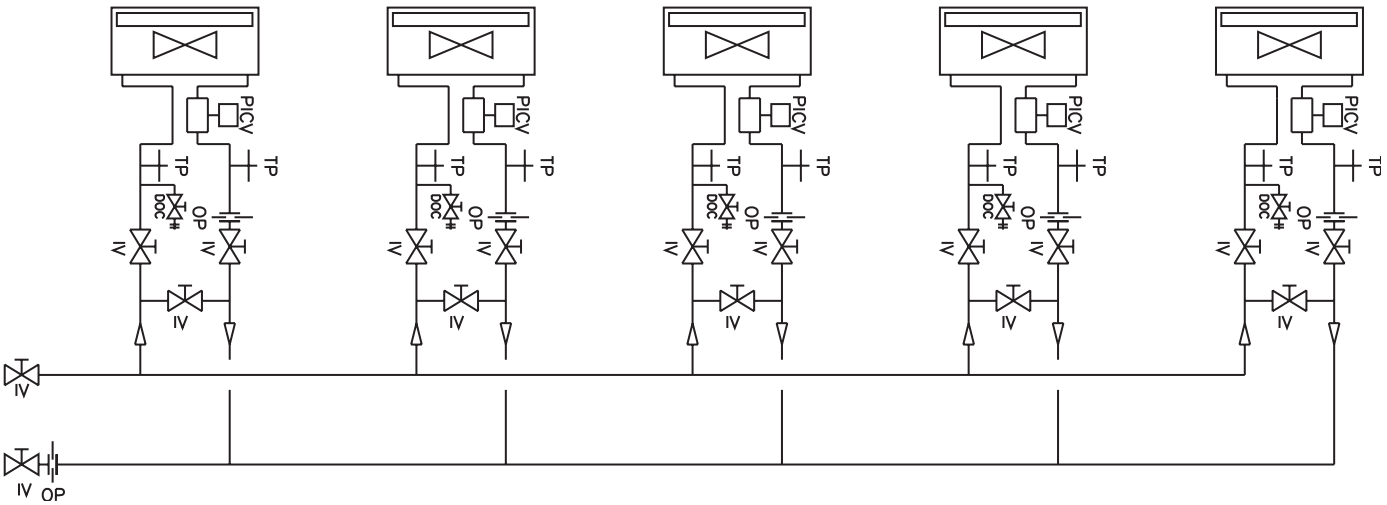
(1) Open all isolating valves in the sub-branches (apart from flushing bypass valves which should remain closed).

(2) For each PICV in any order, adjust the flow to the specified design value and record the setting.

(3) Using the built-in pressure tappings, measure the pressure differential across the PICV installed in the index terminal branch. The index branch is usually either the branch furthest from the pump or the one with the highest resistance terminal unit. If in doubt, measurements should be taken in both of these locations.

(4) Check that the value (or values) measured is/are within the manufacturer's stated pressure differential operating range for the PICV. If not, change the pump speed or close valves elsewhere in the system until the measured pressure differential is within the stated operating range.

(5) If the terminal branches containing PICVs also have flow measurement devices installed, measure the flow rates at each of these points to confirm that the set design flow rate for each terminal is being achieved within the required tolerance limits.



Note: Flow measurement devices in the same branches as PICVs are considered optional and as deemed necessary by the designer. Although not shown, an end of run bypass should be included to improve speed of response, and ensure circulation of water treatment chemicals.

Figure 5 Variable flow circuit serving branches with pressure independent control valves. See page vi for key to symbols.

(6) If the terminal branches containing PICVs do not have flow measurement devices installed, measure the total flow rate in the main branch. Isolate each terminal branch in turn, each time recording the drop in flow through the main branch. Confirm that in each case, the drop in flow is equal to the set design flow rate through the isolated branch.

(7) Confirm that the flow rate measured at the main branch flow measurement device is equal to the sum of downstream PICV settings. If this is not the case, investigate the cause and, if necessary, report to the designer.

W7.8 Flow balancing in systems with diversity

In variable flow systems designed to allow for load diversity, it should never be possible for the entire system to operate at maximum load simultaneously. Under these circumstances, the commissioning and witnessing procedures should be qualified by a statement of the anticipated operating conditions under which maximum load design flow rates should be achievable.

Hence the balancing procedure appropriate to the particular valve solution should be modified as follows:

(1) Regulate flow rates in all parts of the system at as near as possible to the full load design flow rates for each branch. In order to achieve sufficient flow rates for regulation, it may be necessary to isolate some branches or vary pump speed to increase the flow rates through the particular branches to be regulated.

(2) Only after all branches in the system have been balanced in this way should various diversified load conditions be established for the purposes of checking part load operating conditions. Worst case diversified load conditions should be specified by the designer and simulated by the commissioning specialist on site by the closure of specified branch valves.

W7.9 Checks at maximum and minimum load conditions

In order to demonstrate system performance in variable flow systems at full and minimum load conditions (and thereby quantify the potential pump energy saving), pump flow and operating pressure differentials should be measured, recorded and plotted on the manufacturer's pump curve at a minimum of four operating points, these being:

— with all control valves set to full flow through terminal units

— with all control valves closed, i.e. set to zero flow through terminal units

— at two intermediate points, with a sufficient number of valves closed, to give approximately 30% and 60% of design maximum flow.

For each of these conditions, the pump energy consumption, as indicated by the manufacturer's pump curve should be recorded. These values should be included on the commissioning results.

W7.10 Commissioning certification

When the recommended commissioning procedures have been satisfactorily completed, the commissioning specialist should certify that the system has been commissioned in accordance with this Code and the project specification. The certificate should be countersigned by the accepting authority who may be the designer or client or some other witnessing authority.

The certificate should be accompanied by the documents listed in section W5 of this Code together with copies of the static completion certificates and a complete record of all instrumentation used in commissioning including manufacturers' serial numbers and calibration dates.

W8 Evaluation and witnessing of commissioned systems

W8.1 Objective

The objective is to witness formally, on behalf of the client or his/her representative, the degree to which the commissioning requirements of the specification have been met.

W8.2 Witnessing arrangements

W8.2.1 Witnessing period

A specific period of time for client witnessing should be indicated in the initial project programme, with a written contingency allowance.

W8.2.2 Witnessing requirements

All requirements for witnessing should be expressed in an agreed written format, copies of which are made available to the commissioning specialist. This format must contain full details of the tolerances applicable to all parameters.

In deciding the detailed requirements for witnessing commissioning, the interaction of various aspects of an installation in determining its overall performance must be borne in mind. The commissioning of a water distribution system might be witnessed against the requirements of this Code and the project specification. However, witnessing the performance of heat exchangers connected to water distribution systems, for example, would interact with the commissioning of air distribution and automatic control systems as well as of boiler and refrigeration plant. Witnessing is thus an all-embracing and interactive task and this must be reflected in the agreed written format.

W8.2.3 Liaison

The witnessing authority should liaise in detail with the installer, the commissioning manager (where appointed) and the commissioning specialist, as necessary, with regard to:

(*a*) the means to be used to demonstrate that mass or volume flow rates are within the specified tolerances

(*b*) co-ordination requirements where the performance aspects to be witnessed interact with other systems or equipment.

W8.3 Duties of witnessing authority

The witnessing authority should:

(*a*) be satisfied that throughout the installation and regulating process, the requirements of the project specification and this Code have been met

(*b*) check calibration dates for instruments used by the commissioning specialist

(*c*) check the flow rate at any selected flow measurement point using a similar instrument and compare with the data recorded by the commissioning specialist and with the designer's requirements including any permitted tolerance

(*d*) where heating and/or chiller plant are working, check air and water temperatures

(*e*) visually inspect any part of the system covered by this section to ensure that certification is correct

(*f*) countersign and endorse as necessary the certificate of the appointed commissioning specialist verifying that the system has been regulated in accordance with the specification requirements

(*g*) where required, complete a separate witnessing certificate confirming satisfaction, one copy of which is handed to the commissioning specialist.

W8.4 Commissioning documentation

The design of standard forms for the various requirements for commissioning records and certification is outside the scope of this Code, and is a matter for agreement between parties. However, as a minimum, the following basic information should be detailed.

W8.4.1 Flow measurement, double regulating and automatic control devices

(*a*) Measuring device position number

(*b*) Type of measuring device

(*c*) Size (mm)

(*d*) Design flow rate (l/s or kg/s)

(*e*) Design pressure drop (kPa or mmH_2O)

(*f*) Manufacturers' performance data for measuring devices used

W8.4.2 Flow rate balancing and regulation data

(*a*) First scan

(*b*) Actual pressure drop (kPa or mmH_2O)

(*c*) Actual flow (l/s)

(*d*) Percentage of design flow rate (%)

(*e*) Double regulating valve number

(*f*) Double regulating valve setting position (should be fully open)
Note: the formal recording of data in the intermediate stages of balancing is also recommended.

(*g*) Final scan

(*h*) Final pressure drop (kPa or mmH_2O)

(*i*) Final flow rate (l/s)

(*j*) Final percentage of design flow rate (%)

(*k*) Final setting position of double regulating valve (not more than 75% closed)

(*l*) Bypasses (generally set on final run only)

(*m*) Valve number

(*n*) Setting position for final design flow rate

(*o*) Comments

W8.4.3 Pump details

(*a*) Make

(*b*) Type

(*c*) Serial number

(*d*) Drive type

(*e*) Impeller diameter (mm)

(*f*) Pump speed (rev/min)

(*g*) Motor speed (rev/min)

(*h*) Motor full-load current (A)

(*i*) Motor power (kW)

(*j*) Belt

(*k*) Pulleys

(*l*) Manufacturers' performance data/charts

W8.4.4 Other equipment

(*a*) Design flow rate (l/s)

(*b*) Measured flow rate (l/s)

(*c*) Pressure drop (kPa or mmH_2O)

W8.4.5 System data

System data should be presented in the form of a standard table. Recommended proforma tables for commissioning data are provided in BSRIA Guide BG2/2010: *Commissioning water systems*[1].

W8.4.6 Certification of documented commissioning results

These documents should be signed, dated and witnessed, as a true certification of the full working order of the water system.

References

1 Parsloe C J *Commissioning water systems* BSRIA BG2/2010 (Bracknell: Building Services Research and Information Association) (2010)

2 *Commissioning management* CIBSE Commissioning Code M (London: Chartered Institution of Building Services Engineers) (2003)

3 The Building Regulations 2000 Statutory Instruments 2000 No 2531 as amended by The Building Regulations (Amendment) Regulations 2000 Statutory Instruments 2000 No. 1554, The Building (Amendment) Regulations 2001 Statutory Instruments 2001 No. 3335, The Building and Approved Inspectors (Amendment) Regulations 2006 Statutory Instruments 2006 No. 652, The Building (Amendment) Regulations 2009 Statutory Instruments No. 466 2009, The Building (Amendment No. 2) Regulations 2009 Statutory Instruments No. 2397 2009 and The Building and Approved Inspectors (Amendment) Regulations 2010 Statutory Instruments No. 719 2010 (London: The Stationery Office) (2000–2010)

4 *Conservation of fuel and power in new buildings other than dwellings* The Building Regulations 2000. Approved Document L2A Newcastle upon Tyne: NBS) (2010)

5 *Means of ventilation* The Building Regulations 2000. Approved Document F (Newcastle upon Tyne: NBS) (2010)

6 *Air distribution systems* CIBSE Commissioning Code A (London: Chartered Institution of Building Services Engineers) (2002)

7 *Boilers* CIBSE Commissioning Code B (London: Chartered Institution of Building Services Engineers) (2002)

8 *Automatic controls* CIBSE Commissioning Code C (London: Chartered Institution of Building Services Engineers) (2001)

9 *Refrigeration systems* CIBSE Commissioning Code R (London: Chartered Institution of Building Services Engineers) (2002)

10 Teekaram A J *Variable-flow water systems: design, installation and commissioning guidance* BSRIA AG16/2002 (Bracknell: Building Services Research and Information Association) (2002)

11 Parsloe C J *The commissioning of air systems in buildings: Application procedures for buildings* BSRIA AG3/89.3 (Bracknell: Building Services Research and Information Association) (2001)

12 Dicks M *Commissioning management: How to achieve a fully functioning building* BSRIA AG 5/2002 (Bracknell: Building Services Research and Information Association) (2002)

13 *Commissioning Job Book* BSRIA BG11/2010 (Bracknell: Building Services Research and Information Association) (2010)

14 Parsloe C J *Pre-commission cleaning of water systems* BSRIA AG 1/2001.1 (Bracknell: Building Services Research and Information Association) (2001)

15 BS EN 10255: *Non-alloy steel tubes suitable for welding or threading* (London: British Standards Institution) (2004)

16 *Site pressure testing of pipework* HVCA TR/6 (London: Heating and Ventilating Contractors' Association) (2006)

17 Water Supply (Water Fittings) Regulations 1999 Statutory Instruments 1999 No. 1148 (London: The Stationery Office) (1999)

18 Health and Safety at Work etc. Act 1974 (London: Her Majesty's Stationery Office) (1974)

19 Environmental Protection Act 1990 (London: The Stationery Office) (1990)

20 The Control of Substances Hazardous to Health Regulations 2002 Statutory Instruments No. 2677 2002 (London: The Stationery Office) (2002)

21 BS 7350: 1990: *Specification for double regulating globe valves and flow measurement devices for heating and chilled water systems* (London: British Standards Institution) (1990)

22 *Reference data* CIBSE Guide C4 (London: Chartered Institution of Building Services Engineers) (2007)

23 BS EN ISO 5167-2: 2003: *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full. Orifice plates* (London: British Standards Institution) (2003)

24 BS EN ISO 5167-1: 2003: *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full. General principles and requirements* (London: British Standards Institution) (2003)

Bibliography

BS EN 1057: 2006 + A1: 2010: *Copper and copper alloys. Seamless, round copper tubes for water and gas in sanitary and heating applications* (London: British Standards Institution) (2006/2010)

BS EN 24006: 1993: (ISO 4006: 1991): *Measurement of fluid flow in closed conduits. Vocabulary and symbols* (London: British Standards Institution) (1993)

BS 6683: 1985: *Guide to installation and use of valves* (London: British Standards Institution) (1985)

BS 6880-1: 1988: *Code of practice for low temperature hot water heating systems of output greater than 45 kW. Fundamental and design considerations* (London: British Standards Institution) (1988)

BS 6880-2: 1988: *Code of practice for low temperature hot water heating systems of output greater than 45 kW. Selection of equipment* (London: British Standards Institution) (1988)

BS 6880-3: 1988: *Code of practice for low temperature hot water heating systems of output greater than 45 kW. Installation, commissioning and maintenance* (London: British Standards Institution) (1988)

BS 5410-1: 1997: *Code of practice for oil firing. Installations up to 45 kW output capacity for space heating and hot water supply purposes* (London: British Standards Institution) (1997)

BS 5410-2: 1978: *Code of practice for oil firing. Installations of 45 kW and above output capacity for space heating, hot water and steam supply services* (London: British Standards Institution) (1978)

BS 5449: 1990: *Specification for forced circulation hot water central heating systems for domestic premises* (London: British Standards Institution) (1990)

BS 5918: 1989: *Code of practice for solar heating systems for domestic hot water* (London: British Standards Institution) (1989)

BS 7074-1: 1989: *Application, selection and installation of expansion vessels and ancillary equipment for sealed water systems. Code of practice for domestic heating and hot water supply* (London: British Standards Institution) (1989)

BS 7074-2: 1989: *Application, selection and installation of expansion vessels and ancillary equipment for sealed water systems. Code of practice for low and medium temperature hot water heating systems* (London: British Standards Institution) (1989)

BS 7074-3: 1989: *Application, selection and installation of expansion vessels and ancillary equipment for sealed water systems. Code of practice for chilled and condenser systems* (London: British Standards Institution) (1989)

BS 7291-1: 2010: *Thermoplastics pipe and fitting systems for hot and cold water for domestic purposes and heating installations in buildings. General requirements* (London: British Standards Institution) (2010)

BS 7291-2: 2010: *Thermoplastics pipe and fitting systems for hot and cold water for domestic purposes and heating installations in buildings. Specification for polybutylene (PB) pipe and associated fittings* (London: British Standards Institution) (2010)

BS 7291-3: 2010: *Thermoplastics pipe and fitting systems for hot and cold water for domestic purposes and heating installations in buildings. Specification for crosslinked polyethylene (PE-X) pipes and associated fittings* (London: British Standards Institution) (2010)

BS 7593: 2006: *Code of practice for treatment of water in domestic hot water central heating systems* (London: British Standards Institution) (2006)

BS 7671: 2008: *Requirements for electrical installations. IEE Wiring Regulations. Seventeenth edition* (London: British Standards Institution) (2008)

BS EN 12098-1: 1997: *Controls for heating systems. Outside temperature compensated control equipment for hot water heating systems* (London: British Standards Institution) (1997)

BS EN 12098-2: 2001: *Controls for heating systems. Optimum start-stop control equipment for hot water heating systems* (London: British Standards Institution) (2001)

Commissioning engineers compendium (Horsham: Commissioning Specialists Association) (2000)

Confined Spaces Regulations 1997 Statutory Instruments 1997 No. 1713 (London: The Stationery Office) (1997)

Conservation of fuel and power in new dwellings The Building Regulations 2000. Approved Document L1A (Newcastle upon Tyne: NBS) (2010)

Conservation of fuel and power in new buildings other than dwellings The Building Regulations 2000. Approved Document L2A (Newcastle upon Tyne: NBS) (2010)

The Construction (Design and Management) Regulations 2007 Statutory Instruments No. 320 2007 (London: The Stationery Office) (2007)

Construction (Head Protection) Regulations 1989 Statutory Instrument 1989 No. 2209 (London: The Stationery Office) (1989)

Construction (Health, Safety and Welfare) Regulations 1996 Statutory Instruments 1996 No. 1592 (London: The Stationery Office) (1996)

Electricity at Work Regulations 1989 Statutory Instrument 1989 No. 635 (London: The Stationery Office) (1989)

The Gas Safety (Installation and Use) Regulations 1998 Statutory Instruments 1998 No. 2451 (London: The Stationery Office) (1998)

Heating, hot and cold water, steam and gas installations for buildings Defence Estate Organisation Specification 036. (London: The Stationery Office) (1997)

HVAC systems: testing, adjusting and balancing (2nd edition) (Atlanta, GA: American Society of Heating, Refrigerating and Air-Conditioning Engineers) (1990)

Management of Health and Safety at Work Regulations 1999 Statutory Instruments 1999 No. 3242 (London: The Stationery Office) (1999)

Noise at Work Regulations 1989 Statutory Instruments 1989 No. 1790 (London: The Stationery Office) (1989)

Notification of Cooling Towers and Evaporative Condensers Regulations 1992 Statutory Instruments 1992 No. 2225 (London: The Stationery Office) (1992)

Personal Protective Equipment at Work Regulations 1992 Statutory Instruments 1992 No. 2966 (London: The Stationery Office) (1992)

Petitjean R *Total hydronic balancing* (Ljung, Sweden: Tour and Andersson AB) (1994)

Practices for measurement, testing, adjusting and balancing of building heating, ventilation, air-conditioning and refrigeration systems ANSI/ASHRAE Standard 111-1988 (Atlanta, GA: American Society of Heating, Refrigerating and Air-Conditioning Engineers) (1988)

Pressure Systems Safety Regulations 2000 Statutory Instruments 2000 No. 128 (London: The Stationery Office) (2000)

Procedural standards for testing, adjusting, balancing of environmental systems (6th edition) (Gaithersburg, MD: National Environmental Balancing Bureau) (1998)

Provision and Use of Work Equipment Regulations 1998 Statutory Instruments 1998 No. 2306 (London: The Stationery Office) (1998)

Public health engineering CIBSE Guide G (London: Chartered Institution of Building Services Engineers) (2004)

The Building Regulations 2000 Statutory Instruments 2000 No 2531 as amended by The Building Regulations (Amendment) Regulations 2000 Statutory Instruments 2000 No. 1554, The Building (Amendment) Regulations 2001 Statutory Instruments 2001 No. 3335, The Building and Approved Inspectors (Amendment) Regulations 2006 Statutory Instruments 2006 No. 652, The Building (Amendment) Regulations 2009 Statutory Instruments No. 466 2009, The Building (Amendment No. 2) Regulations 2009 Statutory Instruments No. 2397 2009 and The Building and Approved Inspectors (Amendment) Regulations 2010 Statutory Instruments No. 719 2010 (London: The Stationery Office) (2000–2010)

Wild L J *Commissioning HVAC systems — Division of responsibilities* BSRIA TM1/88 (Bracknell: Building Services Research and Information Association) (1988)

Working Time Regulations 1999 Statutory Instruments 1999 No. 3372 (London: The Stationery Office) (1999)

Workplace (Health, Safety and Welfare) Regulations 1992 Statutory Instruments 1992 No. 3004 (London: The Stationery Office) (1992)

Appendix WA1: Design

WA1.1 Design requirements

Effective operation of any system depends on satisfactory commissioning. It is important that practical commissioning requirements are fully considered by the designer at the conceptual stage, i.e. that the system can be regulated and that there are appropriately located valves and flow measurement devices to enable the commissioning specialist to achieve this. Designers are recommended to provide a realistic and unequivocal commissioning specification so that satisfactory commissioning is assured and the systems perform as intended. Early discussions with the commissioning specialist will assist the designer to achieve this.

WA1.2 Design information

To ensure that flow rate measurement and regulation can be carried out correctly, the following information should be properly documented by the designer in the commissioning specification. This should be transmitted to the services installer and commissioning specialist together with a full description of the intended operation of the system explaining the control sequence and logic.

Note: where the installer makes the equipment selection and this differs from the designer's specification, the installer should amend, or add to, the document accordingly. The designer should be advised of all such variations from the specification.

WA1.2.1 Schematic drawings

Complete schematics of all systems should be prepared using standard graphic symbols. They should include, where possible:

(*a*) pipe sizes

(*b*) flow rates in all pipe branches and circuits

(*c*) the positions of all valves and flow measurement devices, with each unique type having its own specific drawing symbol

(*d*) a unique identification number for all valves and flow measurement devices that can be referenced to a separate valve schedule

(*e*) flow rates and manufacturers' quoted pressure drops across heat emitters, heat exchangers and other items of plant

(*f*) flow rates and manufacturers' quoted pressure drops across automatic control valves

(*g*) anticipated design pressure drops throughout the distribution system covering, as a minimum, the whole of the index circuit, risers and main branches

(*h*) draw-off rates for cold water and domestic hot water systems

(*i*) regulating devices approved by the local water company to control cold water and domestic hot water systems

(*j*) cold feed, pressurisation unit, feed and expansion tank points of connection

(*k*) provisions for system flushing and bypass connections to main plant, together with a typical terminal detail of the bypass.

WA1.2.2 Documentation

Schedules of all items of plant with technical data should be provided as follows:

(*a*) *pumps*: duty, impeller size, speed and characteristic curves

(*b*) *boilers*: duty, operating temperatures and pressure

(*c*) *calorifiers*: flow rate and pressure drop, primary and secondary flow and return temperatures

(*d*) *refrigeration condensers*: flow rates and pressure drops, flow and return temperatures

(*e*) *refrigeration evaporators*: flow rates and pressure drops, flow and return temperatures

(*f*) *flow measuring devices*: identification number, size, flow rate, pressure drop and signal flow coefficient (k_{vs})

(*g*) *double regulating valves*: identification number, size, flow rate, pressure drop and valve flow coefficient (k_v)

(*h*) *terminal units*: identification number, design flow and return temperatures; flow rates and pressure drops

(*i*) *control valves*: identification number, flow rate and pressure drop, and k_v

(*j*) *heat exchangers*: identification number, flow rate and pressure drop, primary and secondary flow and return temperatures

(*k*) *glands, etc*: highlight all glands and other components used in the system made from materials likely to be affected by chemical cleaning

(*l*) *differential pressure control valves*: maximum and minimum operating differential pressures, design maximum flow rates and full open k_v values for each valve

(*m*) *pressure independent control valves*: maximum and minimum operating differential pressures, design flow rate value and full open k_v value for each valve.

WA1.2.3 Other information

(*a*) Diagrams for electrical and pneumatic equipment used with the water distribution system.

(*b*) Manufacturers' setting to work, operating and maintenance instructions for equipment.

WA1.3 Tolerances

Suggested ranges of tolerances are given in Tables WA1.1 and WA1.2. Systems regulated to the appropriate tolerance band should be capable of meeting the design intent

in operational use. The nominal tolerances apply to repeatable readings produced by the installed flow measurement device with associated instrumentation and do not account for any inaccuracies within these components.

The tolerances set out in Tables WA1.1 and WA1.2 may be considered to be default target values. They provide a level of accuracy that should be achieved when commissioning the majority of building services installations.

However, it is possible that, following a thorough balancing and regulation procedure, the results may fall outside the limits set out in these tables. In such cases, the commissioning specialist shall report these exceptions to the designer, together with the reasons why the tolerances cannot be met. On receipt of the results and consideration of the reasons for any deviations, the designer may relax the tolerances set out in the tables, or propose changes to the system that allow the tolerances to be met.

Further advice on determining acceptable flow measurement tolerances is provided in BSRIA Guide BG2/2010: *Commissioning water systems*[1].

Where flow rates to terminals are very low and likely to generate pressure differentials of less than 1 kPa across the flow measurement device, then the scope for accurate and repeatable measurement of flow will be severely limited. Measurements will be affected by instrument accuracy and it may be necessary to adopt one of the solutions described in section WA1.4.1.

Furthermore, it should be noted that the values in Tables WA1.1 and WA1.2 are based on the accuracy of fixed orifice flow measurement devices and venturis. When using a variable orifice regulating valve for flow measurement, the pressure differential reading is usually taken across the seat of the valve; hence, the accuracy of the measurement is affected by the position of the regulating disc in relation to the seat. With a correctly sized valve, the normal regulating position should be between fully open and 50% closed. If the disc is in relatively close proximity to the seat (less than 25% open), additional turbulence can occur which, in turn, may affect the differential pressure reading. For this reason, the allowable tolerances shown in the tables are only applicable to the measurement across the seat of the valve when the valve is no more than 50% closed. BS 7350[21] and/or the valve manufacturer should be consulted if the valve is closed further than this.

Table WA1.1 Suggested tolerances for flow regulation in heating systems

Component	Tolerance
Natural convectors (e.g. trench heaters, radiators, and radiant panels)	Return temperatures all within ± 3 °C
Forced convection (fan driven) heating coils where flow rate is < 0.015 l/s	Refer to section WA1.4.1
Forced convection (fan driven) heating coils where flow rate is ≥ 0.015 l/s and < 0.1 l/s:	
Heating water $\Delta T \leq 11$ °C	± 15%
Heating water $\Delta T > 11$ °C	± 10%
Forced convection (fan driven) heating coils where flow rate is ≥ 0.1 l/s:	
Heating water $\Delta T \leq 11$ °C	± 10%
Heating water $\Delta T > 11$ °C	± 7.5%
Branches:	
Heating water $\Delta T \leq 11$ °C	± 10%
Heating water $\Delta T > 11$ °C	± 7.5%
Mains (flow from pump)	0 to +10%

For a proportional balance to be achieved, the upper and lower tolerance levels should not be exceeded. The lower, i.e. negative value, is the minimum value that the least favoured or index unit should achieve. Wherever possible, the remainder of the proportional balance should be achieved within the overall tolerance and should aggregate to a minimum of 100%.

Where the summation of sub-branch flow rates does not add up to the main branch flow rate, causes of flow measurement inaccuracy should be investigated. Appendix section WA2.4 provides an explanation of the possible causes of flow measurement inaccuracy.

Table WA1.2 Suggested tolerances for flow regulation in chilled water systems

Component	Tolerance
Cooling coils where flow rate is < 0.015 l/s	Refer to section WA1.3.1
Cooling coils where flow rate is ≥ 0.015 l/s and < 0.1 l/s	–5 to +10
Cooling coils where flow rate is > 0.1 l/s	0 to +10
Branches	0 to +10
Mains	0 to +10

For a proportional balance to be achieved, the upper and lower tolerance levels should not be exceeded. The lower, i.e. negative value, is the minimum value the least favoured or index unit should achieve. Wherever possible, the remainder of the proportional balance should be achieved within the overall tolerance and should aggregate to a minimum of 100%.

Where the summation of sub-branch flow rates does not add up to the main branch flow rate, causes of flow measurement inaccuracy should be investigated. Appendix section WA2.4 provides an explanation of the possible causes of flow measurement inaccuracy.

WA1.3.1 Ultra low flow rates

The term 'ultra low flow rate' is generally applied to the flow through a forced convection (fan driven) heating coil for which the specified design flow rate is too low to be measured by a standard flow measurement device. Commercially available flow measurement devices may be unable to generate a signal of 1 kPa or more making it difficult to obtain accurate and repeatable flow measurements.

Valve manufacturers' products vary but, in general, any flow rate that is below 0.015 litres per second is at risk of falling into the category of an ultra low flow.

Such low flow rates should not be avoided since some low energy heat generating solutions may be dependent on them. However, where ultra low flow rates are specified, the designer should decide on an appropriate

course of action for commissioning, and should advise the commissioning specialist accordingly.

Options for dealing with ultra low flow rates include:

— incorporating improvised flow measurement solutions as described in Appendix section WA2.1.3

— adopting a 'subtraction method' of flow measurement whereby the flow rate through a particular terminal branch is estimated by measuring the reduction in flow rate that occurs through a flow measurement device when the terminal branch is isolated

— regulating flows based on temperature, the same as for natural convectors

— temporarily increasing branch flow rates (by throttling other branches) until measureable flow rates are achieved through terminal units, and proportional balancing is possible

— the use of self-balancing pipework configurations for small groups of terminals thereby avoiding the need for proportional balancing (*Note*: such designs must be approached with caution. Further advice on this subject is given in BSRIA Guide BG2/2010: *Commissioning water systems*[1]).

In relation to each of the aforementioned alternatives, the designer must decide whether a relaxation in the stated flow measurement tolerances is appropriate.

WA1.4 Flow velocity

Limiting maximum and minimum water velocities should be adopted to minimise dirt and air settlement in horizontal pipes at low velocities, or noise at high velocities.

For guidance on velocity limits, reference should be made to the section '*Flow of fluids in pipes and ducts*' in CIBSE Guide C4: *Reference data*[22].

WA1.5 Pump flow rate margin

A pump should be selected to deliver the maximum design flow rate against the estimated pressure drop around the index circuit. The pump operating point must be located within the pump manufacturer's recommended operating range for the particular pump selected.

WA1.6 Valve sizing

All valves with a commissioning function must be selected by the designer within the requirements of Appendix section WA2 of this Code and in accordance with the manufacturer's recommendations.

WA1.7 Provisions for pressure measurements

Pressure tappings should be included as follows:

— either within two pipe diameters up- and downstream of the pump flange faces (i.e. between the pump and isolating valves) or installed in purpose-made pump flange drillings

— in flow and return connections to all high pressure loss heat exchanger coils, and terminal units

— upstream and downstream of main strainers to detect an increase in pressure differential indicating a blocked mesh

— across flow measurement devices that use pressure differential as an indicator of flow rate

— across differential pressure control valves and pressure independent control valves so that a check can be made that the valves are operating within their stated differential pressure operating ranges (*Note*: some valves have their own built-in pressure tappings for this purpose)

— across the capillary tube connections from differential pressure control valves so that the controlled differential pressure setting can be measured and recorded

— across the connections to differential pressure sensors used for pump speed control so that the controlled pressure used as the basis for pump speed control can be checked

— across 2-port control valves serving low flow terminal units (where pressure differential across the 2-port valve is to be used as an indicator of flow rate as described in Appendix section WA2.1.3).

WA1.8 Ease of access

The designer must provide access to all pressure test points, flow measurement devices, regulating valves, control valves, and any other items of equipment requiring adjustment during commissioning and maintenance.

Appendix WA2: Flow measurement, regulation and differential pressure control

Pipeline devices that are relevant to the commissioning process are likely to be those performing one of the following functions:

(a) Flow measurement

(b) Flow regulation

(c) Differential pressure control

Unless these components are sized correctly and properly located in the system, it may be impossible to commission the system in accordance with the design intent.

The following sections describe the main device options and how they should be applied and sized. More detailed guidance on valve and flow measurement devices is provided in BSRIA Guide BG2/2010: *Commissioning water systems*[1].

WA2.1 Flow measurement devices

Flow measurement devices should be permanently installed components that enable flow rate to be determined based on the measurement of the pressure differential across a fixed resistance. Since there is an approximately square law relationship between pressure differential and flow rate, the pressure drop measured across a fixed resistance can be used to determine flow rate. The fixed resistance should usually take the form of a fixed orifice fitting, an orifice plate or a venturi.

Manufacturers of flow measurement devices should provide data describing the characteristics of the measuring device either in a graphical or a tabular form suitable for use by the commissioning specialist. The published data should be produced from component type test data and should quote the accuracy of the device. A flow coefficient (k_{vs} value) should also be provided by the manufacturer to enable flow rate to be calculated from the equations provided in section WA2.6.1.

WA2.1.1 Orifice plate (fixed orifice flow measurement device)

A fixed orifice flow measurement device uses the pressure differential across an orifice plate as an indicator of flow rate. An orifice plate is a plate with a circular opening at its centre of a diameter that is less than the internal bore of the adjoining pipe. Pressure tappings are fitted upstream and downstream of the orifice plate and are used to measure the pressure differential signal across the orifice.

Fixed orifice flow measurement devices up to 50 mm diameter should comply with BS 7350: 1990[21]. Orifice plates greater than 50 mm nominal diameter should comply with BS EN ISO 5167-2: 2003[23].

WA2.1.2 Venturi meter

A venturi meter uses the pressure differential across a concentric pipework constriction as an indicator of flow rate. The inside diameter of the meter reduces gradually until it reaches the narrowest point (the throat) and then opens gradually back to the adjoining pipe diameter. Pressure tappings at the throat (maximum velocity) and at the maximum diameter (minimum velocity), enable the pressure differential signal to be recorded.

Venturi meters should comply with BS EN ISO 5167[23,24] or be shown to provide a flow measurement accuracy equivalent to that achievable by an equivalent fixed orifice device.

WA2.1.3 Other fixed resistances

In theory, all fixed resistance items in the system can be used as indicators of flow rate if pressure tappings are provided on the inlet and outlet ports. However, the accuracy and repeatability of such solutions will not be as good as that achieved by purpose-made flow measurement devices. Hence, this type of solution should normally only be considered when the use of a purpose-made device is not possible, e.g. for ultra low flow situations.

The most obvious fixed resistance items to use for flow measurement purposes are terminal units and control valves. Figure WA2.1 illustrates the proposed optional locations for pressure tappings. In practice, these may need to be agreed and installed by the terminal unit manufacturer.

The pressure differential across either the terminal unit or its control valve can be used to determine flow rate provided that the respective manufacturer is able to provide an accurate resistance value for their equipment. Control valve manufacturers in particular, are able to provide accurate k_{vs} values for their valves in the fully open position.

WA2.2 Regulating valves

Regulating valves (in the context of commissioning) are valves that are used to add resistance in pipework circuits so as to enable the regulation of system flow rates. The term 'regulating valve' usually implies a manually operated valve as opposed to a self-acting valve.

WA2.2.1 Lockshield valve

Lockshield radiator valves are a simple example of a regulating valve. These valves are fitted to radiator outlets to enable proportional balancing of flows through radiators. Lockshield valves can be adjusted using a spanner to rotate the valve spindle. Once set, a cap is placed over the spindle to make it less prone to tampering with by occupants. If the valve is subsequently used to isolate the radiator, its flow setting is lost and it will need to be re-set.

WA2.2.2 Double regulating valve

A double regulating valve is a regulating valve that can perform the double function of flow isolation and

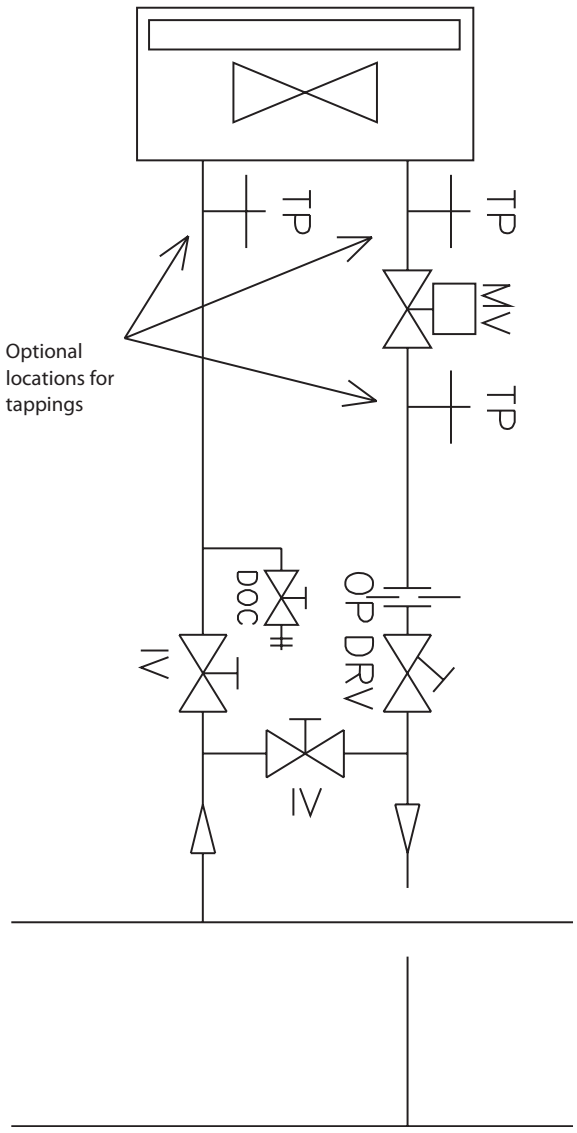


Figure WA2.1 Locations of pressure tappings around fixed resistances. See page vi for key to symbols.

regulation. This double function is achieved by incorporating a locking mechanism in the handle of the regulating valve. This allows the valve handle to be adjusted until the required flow rate is achieved and then locked in place. If the valve is subsequently closed for isolation purposes, on re-opening, the valve handle will only open as far as its locked position.

Double regulating globe valves should comply with BS 7350: 1990 *Specification for double regulating globe valves and flow measurement devices for heating and chilled water systems*[21]. Other valve types should be shown to provide an equal level of regulating ability.

WA2.2.3 Constant flow regulator

A constant flow regulator is any self-acting device that operates to hold the flow rate through the branch in which it is installed constant regardless of pressure and flow rate changes in surrounding branches. When used in variable flow applications, these devices are often referred to as 'flow limiting valves' since they limit the maximum flow but allow the flow to drop to zero as the system closes down.

The simplest type of constant flow regulator comprises a spring loaded stainless steel cartridge containing a piston with specially profiled holes, that sits inside a brass casing. An interchangeable orifice plate forms the entry port of the cartridge which enables a variety of flow values to be specified.

Once water starts to flow, the upstream pressure is exerted onto the front surface area of the orifice plate whilst, due to the friction loss across the orifice plate, a reduced pressure is exerted onto the same surface area in the reverse direction. Once the pressure differential exceeds the cartridge start-up pressure (typically 8 to 12 kPa for a 15 mm valve), the net force from the pump pressure causes the spring to compress and the piston lifts off of its seat. As the piston compresses the spring, the profiled holes (exit ports) are gradually restricted until the net force against the orifice plate equals the spring force and a balance point is obtained. Although the pressure loss across the exit ports of the controller varies in response to pressure fluctuations in the pipework and the resulting modulation of the piston, the pressure loss across the orifice plate remains relatively constant within the controlled pressure range. Above the cartridge start-up pressure, a constant pressure differential is maintained across a fixed orifice thus the flow through the cartridge is limited to the required flow rate and is determined only by the spring force and the surface area of the selected orifice plate.

A more sophisticated type of a constant flow regulator would be a differential pressure control valve (as described in section WA2.4.1) that acts to maintain a constant pressure differential across a fixed resistance such as an orifice plate.

WA2.2.4 Regulating 2-port control valve

Control valves, for which the main function is to automatically vary flow rates through terminal units during normal operation, sometimes incorporate a regulating function alongside the control function. This is possible since most control valves are globe valves and have an ideal flow control characteristic.

A common solution is to allocate the first part of the travel of the valve for regulating purposes. This means that the valve can be used to manually regulate the flow to the required value. Once the flow rate is set, an actuator is fitted to the valve handle and the remaining closure of the valve is then available for flow control.

WA2.3 Combined flow measurement and regulating devices

WA2.3.1 Fixed orifice double regulating valve (commissioning set)

Fixed orifice double regulating valves are so called because they comprise a fixed orifice flow measurement device, close coupled to a double regulating valve enabling flow rate to be measured and regulated from a single location. This combination is commonly referred to as a 'commissioning set'.

The two components can be cast into a single body or screwed together. For larger sizes, they may be linked by

a short section of pipe (spool piece). The flow measurement device must be located upstream of the double regulating valve to avoid any flow disturbance at the inlet to the orifice plate.

WA2.3.2 Variable orifice double regulating valve

A variable orifice double regulating valve is a double regulating valve that uses the pressure differential across the valve opening as an indicator of flow rate. Pressure tappings either side of the valve opening enable the pressure differential to be measured. The manufacturer of the valve provides different flow coefficients (k_{vs} values) for each setting of the valve. Hence, a flow measurement can be achieved at any flow setting using the same equation as for fixed orifice flow measurement devices.

WA2.4 Combined flow regulation and differential pressure control valves

WA2.4.1 Differential pressure control valves

Differential pressure control valves are self-acting valves that act in response to changes in pressure differential between flow and return pipes. These two pressures are transmitted to either side of a flexible diaphragm inside the valve via small capillary tubes. As the diaphragm flexes in response to the changing pressure differential, it causes the valve plug to move thereby varying the opening through the valve. The effect is to maintain a constant pressure differential between the inlet to the valve and the upstream point to which the capillary tube attaches. The pressure setting can be varied, but once set, the action of the valve will hold the pressure differential constant regardless of changes in the resistance of the circuit and regardless of changes in the available pump pressure.

Because differential pressure control valves rely on the operation of a spring to respond to changes in pressure differential, they will not always control the downstream pressure differential constant under varying upstream differential pressure conditions. This drift is known as the valve's 'proportional band'. Specifiers should therefore satisfy themselves that for the range of operating pressures in their system, the proposed valves will maintain differential pressures constant within an acceptable range. Valve manufacturers should be able to provide test data to enable this check to be made.

WA2.4.2 Pressure independent control valves

Pressure independent control valves, sometimes referred to as 'combination valves', combine the functions of a double regulating valve, differential pressure control valve and 2-port control valve within a single valve body.

Because the integral differential pressure control valve holds the pressure differential constant across the integral 2-port control valve, the result is that whenever the control valve is fully open, the flow rate through the valve should always return (approximately) to its set value, since a constant pressure differential across a fixed resistance results in a constant flow rate.

The opening through the 2-port control valve can be varied manually, and can therefore be used to regulate the flow rate through the valve to the required design value. A flow setting dial on the valve spindle can be used for this purpose. Once set, the valve should perform the function of a constant flow regulator (i.e. flow limiting valve) whenever the 2-port control valve is fully open. Only when the control valve begins to close might the flow rate change from its set value.

Because pressure independent control valves rely on the operation of a spring to respond to changes in pressure differential, they will not always control the flow rate constant under varying differential pressure conditions. This drift is known as the valve's 'proportional band'. Specifiers should therefore satisfy themselves that for the range of operating pressures in their system, the proposed valves will maintain flow rates within an acceptable range. Valve manufacturers should be able to provide test data to enable this check to be made.

Pressure independent control valves vary in design and performance. In order to provide optimum modulating control, valves (or the combination of valve and actuator) should be able to demonstrate an approximately equal percentage control characteristic (rather than on/off or linear), and must be sized such that the design flow rate is within the setting range of the valve.

Advice on valve selection is provided in section WA2.5.5.

WA2.5 Correct sizing and positioning of commissioning devices

The following sections explain the sizing considerations for different valve and flow measurement device options.

WA2.5.1 Sizing of fixed orifice flow measurement devices and venturi meters

When selecting and positioning fixed orifice and venturi type flow measurement devices, the designer shall comply with the following requirements:

(*a*) Flow measurement devices must always be selected based on the flow rate to be measured — it should never be assumed that all devices will be line size.

(*b*) Flow measurement devices must be selected such that the pressure differential signal generated at the design flow rate is at least 1 kPa (the minimum that can be measured by portable instruments on site).

(*c*) Fixed orifice double regulating valves and variable orifice double regulating valves should be installed in accordance with the manufacturer's recommendations. This typically requires them to have at least a 5 diameter length of straight pipe at their inlet and at least a 2 diameter length of straight pipe at their outlet.

(*d*) Fixed orifice flow measurement devices (such as orifice plates or venturis) when installed alone or close coupled to a full bore isolating valve, should

be installed in accordance with the manufacturer's recommendations. This typically requires them to have at least a 10 diameter length of straight pipe at their inlet and at least a 5 diameter length of straight pipe at their outlet.

Where the design flow rate for a particular terminal unit is less than the minimum flow rate that can be measured using a commercially available fixed orifice flow measurement device, the flow may be classified as an 'ultra low flow rate' and the advice provided in section WA1.4.1 of this Code should be followed.

WA2.5.2 Sizing of double regulating valves

When selecting double regulating valves, the designer/installer shall comply with the following requirements:

(*a*) Regulating valves must always be selected based on the flow rate and pressure loss requirements of the branches in which they are installed — it should never be assumed that all valves will be line size.

(*b*) To minimise the risk of noise, cavitation, and the build-up of solids between the plug and seat, double regulating valves should be sized such that the valve will not need to be closed to a setting of less than 25% open.

WA2.5.3 Sizing of fixed orifice double regulating valves

The rules governing the sizing of the valve and flow measurement device (as explained in the preceding sections WA2.2.1 and WA2.2.2) are equally applicable when they are coupled together.

WA2.5.4 Sizing of differential pressure control valves

Differential pressure control valves must be sized based on the downstream pressure differential that they are required to hold constant, and the upstream pressure differential that they may be required to control against.

The pressure differential to be held constant by the action of the valve will be the pressure loss in the downstream branch or circuit where the valve is to be installed. The maximum upstream pressure differential that the valve might be exposed to is usually the full pump pressure.

In order for the valve to operate effectively, the controlling spring must remain within the central region of its compression during normal operation. Therefore, the manufacturer's stated minimum pressure differential across the valve itself must be included in the calculation of pump pressure.

WA2.5.5 Sizing of constant flow regulators and pressure independent control valves

Constant flow regulators and pressure independent control valves can be selected based on flow rate alone. If pipes are sized within normal design parameters, the selection of constant flow regulators and pressure independent control valves will result in a valve size that is the same as the adjoining pipe size. However, this cannot be guaranteed and it may sometimes be necessary to reduce down the pipework size to match the valve size.

Each pressure independent control valve must be selected such that the design flow rate for the terminal unit it is to serve is not less than the minimum setting of the valve.

WA2.6 Access to flow measurement and regulating devices

WA2.6.1 Pressure test point access

Pressure test points on flow measuring devices require a minimum clearance of 200 mm from objects within the path of the axis of the pressure test point. This enables the commissioning specialist to insert and withdraw manometer probes without kinking the tube, and to insert temperature probes.

WA2.6.2 Scale settings

The scale settings on all types of double regulating valves should be visible and accessible in all instances.

WA2.7 Factors affecting flow measurement accuracy

Where the summation of sub-branch flow rates does not add up to the main branch flow rate, causes of flow measurement inaccuracy should be investigated. Possible causes of flow measurement inaccuracy are described in the following sections.

WA2.7.1 Use of pipe other than BS EN 10255 medium grade

Manufacturers' performance charts are generally based on BS EN 10255[15] medium grade steel pipe, unless otherwise stated. This gives a known inside diameter (within specified tolerances) from which the beta ratio of the orifice device is determined.

The inside diameters of BS EN 10255 heavy grade pipe, copper and plastic pipes differ sufficiently to alter the beta ratio enough to require different flow rate data. The manufacturer should be consulted for either an amended performance graph or a suitable conversion factor.

WA2.7.2 Insufficient straight pipe length around flow measurement devices

If the advice in section WA2.2.1 on upstream and downstream pipe lengths has not been followed, this may cause inaccurate flow measurements. Inaccuracy can be caused if fittings such as bends, tees, restrictions or enlargements are located too close to the inlet or outlet of the flow measurement device. Similarly, any fitting that constricts flow (such as a flexible hose or plastic to metal pipe adaptor) can cause an error when coupled directly to the flow measurement device.

WA2.7.3 Use of antifreeze solution

The presence of antifreeze in water changes its specific gravity, viscosity and surface tension. The performance of the volume flow rate measuring device will vary according to the proportion of antifreeze used. The device manufacturer should be consulted for a corrected performance graph or conversion factor appropriate to the antifreeze mix.

WA2.7.4 Entrained air

Aerated water has modified fluid flow characteristics and the presence of air will severely affect reproducible measurements. Complete and thorough venting of the system is of considerable importance.

Further guidance on de-aeration of closed re-circulating pipework systems is provided in BSRIA Guide BG2/2010: *Commissioning water systems*(1).

WA2.7.5 Oscillating manometer readings

Care should be taken when reading a manometer with an oscillating fluid column as an average reading will have to be taken. Time should be allowed for a representative average to be established.

WA2.7.6 Throttling of variable orifice valves

Variable orifice valves, where the pressure differential across the plug is used for flow measurement, can become less accurate when closed below 50% open. This inaccuracy can be further increased if debris is able to block the opening around the plug.

WA2.8 Instrumentation

All instruments must be regularly cleaned and serviced at least every 12 months in accordance with manufacturers' instructions. Where appropriate, instruments must be calibrated at periodic intervals by an accredited calibration laboratory to traceable standards and a calibration certificate issued.

Further guidance on the operation and use of commissioning instrumentation is provided in BSRIA Guide BG2/2010: *Commissioning water systems*(1).

The following instruments and accessories are necessary to carry out the commissioning procedures prescribed in this Code.

WA2.8.1 Manometers

The choice of manometer listed in Table WA2.1 will depend on the flow measurement device selected.

WA2.8.2 Thermometers

— Sling psychrometer (wet and dry bulb thermometer)

— Contact and immersion electronic thermometer

Table WA2.1 Manometer types and attributes

Type	Specific gravity of fluid	Scale (kPa)
Fluorocarbon	1.88	0–4.6
Mercury	13.6	0–65
Digital electronic*	–	0–200
Analogue diaphragm*	–	0–100

*Should be calibrated regularly and a calibration certificate obtained.

WA2.8.3 Other instruments

— Multi-purpose electronic meter for measuring current

— Tachometer (revolution counter or stroboscope)

WA2.9 Flow coefficients

Flow coefficient (k_v) is defined as the flow rate in cubic metres per hour (m^3/h) through a pipeline component required to generate a pressure differential of 1 bar (100 kPa). Hence, the lower the k_v value, the higher the resistance of the component.

The signal flow coefficient (k_{vs}) has the same definition but is applied to the pressure differential signal measureable between the pressure tappings connected to a flow measurement device.

Appropriate values of k_v and k_{vs} for different pipeline components are available from the component manufacturer. Their use in determining flow rate and pressure drop is explained in the following section WA2.9.1.

WA2.9.1 Useful formulae

WA2.9.1.1 For use by the designer

To select a device within an allowable Δp band:

$$k_{vs} = 36\ Q/(\Delta p)^{1/2} \qquad \text{(WA2.1)}$$

where k_{vs} is the signal flow coefficient, Q is the flow rate (l/s) and Δp is the minimum permissible pressure drop (i.e. 1 kPa). Select the device with the next lower value of k_{vs}.

To find the signal Δp with a known k_{vs}:

$$\Delta p = (36\ Q/k_{vs})^2 \qquad \text{(WA2.2)}$$

WA2.9.1.2 For use by the commissioning specialist

To find the actual flow rate from a known signal flow coefficient:

$$Q = k_{vs}\ (\Delta p)^{1/2}/36 \qquad \text{(WA2.3)}$$

To find the signal flow coefficient from a known flow rate and pressure drop:

$$k_{vs} = 36\ Q/(\Delta p)^{1/2} \qquad \text{(WA2.4)}$$

Index

Note: section numbers are followed by page numbers in parenthesis.

The Chartered Institution of Building Services Engineers
222 Balham High Road, London SW12 9BS
+44 (0)20 8675 5211
www.cibse.org

ISBN 978-1-906846-15-2
9 781906 846152
A52825963

Bond No: 58540/0110/5794
Copy 2 of 3

This **GUARANTEE BOND** is made BETWEEN the following parties whose names and registered office addresses are set out in the Schedule to this Bond (the "Schedule")

BETWEEN

(1) The "Contractor" as principal,

(2) The "Guarantor" as guarantor, and

(3) The 'Employer"

WHEREAS

(1) By a contract (the "Contract") entered into or to be entered into between the Employer and the Contractor particulars of which are set out in the Schedule the Contractor has agreed with the Employer to execute works comprising Stage 1 (Detailed design and construction of the laboratories and FM hub) ("the Works") upon and subject to the terms and conditions therein set out

(2) The Guarantor has agreed with the Employer at the request of the Contractor to guarantee the performance of the obligations of the Contractor under the Contract in respect of the Works upon the terms and conditions of this Guarantee Bond subject to the limitation set out in clause 2

NOW IT IS AGREED as follows:-

1. The Guarantor guarantees to the Employer that in the event of a breach by the Contractor of its obligations under and/or arising out of the Contract in respect of the Works or in the event of termination of the Contractor's obligation to Provide the Works (as defined in the Contract) by reason of the Contractor being affected by one or more of the events set out in Clause 91.1 of the Contract, the Guarantor shall subject to the provisions of this Guarantee Bond pay all losses, damages, expenses claims and costs of proceedings sustained by the Employer and due from the Contractor as a result of such breach or termination as aforesaid. Subject to Clause 1E, such losses, damages, claims and costs shall be as agreed between the parties or determined by an adjudicator in accordance with the provisions of Clause 1A or a

court provided that any payment made under this Guarantee pursuant to an award of an adjudicator ("Award") shall not prejudice the right of the Contractor or , following the occurrence of one or more of the events set out in Clause 91.1 of the Contract affecting the Contractor, the Guarantor, to refer any such Award, or any of the matters giving rise to such a Award, for further or final determination by any court having competent jurisdiction (a "Referral") and the period of four weeks from the date of the Award referred to in the Contract for the making of any Referral shall not apply to the Guarantor (a) until such time as it has received a copy of such Award and (b) in the case of an Award made prior to the occurrence of an Insolvency Event (as hereinafter defined) until that event occurs.

1A (i) Prior to the occurrence in relation to the Contractor of any of the events (each an "Insolvency Event") set out at Clause 91.1 of the Contract the sum due from the Contractor to the Employer pursuant to Clause 1 may be established for the purposes of this Guarantee Bond by an Award made in an adjudication between the Employer and the Contractor pursuant to which an amount not less than that claimed by the Employer hereunder shall be presently due and payable to it by the Contractor and

(ii) following the occurrence of an Insolvency Event in relation to the Contractor the sums due and payable under this Guarantee Bond may be agreed between the Guarantor and the Employer and in default of such agreement within 30 days either the Guarantor or the Employer shall be entitled to refer the determination of the sums due and payable hereunder to an Adjudicator upon the terms and conditions applicable to an adjudication between the Employer and the Contractor under the Contract which shall apply mutatis mutandis to this Guarantee Bond but so that all references therein to the Contractor shall for the purposes of an adjudication conducted pursuant to this Clause 1A be construed as references to the Guarantor

1B In the event that it is subsequently so determined whether or not prior to Expiry as a result of any Referral either:

(i) that the Contractor and/or the Guarantor is not liable to pay the Employer where a previous Award found it was liable to pay the Employer; or

(ii) that the Guarantor made an over payment as a consequence of an Award

then the amount so paid or the excess (as the case may be) (the "Over Payment") shall be refunded to the Guarantor by the Employer (together with interest from the date and at the rate being not less than five percent determined by the court pursuant to such Referral).

1C If it is subsequently determined whether or not prior to Expiry as a result of any Referral either:

(i) that the Contractor and/or the Guarantor is liable where the previous Award to which the Referral relates has determined that the Contractor or the Guarantor was not liable and therefore the Guarantor made no payment; or

(ii) that the Guarantor made an underpayment as a consequence of the previous Award to which the Referral relates,

then upon receipt of a claim in respect thereof an amount equal to the amount so determined (together with interest from the date and at the rate being not less than five percent determined by the court pursuant to such Referral) shall be paid to the Employer by the Guarantor subject always to clause 2.

1D In the event that the Contractor or the Guarantor make a Referral which is determined by a court to be vexatious or have no bona fide foundation in law or fact, the Contractor or the Guarantor (as the case may be) shall indemnify the Employer in respect of all reasonable costs, losses, and expenses (including legal expenses) incurred by the Employer in respect of such Referral, which reasonable costs, losses and expenses are agreed in the case of such a determination in respect of the Guarantor not to be included in the Bond Amount.

1E. For the purposes of this Guarantee Bond:-

(1) no estimate forecast or assessment of the *Project Manager* (as defined in the Contract) shall be binding and conclusive against the Guarantor; and

(2) the damages due and payable under clause 1 of this Guarantee Bond to the Employer following termination of the Contractor's employment under condition Clause 91.1 of the Contract shall be such amounts as shall represent the difference between:-

(i) the amounts actually paid by the Employer to complete the whole of the works' together with all direct loss and expense caused to the Employer by reason of such termination; and

(ii) the amount that would have been payable to the Contractor in respect thereof but for such termination

and so that the Employer shall be placed in the same position (no better and no worse) that would have been obtained if the Contractor had duly performed and discharged its obligations under the Contract.

2. Subject to Clause 1D, the maximum aggregate liability of the Guarantor and the Contractor under this Guarantee Bond shall not exceed the sum set out in the Schedule (the "Bond Amount") but subject to such limitation and to clause 4 the liability of the Guarantor shall be co-extensive with the liability of the Contractor under the Contract.

3. The Guarantor's obligation to make payment under this Guarantee Bond shall be an independent and absolute obligation and the Guarantor shall not be entitled to delay or withhold payment for any reason. The Guarantor's obligation hereunder shall not be affected by any act, omission, matter or thing which, but for this provision, might operate to release or otherwise exonerate the Guarantor from the obligations hereunder in whole or in part, including without limitation and whether or not known to the Guarantor or to the Employer:

a) any time or waiver granted to the Guarantor or to the Contractor;

b) any variation, compromise or neglect to enforce any rights or remedies against the Guarantor or the Contractor;

c) any legal limitation, disability or incapacity relating to the Guarantor or the Contractor;

d) any variation of or amendment to the terms, conditions and provisions of the Contract, the Contract price or the extent or nature of the Works;

e) any unenforceability, invalidity or frustration of any rights or obligations of the Employer or the Contractor under the Contract or any other document or security;

f) any other fact, circumstance, provision of statute or rule of law which might entitle the Guarantor to be released or discharged in whole or in part from its undertaking.

Bond No: 58540/0110/5794
Copy 2 of 3

4. Whether or not this Guarantee Bond shall be returned to the Guarantor the obligations of the Guarantor under this Guarantee Bond shall be released and discharged absolutely upon Expiry (as defined in the Schedule) save in respect of any Referral or any breach of the Contract which has occurred and in respect of which a claim in writing containing particulars of such breach has been made upon the Guarantor before Expiry.

5. The Contractor having requested the execution of this Guarantee Bond by the Guarantor undertakes with the Guarantor (without limitation of any other rights and remedies of the Employer or the Guarantor against the Contractor) to perform and discharge the obligations on its part set out in the Contract.

6. This Guarantee Bond and the benefit thereof shall not be assigned by the Guarantor without the prior written consent of the Employer. Subject to any assignee accepting the repayment obligation of the Employer in clause 1A the Employer may assign its interest in this Guarantee Bond to any party to whom it may assign its interest under the Contract.

7. No party who is not a party to this Guarantee Bond shall be entitled to enforce any of its terms for his own benefit and the application of the *ius quaesitum* tertio to the terms of this Guarantee Bond are hereby expressly excluded.

8. This Guarantee Bond shall be governed by and construed in accordance with the laws of Scotland and only the courts of Scotland shall have jurisdiction hereunder.

IN WITNESS WHEREOF these presents consisting of this, the preceding pages and the Schedule are executed as follows:-

By the Guarantor at **ZURICH INSURANCE PUBLIC LIMITED COMPANY** on the 15th day of January 2010

[redacted].....Signature of Authorised signatory

Richard John White Full name

[redacted].....Signature of Authorised signatory

Louise Alexandra Town Full name

A52825963

Bond No: 58540/0110/5794
Copy 2 of 3

By the Contractor at **BROOKFIELD CONSTRUCTION (UK) LIMITED** on the 15th day of January 2010

[redacted]....Signature of Director/Authorised signatory

JOHN PAUL BALLINGALL.....Full name

[redacted].....Signature of Director/Authorised signatory

TIMOTHY A BICKNELL....Full name

By the Employer at **GREATER GLASGOW HEALTH BOARD** on the 21st day of January 2010

[redacted]Signature of Director/Authorised signatory

ROBERT CALDERWOOD...Full name

[redacted].....Signature of Director/Authorised signatory

DAVID DOUGLAS GRIFFIN.....Full name

Bond No: 58540/0110/5794
Copy 2 of 3

This is the Schedule referred to in the foregoing Guarantee Bond between **ZURICH INSURANCE PUBLIC LIMITED COMPANY, BROOKFIELD CONSTRUCTION (UK) LIMITED** and **GREATER GLASGOW AND CLYDE HEALTH BOARD**

The Contractor: **BROOKFIELD CONSTRUCTION (UK) LIMITED** whose registered office address is at 23 Hanover Square London W1S 1JB

The Guarantor: **ZURICH INSURANCE PUBLIC LIMITED COMPANY** a public limited company incorporated in Ireland (Registration No. 13460) whose registered office is at Zurich House Ballsbridge Park Dublin 4 Ireland UK branch registered in England and Wales Registration No. BR7985 and whose address for service for the purposes of this Bond is Zurich Global Corporate UK Surety of Second Floor Sandfield House Water Lane Wilmslow SK9 5BZ

The Employer: **GREATER GLASGOW HEALTH BOARD** whose address is at Dalian House, 350 St Vincent Street, Glasgow G3 8YZ [redacted]

The Contract: A contract dated the 18th day of DECEMBER 2009. [redacted] between the Employer and the Contractor for the design and construction of the New South Glasgow Hospital Project

The Bond Amount: The sum of £3,826,695 (Three Million Eight Hundred and Twenty Six Thousand Six Hundred and Ninety Five Pounds)

Expiry: Completion of the Works and so that any certificate issued by the Project Manager setting out the date upon which the Employer shall take over the whole of the Works shall if regular on its face be conclusive that expiry has occurred) for the purposes of this Guarantee Bond save in respect of any breach of the Contract which has occurred and in respect of which a claim in writing containing particulars of such breach has been made upon the Guarantor before Expiry.

A52825963

NHS Greater Glasgow and Clyde *Project Risk*

Risk is the chance of something happening which will cause harm or detriment to the organisation, staff or patients.

Risk is assessed in terms of likelihood of an event occurring and the severity of its impact upon the organisation, staff or patients.

NHS Greater Glasgow and Clyde has adopted, as standard, a "1 - 5" scoring system which enables the risks to be prioritised. This is illustrated in the following table.

Likelihood (L)		Consequence (C)		Risk (LxC) = Priority		
Almost certain	5	Extreme	5	20 - 25	=	Priority 1 = VERY HIGH
Likely	4	Major	4	12 - 19	=	Priority 2 = HIGH
Possible	3	Moderate	3	6 - 11	=	Priority 3 = MEDIUM
Unlikely	2	Minor	2	1 - 5	=	Priority 4 = LOW
Rare	1	Negligible	1			

NHS Greater Glasgow and Clyde

Project Risk Register

Completed by New South Glasgow Hospitals Project Team

Date Reviewed by Joint Project Team 7th May 2010

Date reviewed by ASR Redesign Group 20th May 2010

Date to be reviewed by Joint Project Team 4th June 2010

Date to be reviewed by ASR Exec Board 4th June 2010

LEGEND (RISK OWNERSHIP)
AS - Alan Seabourne
HG - Heather Griffin
HMcD - Hugh McDerment
JB - Jonathan Best
MM - Mairi Macleod
MMc - Mark McAllister
PM - Peter Moir
RC - Richard Copland

Risk = the chance of something happening which will cause harm
Levels of risk = assessed in terms of likelihood and consequence (LxC)

Likelihood (L)		Consequence (C)		Risk Ranking Priority	
5		Extreme	5	20 - 25	= Priority 1 - **VERY HIGH**
4		Major	4	12 - 19	= Priority 2 - **HIGH**
3		Moderate	3	6 - 11	= Priority 3 - **MEDIUM**
2		Minor	2	1 - 5	= Priority 4 - **LOW**
1		Negligible	1		

Ref	THE RISK - what can happen and how it can impact	CONTROLS IN PLACE	RISK EXPOSURE Likelihood (L)	RISK EXPOSURE Consequence (C)	RISK RATING (LxC)	RISK RANKING PRIORITY	FURTHER ACTION REQUIRED	OWNER
1	New hosptials inappropriately sized due to design development on 1:200s and 1:50s. Need for client discipline to control changes.	Fully approved change control process implemented Any potential changes reported to and agreed by ASR Exec Group (chaired by CE) Continuing to review design development through User Group meetings. Scope clearly set and cannot be changed.	2	5	10	3	Continue to work with User Groups to detail design within current footprint through the 1:50 process	HG/MM
2	LABS - Ensure clean site in time for commencement of construction	Enabling plans in place to deliver brown field site. Plans contained within Capital Plan and on schedule Survey work undertaken Demolition plan prepared	2	5	10	3	Continue to review progres through Labs Construction Site Progress Group, Project Team and Construction Interface Group.	HMcD
3	HOSPITALS - Ensure vacated site in time for commencement of construction Delay to demolitions (decants)	Buildings to be vacated through FM Directorate Enabling plans in place to deliver brown field site. Plans contained within Capital Plan and on schedule Survey work undertaken Demolition plan prepared Decant plan prepared Continuing to liaise with Director of Facilities	1	3	3	4	Review progress on a monthly basis at Project Team Meeting. Liaise with FM Directorate on detailed plan Under continual review	PM
4	Appropriate Design Quality is Achieved.	Detailed Employer's requirements set out Quality Standards. A&DS supporting project with enabler input. Evaluation criteria has quality as a key element and priority. Design Action considered in specifications BREEAM Consultant Input to Planning process Project Supervisor contracted from 1st June 2010	2	5	10	3	Design checks on appendix K agreed Supervisors on site from June 2010	PM
5	Failure to obtain Local Authority Agreement to revised Master Plan timeously	Meetings continuing with Glasgow City Council to present Master Plan developments on a regular basis. Involvement of Architecture & Design Scotland in development and review of Master Plan. Working with Glasgow City Council on the 4 key aspects of Planning i.e. Architecture, Transport, Drainage and Landscape.	3	3	9	3	Master Plan submitted to Glasgow City Concil on 22nd April 2010. Board awaiting A&DS Review response Board awaiting formal consultee comments by 28th May 2010 Submitted to Planning Committee 22nd June 2010	PM
6	Utilities: Supplies not available to meet programme and/or budget overrun	Initial spec completed. Tenders returned Scottish Power selected SP Tender within cost plan	3	4	12	2	Detailed design with succesful bidder (Scottish Power) developed over next 2/3 months New programme meets Labs timescale	AS

A52825963

Ref	THE RISK - what can happen and how it can impact	CONTROLS IN PLACE	RISK EXPOSURE Likelihood (L)	Consequence (C)	RISK RATING (LxC)	RISK RANKING PRIORITY	FURTHER ACTION REQUIRED	OWNER
7	LABS - Drainage Strategy: failure to agree viable drainage strategy with Scottish Water	Labs drainage strategy nearing completion	2	4	8	3	Work ongoing to finalise drainage strategy	PM
8	HOSPITALS - Drainage Strategy: failure to agree viable drainage strategy with Scottish Water	Hospitals drainage strategy nearing completion	2	4	8	3	Work ongoing to finalise drainage strategy	PM
9	Capital costs outwith affordable level	Tenders returned in September 2009 - well within affordability Formal change control process in place to control scope change	2	5	10	3	Ongoing monitoring. Regular reporting to the Exec Group	AS
10	Ensure adequate resources and skills for next stage of the project (Stages 1 & 2) are in place	Realign project team and technical team to meet new project challenge. Review and change technical advisor input. Identified requriement to commission quality regime for constrcution phases of the project (supervisors) Restructured Project team	3	3	9	3	Obtained support from Procurement, Laboratoratories and Medical Physics Continuous Review	AS
11	Governance of project not suitable for next stages(s)	Initial discussion on agenda for NSGH&L Executive Board to be held on 7th December 09 Governance arrangements reviewed by Board and PWC New governance arrangements signed off by PRG (March 2010) New governance arangements instigated by April 2010	1	3	3	4	After initial discussion at NSGH&L Executive Board put forward governance paper to next Executive Board PWC comments on new governance structure to be addressed	AS
12	Major Labs works starting on site from Jan 2010 and potential risk to current site operation	Construction Interface Group established to manage, control and monitor all activities and liaise with Contractor, SGH Facilities and SGH Estates Depts. Group undertakes a weekly "look-ahead" of programme to identify any potential disruption. Site and/or specific department notified in advance of any potential disruption. Other site projects also members of this group Complaints Register instigated to log and complaints and actions taken	2	4	8	3	Continuous monitoring and evaluation of processes and outcomes by Project Team and PMG	PM
13	Communications are being provided to all stakeholders	Since Ministerial announcement with role out communication plant to all stakeholders Communications Plan in force	1	2	2	4	Project team continue to review communications Boards website updated monthly with webcam images A project web-portal has been set-up	HG/MM
14	Scottish Water Land Acquisition - Failure to achieve proposed new main entrance	Project team liaising with Contractor and Scottish Water re proposals (Provided Scottish Water with detailed drawings)	2	5	10	3	Continue to work with BCL to confirm landtake requirements Awaiting response from Scottish Water	PM
15	Scottish Ambulance Service Land Acquisition - Failure to conclude land acquisition	Project Team continuing to liaise with Scottish Ambulance Service to conclude land acquisition Consulting with GCC Planners and residents (re Leverndale) Working to transfer the 3 SAS services off their site	2	2	4	4	Continue to work with Scottish Ambulance Service and CLO to conclude land acquisition Paper to be submitted to NHS Property Committee for approval	PM
16	Risk to Construction works because of helicopter arrivals and departures	Helicopter Management Plan developed All stakeholders have agreed and signed-off the Helicopter Management Plan	2	5	10	3	HMP being continually reviewed by NHS, BCL and other stakeholders Formal review dates scheduled	AS
17	Existing Helipad decommissioning being delayed	SAS to develop final plan for new heliport	4	4	16	2	All work in progress Contingency Plan nearing completion by SAS	AS
18	Non delivery of Community Benefits Programme	Agreed plan with NHS and BCL Under continual review by Community Engagement Team, Project Team and Brookfield	3	3	9	3	Regular reports to Senior NHS GG&C Committees Currently on target	AS/MMc
19	Detrimental environmental impacts i.e. Noise disruption and pollution	All works to be asseessed for noise disruption and/or pollution consequences Encology report undertaken Contractors envirnmental policy implemented WRAP initiative implemented	3	3	9	3	Ongoing review by PMG	PM
20	BREEAM required standards not achieved for labs Stage E Design	Fully achieved to Stage D BREEAM reporting log updated by qualified BREEAM Advisor	3	3	9	3	Interim Certificate Assessment scheduled for June 2010 at Labs Stage E	PM

Ref	THE RISK - what can happen and how it can impact	CONTROLS IN PLACE	RISK EXPOSURE Likelihood (L)	Consequence (C)	RISK RATING (LxC)	RISK RANKING PRIORITY	FURTHER ACTION REQUIRED	OWNER
21	LABS - Planners do not approve the external finishes materials. Increase to cost above cost plan	Alternative finishes being identified and discussed with Planners	2	4	8	3	Continuing to liaise with the GGC Planners Baord approving proposed external finish materials Should be concluded by end May 2010	PM
22	HOSPITALS - Planners do not approve the external finishes materials	Alternative finishes being identified and discussed through reserve matters	3	4	12	2	Continuing to liaise with the GGC Planners Board approving proposed external finish materials Should be concluded by end July 2010	AS
23	Car Park 1 - delay to construction	Interim solution being identified to cover delay to CP1	3	3	9	3	CP1 programme regularly reviewed. Progress updates provided to the weekly Construction Interface group Working with FM to determine interim solution	PM
24	Inadequate FBC Design	Fully involved with Architects, Project Team, Technical Advisers and other Users to develop design to appropriate standard	2	5	10	3	2 Stage review process - 1st stage review to be undertaken in July 2010	AS
25	FBC - Capital Cost not affordable	Fully approved change control process overseen by CE and COO through Acute Services Strategy Board	2	5	10	3	Continue to advise Exec Sub-group immediately of potential changes	AS
26	Increased demand on Scottish Water capacity	Capacity Review being undertaken to check that existing Scottish Water pipework can provide new hospitals demand	3	5	15	2	Not under Project Team or Advisor control	AS
27	LABS - Equipment Funding - No allowance in FBC for equipment (i	Provided within Project Budget of £842m	2	5	10	3	Currently pulling together all group 1, 2, 3, 4 and 5 Managed contract fulfills some equipment requirements May transfer current equipment/IT	PM
28	Delay to relocation of Project staff to Site Offices	Fully agreed transition plan from BCL	4	1	4	4	Transition Plan delayed due to installation of services not being completed BCL pursuing completion of final services New move date agreed between NHS and BCL	PM
29	IT - No IT Budget allowed for in Project (Hardware/Software)	IT to be funded for from Board's CRL Maximum transfer of IT kit to be achieved	2	5	10	3	Groups established to determine IT Systems and functionality	AS/RC/JB
30	Completion of Mock-up room impacting on design process	Programmed in by BCL for completion end of April 2010	4	2	8	3	Board informed by BCL that the mock-ups will be delayed New completion date for mock-ups agreed between Board and BCL No impact to design process at this time Being monitored by NCH and NSG Project Managers	HM/MM
31	Identification of Japanese Knotweed on site	Labs Site fully cleared of Japanese Knotweed at May 2010	1	5	5	4	Under continual review Managed through Early Warning Process	PM
32	Delay to demolitions (Bats in resident)	Bat survey undertaken August 2009 Further Bat survey to be undertaken by end May 2010	1	5	5	4	Not an issue at this time. Awaiting outcome of May 2010 survey	PM
33	Disturbance/Disruption to the Clinical Site	Project Team and BCL respond to any complaints. Construction Interface Group manage, control and monitor all activities and liaise with Contractor, SGH Facilities and SGH Estates Depts. Group undertakes a weekly "look-ahead" of programme to identify any potential disruption. Site and/or specific department notified in advance of any potential disruption. Other site projects also members of this group Complaints Register instigated to log any complaints and actions taken	2	5	10	3	Continuous monitoring and evaluation of processes and outcomes by Project Team and PMG	PM
34	Impact of sale of Nightingale Associates on the design programme due to staff disruption	BCL provided Board woth assurance that they will take the risk on the design process. Nightingale are fully contracted to BCL.	2	5	10	3	Under continuous review by Project Team	AS

From: Tither S (Stephen)
To: Roy G (Glenda); Macdonald S (Sheena)
Subject: RE: New South Glasgow Hospitals - Full Business Case
Date: 15 November 2010 08:51:04

Glenda,
I have no comments on this.
ST

From: Roy G (Glenda)
Sent: 15 November 2010 07:28
To: Macdonald S (Sheena)
Cc: Tither S (Stephen)
Subject: RE: New South Glasgow Hospitals - Full Business Case

Sheena

Thanks for getting back to me. As yet no comments have been received from Primary Care, however Dr Armstrong has commented.

Kind regards

Glenda

Glenda Roy

Health Finance Directorate| Capital Planning and Asset Management

---

From: Macdonald S (Sheena)
Sent: 12 November 2010 12:35
To: Roy G (Glenda)
Subject: RE: New South Glasgow Hospitals - Full Business Case

Many apologies Glenda – not been at desk to be able to deal with this but I am sure Steven will have contributed and as my comments are becoming seriously repetitive he will have included areas that I normally raise

sheena

Dr Sheena L MacDonald

Senior Medical Advisor

Primary Care and Community Care Directorate

Scottish Government

Room 1R05

St Andrews House

[redacted]

From: Roy G (Glenda)
Sent: 04 November 2010 10:07
To: Tither S (Stephen); Calderwood C (Catherine); Macdonald S (Sheena); Connaghan J (John)
Cc: Haggarty P (Phyllis); Aitken S (Stuart)
Subject: FW: New South Glasgow Hospitals - Full Business Case
Importance: High

Good morning

I refer to the e-mails below. The deadline for commenting on the New South Glasgow FBC has now passed. A small extension is being given, therefore if you wish to comment then please do so before **close of play Friday 5th November**. If no comment has been received by the revised deadline then it will be assumed that you are content with the FBC.

Stuart – Previous discussion noted. Document now released to enter Health Finance contentment.

Regards

Glenda

Glenda Roy

Health Finance Directorate| Capital Planning and Asset Management

From: Roy G (Glenda)
Sent: 02 November 2010 09:51
To: Baxter M (Mike) (Health); Sizeland B (Bettina); Kinnear N (Norman); Waugh I (Ian); Tither S (Stephen); Marshall M (Marjorie); Michael N (Nils); Welsh J (Joe); Sheriff C (Carmel); Armstrong J (Jennifer); Calderwood C (Catherine); Macdonald S (Sheena); Froggatt J (John); Connaghan J (John); Rhodes P (Paul)
Cc: Haggarty P (Phyllis)
Subject: FW: New South Glasgow Hospitals - Full Business Case
Importance: High

Good morning

I refer to my e-mail below. As only one comment has been received, I wanted to remind you all that the deadline for comments on the attached business case is close of play tomorrow.

Regards

Glenda

Glenda Roy

Health Finance Directorate| Capital Planning and Asset Management

From: Roy G (Glenda)
Sent: 22 October 2010 13:18
To: Baxter M (Mike) (Health); Sizeland B (Bettina); Kinnear N (Norman); Waugh I (Ian); Tither S (Stephen); Marshall M (Marjorie); Michael N (Nils); Welsh J (Joe); Sheriff C (Carmel); Armstrong J (Jennifer); Calderwood C (Catherine); Macdonald S (Sheena); Froggatt J (John); Verrall R (Ricky);

Connaghan J (John); Rhodes P (Paul)
Cc: Haggarty P (Phyllis)
Subject: New South Glasgow Hospitals - Full Business Case
Importance: High

Good afternoon

Please find attached NHS Greater Glasgow and Clyde's FBC for the New South Glasgow Hospitals and its appendices.

<< File: NHS Greater Glasgow and Clyde - New South Glasgow Hospitals - Full Business Case - Oct 2010.obr >> << File: NHS Greater Glasgow and Clyde - New South Glasgow Hospitals - Full Business Case - Appendices - October 2010.obr >>

Please note that both documents are password protected. They are also huge in size so think twice before printing!

The passwords are as follows:

FBC – to open – gLASGOW

to print – gLASGOW123

Appendices – to open – Glasgow

to print – Glasgow123

It is hoped that this will be discussed at 9th November CIG meeting so could I ask that any comments you may have including nil returns be entered into the attached comments table by close of play 3rd November at the very latest.

<< File: NHS Greater Glasgow and Clyde - New South Glasgow Hospitals - Full Business Case - comments table.obr >>

Thanks

Glenda

Glenda Roy

Scottish Government Health Directorates

Health Finance Directorate | Capital Planning and Asset

Management

Basement Rear

St Andrew's House

Edinburgh

EH1 3DG

[redacted]

[redacted]

Design User Group Meetings - 1:50 Fully Loaded Stage (Week One)

Venue/s: **New South Glasgow Hospitals Project Office, Hardgate Road, Govan, G51 4SX**
QMH, Dalnair Street, Glasgow G38SJ.
RHSC, Dalnair Street, Glasgow G38SJ.

Day			1				2				3				4				5			
	Monday					Tuesday					Wednesday				Thursday				Friday			
Date			21/03/2011				22/03/2011				23/03/2011				24/03/2011				25/03/2011			
															Adult				Adult			
	9.00	1	FM Facilites (Adult & Children's)	MP / JT		9.00	1	FM Facilites (Adult & Children's)	MP / JT		9.00		Float		9.00	2	Critical Care	GHa/ CQ		9.00	2	Critical Care	GHa/ CQ
	10.00					10.00					10.00				10.00					10.00			
	11.00					11.00					11.00				11.00					11.00			
	11.30					11.30					11.30				11.30					11.30			
	12.00					12.30					12.30				12.30					12.30			
	13.30		Lunch (30mins)			13.30		Lunch (30mins)			13.00				13.30		Lunch (30mins)			13.30		Lunch (30mins)	
											13.30												
	14.00	1	FM Facilites (Adult & Children's)	MP / JT		14.00	1	FM Facilites (Adult & Children's)	MP / JT		14.30		Float		14.00	2	Critical Care	GHa/ CQ		14.00	3	Coronary Care Unit (CCU)	GHa/ CQ
	15.30					15.30					15.30				15.00					15.00			
	15.30					15.30					15.30				15.30					15.30			
	16.30					16.30					16.30				16.00					16.30			
	17.30					17.30					17.30				17.00					17.30			

Board Group Membership:
Heather Griffin
Mairi Macleod
Frances Wrath
Fiona McCluskey
Karen Connelly
Jackie Stewart

Brookfield :
tbc

NA Team:
Rowland Phillips (RP)
Sonja Von Maltzhan (SvM)
Graham Harris (GHa)
Carla Queiroz (CQ)
Magda Szczepanska (MS)
Jason Truscott (JT)
Rob Hall (RH)
Rob Powell (RPo)
Tom Pond (TP)
Mark Lloyd (ML)
Matthias Peretz (MP)
Liane Edwards (LE)
Jonathan Hendrick (JH)
Matt Cromack (MC)
Mark Drane (MD)
Andrew Callicott (AC)
Toby Ingle (TI)
Michael Hughes (MH)

Currie & Brown
David Hall

Doig & Smith
tbc

ZBP:
tbc

Design User Group Meetings - 1:50 Fully Loaded Stage (Week Two)

Venue/s: **New South Glasgow Hospitals Project Office, Hardgate Road, Govan, G51 4SX**
QMH, Dalnair Street, Glasgow G38SJ.
RHSC, Dalnair Street, Glasgow G38SJ.

Day		6				7				8				9				10			
	Monday					Tuesday				Wednesday				Thursday				Friday			
Date			28/03/2011				29/03/2011				30/03/2011				31/03/2011				01/04/2011		
			Adult				Adult								Adult				Adult		
	9.00	4	Operating Theatres, AODOS & Recovery	RP / SvM	9.00	4	Operating Theatres, AODOS & Recovery	RP / SvM	9.00		Float		9.00	5	Acute Assessment Unit (General)	MC/ AC	9.00	6	Emergency Department	GHa/ CQ
	10.00				10.00				10.00				10.00				10.00			
	11.00				11.00				11.00				11.00				11.00			
	11.30				11.30				11.30				11.30				11.30			
	12.30				12.30				12.30				12.30				12.30			
	13.30		Lunch (30mins)		13.30		Lunch (30mins)		13.30				13.30		Lunch (30mins)		13.30		Lunch (30mins)	
	14.00	4	Operating Theatres, AODOS & Recovery	RP / SvM	14.00	4	Operating Theatres, AODOS & Recovery	RP / SvM	14.00		Float		14.00	5	Acute Assessment Unit (General)	MC/ AC	14.00	6	Emergency Department	GHa/ CQ
	15.00				15.00				15.00				15.00				15.00			
	15.30				15.30				15.30				15.30				15.30			
	16.30				16.30				16.30				16.30				16.30			
	17.30				17.30				17.30				17.30				17.30			

Board Group Membership:
Heather Griffin
Mairi Macleod
Frances Wrath
Fiona McCluskey
Karen Connelly
Jackie Stewart

Brookfield :
tbc

NA Team:
Rowland Phillips (RP)
Sonja Von Maltzhan (SvM)
Graham Harris (GHa)
Carla Queiroz (CQ)
Magda Szczepanska (MS)
Jason Truscott (JT)
Rob Hall (RH)
Rob Powell (RPo)
Tom Pond (TP)
Mark Lloyd (ML)
Liane Edwards (LE)
Matthias Peretz (MP)
Jonathan Hendrick (JH)
Matt Cromack (MC)
Mark Drane (MD)
Andrew Callicott (AC)
Toby Ingle (TI)
Michael Hughes (MH)

Currie & Brown
David Hall

Doig & Smith
tbc

ZBP:
tbc

Design User Group Meetings - 1:50 Fully Loaded Stage (Week Three)

Venue/s: **New South Glasgow Hospitals Project Office,**
Hardgate Road, Govan, G51 4SX
QMH, Dalnair Street, Glasgow G38SJ.
RHSC, Dalnair Street, Glasgow G38SJ.

Day	11	12	13	14	15
	Monday	Tuesday	Wednesday	Thursday	Friday
Date	04/04/2011	05/04/2011	06/04/2011	07/04/2011	08/04/2011
	9.00	9.00	9.00	9.00	9.00
	10.00	10.00	10.00	10.00	10.00
	11.00	11.00	11.00	11.00	11.00
	11.30	11.30	11.30	11.30	11.30
	12.00	12.30	12.30	12.30	12.30
	13.30	13.30	13.00	13.30	13.30
			13.30		
	14.00	14.00	14.30	14.00	14.00
	15.30	15.30	15.30	15.00	15.00
	15.30	15.30	15.30	15.30	15.30
	16.30	16.30	16.30	16.00	16.30
	17.30	17.30	17.30	17.00	17.30
	UGM Meeting Break	UGM Meeting Break	UGM Meeting Break	UGM Meeting Break	UGM Meeting Break

Board Group Membership:
Heather Griffin
Mairi Macleod
Frances Wrath
Fiona McCluskey
Karen Connelly
Jackie Stewart

Brookfield :
tbc

NA Team:
Rowland Phillips (RP)
Sonja Von Maltzhan (SvM)
Graham Harris (GHa)
Carla Queiroz (CQ)
Magda Szczepanska (MS)
Jason Truscott (JT)
Rob Hall (RH)
Rob Powell (RPo)
Tom Pond (TP)
Mark Lloyd (ML)
Matthias Peretz (MP)
Liane Edwards (LE)
Jonathan Hendrick (JH)
Matt Cromack (MC)
Mark Drane (MD)
Andrew Callicott (AC)
Toby Ingle (TI)
Michael Hughes (MH)

Currie & Brown
David Hall

Doig & Smith
tbc

ZBP:
tbc

Design User Group Meetings - 1:50 Fully Loaded Stage (Week Four)

Venue/s: **New South Glasgow Hospitals Project Office,**
Hardgate Road, Govan, G51 4SX
QMH, Dalnair Street, Glasgow G38SJ.
RHSC, Dalnair Street, Glasgow G38SJ.

Day		16	17	18	19	20
		Monday	Tuesday	Wednesday	Thursday	Friday
Date		11/04/2011	12/04/2011	13/04/2011	14/04/2011	15/04/2011
	9.00	UGM Meeting Break	UGM Meeting Break	UGM Meeting Break	UGM Meeting Break	UGM Meeting Break
	10.00					
	11.00					
	11.30					
	12.00					
	13.30		13.30	13.00	13.30	13.30
				13.30		
	14.00	UGM Meeting Break	14.00 UGM Meeting Break	14.30 UGM Meeting Break	14.00 UGM Meeting Break	14.00 UGM Meeting Break
	15.30		15.30	15.30	15.00	15.00
	15.30		15.30	15.30	15.30	15.30
	16.30		16.30	16.30	16.00	16.30
	17.30		17.30	17.30	17.00	17.30

Board Group Membership:
Heather Griffin
Mairi Macleod
Frances Wrath
Fiona McCluskey
Karen Connelly
Jackie Stewart

Brookfield :
tbc

NA Team:
Rowland Phillips (RP)
Sonja Von Maltzhan (SvM)
Graham Harris (GHa)
Carla Queiroz (CQ)
Magda Szczepanska (MS)
Jason Truscott (JT)
Rob Hall (RH)
Rob Powell (RPo)
Tom Pond (TP)
Mark Lloyd (ML)
Matthias Peretz (MP)
Liane Edwards (LE)
Jonathan Hendrick (JH)
Matt Cromack (MC)
Mark Drane (MD)
Andrew Callicott (AC)
Toby Ingle (TI)
Michael Hughes (MH)

Currie & Brown
David Hall

Doig & Smith
tbc

ZBP:
tbc

Design User Group Meetings - 1:50 Fully Loaded Stage (Week Five)

A52825963

Venue/s: **New South Glasgow Hospitals Project Office,**
Hardgate Road, Govan, G51 4SX
QMH, Dalnair Street, Glasgow G38SJ.
RHSC, Dalnair Street, Glasgow G38SJ.

Day		21				22				23				24				25			
		Monday				Tuesday				Wednesday				Thursday				Friday			
Date			18/04/2011				19/04/2011				20/04/2011				21/04/2011				22/04/2011		
			Children's				Children's														
	9.00	7	Emergency Department	JH / CQ	9.00	7	Observation Ward	JH / CQ	9.00		Float		9.00	9	Nuclear Medicine (Adult & Children's)	RP / SvM	9.00		Bank Holiday	
	10.00				10.00				10.00				10.00				10.00			
	11.00				11.00				11.00				11.00				11.00			
	11.30				11.30				11.30				11.30				11.30			
	12.30				12.30				12.30				12.30				12.30			
	13.30		Lunch (30mins)		13.30		Lunch (30mins)		13.30				13.30		Lunch (30mins)		13.30			
	14.00	7	Emergency Department	JH / CQ	14.00	8	Child Protection	JH / CQ	14.00		Float		14.00	9	Nuclear Medicine (Adult & Children's)	RP / SvM	14.00		Bank Holiday	
	15.00				15.00				15.00				15.00				15.00			
	15.30				15.30				15.30				15.30				15.30			
	16.30				16.30				16.30				16.30				16.30			
	17.30				17.30				17.30				17.30				17.30			

Board Group Membership:
Heather Griffin
Mairi Macleod

Frances Wrath
Fiona McCluskey
Karen Connelly
Jackie Stewart

Brookfield :
tbc

NA Team:
Rowland Phillips (RP)
Sonja Von Maltzhan (SvM)
Graham Harris (GHa)
Carla Queiroz (CQ)
Magda Szczepanska (MS)
Jason Truscott (JT)
Rob Hall (RH)
Rob Powell (RPo)
Tom Pond (TP)
Mark Lloyd (ML)
Matthias Peretz (MP)
Liane Edwards (LE)
Jonathan Hendrick (JH)
Matt Cromack (MC)
Mark Drane (MD)
Andrew Callicott (AC)
Toby Ingle (TI)
Michael Hughes (MH)

Currie & Brown
David Hall

Doig & Smith
tbc

ZBP:
tbc

Design User Group Meetings - 1:50 Fully Loaded Stage (Week Six)

Venue/s: **New South Glasgow Hospitals Project Office,**
Hardgate Road, Govan, G51 4SX

QMH, Dalnair Street, Glasgow G38SJ.
RHSC, Dalnair Street, Glasgow G38SJ.

Day	26	27	28	29	30
	Monday	Tuesday	Wednesday	Thursday	Friday
Date	25/04/2011	26/04/2011	27/04/2011	28/04/2011	29/04/2011
		Adult	Adult		
	9.00	9.00 10	9.00 10	9.00	9.00
	10.00	10.00	10.00	10.00	10.00
	11.00 Bank Holiday	11.00 Radiology MC/ AC	11.00 Radiology MC/ AC	11.00 Float	11.00 Bank Holiday
	11.30	11.30	11.30	11.30	11.30
	12.30	12.30	12.30	12.30	12.30
	13.30	13.30 Lunch (30mins)	13.30 Lunch (30mins)	13.30	13.30
	14.00	14.00 10	14.00 10	14.00	14.00
	15.00	15.00	15.00	15.00	15.00
	15.30 Bank Holiday	15.30 Radiology MC/ AC	15.30 Radiology MC/ AC	15.30 Float	15.30 Bank Holiday
	16.30	16.30	16.30	16.30	16.30
	17.30	17.30	17.30	17.30	17.30

Board Group Membership:
Heather Griffin
Mairi Macleod
Frances Wrath
Fiona McCluskey
Karen Connelly
Jackie Stewart

Brookfield :
tbc

NA Team:
Rowland Phillips (RP)
Sonja Von Maltzhan (SvM)
Graham Harris (GHa)
Carla Queiroz (CQ)
Magda Szczepanska (MS)
Jason Truscott (JT)
Rob Hall (RH)
Rob Powell (RPo)
Tom Pond (TP)
Mark Lloyd (ML)
Matthias Peretz (MP)
Liane Edwards (LE)
Jonathan Hendrick (JH)
Matt Cromack (MC)
Mark Drane (MD)
Andrew Callicott (AC)
Toby Ingle (TI)
Michael Hughes (MH)

Currie & Brown
David Hall

Doig & Smith
tbc

ZBP:
tbc

Design User Group Meetings - 1:50 Fully Loaded Stage (Week Seven)

Venue/s: **New South Glasgow Hospitals Project Office, Hardgate Road, Govan, G51 4SX**

A52825963

QMH, Dalnair Street, Glasgow G38SJ.
RHSC, Dalnair Street, Glasgow G38SJ.

Day	31	32	33	34	35
	Monday	Tuesday	Wednesday	Thursday	Friday
Date	02/05/2011	03/05/2011	04/05/2011	05/05/2011	06/05/2011
		Children's	Children's	Children's	Children's
	9.00	9.00 11 Radiology/CT/MRI Suite MC/ AC	9.00 11 Radiology/CT/MRI Suite MC/ AC	9.00 12 Theatres/Endoscopy & Recovery/Day & 23 Hour Unit JH / SvM	9.00 12 Theatres/Endoscopy & Recovery/Day & 23 Hour Unit JH / SvM
	10.00	10.00	10.00	10.00	10.00
	11.00 Bank Holiday	11.00	11.00	11.00	11.00
	11.30	11.30	11.30	11.30	11.30
	12.30	12.30	12.30	12.30	12.30
	13.30	13.30 Lunch (30mins)	13.30 Lunch (30mins)	13.30 Lunch (30mins)	13.30
	13.00	13.00 11 Radiology/CT/MRI Suite MC/ AC	13.00 11 Radiology/CT/MRI Suite MC/ AC	13.00 12 Theatres/Endoscopy & Recovery/Day & 23 Hour Unit JH / SvM	13.00 Float
	14.00	14.00	14.00	14.00	14.00
	15.00 Bank Holiday	15.00	15.00	15.00	15.00
	15.30	15.30	15.30	15.30	15.30
	17.00	17.00	17.00	17.00	17.00

Board Group Membership:
Heather Griffin
Mairi Macleod
Frances Wrath
Fiona McCluskey
Karen Connelly
Jackie Stewart

Brookfield :
tbc

NA Team:
Rowland Phillips (RP)
Sonja Von Maltzhan (SvM)
Graham Harris (GHa)
Carla Queiroz (CQ)
Magda Szczepanska (MS)
Jason Truscott (JT)
Rob Hall (RH)
Rob Powell (RPo)
Tom Pond (TP)
Mark Lloyd (ML)
Matthias Peretz (MP)
Liane Edwards (LE)
Jonathan Hendrick (JH)
Matt Cromack (MC)
Mark Drane (MD)
Andrew Callicott (AC)
Toby Ingle (TI)
Michael Hughes (MH)

Currie & Brown
David Hall

Doig & Smith
tbc

ZBP:
tbc

Design User Group Meetings - 1:50 Fully Loaded Stage (Week Eight)

Venue/s: **New South Glasgow Hospitals Project Office, Hardgate Road, Govan, G51 4SX**
QMH, Dalnair Street, Glasgow G38SJ.
RHSC, Dalnair Street, Glasgow G38SJ.

Day	36				37				38				39				40			
	Monday				Tuesday				Wednesday				Thursday				Friday			
Date			09/05/2011				10/05/2011				11/05/2011				12/05/2011				13/05/2011	
															Adult				Adult	
	9.00	13	Pharmacy Aseptic Suite (Adult & Children's)	MD/ TI	9.00	13	Pharmacy Dispensary (Adult & Children's)	MD/ TI	9.00	14	Medical Illustration (Adults & Childrens)	RP/ MS	9.00	15	Renal Inpatients & Day Unit	MD/ TI	9.00	16	Renal Dialysis	MD/ TI
	10.00				10.00				10.00				10.00				10.00			
	11.00				11.00				11.00				11.00				11.00			
	11.30				11.30				11.30				11.30				11.30			
	12.30				12.30				12.30				12.30				12.30			
	13.30		Lunch (30mins)		13.30				13.30				13.30		Lunch (30mins)		13.30			
	13.00	13	Pharmacy Aseptic Suite (Adult & Children's)	MD/ TI	13.00		Float		13.00		Float		13.00	15	Renal Inpatients & Day Unit	MD/ TI	13.00		Float	
	14.00				14.00				14.00				14.00				14.00			
	15.00				15.00				15.00				15.00				15.00			
	15.30				15.30				15.30				15.30				15.30			
	17.00				17.00				17.00				17.00				17.00			

Board Group Membership:
Heather Griffin
Mairi Macleod
Frances Wrath
Fiona McCluskey
Karen Connelly
Jackie Stewart

Brookfield :
tbc

NA Team:
Rowland Phillips (RP)
Sonja Von Maltzhan (SvM)
Graham Harris (GHa)
Carla Queiroz (CQ)
Magda Szczepanska (MS)
Jason Truscott (JT)
Rob Hall (RH)
Rob Powell (RPo)
Tom Pond (TP)
Mark Lloyd (ML)
Matthias Peretz (MP)
Liane Edwards (LE)
Jonathan Hendrick (JH)
Matt Cromack (MC)
Mark Drane (MD)
Andrew Callicott (AC)
Toby Ingle (TI)
Michael Hughes (MH)

Currie & Brown
David Hall

Doig & Smith
tbc

ZBP:
tbc

Design User Group Meetings - 1:50 Fully Loaded Stage (Week Nine)

Venue/s: **New South Glasgow Hospitals Project Office, Hardgate Road, Govan, G51 4SX**
QMH, Dalnair Street, Glasgow G38SJ.
RHSC, Dalnair Street, Glasgow G38SJ.

Day	41				42				43				44				45			
	Monday				Tuesday				Wednesday				Thursday				Friday			
Date			16/05/2011				17/05/2011				18/05/2011				19/05/2011				20/05/2011	
			Adult				Adult								Adult				Adult	
	9.00	17	MDU/Clinical Investigations Unit	RP / TP	9.00	19	Stroke Ward	RP / TP	9.00		Float		9.00	20	Main Entrance & Public Areas	GHa/ CQ/RPo	9.00	20	Main Entrance & Public Areas	GHa/ CQ/RPo
	10.00				10.00				10.00				10.00				10.00			
	11.00				11.00				11.00				11.00				11.00			
	11.30				11.30				11.30				11.30				11.30			
	12.30				12.30				12.30				12.30				12.30			
	13.30		Lunch (30mins)		13.30		Lunch (30mins)		13.30				13.30		Lunch (30mins)		13.30			
	13.00	18	OPD Pre-Assessment Unit	RP / TP	13.00	19	Stroke Ward	RP / TP	13.00		Float		13.00	20	Main Entrance & Public Areas	GHa/ CQ/RPo	14.00		Float	
	14.00				14.00				14.00				14.00				15.00			
	15.00				15.00				15.00				15.00				15.30			
	15.30				15.30				15.30				15.30				16.30			
	17.00				17.00				17.00				17.00				17.30			

Board Group Membership:
Heather Griffin
Mairi Macleod
Frances Wrath
Fiona McCluskey
Karen Connelly
Jackie Stewart

Brookfield :
tbc

NA Team:
Rowland Phillips (RP)
Sonja Von Maltzhan (SvM)
Graham Harris (GHa)
Carla Queiroz (CQ)
Magda Szczepanska (MS)
Jason Truscott (JT)
Rob Hall (RH)
Rob Powell (RPo)
Tom Pond (TP)
Mark Lloyd (ML)
Matthias Peretz (MP)
Liane Edwards (LE)
Jonathan Hendrick (JH)
Matt Cromack (MC)
Mark Drane (MD)
Andrew Callicott (AC)
Toby Ingle (TI)
Michael Hughes (MH)

Currie & Brown
David Hall

Doig & Smith
tbc

ZBP:
tbc

Design User Group Meetings - 1:50 Fully Loaded Stage (Week Ten)

Venue/s: **New South Glasgow Hospitals Project Office, Hardgate Road, Govan, G51 4SX**
QMH, Dalnair Street, Glasgow G38SJ.
RHSC, Dalnair Street, Glasgow G38SJ.

Day	46	47	48	49	50

	Monday				Tuesday				Wednesday				Thursday				Friday			
Date			**23/05/2011**				**24/05/2011**				**25/05/2011**				**26/05/2011**				**27/05/2011**	
			Adult				**Adult**								**Adult**				**Adult**	
	9.00	**21**	Level 3 - Staff Change/Hotel Services/Staff Accommodation	**RP** / LE	**9.00**	**23**	Decontamination Suite	**RP**/ MS	**9.00**		Float		**9.00**	**25**	Haemato-Oncology Ward	**MD** / TI	**9.00**	**26**	Dermatology OPD & Ward	**MC** / AC
	10.00				**10.00**				**10.00**				**10.00**				**10.00**			
	11.00				**11.00**				**11.00**				**11.00**				**11.00**			
	11.30				**11.30**				**11.30**				**11.30**				**11.30**			
	12.30				**12.30**				**12.30**				**12.30**				**12.30**			
	13.30		Lunch (30mins)		**13.30**		Lunch (30mins)		**13.30**				**13.30**				**13.30**		Lunch (30mins)	
	13.00	**22**	Admin, Training, Health Records & Staff Facilities	**RP** / LE	**13.00**	**24**	Medical Physics & Bio-Engineering	**RP**/ MS	**14.00**		Float		**13.00**	**25**	Haemato-Oncology Ward	**MD** / TI	**13.00**	**26**	Dermatology OPD & Ward	**MC** / AC
	14.00				**14.00**				**15.00**				**14.00**				**14.00**			
	15.00				**15.00**				**15.30**				**15.00**				**15.00**			
	15.30				**15.30**				**16.30**				**15.30**				**15.30**			
	17.00				**17.00**				**17.30**				**17.00**				**17.00**			

Board Group Membership:
Heather Griffin
Mairi Macleod
Frances Wrath
Fiona McCluskey
Karen Connelly
Jackie Stewart

Brookfield :
tbc

NA Team:
Rowland Phillips (RP)
Sonja Von Maltzhan (SvM)
Graham Harris (GHa)
Carla Queiroz (CQ)
Magda Szczepanska (MS)
Jason Truscott (JT)
Rob Hall (RH)
Rob Powell (RPo)
Tom Pond (TP)
Mark Lloyd (ML)
Matthias Peretz (MP)
Liane Edwards (LE)
Jonathan Hendrick (JH)
Matt Cromack (MC)
Mark Drane (MD)
Andrew Callicott (AC)
Toby Ingle (TI)
Michael Hughes (MH)

Currie & Brown
David Hall

Doig & Smith
tbc

ZBP:
tbc

Design User Group Meetings - 1:50 Fully Loaded Stage (Week Eleven)

Venue/s: **New South Glasgow Hospitals Project Office, Hardgate Road, Govan, G51 4SX**
QMH, Dalnair Street, Glasgow G38SJ.
RHSC, Dalnair Street, Glasgow G38SJ.

Day	**51**	**52**	**53**	**54**	**55**
	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**

Date			30/05/2011				31/05/2011				01/06/2011				02/06/2011				03/06/2011	
							Adult								Children's				Children's	
	9.00		Bank Holiday		9.00	27	Rehabilitation & Therapies	MC/ AC	9.00		Float		9.00	28	Critical Care (PICU)	JH / SvM	9.00	29	Medical Day Unit	JT/ SvM
	10.00				10.00				10.00				10.00				10.00			
	11.00				11.00				11.00				11.00				11.00			
	11.30				11.30				11.30				11.30				11.30			
	12.30				12.30				12.30				12.30				12.30			
	13.30				13.30		Lunch (30mins)		13.30				13.30		Lunch (30mins)		13.30			
	13.00		Bank Holiday		13.00	27	Rehabilitation & Therapies	MC/ AC	13.00		Float		13.00	28	Critical Care (PICU)	JH / SvM	13.00		Float	
	14.00				14.00				14.00				14.00				14.00			
	15.00				15.00				15.00				15.00				15.00			
	15.30				15.30				15.30				15.30				15.30			
	17.00				17.00				17.00				17.00				17.00			

Board Group Membership:
Heather Griffin
Mairi Macleod
Frances Wrath
Fiona McCluskey
Karen Connelly
Jackie Stewart

Brookfield :
tbc

NA Team:
Rowland Phillips (RP)
Sonja Von Maltzhan (SvM)
Graham Harris (GHa)
Carla Queiroz (CQ)
Magda Szczepanska (MS)
Jason Truscott (JT)
Rob Hall (RH)
Rob Powell (RPo)
Tom Pond (TP)
Mark Lloyd (ML)
Matthias Peretz (MP)
Liane Edwards (LE)
Jonathan Hendrick (JH)
Matt Cromack (MC)
Mark Drane (MD)
Andrew Callicott (AC)
Toby Ingle (TI)
Michael Hughes (MH)

Currie & Brown
David Hall

Doig & Smith
tbc

ZBP:
tbc

Design User Group Meetings - 1:50 Fully Loaded Stage (Week Twelve)

Venue/s: **New South Glasgow Hospitals Project Office, Hardgate Road, Govan, G51 4SX**
QMH, Dalnair Street, Glasgow G38SJ.
RHSC, Dalnair Street, Glasgow G38SJ.

Day	56	57	58	59	60
	Monday	Tuesday	Wednesday	Thursday	Friday
Date	06/06/2011	07/06/2011	08/06/2011	09/06/2011	10/06/2011
	Children's	Children's	Adult	Children's	Adult

	9.00	30	Inpatient Wards	RP/ SvM	9.00	30	Inpatient Wards	RP/ SvM	9.00	32	Endoscopy	RP/ SvM	9.00	33	Cardiology Ward	JH / MS	9.00	34	OPD	MC/ AC
	10.00				10.00				10.00				10.00				10.00			
	11.00				11.00				11.00				11.00				11.00			
	11.30				11.30				11.30				11.30				11.30			
	12.30				12.30				12.30				12.30				12.30			
	13.30		Lunch (30mins)		13.30		Lunch (30mins)		13.30				13.30		Lunch (30mins)		13.30		Lunch (30mins)	
	13.00	30	Inpatient Wards	RP/ SvM	13.00	31	Renal Services	RP/ SvM	13.00		Float		13.00	33	Cardiology Testing & Lung Function Suite	JH / MS	13.00	34	OPD	MC/ AC
	14.00				14.00				14.00				14.00				14.00			
	15.00				15.00				15.00				15.00				15.00			
	15.30				15.30				15.30				15.30				15.30			
	17.00				17.00				17.00				17.00				17.00			

Board Group Membership:
Heather Griffin
Mairi Macleod
Frances Wrath
Fiona McCluskey
Karen Connelly
Jackie Stewart

Brookfield :
tbc

NA Team:
Rowland Phillips (RP)
Sonja Von Maltzhan (SvM)
Graham Harris (GHa)
Carla Queiroz (CQ)
Magda Szczepanska (MS)
Jason Truscott (JT)
Rob Hall (RH)
Rob Powell (RPo)
Tom Pond (TP)
Mark Lloyd (ML)
Matthias Peretz (MP)
Liane Edwards (LE)
Jonathan Hendrick (JH)
Matt Cromack (MC)
Mark Drane (MD)
Andrew Callicott (AC)
Toby Ingle (TI)
Michael Hughes (MH)

Currie & Brown
David Hall

Doig & Smith
tbc

ZBP:
tbc

Design User Group Meetings - 1:50 Fully Loaded Stage (Week Thirteen)

Venue/s: **New South Glasgow Hospitals Project Office, Hardgate Road, Govan, G51 4SX**
QMH, Dalnair Street, Glasgow G38SJ.
RHSC, Dalnair Street, Glasgow G38SJ.

Day			61				62				63				64				65			
	Monday						Tuesday				Wednesday				Thursday				Friday			
Date			13/06/2011						14/06/2011				15/06/2011				16/06/2011				17/06/2011	
			Adult						Adult								Children's				Children's	
	9.00	34				9.00	34				9.00				9.00	35				9.00	35		
	10.00					10.00					10.00				10.00					10.00		

	11.00		OPD	MC/ AC	11.00		OPD	MC/ AC	11.00		Float		11.00		OPD	RP/ LE	11.00		OPD	RP/ LE
	11.30				11.30				11.30				11.30				11.30			
	12.30				12.30				12.30				12.30				12.30			
	13.30		Lunch (30mins)		13.30		Lunch (30mins)		13.30				13.30		Lunch (30mins)		13.30		Lunch (30mins)	
	13.00	34	OPD	MC/ AC	13.00	34	OPD	MC/ AC	13.00		Float		13.00	35	OPD	RP/ LE	13.00	35	OPD	RP/ LE
	14.00				14.00				14.00				14.00				14.00			
	15.00				15.00				15.00				15.00				15.00			
	15.30				15.30				15.30				15.30				15.30			
	17.00				17.00				17.00				17.00				17.00			

Board Group Membership:
Heather Griffin
Mairi Macleod
Frances Wrath
Fiona McCluskey
Karen Connelly
Jackie Stewart

Brookfield :
tbc

NA Team:
Rowland Phillips (RP)
Sonja Von Maltzhan (SvM)
Graham Harris (GHa)
Carla Queiroz (CQ)
Magda Szczepanska (MS)
Jason Truscott (JT)
Rob Hall (RH)
Rob Powell (RPo)
Tom Pond (TP)
Mark Lloyd (ML)
Matthias Peretz (MP)
Liane Edwards (LE)
Jonathan Hendrick (JH)
Matt Cromack (MC)
Mark Drane (MD)
Andrew Callicott (AC)
Toby Ingle (TI)
Michael Hughes (MH)

Currie & Brown
David Hall

Doig & Smith
tbc

ZBP:
tbc

Design User Group Meetings - 1:50 Fully Loaded Stage (Week Fourteen)

Venue/s: **New South Glasgow Hospitals Project Office,**
Hardgate Road, Govan, G51 4SX
QMH, Dalnair Street, Glasgow G38SJ.
RHSC, Dalnair Street, Glasgow G38SJ.

Day		66		67		68		69		70	
		Monday		Tuesday		Wednesday		Thursday		Friday	
Date		20/06/2011		21/06/2011		22/06/2011		23/06/2011		24/06/2011	
		Children's		Children's				Children's		Children's	
	9.00	36		9.00	36	9.00		9.00	37	9.00	37
	10.00		Rehabilitation &	10.00	Rehabilitation &	10.00		10.00	Schiehallion Ward &	10.00	Schiehallion

	11.00		Rehabilitation & Therapies	JT/ SvM	11.00		Rehabilitation & Therapies	JT/ SvM	11.00		Float		11.00		Schiehallion Ward & Day Unit	JH/ ML	11.00		Radiotherapy Treatment Suite	JH/ ML
	11.30				11.30				11.30				11.30				11.30			
	12.30				12.30				12.30				12.30				12.30			
	13.30		Lunch (30mins)		13.30				13.30				13.30		Lunch (30mins)		13.30			
	13.00	36	Rehabilitation & Therapies	JT/ SvM	13.00		Float		13.00		Float		13.00	37	Schiehallion Ward & Day Unit	JH/ ML	13.00		Float	
	14.00				14.00				14.00				14.00				14.00			
	15.00				15.00				15.00				15.00				15.00			
	15.30				15.30				15.30				15.30				15.30			
	17.00				17.00				17.00				17.00				17.00			

Board Group Membership:
Heather Griffin
Mairi Macleod
Frances Wrath
Fiona McCluskey
Karen Connelly
Jackie Stewart

Brookfield :
tbc

NA Team:
Rowland Phillips (RP)
Sonja Von Maltzhan (SvM)
Graham Harris (GHa)
Carla Queiroz (CQ)
Magda Szczepanska (MS)
Jason Truscott (JT)
Rob Hall (RH)
Rob Powell (RPo)
Tom Pond (TP)
Mark Lloyd (ML)
Matthias Peretz (MP)
Liane Edwards (LE)
Jonathan Hendrick (JH)
Matt Cromack (MC)
Mark Drane (MD)
Andrew Callicott (AC)
Toby Ingle (TI)
Michael Hughes (MH)

Currie & Brown
David Hall

Doig & Smith
tbc

ZBP:
tbc

Design User Group Meetings - 1:50 Fully Loaded Stage (Week Fifteen)

Venue/s: **New South Glasgow Hospitals Project Office, Hardgate Road, Govan, G51 4SX**
QMH, Dalnair Street, Glasgow G38SJ.
RHSC, Dalnair Street, Glasgow G38SJ.

Day	71		72		73		74		75	
	Monday		Tuesday		Wednesday		Thursday		Friday	
Date	27/06/2011		28/06/2011		29/06/2011		30/06/2011		01/07/2011	
	Children's		Children's				Adult		Adult	
	9.00	38	9.00	39	9.00		9.00	40	9.00	40
	10.00		10.00		10.00		10.00		10.00	

	11.00		Psychiatry / DCFP	JH/ SvM	11.00		Main Entrance & Public Areas	GHa/ CQ/RH	11.00		Float		11.00		Inpatient Wards	RP / SvM	11.00		Inpatient Wards	RP / SvM
	11.30				11.30				11.30				11.30				11.30			
	12.30				12.30				12.30				12.30				12.30			
	13.30		Lunch (30mins)		13.30		Lunch (30mins)		13.30				13.30		Lunch (30mins)		13.30		Lunch (30mins)	
	13.00	38	Psychiatry / DCFP	JH/ SvM	13.00	39	Main Entrance & Public Areas	GHa/ CQ/RH	13.00		Float		13.00	40	Inpatient Wards	RP / SvM	13.00	40	Inpatient Wards	RP / SvM
	14.00				14.00				14.00				14.00				14.00			
	15.00				15.00				15.00				15.00				15.00			
	15.30				15.30				15.30				15.30				15.30			
	17.00				17.00				17.00				17.00				17.00			

Board Group Membership:
Heather Griffin
Mairi Macleod
Frances Wrath
Fiona McCluskey
Karen Connelly
Jackie Stewart

Brookfield :
tbc

NA Team:
Rowland Phillips (RP)
Sonja Von Maltzhan (SvM)
Graham Harris (GHa)
Carla Queiroz (CQ)
Magda Szczepanska (MS)
Jason Truscott (JT)
Rob Hall (RH)
Rob Powell (RPo)
Tom Pond (TP)
Mark Lloyd (ML)
Matthias Peretz (MP)
Liane Edwards (LE)
Jonathan Hendrick (JH)
Matt Cromack (MC)
Mark Drane (MD)
Andrew Callicott (AC)
Toby Ingle (TI)
Michael Hughes (MH)

Currie & Brown
David Hall

Doig & Smith
tbc

ZBP:
tbc

Design User Group Meetings - 1:50 Fully Loaded Stage (Week Sixteen)

Venue/s: **New South Glasgow Hospitals Project Office,**
Hardgate Road, Govan, G51 4SX
QMH, Dalnair Street, Glasgow G38SJ.
RHSC, Dalnair Street, Glasgow G38SJ.

Day	**76**				**77**				**78**				**79**				**80**			
	Monday				**Tuesday**				**Wednesday**				**Thursday**				**Friday**			
Date			**04/07/2011**				**05/07/2011**				**06/07/2011**				**07/07/2011**				**08/07/2011**	
	9.00		Additional Sign-Off		**9.00**		Additional Sign-Off		**9.00**		Additional Sign-Off		**9.00**		Additional Sign-Off		**9.00**		Additional Sign-Off	
	10.00				**10.00**				**10.00**				**10.00**				**10.00**			

	11.00		Meeting (**Board ONLY**)		11.00		Meeting (**Board ONLY**)		11.00		Meeting (**Board ONLY**)		11.00		Meeting (**Board ONLY**)		11.00		Meeting (**Board ONLY**)			
	11.30				11.30				11.30				11.30				11.30					
	12.30				12.30				12.30				12.30				12.30					
	13.30				13.30				13.30				13.30				13.30					
	13.00		Additional Sign-Off Meeting (**Board ONLY**)		13.00		Additional Sign-Off Meeting (**Board ONLY**)		13.00		Additional Sign-Off Meeting (**Board ONLY**)		13.00		Additional Sign-Off Meeting (**Board ONLY**)		13.00		Additional Sign-Off Meeting (**Board ONLY**)			
	14.00				14.00				14.00				14.00				14.00					
	15.00				15.00				15.00				15.00				15.00					
	15.30				15.30				15.30				15.30				15.30					
	17.00				17.00				17.00				17.00				17.00					

Board Group Membership:
Heather Griffin
Mairi Macleod
Frances Wrath
Fiona McCluskey
Karen Connelly
Jackie Stewart

Brookfield :
tbc

NA Team:
Rowland Phillips (RP)
Sonja Von Maltzhan (SvM)
Graham Harris (GHa)
Carla Queiroz (CQ)
Magda Szczepanska (MS)
Jason Truscott (JT)
Rob Hall (RH)
Rob Powell (RPo)
Tom Pond (TP)
Mark Lloyd (ML)
Matthias Peretz (MP)
Liane Edwards (LE)
Jonathan Hendrick (JH)
Matt Cromack (MC)
Mark Drane (MD)
Andrew Callicott (AC)
Toby Ingle (TI)
Michael Hughes (MH)

Currie & Brown
David Hall

Doig & Smith
tbc

ZBP:
tbc

NHSScotland

Estates Asset Management

Property Appraisal Manual

Health Facilities Scotland
Property and Capital Planning

March 2011

Contents

A52825963

A52825963

1. Introduction

1.1 It is essential that the Land and Property Assets of the NHS Estate in Scotland positively contribute to the delivery of healthcare services.

1.2 In order to develop a Property and Asset Management Strategy (PAMS), it is necessary to carry out an appraisal of the existing land and property as a baseline assessment of the current NHS Estate. This includes all property owned and leased by NHSScotland, however it excludes leases to third parties.

1.3 By taking stock of the existing estate, future investment priorities can be identified together with opportunities for rationalisation.

1.4 In view of the size and diverse geographical locations of the NHS Estate in Scotland, it is important that the method of appraisal and the information gathered is carried out and recorded in a consistent manner to enable the results to be presented in a coherent and meaningful way and to streamline the preparation of the NHS in Scotland, All Scotland Report.

1.5 It should be understood that the Estates Asset Management System is a high level strategic tool to assess the current condition of the Property Assets and to identify backlog maintenance costs. The information collected will inform the action plan forming part of the comprehensive property strategy for the NHS in Scotland.

1.6 This Property Appraisal Manual is structured in the following five main parts:

Part 1 deals with issues and definitions;

Part 2 outlines the approach to the appraisal in terms of the Six Facets;

Part 3 covers the survey process for carrying out new Condition Survey Appraisals;

Part 4 deals with Survey Partner Matters and has been included for information only.

Note: The Estates Asset Management System is a high level Strategic Tool rather than an Operational Tool

2. Purpose

2.1 NHSScotland and Health Facilities Scotland (HFS), working with the 14 NHSScotland Boards and 7 Special Health Boards and Support Organisations, intends to implement an Estate Management System for the NHS Estate in Scotland. Once the system is operational, it will inform the Boards of the condition, compliance, functionality, utilisation, environmental performance and quality of their Estate and comply with the requirements of the Scottish Government following the Audit Scotland Report dated January 2009 entitled 'Asset Management in the NHS in Scotland'.

2.2 The appraisal of the existing estate, in terms of its condition and performance, is a fundamental requirement for the development of a comprehensive property strategy for the NHS in Scotland and requires knowledge of the physical condition of the buildings, their engineering systems and external works.

2.3 It is anticipated that the appraisal will identify various issues that will need to be considered such as backlog maintenance, poor functional suitability and space utilisation, and non-compliance with health and safety legislation.

2.4 Establishing the current physical condition of the estate will assist with developing the property strategy by identifying properties to be retained or disposed of and this will enable robust capital and revenue investment programmes to be developed based on accurate information on the estate.

2.5 As part of the process, Scottish Government Health Directorates (SGHD) and the NHSScotland Boards require condition information on the property assets. While a proportion of this information is available, the Boards have indicated that a substantial amount of work is required to update the level of information to comply with guidance and recommendations that each property should be surveyed on a 5 yearly cycle.

2.6 National Services Scotland (NSS) has entered into a Framework Agreement and a call-off agreement with 3i Studio for the provision of their 3i Studio ESTATEManager software and support.

2.7 The Estate Management System, when populated, will:

- identify the condition and performance of the existing property assets;
- quantify the costs of rectifying backlog maintenance;
- identify the risks associated with the condition, compliance and suitability of the property assets to enable prioritisation of the main issues.

2.8 Risks will be assessed according to the likelihood that the risk will be realised and the potential adverse consequences that may arise.

2.9 To assist with the implementation and population of the ESTATEManager software, HFS are appointing a 'Survey Partner' for each year of the Estates

Asset Management Project. This survey partner will become an integral part of the team and will assist the Boards with the collection of some of the survey data on a prioritised basis. In conjunction with this work, Boards will be required by SGHD to develop and execute an Implementation Plan which sets out how the Boards intend to initially coordinate and collect all core data and six facet property appraisal data. In addition, it is expected that SGHD will require Boards to be continuously updating this data in an ongoing basis (at least 20% of data refreshed per year).

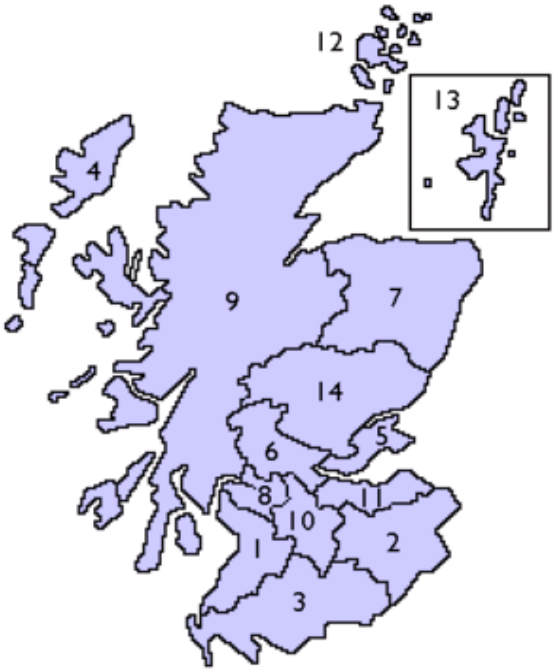
2.10 This Manual has been prepared to provide guidance on the methodology to be used to ensure a standard and consistent approach is adopted across all Boards.

PART 1: Issues and Definitions

3. The NHS Estate in Scotland

Composition

3.1 The NHS in Scotland covers some 14 geographical Board areas, as detailed on the following diagram, as well as 7 Special Health Boards and National Services Scotland which are national organisations.



NHSScotland Health Boards

1. NHS Ayrshire and Arran
2. NHS Borders
3. NHS Dumfries and Galloway
4. NHS Western Isles
5. NHS Fife
6. NHS Forth Valley
7. NHS Grampian
8. NHS Greater Glasgow and Clyde
9. NHS Highland and Argyll
10. NHS Lanarkshire
11. NHS Lothian
12. NHS Orkney
13. NHS Shetland
14. NHS Tayside
15. National Waiting Times Centre Board
16. NHS 24
17. NHS Education in Scotland
18. NHS Health Scotland
19. NHS Quality Improvement Scotland
20. The State Hospitals Board for Scotland
21. Scottish Ambulance Service
22. National Services Scotland

3.2 In addition there are numerous GP and Dental Practices, Pharmacies and Opticians forming part of the Primary Care Estate. While these facilities are not owned by the NHS, they need to be incorporated into the overall strategic planning process.

A52825963

4. Estate Hierarchy

Coding and Descriptions

4.1 The appraisal of the NHS Estate in Scotland will generate a significant volume of survey data and to enable analysis at a variety of levels, it is necessary for the survey information to be structured logically.

4.2 Information on the condition and suitability of Elements and Sub-Elements of the Estate need to be linked to the correct asset and this is achieved by adopting a consistent method and hierarchy of coding.

Asset Hierarchy

4.3 The following levels of hierarchy will be adopted in the roll-out of the Estate Asset Management System:

Level Zero - The NHS in Scotland
This includes all land and buildings in ownership or occupation by the NHS in Scotland.

Level One - NHS Board/Organisation
This covers all land and buildings owned or occupied by a specific Board or organisation.

Level Two - Site Level
This details all land and buildings owned or occupied at a specific geographical location. The Site may contain a number of buildings or Blocks.

Level Three - Block Level (Physical Block)
This covers each physical Block on each Site. Generally a Block equates to a building however, in certain circumstances it may be helpful to break a building into a number of Blocks. For example, where a building has a number of wings or where a modern extension has been added to an older building, it may assist to differentiate the different forms of construction and condition by identifying the extension and the original building as separate Blocks.

External areas are also collectively treated as a separate Block.

Level Four - Location Level (Survey Block)

This is a sub-set of a Block and can be either internal or external, eg:

East Elevation

First Floor

X-Ray Department

When used internally, location level can be used to define a number of rooms by location eg. 'First Floor' or by occupation eg. 'X-Ray Department'.

Level Four can also be used for room level data when the internal spaces within a Block are defined by their allocated room reference.

Location Code Directory

4.4 It is important that the condition data is linked to the correct asset as a whole or the relevant part of the asset.

4.5 The Location Code Directory has been in common use throughout the NHS Estate since the 1970s and will continue to be used for the Estates Asset Management System, but in a modified format.

4.6 The Location Code Directory assigns a unique 5 character code to each location, made up of an alpha-prefix, usually referring to a Health Board, followed by a 3 digit serial number and ending with an alpha-suffix representing the type of location. When a location closes, its code is not re-allocated to another location to avoid confusion.

4.7 The system is web based (www.isdscotland.org) and is updated weekly for all NHS properties at Site level but it does not currently go down to Block Level.

4.8 The following table summarises the Location Code Directory coding method:

Prefix	*Health Board*
A	Ayrshire and Arran
B	Borders
C	Argyll and Clyde (see note below)
F	Fife
G	Greater Glasgow (now Greater Glasgow and Clyde)
H	Highland (now Highland and Argyll)
L	Lanarkshire
N	Grampian
R	Orkney
S	Lothian
T	Tayside
V	Forth Valley
W	Western Isles
Y	Dumfries and Galloway
Z	Shetland
D	Nationally Based Locations
E	Outwith Scotland
X	Common Services Agency, etc

Suffix	*Original Description*	*Current Description*
H	NHS Hospital	NHS Hospital
J	Joint User Hospital	Joint User Hospital or Suffix-J Hospital
K	Contractual Hospital	Contractual Hospital or Suffix-K Hospital
M	Non-NHS Maternity	Non-NHS Maternity
N	Non-Institutional	Non-Institutional
P	Prison	Prison
R	Home for the Elderly	Home for the Elderly
S	Other Home	Other Home
V	Non-NHS Non-Maternity	Private Hospital or Private Nursing Home
A	Admin Office	Health Service Administrative Office
B	Health Centre	Health Centre, most GP Surgery Locations
C	Clinic	Clinic Premises, etc
E	Extra-Mural Clinic	Extra-Mural Clinic
L,-Q,-W	School	School
T	-	Miscellaneous Premises

Footnote

The former Argyll and Clyde properties have been allocated geographically between NHS Greater Glasgow and Clyde and NHS Highland and Argyll

Table 1: Location Code Directory coding method

4.9 The coding for new properties can be obtained by completing a standard pro-forma. Direct access to the Directory is available following satisfactory completion of a Confidentiality Statement.

4.10 As part of this project, it will be necessary for all NHS Boards to update their existing property lists using the relevant codes from NHS National Services Scotland. Any properties missing from the Boards' lists or which have not been coded correctly will need to be added and properly coded.

4.11 It will be necessary for the Boards to extend the coding of their property lists to include each Block at each Site.

Site Reference Number (SRN)

4.12 The ESTATEManager software and any new Property Appraisals will adopt the existing Location Code Directory as the Unique Site Reference Number (SRN) to identify each Site.

Block Codes

4.13 All Blocks/Buildings on each Site need to be identified by means of a Unique Block Reference Number and the name by which the Block is known.

4.14 Where Boards already have reference numbers for Blocks, these may be retained if so desired.

4.15 The use of Block '00' for the Site and external areas on a Site require to be used by all Boards.

4.16 Where there are no existing reference numbers, the following codes are suggested to identify the Blocks:

00 The Site and External Areas

01 First Building on Site

02 Second Building on Site

03 and so on……

Elements and Sub-Elements

4.17 The physical condition of the Estate will be assessed on the basis of the following 20 building and engineering Elements and Sub-Elements.

1.0 Structure

1.01 Substructure

1.02 Frames

1.03 Floors and Stairs

1.04 Roofs

1.99 Other

2.0 External Fabric

2.01 External Walls and Finishes

2.02 Windows and Ironmongery

2.03 External Doors and Ironmongery

2.04 External Cladding/Eaves Detail

2.05 External Decoration
2.99 Other

3.0 Roof
3.01 Coverings – Pitched
3.02 Coverings – Flat
3.03 Roof Lights
3.04 Rainwater Goods
3.05 Chimney Stacks and Parapet Walls
3.99 Other

4.0 Internal Fabric
4.01 Internal Walls and Finishes
4.02 Floor Coverings
4.03 Ceilings Finishes
4.04 Ceilings - Suspended
4.05 Internal Doors and Ironmongery
4.06 Internal Decoration
4.99 Other

5.0 Internal Fittings and Fixtures
5.01 Sanitary Ware/Fittings
5.02 Unit Furniture
5.03 Internal Fittings and Furniture
5.99 Other

6.0 External Grounds and Gardens
6.01 Landscaping
6.02 Walls, Fencing and Gates
6.03 Roads and Car Parks
6.04 Paths and Paved Areas
6.05 External Fittings and Furniture
6.06 Ancillary Buildings
6.99 Other

7.0 Drainage and External Services
7.01 Drainage/Sewerage
7.02 External Utilities Infrastructure

7.03 Site Lighting
7.04 Lightning Protection
7.05 CCTV (External)
7.99 Other

8.0 Fuel Storage and Distribution
8.01 Fuel Supply/Distribution
8.02 Storage
8.99 Other

9.0 Boilers and Calorifiers
9.01 Boiler Plant
9.02 Pressurisation Plant
9.03 Calorifiers/Heat Exchangers
9.04 Flues
9.05 Controls/Meters
9.06 Insulation
9.99 Other

10.0 Steam Systems
10.01 Distribution Pipework
10.02 Valves
10.03 Controls
10.04 Meters
10.05 Condense Systems
10.06 Insulation
10.99 Other

11.0 Heating Systems
11.01 Distribution Pipework
11.02 Heat Emitters
11.03 Controls
11.04 Heating Pumps
11.05 Insulation
11.99 Other

12.0 Ventilation Systems
12.01 Ventilation Plant

12.02 Distribution Ductwork
12.03 Automatic Fire Dampers and Control Panel
12.04 Controls
12.05 Room Split/Chillers/Compressors
12.06 Chillers/Cooling Systems
12.07 Cooling Towers
12.99 Other

13.0 Medical Gas Systems

13.01 Vacuum Insulated Evaporators
13.02 Distribution
13.03 Manifolds
13.04 Gas Cylinder Storage
13.05 Outlets
13.06 Alarm Systems
13.07 Medical Air Compressors/Vacuum Pumps
13.99 Other

14.0 Hot and Cold Water Systems

14.01 Water Storage and Header Tanks
14.02 Water Treatment Plant
14.03 Distribution Pipework
14.04 Pumps
14.05 Valves/Controls
14.06 Water Heaters
14.07 Insulation
14.99 Other

15.0 Lifts and Hoists

15.01 Passenger Lifts
15.02 Goods Lifts
15.03 Hoists
15.04 Control Panel
15.99 Other

16.0 Fixed Plant/Equipment

16.01 Sterilisers
16.02 Bedpan Disposal

16.03 Disinfection Equipment
16.04 Catering Equipment
16.05 Laundry Equipment
16.06 Miscellaneous Equipment
16.09 Other

17.0 Electrical System

17.01 HV Network
17.02 Generators
17.03 Switchgear
17.04 Distribution Boards
17.05 Wiring Systems/Bonding
17.06 Fittings
17.07 Luminaires
17.08 Emergency Luminaires
17.99 Other

18.0 Communication Systems

18.01 Telephone Systems
18.02 Data Transmission
18.03 Paging Systems
18.04 Nurse Call Systems
18.05 Radio and Television Systems
18.06 Bedhead Services
18.99 Other

19.0 Alarms and Detection Systems

19.01 Fire Alarm Panels
19.02 Fire Alarm Wiring System
19.03 Security Systems
19.04 CCTV (Internal)
19.05 Panic Attack System
19.06 Other Alarm Systems
19.99 Other

20.0 Building Management Control System

20.01 Building Management System
20.99 Other

4.18 For appraisal purposes, the physical condition of each Block will be split into four constituent parts:

- building envelope;
- engineering services;
- internal elements;
- external areas.

4.19 The condition of the property's building envelope and external areas will be assessed for the whole building.

4.20 Engineering services will be assessed on a system basis and reported at building level while the internal Elements will be appraised on a zone/space level.

4.21 Once the building and Engineering Appraisals are complete, an Overall Physical Condition assessment for each Block should be derived based on the individual element and sub-element assessments. This will require to be derived using professional judgment on the strength of the information available and will be the basis of national reporting on the Physical Condition of the Block.

4.22 On multi-building Sites, Elements of the Engineering Services may service the whole Site in which case they should be recorded against Block '00' External Grounds and Gardens.

5. Minimum Dataset of Baseline Information

General information at National Level (Level Zero)

5.1 The Estates Asset Management System is driven by the regional and special health Boards who are responsible for uploading and maintaining their information to allow analysis and reporting at national level. Therefore collection of data is on a 'bottom up' basis and only limited 'General Information' is held at national level on NHSScotland as a whole.

5.2 Once the database is populated and complete, the ESTATEManager software will include a text box providing general information about NHSScotland on a national basis.

5.3 The ESTATEManager software will also contain a map of Scotland graphic showing the geographical boundaries and land mass of NHSScotland Boards for information purposes.

General information at Board Level (Level One)

5.4 The ESTATEManager software contains a text box to enable each NHS Board to provide general information about the Board including population, geographical coverage and which Local Authority the Boards covers.

General information at Site Level (Level Two)

5.5 The following minimum information is required for each NHS Board at Site level to identify all Land and Buildings:

- SRN based on existing national code;
- name of NHS Board;
- site name;
- site address;
- town;
- postcode;
- contact name;
- contact number;
- contact email.

Type of Site

5.6 The NHS Estate in Scotland comprises a variety of types and the following codes have been agreed for grouping purposes.

01 Acute Hospital

02 Childrens Hospital
03 Maternity Hospital
04 Specialist Hospital
05 Mental Health Hospital
06 Community Hospital
07 Older People Hospital
08 Multi Service Hospital
21 Health Centre
22 Clinics (including Day Hospitals and Resource Centres)
23 Offices
24 Support Facilities
25 Staff Residential Accommodation
26 Patient Residential Accommodation
41 GP Practice
42 Dental Practice
43 Pharmacy
44 Optician
91 Non NHS functions
99 Other

Status of each Site

5.7 The NHS Estate in Scotland requires to be further categorised for each Site (Land) with reference to the following options:

- occupied;
- vacant;
- surplus;
- sold;
- surrendered;
- terminated.

Requirement of each Site

5.8 The requirement of each Site forming the NHS Estate in Scotland requires to be defined in terms of whether it is regarded as being essential or non essential using a ‘flag’ in the software.

5.9 This requires to be further detailed in relation to the future expectation for each Site in terms of the following categories:

- to be retained;
- expected to be sold.
    - within 3 years;
    - within 3-5 years;
    - over 5 years.

Quantitative Data for Sites

5.10 Details of the total area and breakdown by user is required for all Sites against the following categories:

Land Area

- site area for each Site owned or occupied by the NHS Board (hectares);
- area occupied by Holding Body. This will be the total area of the Site occupied by NHS less any areas leased to other Bodies;
- area leased to another NHS body;
- area leased to other body for PFI/PPP;
- area leased to other body for other purposes.

Valuation of Sites (Recorded against Block 00)

5.11 Details of the last valuation of all Land, including:

- land value;
- date of valuation.

5.12 Details of the last valuation of all Sites including:

- net book value;
- date of valuation.

5.13 Details of the Capital Charges recorded at Block Level if available, failing which at Site level, for:

- land;
- buildings.

General information at Block (Building) Level (Level Three)

5.14 The following information is required for each Block on each Site:

- block number;
- block name.

Type of Blocks

5.15 The type of each Building (Block) on the Site should be identified from the following list:

01 Acute Hospital
02 Childrens Hospital
03 Maternity Hospital
04 Specialist Hospital
05 Mental Health Hospital
06 Community Hospital
07 Older People Hospital
08 Multi Service Hospital
21 Health Centre
22 Clinics (including Day Hospitals and Resource Centres)
23 Offices
24 Support Facilities
25 Staff Residential Accommodation
26 Patient Residential Accommodation
41 GP Practice
42 Dental Practice
43 Pharmacy
44 Optician
91 Non NHS functions
99 Other

Tenure of Blocks

5.16 The NHS Estate in Scotland is in a variety of ownerships and the following categories have been identified:

- owned (by Scottish Ministers);
- leased (by Scottish Ministers);
- PFI;
- third Party Ownership;
- endowment.

Status of Blocks

5.17 The NHS Estate in Scotland requires to be further categorised for each Block with reference to the following options:

- occupied;
- vacant;
- surplus;
- sold;
- demolished;
- surrendered;
- terminated.

Requirement of Blocks

5.18 The requirement of the Blocks forming the NHS Estate in Scotland require to be defined in terms of whether they are regarded as being essential or non essential using a 'flag' in the software.

5.19 This requires to be further detailed in relation to the future expectation for each Block in terms of the following categories:

- retained;
- expected to be sold;
- within 3 years;
- within 3-5 years;
- over 5 years.

Historic Listing

5.20 Details of whether the Buildings (Blocks) are Listed under Planning Legislation require to be defined in terms of the following categories:

- Category A;
- Category B;
- Category C;
- Category C(s);
- not listed.

Age band of Blocks

5.21 The year of construction of each building at Block Level requires to be assessed.

5.22 Where the actual year of construction is not known, the following age bands may be used for guidance to make an informed estimate of the likely year of construction (these are the bandings which will be used for reporting purposes, however the year of construction will still require to be input as a single year which should be estimated as closely as possible/practical):

- pre 1900;
- 1900-1960;
- 1961-1980;
- 1981-2000;
- 2000 or later.

Quantitative data for Blocks

5.23 Details of the total area and breakdown by user is required for all Blocks against the following categories.

Gross Internal Floor Area

- gross internal area (m^2);
- area occupied by Holding Body. This will be the total area of the Block occupied by NHS less any areas leased to other Bodies;
- area leased to another NHS body;
- area leased to other body.

Six Facet ranking

5.24 All Land and Buildings forming the NHS Estate in Scotland requires to be ranked at Block Level in terms of the following Facets:

- Facet 1: Physical Condition (of each Element and Sub-Element);
- Facet 2: Statutory Compliance;
- Facet 3: Environmental Management;
- Facet 4: Space Utilisation;
- Facet 5: Functional Suitability;
- Facet 6: Quality.

5.25 Further guidance on the appraisal against the Six Facets is given in Part 2.

Information to be provided by the NHS Boards

5.26 Each NHS Board currently maintains their own property list for the Land and Buildings under their control. In order to develop a more strategic Property and Asset Management Strategy (PAMS), a comprehensive Property Asset Register for the entire NHS Estate in Scotland is required. The Property Asset Register

will include all premises currently used in the support and delivery of healthcare services irrespective of ownership.

5.27 Where fresh survey appraisals are being commissioned, the following information requires to be provided to the Survey Partner by the NHS Boards:

- the Site Reference Number (SRN) – quoted in accordance with the guidance given in this Property Appraisal Manual;
- site names and addresses;
- block/building names and addresses;
- building/block gross internal area floor sizes;
- building/block age;
- building/block tenure;
- building/block status;
- building/block standing;
- building/block historic listing;
- land/Site area;
- existing Site plans detailing names and numbers of buildings;
- existing floor plans for each building to be appraised;
- room and space referencing currently in use;
- access to existing reports eg. Disability Discrimination Act (DDA)/Asbestos Register/Fire Risk Assessment;
- contact names and numbers of key Estates personnel to arrange access (at Site and Block Levels);
- contact names and numbers of key personnel to arrange interviews.

CAD drawings and Layout drawings

5.28 Building plans and elevations at Block Level are extremely useful when carrying out property appraisal surveys, to ensure that all parts of the land and buildings have been inspected where practicable and to identify where access is not available.

5.29 It is anticipated that most NHS Boards will have CAD or layout drawings for each Site and these will be used to identify each Block on the Site. Additional drawings may also be available for the Blocks on each Site.

5.30 It is accepted that any drawings which are available will be in a variety of formats and that they may not always be an accurate reflection of the current arrangements of the building.

6. Existing Historic Survey Information

Record information

6.1 Information from previous surveys can often enhance a Condition Survey Appraisal and bring cost efficiencies by importing the previous data into the current survey system and reducing the number of fresh surveys required.

6.2 The volume and quality of record information for the NHS Estate in Scotland varies across the NHS Boards from little or no information to current detailed information and is held in a variety of formats including hard copy and electronically in a mixture of spreadsheets, databases and word processed documents.

6.3 In normal circumstances, existing information would need to be comparable with that arising from a fresh Level 2 Appraisal to be suitable for informing the baseline in the All Scotland Report and for developing the PAMS.

6.4 It has however been decided that for the initial population of ESTATEManager, all existing record information will be imported if it is in a usable format. The quality and accuracy of the information will then be improved and upgraded as part of the ongoing annual assessment by the NHS Boards in Scotland.

Format and compatibility

6.5 While in theory it is possible that existing data can be imported directly into ESTATEManager, in practice, it is likely that due to differing briefs, the record information may not be directly compatible in terms of format and content.

6.6 Consequently, it will be necessary for each of the NHS Boards to review and assess the quality and quantity of their existing record information using their own resources or with assistance from the Survey Partner and/or 3i Studio.

Mapping Data from existing to current format

6.7 The existing data will require to be mapped into the structure of the new ESTATEManager Asset Management System and there are time and resource implications for this work to be carried out.

6.8 Typical issues which will need to be addressed include:

- compatibility problems between the record information and new survey format;
- different data structures;
- errors and omissions in the record information;
- increased costs for conversion of the record information;
- distinguishing between old survey information and new survey information.

6.9 As a result, the cost of converting the existing data to a format which is usable for the new Asset Management software will need to be assessed in terms of relevance and accuracy. In some circumstances it may be more efficient and quicker to amend and update existing data or to carry out a fresh inspection.

Data transfer

6.10 It is anticipated that a separate exercise, running in parallel with the fresh surveys, will be required to rationalise existing data prior to importing it into the new Estates Asset Management Software.

6.11 The outcome of this exercise will determine whether existing data can be incorporated into ESTATEManager or whether further sampling or refresh inspections are required.

6.12 Elements of the existing data may also be contaminated depending on how it has been gathered, input, edited and managed. Common problems arise due to simple issues relating to incorrect field entries such as the formatting of dates and the naming and coding of assets.

6.13 Dependent on the quality of information, data transfer will be carried out by a variety of methods including:

- database queries;
- macros;
- manual operation.

Aged data

6.14 Any data over 5 years old should be regarded as ‘aged’.

6.15 Any costs associated with the aged data will be historic. While the costs can be updated to current level using the indices produced by the Building Cost Information Service (BCIS), it must be recognised that there are inherent dangers in updating the costs using this method as this may not reflect further deterioration in the condition of the fabric or installations.

6.16 To facilitate updating using BCIS Cost Indices, the age of the existing cost information must be stated to the nearest quarter year eg. QII 2006.

6.17 Following updating of aged costs to current costs as at QII 2010, a further manual adjustment will require to be made to reflect the increase in costs due to further deterioration through the passage of time in addition to rebasing of the cost. In certain circumstances, it may be preferable to re-inspect the Sub-Element to assess the current cost rather than rely on re-basing of costs using indices.

Plugging the gaps

6.18 Once the existing record information has been analysed, any obvious gaps will require to be 'plugged' and this can be done by means of:

- a desktop exercise;
- cloning the information;
- carrying out fresh appraisals and inspections.

7. Key Elements – The six facets

7.1 The survey methodology of the NHS Estate in Scotland will incorporate the requirements of the guidance document being developed on behalf of Health Facilities Scotland, 'A Risk Based Methodology for Property Appraisal' and will be undertaken on the basis of the Six Facets which are:

- physical condition;
- statutory compliance;
- environmental management;
- space utilisation;
- functional suitability;
- quality.

7.2 While the Boards are expected to import existing information for all Six Facets into ESTATEManager, the initial phases of the Survey Partner commission will be restricted to the following:

- physical condition;
- statutory compliance;
- environmental management.

7.3 The appraisals will identify the works that are needed at the time of survey or which will become due within 5 years of the survey date, priority coded by risk assessment and costed in accordance with this guidance document.

7.4 It is anticipated that the Statutory Compliance and Environmental Management Facets will primarily be desktop exercises, collating existing information previously collected or currently in the course of being collected by the Boards.

7.5 In addition to providing the data required for database purposes, a Property Executive Summary will be prepared for each NHS Board reviewing the main findings of the survey, explaining the priority coding used, identifying the main issues to be addressed and identifying any areas that could not be accessed.

7.6 Further guidance on the Six Facets is given in Part 2 of this Manual.

8. Appraisal methodology

Basis of appraisal

8.1 The Land and Property Assets of the NHS Estate in Scotland will be assessed against the Six Facets through a combination of on-site appraisal and interviews with key estates personnel with the intention of providing robust information on which strategic decisions will be made on the future management, development and performance of the Estate and to form part of the baseline position for a PAMS.

8.2 The Estates Asset Management System is a high level strategic tool which will be populated through a combination of existing information, where available, and by fresh appraisals to plug gaps in the existing data.

8.3 It must be emphasised that the fresh data collected by the Survey Partner as part of the initial national exercise on the properties prioritised/selected for survey is based on a high level appraisal of the Estate rather than on a detailed Condition Survey. Information being collected and collated by the Boards' own staff can also follow a high level appraisal format, or can be more detailed if desired.

8.4 Asset Information such as descriptions of the materials, design and forms of construction of properties may be useful for the Boards to collect and hold within the database system, however will not be required for the national exercise or reporting.

8.5 The aim of the appraisal is to assess the cost and risk priority of any works required to return the Estate to Condition B, i.e. satisfactory condition.

Levels of appraisal

8.6 The appraisal of each of the Six Facets can be carried out at any one of the following three levels:

- Level 1 - This is the highest level/least detailed method of appraisal and comprises a desktop review by a member of NHS Estates personnel with a good understanding of the entire Estate;
- Level 2 - This comprises a combination of on-site inspections at Department Level and interviews with key NHS Estates personnel;
- Level 3 - This is the most detailed appraisal carried out on a room by room basis. Note: full CAD floor plans are required to carry out a Level 3 Appraisal to enable individual rooms/spaces to be identified.

Ranking protocols

8.7 As part of the appraisal, a subjective judgement requires to be made of the current condition/performance of the Elements and Sub-Elements of certain

Facets and a ranking assigned, generally based on a grading of A-D, which has been defined for each Facet separately.

Risk assessment

8.8 Where remedial action costs have been identified, a Risk Assessment requires to be carried out as detailed in Section 17 of this Manual.

Interviews with key Estates personnel

8.9 Collectively and corporately, NHS organisations retain a significant amount of data relevant to the survey process, not least the in-depth knowledge of individual estates personnel.

8.10 Historical condition and performance information associated with individual Sites and Blocks has also been collected over a number of years.

8.11 As part of the appraisal process, it will be necessary to conduct interviews with key personnel at various levels of each Board, including:

- NHS Board level - Director responsible for Estates and Facilities;
- site level - General Manager;
- block (building level) - Person in charge;
- location level - Person in charge at Department Level.

PART 2: The Six Facets

9. Facet 1: Physical condition

Levels of appraisal

9.1 The Appraisal of Physical Condition will be assessed at one of the following three possible levels:

- Level 1 - a desktop review by the assigned Property Manager/Estates personnel with a good understanding of the general condition of the Estate and any improvement requirements;
- Level 2 - a combination of on-site visual inspection of each Block and interviews with key estates personnel;
- Level 3 - a detailed inspection at room level to identify the condition of the Elements and Sub-Elements sufficient to prepare planned maintenance and cyclical replacements.

Recommended appraisal level

9.2 The Recommended appraisal level is Level 2.

9.3 The properties prioritised/selected for the national exercise will be appraised at Level 2. However, Boards may wish to consider appointing a survey partner or allocating their own resources to carry out Level 3 inspections if these are desired.

Ranking protocol

9.4 Each of the building Elements and Sub-Elements will be appraised and assigned a rank dependent on its overall condition in accordance with the following definitions:

A - Excellent/as new condition (generally less than 2 years old);
- Expected to perform as intended over its expected useful service life.

B - Satisfactory condition with evidence of only minor deterioration;
- Element/Sub-Element is operational and performing as intended.

C - Poor condition with evidence of major defects;
- Element/Sub-Element remains operational but is currently in need of major repair or replacement.

D - Unacceptable condition;
- Non-operational or about to fail;
- Has reached the end of its useful life.

X - Supplementary rating added to D only to indicate that it is impossible to improve without replacement.

Assessment process

9.5 The appraisal comprises an assessment of the following primary data components:

- block level information consisting the name of the Block, the approximate Build Year and the gross internal area;
- Building Fabric (including External Grounds) and Mechanical and Electrical Engineering Condition information at 'Location' level for each Block including a risk assessment for any hazard items and photographs of any key items as supporting evidence;
- an overall Condition Ranking and an Executive Summary for Building Fabric for each Block;
- an overall Condition Ranking and an Executive Summary for Mechanical and Electrical Engineering for each Block.

Remaining life of Condition B Sub-Elements

9.6 The remaining life that each Sub-Element currently ranked as Condition B will remain in Condition B requires to be estimated and expressed in years. This should be judged based on a consideration of the following information:

- the age of the Sub-Element, if known;
- the date of construction of the building, if known;
- the date of installation of the building services, if known;
- evidence of deterioration.

9.7 In practice, it is extremely difficult to accurately assess the remaining life of Sub-Elements and Components. Where the age of the Sub-Element is not clear, judgement is required to make a 'best estimate' when compared with standard typical life expectancies as listed in Appendix 4.

Costs to upgrade to Condition B (Backlog Maintenance Costs)

9.8 Sub-Elements assessed as being Condition A or Condition B with a remaining life greater than 5 years do not need to be costed.

9.9 Where a Sub-Element's current condition is assessed as Condition B, but the remaining life is assessed as being between 1-5 years, the impending Backlog Costs should also be estimated and risk assessed to ensure funding is available to prevent the assets falling below Condition B.

9.10 A costed allowance should be included for redecoration of walls and ceilings (even where currently condition A or B) at a maximum of 5 years remaining life.

9.11 Where a Sub-Element is currently assessed as Condition C or Condition D, the cost to return the Sub-Element to Condition B should be identified and risk assessed.

9.12 Guidance on assessing the costs is given in Section 16.

9.13 Guidance on assessing the risk is given in Section 17.

Notes

9.14 Information about the nature and location of the required rectification work should be entered in the 'Notes' section.

9.15 The purpose of the note is to inform those reading the post-survey reports on the nature and scope of the remedial works.

9.16 The narrative will not extend to a schedule of works clause and it is accepted that further post-appraisal Site visits will be required in order to prepare appropriate Schedules of Work and/or Specifications.

Remedial action

9.17 The recommended remedial action should be selected from the following options:

- no action required;
- overhaul/repair;
- replace;
- further investigation required.

9.18 Additional text should be provided to aid interpretation, where necessary.

10. Facet 2: Statutory Compliance

Levels of appraisal

10.1 The appraisal of Statutory Compliance will be carried out to one of the following three possible levels:

Level 1 - an indication from the responsible NHS Board Estates personnel that appropriate controls are in place to manage compliance with relevant legislation;

Level 2 - a desktop style review of any identified outstanding items and interview of key NHS Board personnel;

Level 3 - a detailed on-site compliance check of all aspects of statutory compliance

Recommended appraisal level

10.2 The Recommended appraisal level is Level 2.

Ranking protocol

10.3 The standard Ranking protocol does not apply to this Facet as this is not deemed appropriate for statutory items which are either compliant or non compliant, therefore risk assessment is used to assess individual items.

Assessment process

10.4 In the future, it is intended that the assessment of this Facet will be based on the findings from the Statutory Compliance Audit and Risk Assessment Tool (SCART) system and other property assurance information. It is however, recognised that this information may not currently be available down to Block Level.

10.5 Consequently, the Statutory compliance facet will be assessed by identifying the scope of any known works and costs at Block Level against the following Elements and Sub-Elements. These are based on SCART but with the addition of Disability Discrimination Act 1995 and Radiation Protection and have also been further developed into a series of sub elements.

1.0 Pressure Systems Safety Regulations 2000

1.01 Written Scheme of Examination

1.02 Automatic Controls

1.03 Pressure Alarms

1.04 Fire Proofing of Rooms

1.05 Safe Discharge Area

1.06 Schematic Diagrams

1.99 Other

2.0 Control Of Substances Hazardous to Health (COSHH) Regulations 2002

2.01 Is Local Exhaust Ventilation Required

2.02 Secure Storage

2.03 PPE Storage and Changing

2.04 WHB available

2.05 Signage

2.99 Other

3.0 Electricity at Work Regulations 1989 (incorporating SHTM 2020 and SHTM 2021)

3.01 Electrical System Protected from Unauthorised Use

3.02 Protected from Damage

3.03 Emergency Lighting Available

3.04 Earth Bonding

3.05 Signage

3.99 Other

4.0 Lifting Operations and Lifting Equipment (LOLER) Regulations 1998 (incorporating SHTM 2024: Lifts)

4.99 Other

5.0 Workplace (Health, Safety and Welfare) Regulations 1992

5.01 Access

5.02 Environmental

5.03 Building Elements

5.04 Engineering Elements

5.05 Work Equipment/Machinery

5.06 Signage – HandS, Equity and Diversity

5.07 Gas Storage

5.08 Roof Lights

5.09 Safety Glazing

5.10 Radiation Protection

5.99 Other

6.0 Personal Protective Equipment (PPE) at Work Regulations 1992

6.99 Other

7.0 Provision and use of work equipment (PUWER) Regulations 1992

7.99 Other

8.0 Lifting Operations and Lifting Equipment (LOLER) Regulations 1998 – (Lifting Equipment)

8.99 Other

9.0 Manual Handling Operations Regulations 1992 (Amended 2002)

9.99 Other

10.0 Asbestos – The Control of Asbestos at Work Regulations 2006

10.01 Is there an Asbestos Register

10.02 Encapsulation

10.03 Removal

10.99 Other

11.0 Management of Health and Safety at Work Regulations 1999 (incorporating SHTM 2050)

11.99 Other

12.0 Construction, Design and Management (CDM) Regulations

12.99 Other

13.0 Noise at Work Regulations (incorporating SHTM 2045) Acoustics

13.01 Building Solution

13.02 Engineering Solution

13.03 PPE Solution

13.99 Other

14.0 Display Screen Equipment (Health and Safety) Regulations 1992

14.99 Other

15.0 Ventilation in Healthcare Premises (incorporating SHTM 2025)

15.99 Other

16.0 Medical Gas Pipeline Systems (MGPS) (incorporating SHTM 2022)

16.99 Other

17.0 Oil Storage – The Water Environment (Scotland) Regulations 2006

17.99 Other

18.0 Electrical Services (Abatement of) (incorporating SHTM 2014)

A52825963

18.99 Other

19.0 Electrical Services (Emergency) (incorporating SHTM 2011)

19.01 Standby Generator (Hospitals)

19.02 Emergency Lighting

19.03 Signage

19.99 Other

20.0 Sterilisation (SHTM 2010)

20.99 Other

21.0 Firecode, Alarm and Detection Systems (incorporating SHTM 82)

21.01 Alarm and Detection

21.99 Other

22.0 Legionellae (Control of) In Healthcare Premises (incorporating SHTM 2040 and HSE Guidance Document L8)

22.01 Supply

22.02 CW Tank Storage and Distribution

22.03 Flushing Provision

22.04 CW Outlet Temperature

22.05 HW Tank Storage and Distribution

22.06 Calorifier Storage and Flow Temp

22.07 Continuous Distribution Temp

22.08 HW Outlet Temperature

22.09 Blended Water Pipework

22.10 Dead Legs

22.11 Towel Rails/DHWS Radiators

22.12 Circulation Pumps

22.13 Non-Return Valves

22.14 System Flushing Provision

22.15 Calorifier Open Vent

22.16 Calorifier Temp. Control Sys.

22.17 Temp. Monitoring

22.18 Ductwork System

22.19 Steam Humidification

22.20 Water Bylaws

22.99 Other

23.0 Hot Water and Surface Temperatures (Safe) Scottish Health Guidance Note (SHGN)

23.01 Outlet Temperature

23.02 Outlet Physical Precautions

23.03 Lower Max. Safe Temp

23.04 Thermostatic Mixer – Fail Safe

23.05 Max. Surface Temperature (Radiators)

23.06 Exposed Pipework

23.99 Other

24.0 Firecode – General (incorporating SHTM 80-86 excluding SHTM 82)

24.01 Containment

24.02 Escape Lighting

24.03 Signage

24.04 Manual Fire Fighting Equipment

24.05 Sprinklers/Automatic Fire Extinguisher System

24.06 Textiles and Furniture

24.07 Fire Brigade Access etc.

24.08 Lightening Conductors

24.09 Fire Doors

24.10 Storage of Flammable Substances

24.11 Fire Exits

24.12 Fire Hydrants

24.99 Other

25.0 Confined Spaces Regulations 1997

25.99 Other

26.0 Patient Bearing Equipment (including Slings)

26.99 Other

27.0 Working at Height Regulations 2005

27.01 Restricted Access

27.02 Barriers

27.03 Anchor Points

27.04 Signage

27.99 Other

28.0 Statutory/Mandatory Training

28.99 Other

29.0 Gas Safety (Installation and Use) Regulations 1998

29.99 Other

30.0 Contractors (Control of) – (The Management of Health and Safety at Work Regulations 1999)

30.99 Other

31.0 Decontamination of Equipment

31.99 Other

32.0 Contingency Planning (Civil Contingencies Act 2004)

32.99 Other

33.0 Slips, Trips and Falls – Floor Hazards

33.99 Other

34.0 Infection Control – HAI Level 4

34.01 Finishes and Floors, Walls, Ceilings, Doors, Windows, Fixtures and Fittings

34.02 Space around Beds and Isolation Rooms

34.03 Provision of Hand-Wash Basins, Liquid Soap Dispensers, Paper Towels and Alcohol Gel Dispensers

34.04 Provision of Facilities for Decontamination

34.05 Engineering Services

34.06 Storage

34.07 Laundry and Linen Services

34.99 Other

35.0 Steam Systems

35.99 Other

36.0 Dangerous Substances and Explosive Atmospheres Regulations 2002

36.99 Other

37.0 Washer Disinfectors

37.99 Other

38.0 Window Security

38.99 Other

39.0 Suicide Risk

39.99 Other

40.0 Disability Discrimination Act (1995)

40.01 Car Parking

40.02 Toilets

40.03 Visual Issues

40.04 Ramping and Handrails

40.05 Entrances and Doors

40.06 Reception Areas

40.07 Signage

40.08 Horizontal and Vertical Circulation

40.09 Internal Space

40.10 Evacuation Management Plan

40.99 Other

41.0 Radiation Protection

41.01 Additional Walls (Normal or Lead Lined)

41.02 Additional Doors (Normal or Lead Lined)

41.03 Local Exhaust Ventilation and Associated Ducting

41.04 Additional or Higher Rated Power Supply/Junction Boxes

41.05 Additional Waste Water/Sewerage Treatment Facilities Isolated from Mains

41.06 Creation of Restricted Access Zones

41.07 Alterations to Glass in Functional Unit

41.08 Additional Security

41.09 Lining of Rooms or Screening Built into Walls

41.10 Additional Change/Storage Facilities for Personal Protective Equipment

41.99 Other

42.0 Other

42.99 Other

Costs to upgrade to meet statutory requirements

10.6 Any works and their associated costs require to be identified and risk assessed.

10.7 Guidance on assessing the costs is given in Section 16.

10.8 Guidance on assessing the risk is given in Section 17.

Avoidance of double counting

10.9 Where the Physical Condition and/or the Functional Suitability results in a breach of statutory or safety requirements, the defects should be recorded against safety and statutory requirements only to avoid the risk of double cost counting.

Notes

10.10 Additional information about the nature and location of the works required should be entered in the 'Notes' section.

10.11 The purpose of the note is to inform those reading the post-survey reports on the nature and scope of the remedial works.

10.12 The narrative will not extend to a schedule of works clause and it is accepted that further post-appraisal Site visits will be required in order to prepare appropriate Schedules of Work and/or Specifications.

Remedial action

10.13 Additional text should be provided to aid interpretation of the recommended upgrading works, where necessary.

11. Facet 3: Environmental Management

Levels of appraisal

11.1 Each NHSScotland Board is already required to complete an Energy and Environment return using the national Environmental Monitoring and Reporting Tool (eMART) which covers all hospital sites. In addition, Boards may have an Environmental Management System and associated action plan for improving energy and environmental performance.

11.2 To avoid duplication, the requirements for this Facet are limited to inputting existing record information into ESTATEManager.

Recommended appraisal level

11.3 The recommended level of appraisal does not apply to this Facet.

Ranking protocol

11.4 The standard Ranking protocol does not apply to this Facet.

Assessment process

11.5 The Appraisal of Energy Management will include a consideration of the following matters:

Details of the energy consumption at each Site measured in GJ/100m^3 and recorded against Block '00' with corresponding Sub-Elements for:

- electricity consumption;
- gas consumption;
- oil consumption.

The Energy Performance Rating of the building based on the Energy Performance Certificate (EPC) (where available) based on the energy rating from the following options:

- carbon neutral;
- A;
- B;
- C;
- D;
- E;
- F;
- G;

- the Carbon Dioxide Emissions calculated in terms of kg/m^2 floor area per year;
- the approximate current energy use/m^2 of floor area expressed in kWh/m^2.

Clinical waste produced at Site level, measured in tonnes.

Details of any NHS Board schemes to improve environmental performance with associated costs.

Details of water consumption at each Site in cubic meters per bed.

Costings

11.6 There is no requirement to cost this Facet other than costs of any schemed to improve environmental performance.

12. Facet 4: Space utilisation

Levels of appraisal

12.1 The appraisal of Space Utilisation will be assessed at one of the following three possible levels:

- Level 1 - a desktop review by an Estates and/or Service Manager with a good understanding of the general usage of the Estate;
- Level 2 - a combination of on-site visual inspection of each department together with discussions with users and consideration of acceptable space standards by an Estates and/or Service Manager;
- Level 3 - a room by room assessment to identify the level of occupation of each room throughout a typical working day.

Recommended appraisal level

12.2 The recommended level of appraisal is Level 2.

12.3 Those Boards which have CAD drawings available may decide to carry out a detailed appraisal at Level 3.

Ranking protocol

12.4 The assessment of the Block requires to be appraised at Departmental Level and assigned a rank in accordance with the following definitions:

E - empty or grossly underused at all times (excluding temporary closure).

U - underutilised: utilisation could be significantly increased.

F - fully utilised: a satisfactory level of utilisation.

O - overcrowded, overloaded and facilities generally stretched.

Assessment process

12.5 When conducting an appraisal of this Facet, the following matters should be considered:

The current use of the space:

- how intensively is the space being used?
- are there any rooms or areas under used?

Use of the space over time:

- does the use vary over time?
- do occupation levels change over the working day/week?

Comparison of space with national guidance

- how does the space compare with national guidance eg. the Activity Database (ADB), Scottish Health Planning Notes and Scottish Health Building Notes.

Costings

12.6 There is no requirement to cost this Facet however Boards may optionally do so.

A52825963

13. Facet 5: Functional suitability

Levels of appraisal

13.1 The appraisal of Functional Suitability will be carried out at one of the following three possible levels:

- Level 1 - the desktop review by an NHS Board Estates and/or Service Manager with a good understanding of the general functionality of the accommodation;
- Level 2 - a combination of on-site visual inspection of each department and discussions with users about the three Elements of functionality based on a Broad assessment;
- Level 3 - a detailed on-site inspection of each department against this specific level of functionality related criteria based on a Detailed Assessment.

Recommended appraisal level

13.2 The recommended level of appraisal is Level 2.

Ranking protocol

13.3 The assessment of each Block requires to be appraised at Departmental Level and assigned a rank based on the following definitions:

A - very satisfactory, ideal accommodation, no change needed.

B - satisfactory with only minor change needed.

C - not satisfactory with significant change needed.

D - unacceptable in its present condition, major change needed.

X - supplementary rating added to D only, to indicate that it is impossible to improve without replacement.

Assessment process

13.4 The assessment should be carried out on the basis of the following three Elements:

- internal space relationships;
- support facilities;
- location.

Broad assessment (Level 1 Appraisal)

13.5 When conducting a broad assessment of this Facet, the following matters should be considered:

Internal Space Relationships

- how efficient and effective are the relationships of the internal spaces to each other?

Support Facilities

- are there sufficient services supporting the function?

Location

- is the space well sited in relation to other departments and access points?

Detailed assessment (Level 2 and Level 3 appraisals)

13.6 When conducting a detailed assessment of this Facet, the following matters should be considered:

Internal Space Relationships

- does the accommodation allow safe and effective service delivery?
- is the available accommodation sufficient for the department to function appropriately?
- are critical rooms adequately sized?
- is good observation of patients possible?

Support Facilities

- are adequate toilet and bathroom facilities available?
- is adequate storage space available?
- is adequate seating and meeting space available?
- are public areas accessible for all?

Location

- is the space well sited and located close to inter-dependent departments?
- is good access available for vertical and horizontal circulation (eg. lifts, stairs, etc)?
- is access sufficiently close to car parks/public transport?

Costs to upgrade to Category B

13.7 There is no requirement to cost this Facet as the costs to upgrade will not be reported nationally however Boards may optionally do so.

13.8 The software has the facility to hold upgrade costs and Boards may choose to include these costs, should they wish to do so.

Notes

13.9 Additional information about the nature and location of the works required should be entered in the 'Notes' section.

13.10 The purpose of the note is to inform those reading the post-survey reports on the nature and scope of the remedial works.

13.11 The narrative will not extend to a schedule of works clause and it is accepted that further post-appraisal Site visits will be required in order to prepare appropriate Schedules of Work and/or Specifications.

Remedial action

13.12 Additional text should be provided to aid interpretation of the recommended upgrading works, where necessary.

14. Facet 6: Quality

Levels of appraisal

14.1 The appraisal of Quality will be carried out to one of the following three possible levels:

- Level 1 - a desktop review by an NHS Estates and/or Service Manager with a good understanding of the general quality of the available accommodation based on a Broad assessment;
- Level 2 - a combination of on-site visual inspection of each department and discussions with users about the three Elements of quality based on a Detailed Assessment;
- Level 3 - a Detailed Assessment based on Site inspection of each Department against the specific set of quality related criteria.

Recommended appraisal level

14.2 The recommended level of appraisal is Level 2.

Ranking protocol

14.3 The appraisal Block at Department Level requires to be made in accordance with the following definitions:

A - a facility of excellent quality;

B - a facility of satisfactory quality with only general quality improvements required;

C - a facility of less than satisfactory quality with investment needed;

D - a facility of poor quality with significant investment needed;

X - improvements are either impractical or too expensive to be tenable – only total rebuild or relocation will suffice.

Assessment process

14.4 The assessment should be based upon the following three Elements:

- amenity;
- comfort engineering;
- design.

Broad assessment (Level 1 Appraisal)

14.5 When conducting a Broad assessment, the following matters should be considered:

Amenity

- does the facility/accommodation offer attract pleasing area for patients and staff in terms of privacy, dignity, comfort, working conditions, signposting?

Comfort Engineering

- does the facility/accommodation offer an acceptable environment? Is it well lit, adequately heated and cooled, noise and odour free?

Design

- is the internal/external environmental attractively designed in terms of good colour schemes, well furnished, enhanced by art, plants, landscaping, views, etc?

Detailed assessment (Level 2 and Level 3 Appraisals)

14.6 When conducting a detailed assessment of this Facet, the following matters should be considered:

Amenity

- attracts at the main entrance/reception area/departments?
- privacy and dignity issues are addressed?
- confidential conversations can be held satisfactorily?
- toilet facilities are well provided?
- appropriate storage provisions been made?
- disabled users are catered for?
- appropriate facilities are provided for children?
- seating and waiting areas are sufficient?
- appropriate safety and security measures are in place?
- way finding is visible, legible and consistent?

Comfort Engineering

- artificial lighting enhances the overall design?
- comfort conditions are achieved in heating?
- comfort conditions are achieved in ventilation?
- acoustic privacy is achieved?
- noise levels are acceptable?
- persistent odours are absent?

Design

- colour is created when therapeutically used for definition and variety?
- landscaping is attractive?
- planting is optimised for all seasons?
- natural daylight is used to optimum effect?
- appropriate finishes are used for floor, ceilings and walls?
- furniture co-ordinates well with overall design?
- art and craftwork is integrated into overall design?
- interior is in re-assuring and non-clinical where appropriate?
- where possible, patients and staff have pleasing views from both inside and out?
- first impressions of the entrance/reception areas are welcoming?

Costs to upgrade to Category B

14.7 There is no requirement to cost this Facet however Boards may optionally do so.

Notes

14.8 Additional information about the nature and location of the works required should be entered in the 'Notes' section.

14.9 The purpose of the note is to inform those reading the post-survey reports on the nature and scope of the remedial works.

14.10 The narrative will not extend to a schedule of works clause and it is accepted that further post-appraisal Site visits will be required in order to prepare appropriate Schedules of Work and/or Specifications.

Remedial action

14.11 Additional text should be provided to aid interpretation of the recommended upgrading works, where necessary.

15. Appraisal aggregation

Producing an overall rating

15.1 As detailed earlier, the objective of the exercise is to ensure that the Estate as an asset supports healthcare service delivery by providing the right facilities, in the right place, at the right time.

15.2 The purpose of the appraisal is to establish what it will cost to return the NHS Estate in Scotland to an acceptable standard and to identify opportunities for adaptation and rationalisation as a baseline assessment for developing a PAMS.

15.3 To ensure the consistency of the appraisal across the entire Estate, the Six Facet approach has been adopted. The use of a new computerised database, ESTATEManager, will allow the large amounts of data to be stored, manipulated and interrogated easily. This will enable output reports to be generated summarising the performance across the Estate.

15.4 The appraisal is however, dependent on subjective assessment, based on the ranking of each Element and Sub-Element of the Six Facets and this requires a pragmatic approach, based upon observation and interviews with knowledgeable NHS Estate personnel.

Physical condition

15.5 For Physical Condition, the condition of each Sub-Element requires to be assessed and assigned a Category based on the Ranking protocol.

15.6 The range of ranks of each of the Sub-Elements should then be considered and a pragmatic approach adopted to arrive at an aggregate category ranking for each Element.

15.7 The range of ranks assigned to each of the Building and Engineering Elements should then in turn be considered and an aggregate rank established for the Building and Engineering Elements at Block Level (Level Three).

15.8 An overall aggregate Physical Condition assessment of the Block should subsequently be determined by professional judgement, which should combine all Building and Engineering elements and sub-elements.

Statutory Compliance and Environmental Management

15.9 As ranking protocols do not apply to these two Facets, appraisal aggregation is not relevant.

Space Utilisation, Functional Suitability and Quality

15.10 For these three Facets, a pragmatic approach is required to arrive at an aggregate category ranking of each Facet at Block Level (Level Three).

16. Costing of identified Remedial/Upgrading Works

Backlog maintenance costs

16.1 Backlog maintenance costs are the costs to bring any estate assets that are below acceptable standards, in terms of their physical condition or which do not comply with mandatory fire safety requirements and statutory safety legislation, up to an acceptable condition, Condition B with 5+ years remaining life.

16.2 Backlog maintenance costs are required to be expressed as Works Costs (ie. base costs to undertake works) and these will exclude:

- professional fees;
- value added tax;
- contingencies;
- risk;
- decanting;
- temporary services to other areas;
- overtime/out of hours working;
- disruption.

16.3 Costs should reflect current prices as at Quarter II, 2010 which has been set as the 'Base' year. Aged costs will require to be updated using Building Cost Information Service (BCIS) Cost Indices. Guidance on updating aged cost data is given in Section 19.

16.4 Costs will be updated annually in the future.

Assessment of costs

16.5 Having identified the nature of the remedial works and the anticipated life remaining, it is necessary to estimate the cost of each work item. To facilitate this, the total Sub-Element quantity/area should be measured, calculated and noted, together with the relevant percentage that is assessed as being defective.

16.6 Spot prices should then be calculated using the guidance provided in the Schedule of Rates enclosed as Appendix 5.

Rounding of costs

16.7 All Backlog Maintenance Costs and Remedial/Upgrading Costs are indicative only, and are based on a high level appraisal rather than a detailed Condition Survey. As such, all costs should be rounded up to the nearest £1,000.00.

De-Minimus threshold for costs

16.8 There will be a de-minimus threshold of £1,000.00 for individual items of disrepair subject to the following;

- items of disrepair that in the absence of any remedial intervention, and within a three year period, could lead or cause further deterioration either to the subject Element or other Element(s) resulting in a remedial cost in excess of £1,000.00;
- where there is a recurrent defect giving rise to a number of defects similar in nature but otherwise isolated then these should be grouped and the aggregated cost applied against the de-minimus threshold;
- items that represent a health and safety risk should be recorded as for other items of disrepair regardless of cost.

16.9 Minor day-to-day maintenance and minor routine works (eg inspection; servicing; cleaning; etc) shall be excluded from the survey.

17. Risk Assessment process

The Risk Assessment

17.1 In order to identify high risk factors in the Estate which need to be addressed urgently in comparison to those that can be programmed into an Estate Investment Planning Process over a longer period, it is necessary to carry out a risk assessment of those items in Category B, Category C and Category D where remedial action costs have been identified.

17.2 Risks should be assessed according to the likelihood that the risks will be realised and the severity of the consequence. This will produce a final Risk Score and Ranking for each sub-Element.

17.3 For each item being addressed, a 'Consequence' score of 1-5 should be assigned based on the potential adverse consequence that might arise as a result of the failure based on the following:

Score	*Consequence*
1	**Insignificant**
2	**Minor**
3	**Moderate**
4	**Major**
5	**Catastrophic**

Table 2: Risk Consequence Scores and Definitions

17.4 For each item being assessed a 'Likelihood' score of 1-5 should be assigned based on the likelihood that the risk will be realised, based on the following:

Score	*Likelihood*	*Indicator*	*Estimated Time to Failure*
1	**Rare**	No or minimal remedial action required and/or new/recent upgrade	Circa > 10 years
2	**Unlikely**	Normal wear and tear. Sound, operationally safe and exhibits only minor deterioration	Circa 4 - 6 years
3	**Possible**	Reasonable physical damage/deterioration.	Circa 2 – 4 years
4	**Likely**	Major physical damage/deterioration. Failure apparent/assessed as imminent or unacceptable	Circa 1 – 2 years
5	**Certain**	Failure has occurred. Unacceptable	Circa < 1 year

Table 3: Risk Likelihood Scores and Definitions

A52825963

Risk Score and Risk Ranking Calculation

17.5 By multiplying the consequence scores and the likelihood score, a Risk Score can be produced.

17.6 From the Risk Score, a Risk Ranking is obtained from the following table:

Score Range		*Risk Ranking*	*Colour Coding*
1-6	**Low**		Green
7-10	**Moderate**		Yellow
11-15	**Significant**		Orange
16-25	**High**		Red

Table 4: Risk Scores and Rankings

PART 3: The Survey Process

This Part of the document outlines the survey process which will be utilised for the national Health Facilities Scotland comission with the appointed survey partner. In addition, Boards may use this Part of the document for appointing and briefing their own consutlant/survey partner, or for their own staff to allow an understanding of the process.

18. Arranging access

Access arrangements

18.1 A key issue for the smooth execution of the survey phase of this project is to ensure that continuity of inspection can be provided for the Survey Teams.

18.2 Arranging access for smaller buildings may be relatively straightforward however, for more complex Sites such as Acute Hospitals where there are a variety of buildings and departments the arrangements for access need to be carefully co-ordinated.

18.3 The Survey Partner Teams will be multi-disciplined. Due to the different types of inspections carried out, Surveyors and Engineers work at different rates and they may not visit the various buildings at the same time.

18.4 It will therefore be necessary for each Board to provide the Survey Partner with an appropriate Letter of Authority, a detailed list of contact names, telephone numbers and email addresses down to Block Level to enable access for the inspections to be arranged. It is recognised that some Boards have Access Protocols in place which will assist the Survey Partner gaining unrestricted access.

18.5 Additional arrangements will be required where properties are currently vacant to ensure that keys can be made available as and when required.

18.6 To secure continuity of inspection, a designated member of the Survey Partner Team will act as Access Co-ordinator, responsible for contacting the person in charge of each Site/building/department prior to the proposed inspection dates to make appropriate arrangements for Site access and inductions for the inspection.

18.7 Any difficulties in arranging access to individual Sites will be referred to the appropriate NHSScotland Board representatives for resolution.

18.8 Special arrangements may be necessary for certain facilities eg. mental health.

Survey hours

18.9 Survey Teams will carry out the majority of the inspections during normal business hours, 9.00am to 5.00pm, Monday to Friday.

18.10 It is expected that the Survey Teams will require to use their interpersonal skills to discuss and agree access requirements with the person in charge at Site so that each Site, building and department is inspected.

19. Survey structure

The Appraisal process

19.1 The purpose of the building appraisal is to collect information on the current condition and performance of the NHS Estate in Scotland. To achieve consistency of approach in data collection and reporting, each building asset is being ranked against the Six Facets to enable the overall condition of the NHS Estate in Scotland to be assessed.

19.2 A pragmatic approach is required to the process of collecting data and the output represents a 'snapshot' in time at a strategic high level. Detailed inspections and reports are outwith the scope of this current project.

19.3 The appraisals will be carried out by a large team rather than by one person and to ensure consistency of approach, the systems and procedures set out in this Property Appraisal Manual will be followed.

Scope of inspection

19.4 The Survey Team inspections will include a visual, non-disruptive examination of the accessible building fabric and building services including external areas but they will not include those parts of the structure or its services which are built in, covered up and made inaccessible in the normal course of construction, fitting out or occupation.

19.5 The building appraisals will generally be undertaken from ground level but where safe access is available, we will also inspect flat and pitched roof areas of the estate and any void areas.

19.6 The appraisal of the Building Services will include plant rooms, energy centres and other restricted areas where access can be made available by the appropriate authorised Board personnel at the date of inspection.

19.7 Where survey teams are unable to gain safe means of access, any areas not inspected will be highlighted in the report.

19.8 As part of the Property Summary to be prepared for each Site, the survey partner will identify any areas of the estate which require further investigation.

19.9 Where practicable, there will also identify the need for further specialist examinations or tests where these are considered necessary.

Urgent issues

19.10 During the course of inspection, if the appointed survey partner identifies any health and safety issues which require urgent or emergency action to be taken, the relevant contact point within the Board will be immediately contacted by

telephone or email. In addition, Health Facilities Scotland will be advised for information only.

19.11 Thereafter, an Urgent Issue Report will be issued using the pro-forma included as Appendix 7.

Survey exclusions

19.12 The inspections conducted under this project will not extend to the following:

- lifting of manhole and inspection covers;
- underground drainage surveys;
- water testing (eg. legionella; water quality).

19.13 The following Elements/Features are also expressly excluded from the survey;

- IT infrastructure, equipment and fittings;
- portable appliances including fire fighting appliances;
- specialist medical equipment;
- unfixed fixture and fittings;
- white goods.

20. Survey collection systems

Collecting survey data

20.1 There are a variety of options available for collecting the survey data including:

- manual paper based systems;
- tablet computers;
- hand-held PDA devices.

20.2 Paper based forms are being used for the purposes of the property appraisals being undertaken on the national commission, however when Boards are undertaking their own data collection on an ongoing basis, it may be worth considering the use of electronic data collection methods, however this may require an investment in information technology hardware.

21. Survey data

Data collection

21.1 The proforma data collection sheets have been prepared for each of the Six Facets.

21.2 Copies of the proformas are included as Appendix 7.

General

21.3 **Surveyor Name**

The name of the Surveyor/Engineer carrying out the appraisal.

21.4 **Survey Date**

The date of the inspection.

Site data items (Level Two)

21.5 **Organisation name**

The NHS Organisation that owns, leases or occupies the Site.

21.6 **Site code**

A unique SRN that identifies a Site owned, leased or occupied by an NHS Organisation.

Site codes to be provided by NHSScotland.

21.7 **Site name**

A name by which a Site is known.

Site names to be provided by NHSScotland.

21.8 **Site type**

The primary use of the Site.

21.9 **Site area**

The Site Area of the Site in hectares.

Block data items (Level Three)

21.10 **Block No**

A code, unique within a Site, that identifies a specific Block.

Block numbers to be provided by NHSScotland.

21.11 **Block name**

A name by which a Block is known.

Block names to be provided by NHSScotland.

21.12 **Block general description**

A general textual description of the type, size and construction of the Block.

Eg. Large two storey Victorian building with multiple c1960's infills and extensions. Masonry elevations, clay pantile clad pitched roofs to main areas, flat roofs to other areas, majority of windows are Crittal steel casements.

21.13 **Build year**

The approximate date the Block was built.

A four digit year value (eg. 1985).

21.14 **Organisation name**

The NHS Organisation that is the owner, the main occupier or responsible for the Block.

21.15 **Block Gross Internal Area (GIA)**

The GIA of the whole Block in square metres.

21.16 **Estimated GIA flag**

If the GIA is an estimated value rather than an accurate value from CAD plans then the estimated flag shall be set to True.

21.17 **Block photograph**

A photograph of the front elevation of the Block.

21.18 **Block Fabric Condition Grade**

Having regard to the Building Fabric Condition Data collected during the inspection, the Block as a whole shall be assigned an overall building Fabric Condition Grade

21.19 **Block Fabric Executive Summary**

A brief narrative providing an overview of the main findings of the Building Fabric Appraisal and other observations, at Block Level, identified during the inspection.

21.20 **Block Engineering Services Condition Grade**

Having regard to the Mechanical and Electrical (M&E) condition data collected during the surveys, the Block as a whole shall be assigned an overall M&E Condition Grade.

21.21 **Block Engineering Services Executive Summary**

A brief narrative providing an overview of the main findings of the M&E Appraisal and other observations at Block Level, identified during the inspection.

Location data items (Level Four)

21.22 **Zone/Location Name**

A designation given to an internal or external area of a Block. This may be a collection of rooms in a Block as defined by occupation eg a Department name; a collection of rooms in a Block as defined by a physical attribute eg a Floor level or an external area of a Block eg Elevation 01.

For small to medium sized Blocks there is likely to be only one zone/location per Block (ie the Whole Block).

For larger Blocks that have multiple occupants then they should be sub-divided into smaller zones/locations normally delineated by Departmental Occupancy or the Physical structure (eg floor levels). In these instances the building envelope and engineering services should be assessed for the whole Block whereas the internal Elements should be assessed for each Department/Zone/Location.

21.23 **Facet**

In ESTATEManager, the Six Facets are represented by the following 9 tabs:

01 – Building	}	
02 – Engineering	}	Physical Condition
03 – Function		
04 – Space		
05 – Quality		
06 – Statutory	}	
07 – Fire	}	Statutory Compliance
08 – DDA95	}	
09 – Environment		

21.24 **Physical Condition Elements**

The Elements related to the above Physical Condition Facet are:

Facet: Building

01 Structure
02 External Fabric
03 Roof
04 Internal Fabric
05 Internal Fittings and Fixtures
06 External Grounds and Gardens

Facet: Engineering Services

07 Drainage and External Services
08 Fuel Storage and Distribution
09 Boilers and Calorifiers
10 Steam Systems
11 Heating Systems
12 Ventilation Systems
13 Medical Gas Systems
14 Hot and Cold Water Systems
15 Lifts and Hoists
16 Fixed Plant/Equipment
17 Electrical System
18 Communication Systems
19 Alarms and Detection Systems
20 Building Management Control System

21.25 **Sub-Elements**

1.01 Substructure
1.02 Frames
1.03 Floors and Stairs
1.04 Roofs
1.99 Other

2.01 External Walls and Finishes
2.02 Windows and Ironmongery
2.03 External Doors and Ironmongery
2.04 External Cladding/Eaves Detail
2.05 External Decoration

2.99 Other

3.01 Coverings – Pitched
3.02 Coverings – Flat
3.03 Roof Lights
3.04 Rainwater Goods
3.05 Chimney Stacks and Parapet Walls
3.99 Other

4.01 Internal Walls and Finishes
4.02 Floor Coverings
4.03 Ceilings Finishes
4.04 Ceilings - Suspended
4.05 Internal Doors and Ironmongery
4.06 Internal Decoration
4.99 Other

5.01 Sanitary Ware/Fittings
5.02 Unit Furniture
5.03 Internal Fittings and Furniture
5.99 Other

6.01 Landscaping
6.02 Walls, Fencing and Gates
6.03 Roads and Car Parks
6.04 Paths and Paved Areas
6.05 External Fittings and Fixtures
6.06 Ancillary Buildings
6.99 Other

7.01 Drainage/Sewerage
7.02 External Utilities Infrastructure
7.03 Site Lighting
7.04 Lightning Protection
7.05 CCTV (External)
7.99 Other

8.01 Fuel Supply/Storage/Distribution
8.02 DHW Storage/Non-Storage

A52825963

8.99 Other

9.01 Boiler Plant
9.02 Pressurisation Plant
9.03 Calorifiers/Heat Exchangers
9.04 Flues
9.05 Controls/Meters
9.06 Insulation
9.99 Other

10.01 Distribution Pipework
10.02 Valves
10.03 Controls
10.04 Meters
10.05 Condense Systems
10.06 Insulation
10.99 Other

11.01 Distribution Pipework
11.02 Heat Emitters
11.03 Controls
11.04 Heating Pumps
11.05 Insulation
11.99 Other

12.01 Ventilation Plant
12.02 Distribution Ductwork
12.03 Automatic Fire Dampers and Control Panel
12.04 Controls
12.05 Room Split/Chillers/Compressors
12.06 Chillers/Cooling Systems
12.07 Cooling Towers
12.99 Other

13.01 Vacuum Insulated Evaporators
13.02 Distribution
13.03 Manifolds
13.04 Gas Cylinder Storage

13.05 Outlets
13.06 Alarm Systems
13.07 Medical Air Compressors/Vacuum Pumps
13.99 Other

14.01 Water Storage and Header Tanks
14.02 Water Treatment Plant
14.03 Distribution Pipework
14.04 Pumps
14.05 Valves/Controls
14.06 Water Heaters
14.07 Insulation
14.99 Other

15.01 Passenger Lifts
15.02 Goods Lifts
15.03 Hoists
15.04 Control Panel
15.99 Other

16.01 Sterilisers
16.02 Bedpan Disposal
16.03 Disinfection Equipment
16.04 Catering Equipment
16.05 Laundry Equipment
16.06 Miscellaneous Equipment
16.99 Other

17.01 HV Network
17.02 Generators
17.03 Switchgear
17.04 Distribution Boards
17.05 Wiring Systems/Bonding
17.06 Fittings
17.07 Luminaires
17.08 Emergency Luminaires
17.99 Other

18.01 Telephone Systems
18.02 Data Transmission
18.03 Paging Systems
18.04 Nurse Call Systems
18.05 Radio and Television Systems
18.06 Bedhead Services
18.99 Other

19.01 Fire Alarm Panels
19.02 Fire Alarm Wiring System
19.03 Security Systems
19.04 CCTV (Internal)
19.05 Panic Attack System
19.06 Other Alarm Systems
19.99 Other

20.01 Building Management System
20.99 Other

21.26 **Condition Grade**

Each Sub-Element shall be assigned a Condition Grade.

The External Fabric Elements 01 Structure, 02 External Fabric and 03 Roof should be assessed for the whole Block.

The External Fabric Element 06 External Grounds and Gardens should be assessed against Block Level '00'.

The Internal Fabric Elements 04 Internal Fabric and 05 Internal Fixtures and Fittings should be assessed for each specified Block.

The Engineering Services 07-20, inclusive, should be assessed for the entire installation on a whole building basis. In cases where the whole building has been split into more than one Block, the Engineering Services Elements should be assessed and recorded against the first Block Level '01' in the list of Blocks for that building.

21.27 **Remaining Life**

The remaining life of the item in years. As a guide any items Condition C or below would be expected to have a remaining life of zero as they are not operating as intended.

21.28 **Year Allocation**

The Year that it is intended that remedial works should be carried out on this Element based on its remaining life e.g. an Element with a remaining life of 0 should be identified as 2010.

21.29 **Item Quantity**

The quantity relevant to the proposed remedial action.

21.30 **Cost**

The base cost of the required remedial work.

Insert base date of cost eg. QII 2006. State whether this cost is from existing data or has been assessed as part of the current appraisal.

21.31 **Likelihood**

The likelihood rating 1-5.

21.32 **Consequence**

The consequence rating 1-5.

21.33 **Notes**

A concise description of the location and nature of any defects/deficiencies requires to be provided.

21.34 **Remedial action**

Each Item requires to be given a concise narrative on the nature and type of the proposed remedial or upgrading work sufficient to inform those reading post survey reports on the nature and scope of the remedial works.

21.35 **Element photograph**

Where relevant, a photograph that relates to a specific condition item as supporting evidence.

Aggregate Category Rating

21.36 For Space Utilisation, Functional Suitability and Quality, the Aggregate Category Rating should be assessed and stated at Block Level (Level Three).

22. Digital photographs

Requirements

22.1 As part of the appraisal of the NHS Estate, representative photographs in digital format are required for each property.

The number of photographs required for each Sub-Element, location, Block and Site will vary according to the size, complexity and condition of the asset.

The minimum requirement for photographs is as follows:

- a photograph of the front elevation of each Block;
- a photograph that relates to an item of specific remedial or upgrading work against each Sub-Element.

Photograph format

22.2 Each photograph should be stored as an individual JPG file and be no greater than 150kB in size with a resolution of 150 pixels per inch (recommended size 640 x 480 pixels). Each JPG file should be named in accordance with the following convention;

A – B – C – D – E

where;

A Site Code eg. ‘T504B’;

B Block Code eg. ‘01’;

C the text ‘FABRIC’ for ‘Building Condition’ or ‘MandE’ for ‘Engineering Services’;

D Unique (per Block) three digit photograph reference (assigned by the Surveyor) eg. ‘002’;

E file extension ie. ‘jpg’.

Example: T504B-01-FABRIC-002.jpg

Authority/permission

22.3 Check whether specific permission is required prior to taking photographs on any NHS Site.

Sensitivity

22.4 Care should be taken to ensure that any photographs taken as part of this exercise do not include patients or children.

23. Data input

Data input options

23.1 Existing record information and data collected from fresh appraisals can be imported into ESTATEManager by any of the following means:

- direct input into the software portal;
- importing into the system;
- via an intermediate Excel spreadsheet for uploading by 3i Studio.

Survey partner data

23.2 On returning to the office the completed data collection sheet/Survey Block for each Facet at Block/Site Level will be checked for completeness prior to inputting into an Excel spreadsheet.

23.3 On completion of data input, the spreadsheet will be saved in Comma Separated Values (CSV) file format and forwarded by email to 3i Studio for importing into ESTATEManager.

23.4 Alternatively, the data may be imported directly into the ESTATEManager system.

24. General Health and Safety

Geographical considerations

24.1 The NHS Estate in Scotland is diverse with locations ranging from the Borders to the Highlands and Islands.

24.2 Properties located on the Western and Northern islands present their own unique challenges, both in terms of carrying out inspections and the impact the severe marine weather conditions have on the physical condition of property assets located on remote, exposed Sites. Additionally, the local architecture often sets these assets apart from the 'norm' e.g. Black house felt roof construction on Tiree, Lewis and Harris.

24.3 Survey and travelling arrangements will require to be flexible and adaptable when scheduling visits to these locations and staff may become 'storm' or 'fog' bound on the islands, despite the best intentions of the ferry or flight operators – either outgoing or incoming.

Staff vetting

24.4 During the course of the appraisals, it is likely that the survey teams will come into contact with young and/or vulnerable people during the course of the commission.

24.5 The NHSScotland Boards and the appointed survey partner have responsibilities to ensure the welfare and protection of vulnerable people and to ensure the suitability of individuals who may have access to vulnerable people.

Staff identification

24.6 All Survey Team members will carry an ID pass with a current passport photograph and these will be made available for checking by the person in charge at each Site prior to commencement of the inspection.

24.7 The ID pass will be in addition to any visitor passes which may also require to be worn on any of the Sites.

Security

24.8 On arriving at each property, Survey Teams will report to the person in charge and obtain any Site specific safety briefing and discuss and agree any reasonable operational requests.

24.9 Thereafter, the Survey Teams will work safely, observing and complying with all safety signs and fire safety procedures.

24.10 Prior to leaving the Site, Survey Teams will advise the person in charge of their departure.

Site Induction/Passports to work

24.11 Where necessary, Survey Teams will undertake Site inductions and obtain any necessary Passports to Work to ensure that they are aware of the guidance available on working within wards, etc.

Surveying safely

24.12 The Health and Safety at Work Act 1974 places duties on the Survey Partner as employers, to take reasonable measures to ensure the safety of employees. Our employees in turn have similar responsibilities to take care of their own safety.

24.13 Discharging these responsibilities involves a process of risk assessment in which hazards or events likely to lead to harm are identified and then assessed in terms of the likelihood of the event occurring and the severity of the harm which would result.

24.14 Having identified a hazard and assessed the risk involved, working methods will require to be considered and, if necessary, a safe method of work and method statement for the activity documented.

24.15 A generic risk assessment has been prepared and this is included as Appendix 7. Each member of the Survey Team will be responsible for modifying the assessment for the specific Site being inspected and thereafter for complying with the method statement and safe system of work procedure.

24.16 Further specific guidance 'Surveying safely: your guide to personal safety at work' is issued by The Royal Institute of Chartered Surveyors and can be found on their website www.rics.org.

Personal Protection Equipment (PPE)

24.17 Survey Teams must be equipped with appropriate PPE e.g. high visibility vests, etc.

24.18 Survey teams should be provided locally with gowns/overalls or other clothing where these are required to access specific parts of buildings.

Suspect Asbestos containing materials (ACMs)

24.19 Where an Asbestos Management Plan is available for the premises, the Survey Team must refer to this prior to carrying out our inspection.

24.20 If during the course of the inspection any additional suspect asbestos materials are identified, these must be included in the Property Summary with recommendations for further investigation.

Arrangements for inspections of 'Difficult Areas'

24.21 Inspections of certain parts of the Estate such as Intensive Care Units, Operating Theatres, Neo-natal and Children Wards will be subject to access restrictions.

24.22 It will be necessary for the Survey Teams to liaise with the individual NHSScotland Board representatives to discuss and agree the steps necessary to minimise any potential access problems to these areas.

Infection control

24.23 The Survey Teams will follow published guidelines posted on notice boards in relation to hygiene for the prevention and control of infection.

In particular, the Survey Teams will not inspect any wards subject to vomiting or diarrhoea.

PART 4: Survey Partner Matters

25. Project Management and Co-ordination

Project Management team

25.1 For the purposes of project management and coordination of the survey exercise by the survey partner, a project management team should be out in place and a variety of roles are likely to be necessary including a Project Director, Survey Co-ordinators, Building Services Co-ordinators, Costing Co-ordinator, Statutory Compliance Co-ordinator, Access Co-ordinator/ Administrator and an Information Technology Co-ordinator.

In-House training

25.2 A series of in-house training sessions must be organised for the various members of the Survey Teams to explain the systems and procedures that require to be followed to ensure a consistent approach to data collection, input, costing and reporting.

25.3 This must include worked examples of the various pro-forma data collection sheets and discussion of the condition **Indicators** that should be considered during the on-site appraisal process.

Access for inspections

25.4 Client contact details must be provided by the relevant NHS Board.

25.5 Each of the Survey Co-ordinators must be responsible for arranging access to the relevant Sites/Blocks allocated to them and for making the necessary arrangements for contractor attendance, if required.

25.6 The Survey Co-ordinators must be responsible for ensuring that access has been arranged for each Site allocated to them in advance of the date of inspection.

25.7 Following completion of the Site/Block inspection, the Survey Team Leader must be responsible for completing the Property Return Sheet to ensure that all sections of the property have been inspected and the relevant digital photograph recorded, prior to leaving the Site.

25.8 The Survey Co-ordinator must be responsible for checking that all of the relevant information for each Site/Block has been gathered prior to submitting for data input.

25.9 Further checks of the Survey Books must be made at data input stage and any queries referred to the survey teams for clarification.

25.10 A pro-forma check sheet for the Survey Team Leader and Survey Co-ordinators is enclosed as Appendix 7.

Transport and accommodation

25.11 The Survey Co-ordinators must liaise with the Project Administrator to ensure that suitable travel arrangements are in place for the conduct of the survey phase of the commission.

25.12 To ensure efficient and effective implementation of the survey phase, it is anticipated that it must be more cost effective for overnight accommodation to be arranged for any Sites in excess of 1½ hours travel time from the appointed survey partner's named base office.

25.13 Prior agreement from the Client should be obtained before any accommodation is booked if costs are to be reimbursed directly.

Progress report

25.14 To assist the Project Director in providing the Client with regular progress reports, each Survey Co-ordinator must be responsible for providing weekly progress reports confirming the current status of the inspections of the Sites/Blocks allocated to them.

25.15 A pro-forma progress report is included as Appendix 7.

Progress versus Programme

25.16 Each of the Survey Co-ordinators must be responsible for ensuring that their teams maintain progress on the inspection of the properties allocated to them.

25.17 Close co-ordination will be required with the Project Director and Access Co-ordinator to ensure that any changes in the inspection dates of the properties are referred to the Client for agreement and to ensure that access can be provided.

Timesheets

25.18 All survey staff must complete and return a standard weekly timesheet identifying the time spent on each Site/Block.

25.19 The timesheets of the individual Surveyor/Engineer must be verified on a weekly basis by the Survey Co-ordinators.

26. Methodology

The various steps to be followed to roll-out the survey phase are summarised below:

Preparation

- distribute copies of the Property Appraisal Manual;
- deliver in-house staff training on the survey procedures to be adopted to ensure consistency;
- review the Property List/Asset Register;
- prepare a prioritised survey inspection programme;
- allocate the Property List to the survey teams, by discipline;
- ascertain the availability of record information.

Pilot Survey phase

- Organise and confirm the access arrangements for the pilot inspections. At each Site the appointed survey partner must:
  - notify the person in charge;
  - carry out a Risk Assessment;
  - identify inaccessible areas;
  - carry out our inspection (Note: the building fabric and Engineering Services inspections will be carried out separately);
  - on completion notify the person in charge of the Site prior to departure;
  - complete the overall checklist.
- input data from Survey Books into spreadsheet;
- check and complete costing exercise following agreed audit procedures;
- carry out a final audit for technical consistency and costing;
- import data into Estate Asset Management System;
- run output reports from ESTATEManager;
- check and verify data input and report output meet requirements;
- amend procedures to reflect lessons learned from pilot survey;
- obtain Client approval to proceed with main survey phase.

Main Survey phase

- confirm access arrangements on a phased basis;
- carry out the Data Capture and Appraisals of the property portfolio;

- monitor access arrangements and progress of the survey programme;
- provide regular progress reports to the Client;
- attend regular project meetings.

Report phase

- populate database or spreadsheets with survey data and carry out costing exercise;
- prepare Executive Summary for each Site;
- carry out final audit for technical consistency and costing;
- generate reports via the Estates Asset Management System.

27. Validation

27.1 Due to the nature of the appraisal of the Six Facets, it is impossible to make the assessments objective as there is no absolute measure of the correct answer for a Site/Block in terms of its condition, function or statutory compliance.

27.2 Consequently, much of the appraisal work will rely on the subjective assessment of the Survey Team using their professional judgement.

27.3 To help improve the objectivity of your assessments, it may be helpful to consider the following:

- what record information do I have (desktop review)?
- what evidence is apparent on the condition/compliance of the Elements/Sub-Elements (on Site appraisal)?
- what is the opinion of the Users/Estates Staff (interviews of key personnel)?
- in the case of major issues, is it worth obtaining a further opinion (peer review)?

28. Quality Assurance procedures

28.1 Quality Assurance Audits must be carried out at regular intervals to check and review the collected survey data.

28.2 The Survey Team Co-ordinators must carry out Quality Assurance Audits at regular interviews to check and review the collected survey data prior to data input stage, post data input stage and prior to transferring to 3i Studio.

28.3 The Project Director must also carry out additional random checks at data input stage.

28.4 As a minimum requirement, quality checks are required at the following stages:

Action	*Actioned By*
Confirm access arrangements	Access Co-ordinator
Check all data has been collected on completion of inspection	Survey Team Leader
Carry out random checks of data collection sheets	Survey Co-ordinator
Review data collection sheets prior to input and refer any omissions or queries to the Survey Team	Data Input Team
Check data input is complete	Survey Co-ordinator
Verify costing exercise including any rogue items	Costing Co-ordinator
Carry out random checks of costing	Costing Co-ordinator
Check all information is complete prior to passing to 3i Studio	Survey Co-ordinator
Random checks of data prior to submission to Client	Project Director

Table No 5: Quality check requirements

28.5 In the event that any potential or actual failure in our performance is identified, the Project Director must ensure that the details are recorded and that corrective and preventative action is taken.

29. Health and Safety during the Survey Phase

General

29.1 The Health and Safety at Work etc Act 1974 places a duty on Employers to take reasonable measures to ensure the safety of their employees.

29.2 Employees have similar responsibilities to take care of their own safety.

29.3 Discharging these responsibilities involves the process of risk assessment in which hazards or events likely to lead to harm are identified and then assessed in terms of the likelihood of the event occurring and the severity of the harm which would result.

29.4 Having identified a hazard and assessed the risk involved our working methods will require to be considered and, if necessary, a safe method of work or method statement for the activity documented.

Method statements

29.5 A generic risk assessment has been prepared and is included as Appendix 7.

29.6 Each survey team member will be responsible for modifying the assessment to meet the specific requirements of each Site being inspected and thereafter to comply with the method statement and safe system of work procedure.

First Aid

29.7 All survey teams must carry a proper first aid kit when visiting unoccupied properties.

Security

29.8 On arriving at the property all personnel must sign in and out.

29.9 Survey Team staff must carry their ID Card and appropriate Letter of Authority.

Site Specific information

29.10 You may need to obtain Site specific information eg:

- about specific hazards on Site.

29.11 This information should be obtained from the relevant Key Personnel at each NHS Board.

Access to Site

29.12 Access to the various properties will be arranged in advance.

29.13 It will be necessary for the Survey Teams to liaise with the occupiers of the Buildings and Departments.

Working safely

29.14 Observe and comply with all safety signs.

29.15 Consider other people eg. do not create a trip hazard.

29.16 Practice good housekeeping.

29.17 Ensure you have suitable and sufficient safety equipment and PPE.

29.18 Use all equipment and PPE properly.

Tools and equipment

29.19 All survey teams must carry sectional surveyors ladders.

29.20 Where longer ladders are required arrange contractor attendance.

29.21 All survey teams must carry mobile telephones to maintain contact.

Incident reporting

29.22 Incident

This covers:

- injury;
- damage;
- near hit;
- environmental;
- traffic accident.

29.23 In the event of an incident:

- report all incidents to the local NHS Board contact;
- an incident report must be filled in.

29.24 Serious Incident

This includes:

- fatality;
- major injury/occurrence (as defined by Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR)).

29.25 In the event of a serious incident:

- immediately contact the local NHS Board contact;
- inform your Manager, the Project Administrator and the Project Director;
- do not disturb the scene, except to make it safe.

Management of major emergencies

29.26 Alarms

- fire – continuous bell/sounder throughout building;
- fire alarm test – check what day and time;
- security alarms – check for sounder type.

29.27 Emergency Management

- automated systems;
- use of the PA system;
- emergency controller;
- Fire Marshalls.

29.28 Comply with any specific local procedures.

Fire Safety

29.29 Familiarise yourself with local procedures.

29.30 If you hear the fire alarm always evacuate.

29.31 If you think you have discovered a fire:

- raise the alarm and leave the building by the nearest exit.

29.32 Practice good fire prevention:

- no smoking within the Site boundaries of any NHS Site.

Appendix 1: Index of appendices

Appendix 2: References and acknowledgements

Strategic Property and Asset Management Guidance for NHSScotland 2010 (Version 01)

NHS Estates 'A Risk Based Methodology for Establishing and Managing Backlog' 2010

Land and Property Appraisal 2007; adapted from the 2002 Version of 'Estatecode'

Joint Premises Project Board – Asset Based Information and Delivery Group: **'Minimum Core Dataset for Joint Premises Development and Joint Services Planning'** 2006

RICS Guidance Note **Stock Condition Surveys** 2nd Edition 2006

An Overview of the Location Code Directive 2003

Physical Conditions of the Specification prepared by 3i Studio 2009

Audit Scotland Report, '**Asset Management in the NHS in Scotland'** January 2009

Appendix 3: Definitions

Asset Hierarchy: The different levels adopted for the Estate Asset Management System and comprising: The NHS Estate in Scotland; the individual NHS Board/Organisation; Site Level; Block Level; and Location Level.

Audit Scotland Report: Refers to the report dated January 2009 entitled 'Asset Management in the NHS in Scotland'.

Block Code: The coding system used to identify all Blocks on any Site.

Element: The key components assessed as part of the appraisal e.g. External Fabric.

Environmental Management: Relates to the impact of the Estate on the environment in terms of its water consumption, waste and energy performance.

Functional Suitability: How well the available accommodation supports the delivery of healthcare assessed on the basis of internal space relationships; support facilities and location.

Location Code Directory: The National Register of all locations in Scotland where health services are provided.

Physical Condition: The appraisal of the Physical Condition of the Estate's Buildings, Mechanical Systems, Electrical Systems and External Grounds.

Quality: Whether the available accommodation provides a comfortable, modern, pleasing environment in which healthcare services can be provided.

Site Reference Number (SRN): The Unique Reference Number assigned to each Site based on the Location Code Directory.

Software and Services Provider: 3i Studio.

Space Utilisation: How efficiently and effectively the available space is being used ie. the number of people using it and the frequency of which they use it as well as identifying areas of under/over provision.

Standing of Site: Whether the Site is essential or non-essential.

Status of Site: Whether a building is active or inactive and can be further categorised by occupied/vacant/surplus/sold/surrendered/terminated.

Statutory Compliance: Compliance with all statutory guidance and legislation related to the Estate including fire, health, safety and DDA.

Sub-Element: The Sub-Component of an Element e.g. External Doors and Ironmongery.

Survey Partners: An appointed consultant working in partnership with the NHSScotland Board undertaking surveys and property appraisals as instructed and agreed.

The Six Facets: This is the collective name for Physical Condition; Statutory Compliance; Environmental Management; Space Utilisation; Functional Suitability; and Quality.

Type of Site: This refers to the designation of the Site by use for grouping purposes e.g. Multi-Service Hospital.

Standing: Whether a building is considered to be essential or non essential.

Appendix 4: Schedule of typical life expectancies

	Component	Median Life Expectancy		
		Typical	Min	Max
1.00	**Structure**			
1.01	Substructure			
	Foundations: Generally	100	60	120
	Lowest Floor: Solid Ground Floor: Reinforced concrete slab	60	30	90
	Lowest Floor: Solid Basement Floor: Reinforced concrete with mastic tanking	75	50	100
	Lowest Floor: Suspended Ground Floor: Softwood hollow with boarding, softwood plates and joists	55	30	80
1.02	Frames			
	Columns and Beams: Reinforced Insitu Concrete: Isolated and/or attached concrete columns and beams (25 N/mm^2)	60	47	100
	Columns and Beams: Steel (Grade 43): Exposed; UBs and RSCs primed	75	50	100
	Columns and Beams: Steel (Grade 43): Concrete encased; UBs and RSCs primed; 50mm cover	75	50	100
	Laminated Timber Frame: Generally	60	32	100
	Timber Frame: Generally	60	35	95
	Space Frame: Generally	70	50	100
1.03	Floors and Stairs			
	Upper Floors: Insitu Concrete: Reinforced slab	75	45	100
	Upper Floors: Insitu Concrete: Reinforced coffered slab	75	40	100
	Upper Floors: Insitu Concrete: Reinforced troughed slab	70	40	100
	Upper Floors: Insitu Concrete: Reinforced slab in profiled steel decking	60	40	100
	Upper Floors: Precast/composite Concrete Decking: Insitu concrete on precast/precast prestressed concrete planks	70	40	100
	Upper Floors: Precast/Composite Concrete Decking: Precast/precast prestressed beams with filler blocks	70	40	100
	Upper Floors: Precast Concrete: Slabs generally	75	50	100
	Upper Floors: Decking: Softwood to timber joists	60	40	100
	Upper Floors: Decking: Chipboard to timber joists	42	30	60
	Stairs Structure: Concrete	70	40	100
	Stairs Structure: Steel	50	30	70

	Component	Median Life Expectancy		
		Typical	Min	Max
	Stairs Structure: Softwood	50	30	60
	Stairs Structure: Hardwood	60	30	80
	Stair Finishes: Aluminium: Nosings	15	10	20
	Stair Finishes: Plastic: Nosings	12	10	20
1.04	Roofs			
	Flat Roof Structure: Reinforced Concrete: Slabs on permanent steel shuttering	65	40	100
	Flat Roof Structure: Galvanised Steel: Z profile beams	50	30	65
	Flat Roof Structure: Steel: Prefabricated lattice joists	50	40	70
	Flat Roof Structure: Laminated Timber: Roof beams; softwood bearers	40	30	60
	Pitched Roof Structure: Timber: Generally	75	50	100
1.99	Other			
2.00	**External Fabric**			
2.01	External Walls and Finishes			
	External Wall Structure: Softwood Stud: One layer double sided building paper	50	30	60
	External Wall Structure: Aerated Lightweight Block	60	50	80
	External Wall Structure: Dense Aggregate Block	72	50	100
	External Wall Structure: Class B Engineering Brick	85	60	100
	External Wall Structure: Facing Brick: Machine made; pointed	80	50	100
	External Wall Structure: Clear Hollow Glass Block: Cement and sand joints; mastic pointed; facework both sides	50	40	70
	External Wall Structure: Rendered Blockwork	50	25	75
	Insitu Finishes: Self-Coloured Render: 20mm; to brickwork/blockwork base	47	30	60
	Insitu Finishes: Tyrolean Decorative Render: 15mm; four coats; to brickwork/blockwork base	40	30	50
	Insitu Finishes: Roughcast Coating: 15mm; render and dry dash; to masonry or concrete	40	25	50
2.02	Windows and Ironmongery			
	Curtain Walling System: Double Glazed Polyester Powder Coated Aluminium 'Stick' System: Medium/high quality standard; 6mm laminate glass; including opaque insulated spandrel panels	37	30	50
	Curtain Walling System; Double Glazed Polyester Powder Coated Aluminium 'Unitised/Panelled' Assembly: High quality standard: 6mm laminate glass; including opaque insulated spandrel panels	42	30	57

	Component	Median Life Expectancy		
		Typical	Min	Max
	Curtain Walling System: Structural Siliconed Double Glazed Standard 'Unitised/Panelled' Assembly: 10mm and 6mm clear and laminate; factory produced; on aluminium frame	45	30	60
	Windows: Softwood Casement: Side hung; hardwood sills; weather-stripping; fitted with fasteners; preservative stained base coat	30	20	40
	Windows: Treated Softwood Sash: Single light; ventilators; weather-stripping; opening sashes and fanlights	30	20	40
	Windows: Hardwood Casement: Top Hung; hardwood sills; weather-stripping; fitted with fasteners	40	27	55
	Windows: Softwood: Purpose made frames; treated; rebated and moulded	30	20	40
	Windows: Hardwood: Purpose made frames; rounded; rebated check grooved	40	30	60
	Windows: Polyester Powder Coated Galvanised Steel: Top/side hung; opening lights; weather-stripping; frames bed in mastic, pointed one side	45	30	60
	Windows: Acrylic Finished Aluminium: Vertical or horizontal sliding; plugged and screwed	40	25	50
	Windows: PVCu Casement: Fixed/tilt and turn light; sills and gazing gaskets and weather seals; including all ironmongery	30	20	40
2.03	External Doors and Ironmongery			
	External Doors: Softwood: Matchboarded; 44mm framed, ledged and braced doors; 19mm tongued, grooved and v-jointed boarding; one side vertical boarding; preservative treated	25	19	40
	External Doors: Softwood Standard Panelled: 44mm; hardwood frames; plywood panels; painted	30	20	40
	External Doors: Softwood Standard Flush: 40mm; skeleton or cellular core; plywood faced both sides; preservative treated	25	15	30
	External Doors: Softwood Standard Flush: 40mm; skeleton or cellular core; veneered both sides; preservative treated	25	15	35
	External Doors: Softwood Standard Flush: Half hour fire check; 44mm; solid core; plywood faced both sides	30	20	40
	External Doors: Softwood Standard Flush: One hour fire check; 54mm (60/45); solid core; sapele faced both sides; lipped all edges	27	20	40
	External Doors: Hardwood: Purpose made panelled; 44mm; solid, laminated or veneered; 4 plywood panels; mouldings	35	20	40

	Component	Median Life Expectancy		
		Typical	Min	Max
	External Door Frames and Lining Sets: Treated Softwood: Standard; primed; untreated hardwood sills	27	15	40
	External Door Frames and Lining Sets: Hardwood: Purpose made; jambs and heads; 50x100mm; as frames; rebated, rounded and grooved	35	20	50
2.04	External Cladding/Eaves Detail			
	External Wall Coverings: Timber: Board infill panels	30	15	40
	External Wall Coverings: Tile: Hung infill panels	40	25	50
	External Wall Coverings: Fibre Cement: Profiled sheet cladding; natural or coloured	35	25	50
	External Wall Coverings: PVF2 Coated Galvanised Steel: Profiled sheet cladding	40	25	50
	External Wall Coverings: Glass-Fibre: Profiled sheet cladding	25	17	37
	External Wall Coverings: PVCu: Cladding; 150mm; shiplap; insulated	30	20	40
	External Wall Coverings: GRP: Panels; plain or decorative finish; insulation; aluminium fixings; vapour barrier	35	20	40
	External Wall Coverings: Plastic: Profiled sheet cladding	25	17	32
	External Wall Coverings: Zinc: Flat Sheeting; 12 gauge; seamed joints	50	30	60
	External Wall Coverings: Milled Sheet Lead: Flat Sheeting; BS Code 4	67	45	100
	External Wall Coverings: Precast Concrete Standard Panels: Exposed aggregate finish; insulation; lining and fixings	60	35	75
	External Wall Coverings: Precast Concrete Brick Clad Panels: Insulation; linings	55	35	75
	External Wall Coverings: Precast Concrete Natural Stone Faced Panels: Insulation; lining and fixings	60	40	75
2.05	External Decoration			
2.99	Other			
3.00	**Roof**			
3.01	Coverings – Pitched			
	Pitched Roof Covering: Tile: Generally	60	30	80
	Pitched Roof Covering: Slate: Generally	70	40	100
	Pitched Roof Covering: Thatch: Generally	20	15	30
	Pitched Roof Covering: Fibre Cement: Profiled sheet cladding	35	20	50
	Pitched Roof Covering: PVF2 Coated Galvanised	30	20	40

	Component	Median Life Expectancy		
		Typical	Min	Max
	Steel: Profiled sheet cladding			
	Pitched Roof Covering: Pre-painted Aluminium: Profiled sheet cladding	32	22	47
	Pitched Roof Covering: Glass Fibre: Translucent sheet cladding	20	15	30
	Pitched Roof Covering: Plastic: Generally	26	15	40
	Pitched Roof Covering: Milled Sheet Lead: Generally	27	20	35
	Pitched Roof Covering: Aluminium: Sheeting generally	40	20	50
	Pitched Roof Covering: Copper: Sheeting generally	60	30	80
	Pitched Roof Covering: Zinc: Sheeting generally	40	25	50
3.02	Coverings – Flat			
	Flat Roof Decking: Softwood: Generally	30	20	45
	Flat Roof Decking: WBP Grade Plywood Boarding: Generally	35	22	50
	Flat Roof Decking: Strawboard: Generally	22	15	30
	Flat Roof Decking: Particleboard: Generally	25	15	30
	Flat Roof Decking: Composite Laminated Board: Generally	30	20	40
	Flat Roof Decking: Aluminium: Generally	32	20	40
	Flat Roof Decking: Galvanised Steel: Generally	30	20	40
	Flat Roof Coverings: Bitumen Felt: Generally	20	10	25
	Flat Roof Coverings: PVC: Generally	20	15	30
	Flat Roof Coverings: High Performance Polyester-Based Roofing System: Two layer covering; bonded	20	15	30
	Flat Roof Coverings: Synthetic Rubber (EPDM): Generally	20	15	30
	Flat Roof Coverings: Asphalt: Generally	30	20	50
	Flat Roof Surface Finishes: Solar Reflective Paint: On asphalt surfaces	10	5	15
3.03	Roof Lights			
	Rooflights: Aluminium: Sloping roof window, frame and opening light; integral internal lining, flashings and soakers; ironmongery; double glazing	32	25	40
	Rooflights: PVCu: Single skin; standard square or rectangular dome; plywood lining; timber kerbs; upstands	25	20	30
3.04	Rainwater Goods			
	Roof Drainage: Powder Coated Aluminium: Pipes/gutters/outlets	40	30	50

	Component	Median Life Expectancy		
		Typical	Min	Max
	Roof Drainage: Cast Iron: Rainwater pipes/gutters/roof outlets; red lead primer; 2 undercoat and 1 coat gloss paint finish	50	30	75
	Roof Drainage: PVCu: Rainwater pipes/gutters/roof outlets	25	20	30
	Roof Drainage: Lead: Box gutters and flashings	60	30	75
	Roof Drainage: Zinc: Box gutters and flashings	35	20	40
	Roof Drainage: High Performance Felt: Box gutters and flashings	20	15	30
3.05	Chimney Stacks and Parapet Walls			
	Steam plant: Brick chimneys	35	35	45
3.99	Other			
4.00	**Internal Fabric**			
4.01	Internal Walls and Finishes			
	Partitions: Treated Softwood Stud and Plasterboard: 12.7mm gypsum plasterboard; tapered edges; fixed with galvanised nails to softwood; joints filled, taped and flush jointed	50	30	65
	Partitions: Cellular Core Plasterboard Partitions: 63mm; sawn softwood plates, and battens; flush jointed tapered edge panels	50	30	60
	Proprietary Partitions: Metal Stud and Plasterboard: 100mm; two layers 12.5mm wallboard each side; 48mm studs; flush jointed tapered edge panels	50	30	60
	Proprietary Partitions: Metal Stud and Plasterboard: 65mm; one hour; one layer 15mm fireline board each side; jointed tapered edge panel	50	37	67
	Proprietary Partitions: Laminated Plasterboard: 65mm; 19mm outer layers square edge plank core; 19mm tapered edge plank both sides; softwood plates and battens; flush jointed tapered edge panels	50	30	60
	De-mountable Partitions: Steel: Generally	30	15	40
	De-mountable Partitions: Aluminium: Generally	25	15	35
	De-mountable Partitions: Glass Reinforced Gypsum: Generally	25	10	30
	De-mountable Partitions: Glass: Generally	20	10	30
	Dry Lining: Gyproc Wallboard: Insulating grade, plastic faced; taped joints; for direct decoration	37	20	50
	Dry Lining: WBP Plywood: Including battens	35	22	50
	Dry Lining: Chipboard: Including battens	30	15	40
	Dry Lining: Non-Asbestos Boards: Flame proof; Class O; including battens	37	25	50
	Dry Lining: MDF Boards: Including battens	30	20	40

	Component	Median Life Expectancy		
		Typical	Min	Max
	Boarding/Panelling: Hardwood: Tongued and grooved, v-jointed; including battens	50	30	60
	Insitu Finishes: Lightweight Plaster: Two coats; to brickwork/blockwork base	50	32	62
	Insitu Finishes: Hardwall Plaster: One coat Thistle Universal; to brickwork/blockwork base	50	30	62
	Rigid Finishes: Glazed Ceramic Tiles: Fixing with adhesive; including backing	25	10	30
	Rigid Finishes: Granite Cladding: 20mm; polished finish; jointed and pointed in coloured mortar; to cement/sand base	40	25	60
	Rigid Finishes: Marble Cladding: 20mm; polished finish; jointed and pointed in coloured mortar; to cement/sand base	45	30	65
4.02	Floor Coverings			
	Insitu Screed : Cement/Sand: 25mm; one coat screed (1:3); to concrete	40	25	60
	Insitu Screed: Granolithic: 20mm; one coat; cement and granite chippings; laid on concrete	50	30	65
	Insitu Screed: Latex Cement: 5mm; two coats; to concrete base	20	15	30
	Insitu Screed: Epoxy Resin: Generally	12	10	15
	Rigid Finishes: Terrazzo Paving: 16mm; pavings divided into panels; on screeded bed	50	30	60
	Rigid Finishes: Quarry Tiles: 12.5mm; to cement/sand base	50	30	60
	Rigid Finishes: Parquet: Generally	30	15	50
	Flexible Tile: Cork: 4mm; fixing with adhesive; cement/sand base	15	10	20
	Flexible Tile: Vinyl: Generally	15	10	20
	Flexible Sheet: Linoleum: Generally	20	10	25
	Flexible Sheet: Vinyl: Generally	15	10	20
	Flexible Sheet: Fitted Carpet: Contract medium quality; wool/nylon carpet	10	5	15
	Flexible Sheet: Fitted Carpet: Contract heavy quality; wool/nylon carpet	12	8	18
	Raised Access: Density Particle Board: 30mm panels; light/medium or office grade; 150mm high overall; pedestal supports	25	20	30
	Raised Access: Chipboard Panels: Light/medium or office grade; 300-600mm high; galvanised sheet steel; pedestal supports	30	20	40
	Floating: Chipboard: 19mm panels nailed to softwood battens; 63mm Durabella flooring system;	30	20	37

	Component	Median Life Expectancy		
		Typical	Min	Max
	on concrete floor			
	Skirting: MDF: 25x75mm; polished; incl. grounds	30	20	40
	Skirting: Hardwood: 25x100mm; polished; incl. grounds	47	25	60
	Skirting: Plastic: Generally	24	10	30
4.03	Ceilings Finishes			
	Dry Lining: Gypsum: 12.5mm Fireline board; fixing with nails to softwood base	40	20	50
	Dry Lining: MDF: 25mm	30	20	40
	Dry Lining: Non-Asbestos Boards: 12mm Masterboard fire resisting lining; sanded finish	35	20	40
	Dry Lining: Non-Asbestos Boards: 9mm Supalux lining; sanded finish	30	20	40
	Insitu Finishes: Textured Plastic: One coat sealer and one coat Artex; to plasterboard or concrete ceilings	25	10	30
	Insitu Finishes: Plaster: 5mm; Thistle board; to plasterboard	30	20	45
	Insitu Finishes: Plaster: 10mm two coat lightweight plaster; to concrete/plasterboard	35	20	50
4.04	Ceilings - Suspended			
	Suspended Ceilings: Aluminium: 600x600mm tile; concealed/exposed grid; hangers to concrete	25	15	35
	Suspended Ceilings: Gypsum Based: 600x600mm tile; concealed/exposed grid; hangers to concrete	25	12	32
	Suspended Ceilings: Mineral Wool Based: 300x300mm tile; concealed/exposed grid; to concrete	25	10	30
4.05	Internal Doors and Ironmongery			
	Internal Doors: Softwood: 44mm flush half-hour firecheck door; hardboard faced; including ironmongery	30	20	40
	Internal Doors: Softwood: 44mm flush half-hour firecheck door; plywood faced; including ironmongery	35	20	50
	Internal Doors: Softwood: 54mm flush one-hour firecheck door; wood veneered; including ironmongery	37	25	50
	Internal Doors: Softwood: 44mm purpose made panelled door; including ironmongery	40	25	50
	Internal Door: Glass: Including ironmongery; generally	25	15	30
	Internal Door: Flexible: Including ironmongery; generally	15	10	20

	Component	Median Life Expectancy		
		Typical	Min	Max
	Roller Shutters/Doors: Metal: Including ironmongery; generally	25	10	30
4.06	Internal Decoration			
	Decorations: Emulsion Paint: One mist and two coats; to brick/block walls, cement render/concrete, plaster walls	6	4	10
	Decorations: Eggshell Paint: One undercoat and two finishing coats; to plaster walls	7	5	10
	Decorations: Masonry Paint: One base coat and two finishing coats; to rendered, concrete or brickwork/blockwork	7	5	10
	Decorations: Textured Plastic Finish: One coat sealer and one coat Artex; to plaster, brickwork/blockwork, or concrete walls	15	10	20
	Decorations: Vinyl Wallpaper: Decorative paper backed; adhesive	8	4	12
4.99	Other			
5.00	**Internal Fittings And Fixtures**			
5.01	Sanitary Ware/Fittings			
	Sanitary Fittings: Cast Iron: Baths, etc	50	25	70
	Sanitary Fittings: Plastic: Baths, etc	30	20	40
	Sanitary Fittings: Wash Basin: White/coloured vitreous china wash basin	20	10	30
	Sanitary Fittings: Sink: White glazed fireclay Belfast pattern sink	20	10	27
	Sanitary Fittings: WC Suite: White/coloured vitreous china pan, seat and low level streamlined finish plastic cistern	20	10	30
	Sanitary Fittings: Urinal Suite: Single stall urinal; vitreous china	17	10	25
5.02	Unit Furniture			
	Kitchen Fittings: Wall Units: Generally	15	10	25
	Kitchen Fittings: Floor Units: Generally	15	10	25
5.03	Internal Fittings and Furniture			
5.99	Other			
6.00	**External Grounds And Gardens**			
6.01	Landscaping			
	Soil/Waste Stacks: Cast Iron: Pipes incl. fittings; primed; to masonry	37	27	47
	Soil/Waste Stacks: Polypropylene: Waste pipes and fittings; pipe clips	20	15	30
	Soil/Waste Stacks: muPVC: Waste pipes and fittings; pipe clips	20	15	30

	Component	Median Life Expectancy		
		Typical	Min	Max
6.02	Walls, Fencing and Gates			
	Fencing: Timber Generally	20	10	25
	Fencing: Steel Generally	25	15	40
	Fencing: Concrete Chain and Post	21	15	30
6.03	Roads and Car Parks			
	Roads and Pavings: Insitu Concrete: To car parks generally	25	15	32
	Roads and Pavings: Tarmac Surface: To car parks generally	20	15	30
6.04	Paths and Paved Areas			
	Roads and Pavings: Yorkstone Slabs: On blinded hardcore base	40	30	60
	Roads and Pavings: Precast Concrete Flags: On sand, granular or on blinded hardcore base	40	20	40
	Roads and Pavings: Precast Concrete Blocks: Rectangular coloured paviors on earth base; sand bedding	30	20	40
	Roads and Pavings: Insitu Concrete: To pathways generally	35	20	45
6.05	External Fittings and Furniture			
6.06	Ancillary Buildings			
6.99	Other			
7.00	**Drainage and External Services**			
7.01	Drainage/Sewerage			
	Drainage Below Ground: Vitrified Clay: Flexible joint pipes/fittings; accessories	60	40	80
	Drainage Below Ground: PVCu: Pipes and fittings; incl. accessories	50	32	60
	Drainage Below Ground: Concrete: Pipes and fittings; incl. accessories	60	40	80
7.02	External Utilities Infrastructure			
	Gas Supply: Coiled Service Pipe: Medium density polyethylene; laid underground; electrofusion joints in running length	30	25	40
7.03	Site Lighting			
7.04	Lightning Protection			
7.05	CCTV (External)			
7.99	Other			
8.00	**Fuel Storage and Distribution**			
8.01	Fuel Supply/Distribution			
8.02	Storage			

	Component	Median Life Expectancy		
		Typical	Min	Max
8.99	Other			
9.00	**Boilers and Calorifiers**			
9.01	Boiler Plant			
	Gas/Oil Fired Boilers: Industrial Water Boilers: Cast iron sectional boilers; gas or oil fired on/off or high/low type	20	15	25
	Gas/Oil Fired Boilers: Packaged Water Boilers: Gas or oil fired; on/off or high/low type	20	10	25
9.02	Pressurisation Plant			
9.03	Calorifiers/Heat Exchangers			
	Storage Cylinders/Calorifiers: Copper: Direct/indirect hot water cylinders; single/double feed; pre-insulated	20	15	27
	Storage Cylinders/Calorifiers: Copper: Combination direct hot water storage units	20	15	25
	Storage Cylinders/Calorifiers: Galvanised Mild Steel: Storage calorifier	20	15	25
	Heat Pump: Packaged Air to Water: Three phase 415v compressor; fan; heat exchanger	15	10	20
	Heat Pump: Packaged Reciprocating: Three phase 415v compressor; cooler; condenser; control panel	15	10	22
	Heat Exchanger: Packaged Plate: Instantaneous water heaters; primary pump; temperature sensor; thermostatic control panel	15	10	25
9.04	Flues			
	Steam plant: Steel chimneys/flues	15	8	20
	Steam plant: Stainless steel chimneys/flues	20	15	25
9.05	Controls/Meters			
9.06	Insulation			
9.99	Other			
10.00	**Steam Systems**			
10.01	Distribution Pipework			
	Steam plant: Steam pipework installations	30	25	30
10.02	Valves			
10.03	Controls			
	Steam plant: Control equipment	15	12	20
	Steam plant: Combustion controls	18	15	20
	Steam plant: Feed pumps	18	15	20
	Steam plant: Feedwater treatment plant	18	15	20
	Steam plant: Firing equipment gas	20	15	25
	Steam plant: Firing equipment oil	20	15	25

A52825963

	Component	Median Life Expectancy		
		Typical	Min	Max
	Steam plant: Firing equipment coal	15	10	20
	Steam plant: Fuel handling liquid	25	15	30
	Steam plant: Fuel handling solid	15	10	20
	Steam plant: Grit and ash handling	12	10	15
	Steam plant: Hotwells and makeup tanks - cast iron	25	15	30
	Steam plant: Hotwells and makeup tanks - mild steel	15	10	20
	Steam plant: Induced draught and forced draught fans	15	10	20
10.04	Meters			
	Steam plant: Instrumentation	15	10	20
10.05	Condense Systems			
	Steam plant: Condensate systems	15	10	15
10.06	Insulation			
10.99	Other			
11.00	**Heating Systems**			
11.01	Distribution Pipework			
	Steam plant: Gas pipework	30	20	35
11.02	Heat Emitters			
	Heat Emitters: Radiators: Low surface temperature; single panel	20	15	25
	Heat Emitters: Skirting Heaters: Pressed metal with fins on copper tube	20	15	27
	Heat Emitters: Radiant Strip Heaters: Steel tube aluminium radiant plates incl. insulation, sliding brackets, cover plates, end closures	20	15	25
	Heat Emitters: Perimeter Heating: Metal casing standard finish top, sloping or flat front outlet; punched louvre grill	20	15	25
	Heat Emitters: Electric Convector Heaters: Wall mounted; fixed to structure; 3kW output; integral thermostat	10	7	15
	Heat Emitters: Electric Storage Heaters: Low level wall mounted; thermostatic controls; fixed to structure	20	10	25
	Air Curtains: Ambient Temperature Commercial/Industrial Grade: Recessed/exposed units with rigid steel casing; aluminium grilles; high quality motor/centrifugal fan	15	12	21
	Air Curtains: Water Heated Commercial Grade: Recessed/exposed units with rigid steel casing; aluminium grilles; high quality motor/centrifugal fan	15	12	20
	Air Curtains: Electrically Heated Commercial	15	10	20

	Component	Median Life Expectancy		
		Typical	Min	Max
	Grade: Recessed/exposed units with rigid steel casing; aluminium grilles; high quality motor/centrifugal fan			
	Accessories: Trace Heating: Straight laid or helically wound; for freeze protection or temperature pipe maintenance	15	10	20
11.03	Controls			
	Accessories: Controls: Thermostatic radiator valves	15	10	20
	Accessories: Controls: Heating programme controller/timer generally	10	5	15
	Accessories: Controls: Thermostats generally	15	10	20
11.04	Heating Pumps			
11.05	Insulation			
11.99	Other			
12.00	**Ventilation Systems**			
12.01	Ventilation Plant			
	Air Handling Units: Modular: Steel framed with plastic coated double skinned insulated panels; access panels; channel base frame; fan with motor; filter; damper; LPHW heating coil; cooling coil	20	10	27
	Air Handling Units: Ceiling/Floor Void Mounted: Aluminium framed with double skinned insulated panels; access panels; support brackets/base frame: Air fan with motor; filter; damper; LPHW heating coil; cooling coil; attenuator	20	10	26
	Extract Fans: Flameproof Axial Flow: Single stage; three phase 415v; matching flanges; flexible connectors; anti-vibration mountings	15	10	20
	Extract Fans: Centrifugal: Three phase 415v; belt driven; flexible connectors; base frame; anti-vibration mountings	15	10	20
	Roof Extract Fans: Axial Flow: Single phase 240v; controls; glass fibre weather cap and base; bird guard and shutters; kerb mounted	15	10	19
	Toilet Ventilation: Packaged Units	13	9	18
12.02	Distribution Ductwork			
	Ductwork: Galvanised Mild Steel: Rectangular low pressure; joints and couplers in the running length incl. stiffeners; access doors and test holes	30	20	35
	Ductwork: Aluminium: Generally	25	15	30
	Ductwork Insulation: Foil Faced Flexible: 40mm; secured with adhesive and foil tape; finished with galvanised wire netting	20	10	25
12.03	Automatic Fire Dampers and Control Panel			
	Fire Dampers: Folding Curtain Type: Galvanised	17	12	20

A52825963

	Component	Median Life Expectancy		
		Typical	Min	Max
	steel casing; stainless steel blades; 4hr fire rating; installation frame; local access door in duct line			
12.04	Controls			
12.05	Room Split/Chillers/Compressors			
	Air Conditioning: Induction Units Generally	20	15	30
	Air Conditioning: VAV System: Terminal units (bellows/box type); controls and ancillaries	17	12	27
	Air Conditioning: Terminal Re-Heat System: Units, controllers and ancillaries generally	20	15	30
	Air Conditioning: Two-/Four-Pipe Fan Coil System: Wall/ceiling mounted water coil; single phase 240v centrifugal fan; 3 speed regulator	20	15	25
	Chilled Water: Chilled Beams: Passive; exposed below/flush ceiling	20	15	25
12.06	Chillers/Cooling Systems			
	Air Conditioning: Packaged System: External units generally	15	10	22
	Air Conditioning: Terminal Heat Pump with Central Ventilation: Reverse cycle; wall/floor mounted; single phase 240v compressor; 3 speed fan	15	10	22
	Chilled Water Installation: Chilled Beams: Active; flexible connections; shut-off couplings	20	15	28
	Central Refrigeration Plant: Packaged Chillers: Water cooled; 3 phase 415v screw compressor; condenser; control panel	20	15	30
	Central Refrigeration Plant: Packaged Chillers: Air cooled liquid; 3 phase 415v compressor; evaporator; condenser; control panel; acoustic attenuation and anti-vibration mountings	20	15	30
	Central Refrigeration Plant: Cooling Towers: Water cooled; roof mounted units; induced draught crossflow pattern; belt driven fan; make up tank and interconnecting pipework; 3 phase 415v motor	20	15	30
	Central Refrigeration Plant: Cooling Towers: Air cooled; roof/ground mounted units; three phase 415v motor; fans; refrigerant charged	20	15	27
	Chilled Water: Chilled Beams: Ventilated/active; exposed below ceiling/flush with ceiling	20	15	25
12.07	Cooling Towers			
12.99	Other			
13.00	**Medical Gas Systems**			
13.01	Vacuum Insulated Evaporators			
13.02	Distribution			
	Medical Gas: Distribution pipework	35	20	25

	Component	Median Life Expectancy		
		Typical	Min	Max
13.03	Manifolds			
	Medical Gas: Manifolds	20	15	25
13.04	Gas Cylinder Storage			
13.05	Outlets			
	Medical Gas: Outlets	15	15	25
13.06	Alarm Systems			
	Medical Gas: Alarm Systems	15	15	25
13.07	Medical Air Compressors/Vacuum Pumps			
	Medical Gas: Compressors	25	15	25
	Medical Gas: Vacuum pumps/plant	25	20	25
13.99	Other			
	Medical gas and suction equipment	25	20	25
14.00	**Hot and Cold Water Systems**			
14.01	Water Storage and Header Tanks			
	Storage Tank: Plastic: Generally	30	20	40
	Storage Tank: GRP: Generally	35	20	40
	Storage Tank: PVCu: Generally	25	15	30
14.02	Water Treatment Plant			
14.03	Distribution Pipework			
	Pipes: Medium Density Polyethylene (MDPE): Pipework and fittings	25	15	30
	Pipes: PVCu: Pipework and solvent welded fittings	25	20	35
	Pipes: ABS: Pipework and solvent welded fittings	25	15	30
	Pipes: Polybutylene: Pipes and fittings	25	15	30
	Pipes: Ductile Iron: Pipes and fittings; socketed, flexible joints	30	20	35
	Pipes: Copper: Pipework generally	40	25	50
14.04	Pumps			
	Pumps: Centrifugal Heating: Belt driven	15	10	20
	Pumps: Pipeline Mounted Circulator: For low and medium pressure hot water heating systems	10	10	20
	Pumps: Glandless Accelerator: For low and medium pressure hot water heating systems	10	8	20
14.05	Valves/Controls			
14.06	Water Heaters			
14.07	Insulation			
	Thermal Insulation: Glass Fibre: Preformed; to pipework	20	15	30
	Thermal Insulation: Phenolic Foam: Sections	20	15	30

	Component	Median Life Expectancy		
		Typical	Min	Max
	covered with bright Class `O' foils; to pipework			
	Thermal Insulation: Polyethylene: Black flexible fire resistant; fixed with bands; to pipework	20	15	30
14.99	Other			
	Fixed fire installations	20	15	25
	Fire hydrant systems	35	30	40
	Sprinkler Systems: Wet Riser Generally	30	20	40
	Sprinkler Systems: Dry Riser Generally	40	20	50
	Sprinkler Heads: Brass Body with Frangible Glass Bulb: Conventional /sidewall pattern/satin chrome plated	25	20	30
	Alarms: Water Operated Motor Alarm and Gong: Stainless steel and aluminium body and gong; screwed connections; to sprinkler system and drain pipework	25	20	30
15.00	**Lifts and Hoists**			
15.01	Passenger Lifts			
	Lifts: Light Passenger: Electric traction operated; single opening; standard finish; internal lighting; fireman's controls; in-car telephone; controls; 630kg, 8 person, 0.63m/s	25	20	40
	Lifts: Light Passenger: Electro hydraulic drive; single opening; standard finish; handrail; internal lighting and fireman's controls; in-car telephone; controls; 1000kg, 13 person, 0.63m/s	25	17	35
	Lifts: General Purpose Passenger: Electric traction operated; single opening; standard finish; internal lighting; fireman's controls; in-car telephone; controls; 800kg, 10 person, 1.0m/s	25	20	40
	Lifts: Intensive Passenger: Electric traction operated; single opening; standard finish; internal lighting; fireman's controls; in-car telephone; controls; 1600kg, 21 person, 2.5m/s	25	20	30
15.02	Goods Lifts			
	Lifts: Goods: Electro Hydraulic drive; 2000kg, 0.4m/s, stainless steel car lining; plate floor and galvanised shutters	22	15	30
	Lifts: Goods: Industrial scissor generally	20	10	25
15.03	Hoists			
	Lifts: Service Hoists: Single speed a/c drive; 250kg, 0.4m/s; single opening; self supporting; free standing steel structure; bi-parting doors with stainless steel finish; intercom	25	17	27
15.04	Control Panel			
15.99	Other			

	Component	Median Life Expectancy		
		Typical	Min	Max
	Escalators: 30 degree inclination; 3.50m vertical rise; 0.5m/s	20	15	25
16.00	**Fixed Plant/Equipment**			
16.01	Sterilizers			
	Sterilizing equipment	15	10	20
16.02	Bedpan Disposal			
	Disposal units	15	10	20
16.03	Disinfection Equipment			
16.04	Catering Equipment			
	Cooking equipment	20	15	25
16.05	Laundry Equipment			
	Washing machines	20	15	25
	Other laundry plant	20	15	25
16.06	Miscellaneous Equipment			
16.09	Other			
17.00	**Electrical System**			
17.01	HV Network			
17.02	Generators			
	Generator prime movers - diesel	30	25	35
	Generator standby prime movers	30	25	35
	LV Supply: Standby Generators: Diesel sets; three phase, 440 volt, four wire 50Hz	25	20	30
17.03	Switchgear			
	HV Switchgear: Step Down Transformer: 500kVA; 3 Phase 11Kv/433 Volt 50Hz and LV cable boxes; all necessary connections	30	20	32
17.04	Distribution Boards			
	LV Distribution: MCB Distribution Board: SPandN; external protection enclosure	25	20	27
	LV Distribution: Busbar: Straight aluminium rising mains busbar; insulated supports; earth continuity bar; including couplers; fixed to backgrounds; 400 Amp TPandN	30	25	42
	LV Distribution: Busbar: Straight lengths pre-wired busbar, plug-in trunking for lighting; galvanised sheet steel housing; tin plated copper conductors; 25 Amp, 2 Pole and PE	30	25	40
17.05	Wiring Systems/Bonding			
	Electrical Circuits: Electric Power Circuit Generally	30	20	40
	Electrical Circuits: Electric Lighting Circuit Generally	30	20	40

	Component	Median Life Expectancy		
		Typical	Min	Max
	HV Cables: Single Core: 1900/3000 grade cable; XPLE insulated LSOH sheathed copper stranded conductors	30	20	35
	LV Cables: Armoured Cable: PVC insulated and sheathed; 600/1000 Volt grade; copper conductor	30	27	45
	LV Cables: Armoured Cable: 600/1000 Volt grade; XLPE insulated; LSOH sheathed; copper stranded conductors; aluminium wire armour	30	27	45
	LV Cables: Fire-rated Cable: Light duty 500 Volt grade LSF sheathed; mineral insulated; copper sheathed with copper conductors	30	22	34
	LV Cables: Un-Armoured Cable: PVC insulated and sheathed single core cables; 300/500 Volt grade; solid or stranded copper	30	20	35
	LV Cables: Lighting Cables: Twin twisted bus; LSF sheathed; aluminium conductor	19	15	21
	Cable Tray: Medium Duty Galvanised Steel: Standard fixings	32	20	40
	Cable Tray: PVCu: Including standard coupling, joints	30	20	35
	Conduit: Heavy Gauged Welded Steel: Black enamelled	40	30	40
	Conduit: Light Gauge High Impact Unscrewed PVC: Surface fixed/in chases to backgrounds; standard boxes and fittings	25	20	35
	Conduit: Flexible Flame Retardant Nylon: Surface fixed to backgrounds; standard components for earth continuity	15	15	20
	Trunking: Galvanised Steel Lighting Trunking: 50x50mm; with PVC/steel lid; jointed with standard connectors	30	20	35
	Trunking: PVCu Straight Mini-Trunking: Clip on lid; fixed to backgrounds; supports and fittings	20	15	27
	Trunking: PVCu Underfloor Trunking: Single compartment	25	20	30
17.06	Fittings			
	Accessories: Controls: Light switch generally	25	15	30
	Accessories: Outlets: Small power socket; switched with neon indicator; 13 Amp metal clad; galvanised steel box/coverplate	25	18	27
	Accessories: Outlets: Industrial power socket; switched; 220-250v; 16 Amp; polycarbonate; splashproof; surface mounted	25	16	27
17.07	Luminaires			
	Luminaires: Fluorescent: Linear lighting; switchstart; CAT2 VDT louvre; recessed	15	10	20

A52825963

	Component	Median Life Expectancy		
		Typical	Min	Max
	Luminaires: Fluorescent Lamp: Generally	3	2	5
	Luminaires: Downlighters Fluorescent Lamp: Control gear; aluminium reflector; recessed; 16w	11	10	17
	Luminaires: Uplighters: Stove enamelled white finish; fluorescent lamp; electronic control gear; aluminium reflector	10	10	15
	Luminaires: Incandescent Light Bulb: Generally	2	1	3
	Luminaires: Floodlighting: Enclosed high performance discharge light; integral control gear; reflector; toughened glass	12	10	20
	Luminaires: Lamp with Movement Detectors: 240v AC; tungsten halogen lamps; passive infra red detector; white plastic	15	10	20
	Accessories: Lighting Track: Low voltage with copper conductors; extruded aluminium with white finish	10	9	15
17.08	Emergency Luminaires			
	Luminaires: Fluorescent: Emergency linear lighting; 3hr duration; electronic control gear; CAT2 VDT louvre	11	10	15
17.99	Other			
18.00	**Communication Systems**			
18.01	Telephone Systems			
	Telephones	20	15	25
18.02	Data Transmission			
	Data transmission	20	15	25
	Data Cabling: Unshielded Twisted Pair: Solid copper conductors; LSOH insulation; Cat5e; 4 pair 24AWG; nom o/s dia. 5.6mm	25	21	29
	Data Cabling: Unshielded Twisted Pair: Solid copper conductors; PVC insulation; Cat6; 4 pair 24AWG; nom o/s dia. 5.6mm; installed above ceiling/in riser/below floor/in trunking	20	17	26
	Data Cabling: Fibre Optic Cable: Tight buffered, internal/external application, single mode, LSOH sheathed	25	15	29
18.03	Paging Systems	20	15	25
18.04	Nurse Call Systems			
18.05	Radio and Television Systems			
18.06	Bedhead Services			
18.99	Other			
19.00	**Alarms and Detection Systems**			
19.01	Fire Alarm Panels			

	Component	Median Life Expectancy		
		Typical	Min	Max
19.02	Fire Alarm Wiring System			
	Smoke Detectors: Ionisation/Optical Type	15	10	20
	Smoke Detectors: Beam Detector: With transmitter and receiver	15	10	20
	Heat Detectors: Rate of Rise Detectors: With mounting base	15	10	20
19.03	Security Systems			
	Security: Access Control: Card entry systems including card slot systems, card monitor systems, and push/touch coded systems; automatic lock/release or open/close mechanisms	15	10	20
	Security: Detection: Equipment including pressure pads, break points, vibration/infra-red/ultra-sonic/movement and heat detectors	15	10	20
	Security: Alarm: Equipment including alarm points, bells, indicator panels and lamps	15	10	20
19.04	CCTV (Internal)			
19.05	Panic Attack System			
19.06	Other Alarm Systems			
19.99	Other			
	Alarms/Detection Systems: Batteries - lead acid	5	3	10
	Alarms/Detection Systems: Batteries - nickel	20	15	25
20.00	**Building Management Control System**			
20.01	Building Management System			
20.99	Other			

Appendix 5: Schedule of rates

	Component	Replacement		Repair/Overhaul	
1.00	**Structure**	**Unit**	**Rate**	**Unit**	**Rate**
1.03	Floors and Stairs				
	Stairs Finishes: Aluminium: Nosings	per tread	£ 40.00		
1.04	Roofs				
1.99	Other				
2.00	**External Fabric**				
2.01	External Walls and Finishes				
	External Wall Structure: Facing Brick: Machine made; pointed	m^2	£ 100.00	m^2	£ 125.00
	Repointing existing brickwork			m^2	£ 24.00
	Insitu Finishes: Self-Coloured Render: 20mm; incl brickwork/blockwork base	m^2	£ 110.00	m^2	£ 137.50
	Insitu Finishes: Tyrolean Decorative Render: 15mm; four coats; incl brickwork/blockwork base	m^2	£ 120.00	m^2	£ 150.00
2.02	Windows and Ironmongery				
	Curtain Walling System: Double Glazed Polyester Powder Coated Aluminium `Stick' System: Medium/high quality standard; 6mm laminate glass; including opaque insulated spandrel panels	m^2	£ 420.00		
	Curtain Walling System: Structural Siliconed Double Glazed Standard `Unitised/Panelled' Assembly: 10mm and 6mm clear and laminate; factory produced; on aluminium frame	m^2	£ 750.00		
	Windows: Softwood Casement: Side hung; hardwood sills; weather-stripping; fitted with fasteners; preservative stained base coat	Nr	£ 510.00	Nr	£ 90.00
	Windows: Polyester Powder Coated Galvanised Steel: Top/side hung; opening lights; weather stripping; frames bed in mastic, pointed one side	Nr	£ 730.00	Nr	£ 90.00
	Windows: Acrylic Finished Aluminium: Vertical or horizontal sliding; plugged and screwed	Nr	£ 640.00	Nr	£ 90.00
	Windows: PVCu Casement: Fixed/tilt and turn light; sills and glazing; EPDM glazing gaskets and weather seals; including all ironmongery	Nr	£ 420.00	Nr	£ 90.00

	Component	Replacement		Repair/Overhaul	
2.03	External Doors and Ironmongery				
	External Door Frames and Lining Sets: Treated Softwood: Standard; primed; untreated hardwood sills	Nr	£ 1,000.00	Nr	£ 300.00
	External Door Frames and Lining Sets: Hardwood: Purpose made; jambs and heads; 50x100mm; as frames; rebated, rounded and grooved	Nr	£ 1,240.00	Nr	£ 300.00
	External Door Frames and Lining Sets: glazed aluminium	Nr	£ 1,540.00	Nr	£ 300.00
	External Door Frames and Lining Sets: flush panelled steel, painted	Nr	£ 1,360.00	Nr	£ 300.00
2.04	External Cladding/Eaves Detail				
	External Wall Coverings: Timber: Board infill panels	m^2	£ 120.00	m^2	£ 150.00
	External Wall Coverings: Tile: Hung infill panels	m^2	£ 220.00	m^2	£ 275.00
	External Wall Coverings: PVF2 Coated Galvanised Steel: Profiled sheet cladding	m^2	£ 130.00	m^2	£ 162.50
	External Wall Coverings: Zinc: Flat Sheeting; 12 gauge; seamed joints	m^2	£ 210.00	m^2	£ 262.50
	External Wall Coverings: Milled Sheet Lead: Flat Sheeting; BS Code 4	m^2	£ 210.00	m^2	£ 262.50
	External Wall Coverings: Precast Concrete Standard Panels: Exposed aggregate finish; insulation; lining and fixings	m^2	£ 270.00	m^2	£ 337.50
	External Wall Coverings: Precast Concrete Brick Clad Panels: Insulation; linings	m^2	£ 330.00	m^2	£ 412.50
	External Wall Coverings: Precast Concrete Natural Stone Faced Panels: Insulation; lining and fixings	m^2	£ 390.00	m^2	£ 487.50
2.05	External Decoration	m	£ 12.00		
	Decoration to timber windows			Nr	£ 20.00
	Decoration to downpipes			m	£ 5.00
	Decoration to external timbers			m^2	£ 10.00
2.99	Other				
3.00	**Roof**				
3.01	Coverings – Pitched				
	Pitched Roof Covering: Tile: Generally	m^2	£ 40.00	m^2	£ 50.00
	Pitched Roof Covering: Slate: Generally	m^2	£ 90.00	m^2	£ 112.50
	Pitched Roof Covering: PVF2 Coated Galvanised Steel: Profiled sheet cladding	m^2	£ 60.00	m^2	£ 75.00

A52825963

	Component	Replacement		Repair/Overhaul	
	Pitched Roof Covering: Milled Sheet Lead: Generally	m^2	£ 130.00	m^2	£ 162.50
	Pitched Roof Covering: Copper: Sheeting generally	m^2	£ 150.00	m^2	£ 187.50
	Pitched Roof Covering: Zinc: Sheeting generally	m^2	£ 130.00	m^2	£ 162.50
3.02	Coverings – Flat				
	Flat Roof Coverings: High Performance Polyester-Based Roofing System: Two layer covering; bonded	m^2	£ 70.00	m^2	£ 87.50
	Flat Roof Coverings: Synthetic Rubber (EPDM): Generally	m^2	£ 110.00	m^2	£ 137.50
	Flat Roof Coverings: Asphalt: Generally	m^2	£ 120.00	m^2	£ 150.00
	Flat Roof Surface Finishes: Solar Reflective Paint: On asphalt surfaces	m^2	£ 20.00	m^2	£ 25.00
3.03	Roof Lights				
	Rooflights: Aluminium: Sloping roof window, frame and opening light; integral internal lining, flashings and soakers; ironmongery; double glazing	Nr	£ 1,270.00	Nr	£ 200.00
3.04	Rainwater Goods				
	Roof Drainage: Powder Coated Aluminium: Pipes/gutters/outlets	m	£ 50.00	m	£ 62.50
	Roof Drainage: Cast Iron: Rainwater pipes/gutters/roof outlets; red lead primer; 2 undercoat and 1 coat gloss paint finish	m	£ 80.00	m	£ 100.00
	Roof Drainage: PVCu: Rainwater pipes/gutters/roof outlets	m	£ 30.00	m	£ 37.50
	Roof Drainage: Lead: Box gutters and flashings	m	£ 200.00	m	£ 250.00
3.05	Chimney Stacks and Parapet Walls				
3.99	Other				
4.00	**Internal Fabric**				
4.01	Internal Walls and Finishes				
	Partitions: Treated Softwood Stud and Plasterboard: 12.7mm gypsum plasterboard; tapered edges; fixed with galvanised nails to softwood; joints filled, taped and flush jointed	m	£ 250.00	Nr	£ 312.50
	Proprietary Partitions: Metal Stud and Plasterboard: 65mm; one hour; one layer 15mm fireline board each side; jointed tapered edge panel	m	£ 290.00	Nr	£ 362.50
	Proprietary Partitions: Laminated Plasterboard: 65mm; 19mm outer layers	m	£ 340.00	Nr	£ 425.00

	Component	Replacement		Repair/Overhaul	
	square edge plank core; 19mm tapered edge plank both sides; softwood plates and battens; flush jointed tapered edge panels				
	De-mountable Partitions: Steel: Generally	m	£ 280.00	Nr	£ 350.00
	De-mountable Partitions: Glass: Generally	m	£ 660.00	Nr	£ 825.00
	Dry Lining: Gyproc Wallboard: Insulating grade, plastic faced; taped joints; for direct decoration	m	£ 130.00	Nr	£ 162.50
	Boarding/Panelling: Hardwood: Tongued and grooved, v-jointed; including battens	m	£ 110.00	Nr	£ 137.50
	Insitu Finishes: Lightweight Plaster: Two coats; to brickwork/blockwork base	m^2	£ 40.00	m^2	£ 50.00
	Rigid Finishes: Glazed Ceramic Tiles: Fixing with adhesive; including backing	m^2	£ 80.00	m^2	£ 100.00
	Rigid Finishes: Granite Cladding: 20mm; polished finish; jointed and pointed in coloured mortar; to cement/sand base	m2	£ 240.00	m^2	£ 300.00
	Rigid Finishes: Marble Cladding: 20mm; polished finish; jointed and pointed in coloured mortar; to cement/sand base	m^2	£ 240.00	m^2	£ 300.00
	Toilet Cubicles	Nr	£ 1,120.00		
	IPS system back panel	Nr	£ 1,150.00		
4.02	Floor Coverings				
	Insitu Screed: Granolithic: 20mm; one coat; cement and granite chippings; laid on concrete	m^2	£ 60.00	m^2	£ 75.00
	Rigid Finishes: Terrazzo Paving: 16mm; pavings divided into panels; on screeded bed	m^2	£ 110.00	m^2	£ 137.50
	Rigid Finishes: Quarry Tiles: 12.5mm; to cement/sand base	m^2	£ 80.00	m^2	£ 100.00
	Rigid Finishes: Parquet: Generally	m^2	£ 110.00	m^2	£ 137.50
	Flexible Tile: Vinyl: Generally	m^2	£ 40.00	m^2	£ 50.00
	Flexible Sheet: Fitted Carpet: Contract heavy quality; wool/nylon carpet	m^2	£ 50.00	m^2	£ 62.50
	Raised Access: Density Particle Board: 30mm panels; light/medium or office grade; 150mm high overall; pedestal supports	m^2	£ 70.00	m^2	£ 87.50
	Floating: Chipboard: 19mm panels nailed to softwood battens; 63mm Durabella flooring system; on concrete floor	m^2	£ 50.00	m^2	£ 62.50
	Skirting: MDF: 25x75mm; polished; incl. grounds	m	£ 20.00	m	£ 25.00

	Component	Replacement		Repair/Overhaul	
	Skirting: Hardwood: 25x100mm; polished; incl. grounds	m	£ 30.00	m	£ 37.50
	Skirting: Plastic: Generally	m	£ 20.00	m	£ 25.00
4.03	Ceilings Finishes				
	Dry Lining: Gypsum: 12.5mm Fireline board; fixing with nails to softwood base	m^2	£ 40.00	m^2	£ 50.00
	Insitu Finishes: Textured Plastic: One coat sealer and one coat Artex; to plasterboard or concrete ceilings	m^2	£ 30.00	m^2	£ 37.50
	Insitu Finishes: Plaster: 5mm; Thistle board; to plasterboard	m^2	£ 20.00	m^2	£ 25.00
	Insitu Finishes: Plaster: 10mm two coat lightweight plaster; to concrete/plasterboard	m^2	£ 40.00	m^2	£ 50.00
4.04	Ceilings - Suspended				
	Suspended Ceilings: Aluminium: 600x600mm tile; concealed/exposed grid; hangers to concrete	m^2	£ 40.00	m^2	£ 50.00
	Suspended Ceilings: Mineral Wool Based: 600x600mm tile; concealed/exposed grid; to concrete	m^2	£ 30.00	m^2	£ 37.50
4.05	Internal Doors and Ironmongery				
	Internal Doors: Softwood: 44mm flush half-hour firecheck door; plywood faced; including ironmongery	Nr	£ 940.00	Nr	£ 320.00
	Internal Doors: Softwood: 54mm flush one-hour firecheck door; wood veneered; including ironmongery	Nr	£ 1,360.00	Nr	£ 320.00
	Internal Doors: Softwood: 54mm flush one-hour firecheck door; wood veneered; including ironmongery, with glazed panel	Nr	£ 1,720.00	Nr	£ 320.00
	Internal Doors: Softwood: 54mm flush one-hour firecheck door; laminate finish; including ironmongery, with glazed panel	Nr	£ 2,080.00	Nr	£ 320.00
	Internal Door: Glass: Including ironmongery; generally	Nr	£ 1,960.00	Nr	£ 320.00
	Roller Shutters/Doors: Metal: Including ironmongery; generally	Nr	£ 1,570.00	Nr	£ 300.00
4.06	Internal Decoration				
	Decorations: Emulsion Paint: to walls and ceilings, gloss to woodwork	floor area	£ 20.00	m^2	£ 10.00
	Decorations: Vinyl Wallpaper: Decorative paper backed; adhesive	m^2	£ 13.00	m^2	£ 20.00
4.99	Other				

A52825963

	Component	Replacement		Repair/Overhaul	
5.00	**Internal Fittings and Fixtures**				
5.01	Sanitary Ware/Fittings				
	Sanitary Fittings: Plastic: Baths, etc	Nr	£ 360.00		
	Sanitary Fittings: Wash Basin: White/coloured vitreous china wash basin	Nr	£ 180.00		
	Sanitary Fittings: Sink: White glazed fireclay Belfast pattern sink	Nr	£ 270.00		
	Sanitary Fittings: WC Suite: White/coloured vitreous china pan, seat and low level streamlined finish plastic cistern	Nr	£ 360.00		
	Sanitary Fittings: Urinal Suite: Single stall urinal; vitreous china	Nr	£ 270.00		
5.02	Unit Furniture				
	Kitchen Fittings: Wall Units: Generally	per m	£ 240.00		
	Kitchen Fittings: Floor Units: Generally	per m	£ 360.00		
	Other built in floor units	per m	£ 420.00		
5.03	Internal Fittings and Furniture				
5.99	Other				
6.00	**External Grounds and Gardens**				
6.01	Landscaping				
	Soil/Waste Stacks: Cast Iron: Pipes incl. fittings; primed; to masonry	m	£ 80.00		
	Soil/Waste Stacks: Polypropylene: Waste pipes and fittings; pipe clips	m	£ 30.00		
6.02	Walls, Fencing and Gates				
	Fencing: Timber Generally	m	£ 60.00		
	Fencing: Steel Generally	m	£ 120.00		
	Fencing: Concrete Chain and Post	m	£ 50.00		
6.03	Roads and Car Parks				
	Roads and Pavings: Insitu Concrete: To car parks generally	m^2	£ 80.00	m^2	£ 100.00
	Roads and Pavings: Tarmac Surface: To car parks generally	m^2	£ 60.00	m^2	£ 75.00
6.04	Paths and Paved Areas				
	Roads and Pavings: Yorkstone Slabs: On blinded hardcore base	m^2	£ 110.00	m^2	£ 137.50
	Roads and Pavings: Precast Concrete Flags: On sand, granular or on blinded hardcore base	m^2	£ 60.00	m^2	£ 75.00
	Roads and Pavings: Precast Concrete Blocks: Rectangular coloured paviors on	m^2	£ 70.00	m^2	£ 87.50

	Component	Replacement		Repair/Overhaul	
	earth base; sand bedding				
	Roads and Pavings: Insitu Concrete: To pathways generally	m^2	£ 80.00	m^2	£ 100.00
6.05	External Fittings and Furniture				
6.06	Ancillary Buildings				
6.99	Other				
7.00	**Drainage and External Services**				
7.01	Drainage/Sewerage				
7.02	External Utilities Infrastructure				
7.03	Site Lighting				
7.04	Lightning Protection				
7.05	CCTV (External)				
7.99	Other				
8.00	**Fuel Storage and Distribution**				
8.01	Fuel Supply/Distribution				
8.02	Storage				
8.99	Other				
9.00	**Boilers and Calorifiers**				
9.01	Boiler Plant				
	Gas/Oil Fired Boilers: Packaged Water Boilers: Gas or oil fired; on/off or high/low type	Nr	£ 18,720.00		
9.02	Pressurisation Plant				
9.03	Calorifiers/Heat Exchangers				
	Storage Cylinders/Calorifiers: Copper: Direct/indirect hot water cylinders; single/double feed; pre-insulated	Nr	£ 1,090.00		
	Heat Exchanger: Packaged Plate: Instantaneous water heaters; primary pump; temperature sensor; thermostatic control panel	Nr	£ 720.00		
9.04	Flues				
	Steam plant: Stainless steel chimneys/flues	Nr	£ 6,640.00		
9.05	Controls/Meters				
9.06	Insulation				
9.99	Other				
10.00	**Steam Systems**				
10.01	Distribution Pipework				
	Steam plant: Steam pipework installations	gifa	£ 30.00		

	Component	Replacement		Repair/Overhaul	
10.02	Valves				
10.03	Controls				
	Steam plant: Control equipment	gifa	£ 40.00		
10.04	Meters				
10.05	Condense Systems				
10.06	Insulation				
10.99	Other				
11.00	**Heating Systems**				
11.01	Distribution Pipework				
11.02	Heat Emitters				
	Heat Emitters: Radiators: Low surface temperature; single panel	Nr	£ 270.00	Nr	£ 337.50
	Heat Emitters: Skirting Heaters: Pressed metal with fins on copper tube	m	£ 110.00	m	£ 137.50
	Heat Emitters: Radiant Strip Heaters: Steel tube aluminium radiant plates incl. insulation, sliding brackets, cover plates, end closures	m	£ 180.00	m	£ 225.00
	Heat Emitters: Electric Convector Heaters: Wall mounted; fixed to structure; 3kW output; integral thermostat	Nr	£ 170.00	Nr	£ 212.50
	Heat Emitters: Electric Storage Heaters: Low level wall mounted; thermostatic controls; fixed to structure	Nr	£ 340.00	Nr	£ 425.00
	Air Curtains: Electrically Heated Commercial Grade: Recessed/exposed units with rigid steel casing; aluminium grilles; high quality motor/centrifugal fan	Nr	£ 2,200.00	Nr	£2,750.00
11.03	Controls				
	Accessories: Controls: Thermostatic radiator valves	Nr	£ 50.00	Nr	£ 62.50
11.04	Heating Pumps				
11.05	Insulation				
11.99	Other				
12.00	**Ventilation Systems**				
12.01	Ventilation Plant				
	Air Handling Units: Modular: Steel framed with plastic coated double skinned insulated panels; access panels; channel base frame; fan with motor; filter; damper; LPHW heating coil; cooling coil	Nr	£ 9,360.00		
	Extract Fans: Centrifugal: Three phase 415v; belt driven; flexible connectors; base frame; anti-vibration mountings	Nr	£ 3,320.00		

A52825963

	Component	Replacement		Repair/Overhaul	
	Roof Extract Fans: Axial Flow: Single phase 240v; controls; glass fibre weather cap and base; bird guard and shutters; kerb mounted	Nr	£ 570.00		
	Toilet Ventilation: Packaged Units	Nr	£ 1,600.00		
12.02	Distribution Ductwork				
	Ductwork: Galvanised Mild Steel: Rectangular low pressure; joints and couplers in the running length incl. stiffeners; access doors and test holes	gifa	£ 40.00		
12.03	Automatic Fire Dampers and Control Panel				
	Fire Dampers: Folding Curtain Type: Galvanised steel casing; stainless steel blades; 4hr fire rating; installation frame; local access door in duct line	Nr	£ 720.00		
12.04	Controls				
12.05	Room Split/Chillers/Compressors				
	Air Conditioning: VAV System: Terminal units (bellows/box type); controls and ancillaries	Nr	£ 4,530.00		
	Air Conditioning: Two-/Four-Pipe Fan Coil System: Wall/ceiling mounted water coil; single phase 240v centrifugal fan; 3 speed regulator	Nr	£ 5,740.00		
	Chilled Water: Chilled Beams: Passive; exposed below/flush ceiling	m	£ 910.00		
12.06	Chillers/Cooling Systems				
	Air Conditioning: Packaged System: External units generally	Nr	£ 3,320.00		
	Central Refrigeration Plant: Packaged Chillers: Air cooled liquid; 3 phase 415v compressor; evaporator; condenser; control panel; acoustic attenuation and anti-vibration mountings	Nr	£ 30,790.00		
12.07	Cooling Towers				
12.99	Other				
13.00	**Medical Gas Systems**				
13.01	Vacuum Insulated Evaporators				
13.02	Distribution				
	Medical Gas: Distribution pipework	gifa	£ 5.00		
13.03	Manifolds				
	Medical Gas: Manifolds	Nr	£ 320.00		
13.04	Gas Cylinder Storage				

	Component	Replacement		Repair/Overhaul	
13.05	Outlets				
	Medical Gas: Outlets	Nr	£ 85.00		
13.06	Alarm Systems				
	Medical Gas: Alarm Systems	Nr	£ 320.00		
13.07	Medical Air Compressors/Vacuum Pumps				
13.99	Other				
14.00	**Hot and Cold Water Systems**				
14.01	Water Storage and Header Tanks				
14.02	Water Treatment Plant				
14.03	Distribution Pipework				
	Pipes: Copper: Pipework generally	gifa	£ 20.00		
14.04	Pumps				
	Pumps: Pipeline Mounted Circulator: For low and medium pressure hot water heating systems	Nr	£ 970.00		
14.05	Valves/Controls				
14.06	Water Heaters				
14.07	Insulation				
14.99	Other				
	Sprinkler Heads: Brass Body with Frangible Glass Bulb: Conventional/ sidewall pattern/satin chrome plated	gifa	£ 20.00		
15.00	**Lifts and Hoists**				
15.01	Passenger Lifts				
	Lifts: Light Passenger: Electric traction operated; single opening; standard finish; internal lighting; fireman's controls; in-car telephone; controls; 630kg, 8 person, 0.63m/s	Floors	£ 18,000.00		
	Lifts: General Purpose Passenger: Electric traction operated; single opening; standard finish; internal lighting; fireman's controls; in-car telephone; controls; 800kg, 10 person, 1.0m/s	Floors	£ 31,000.00		
	Lifts: Intensive Passenger: Electric traction operated; single opening; standard finish; internal lighting; fireman's controls; in-car telephone; controls; 1600kg, 21 person, 2.5m/s	Floors	£ 61,000.00		
15.02	Goods Lifts				
	Lifts: Goods: Electro Hydraulic drive; 2000kg, 0.4m/s, stainless steel car lining; plate floor and galvanised shutters	Floors	£ 49,000.00		

A52825963

	Component	Replacement		Repair/Overhaul	
15.03	Hoists				
	Lifts: Service Hoists: Single speed a/c drive; 250kg, 0.4m/s; single opening; self supporting; free standing steel structure; bi-parting doors with stainless steel finish; intercom	Floors	£ 5,000.00		
15.04	Control Panel				
15.99	Other				
	Escalators: 30 degree inclination; 3.50m vertical rise; 0.5m/s	Floors	£148,000.00		
16.00	**Fixed Plant/Equipment**				
16.01	Sterilizers				
	Sterilizing equipment	Nr	£ 5,000.00		
16.02	Bedpan Disposal				
	Disposal units	Nr	£ 10,000.00		
16.03	Disinfection Equipment				
16.04	Catering Equipment				
	Cooking equipment	Nr	£ 5,000.00		
16.05	Laundry Equipment				
	Washing machines	Nr	£ 3,000.00		
	Other laundry plant	Nr	£ 3,000.00		
16.06	Miscellaneous Equipment				
16.09	Other				
17.00	**Electrical System**				
17.01	HV Network				
17.02	Generators				
	Generator standby prime movers	Nr	£ 78,000.00		
	LV Supply: Standby Generators: Diesel sets; three phase, 440 volt, four wire 50Hz	Nr	£ 15,000.00		
17.03	Switchgear				
	HV Switchgear: Step Down Transformer: 500kVA; 3 Phase 11Kv/433 Volt 50Hz and LV cable boxes; all necessary connections	Nr	£ 78,000.00		
17.04	Distribution Boards				
	LV Distribution: MCB Distribution Board: SPandN; external protection enclosure	Nr	£ 8,000.00		
17.05	Wiring Systems/Bonding				
	Electrical Circuits: Electric Power Circuit Generally	gifa	£ 12.00		

A52825963

	Component	Replacement		Repair/Overhaul	
	Electrical Circuits: Electric Lighting Circuit Generally	gifa	£ 12.00		
17.06	Fittings				
	Accessories: Outlets: Small power socket; switched with neon indicator; 13 Amp metal clad; galvanised steel box/coverplate	gifa	£ 11.00	Nr	£ 42.00
17.07	Luminaires				
	Luminaires: Fluorescent: Linear lighting; switchstart; CAT6 VDT louvre; recessed	gifa	£ 29.00	Nr	£ 310.00
17.08	Emergency Luminaires				
	Luminaires: Fluorescent: Emergency linear lighting; 3hr duration; electronic control gear; CAT2 VDT louvre	gifa	£ 17.00	Nr	£ 280.00
17.99	Other				
18.00	**Communication Systems**				
18.01	Telephone Systems				
	Telephones	Nr	£ 300.00		
18.02	Data Transmission	gifa	£ 12.00		
18.03	Paging Systems	gifa	£ 9.00		
18.04	Nurse Call Systems	gifa	£ 12.00		
18.05	Radio and Television Systems	gifa	£ 4.00		
18.06	Bedhead Services	Nr	£ 3,000.00		
18.99	Other				
19.00	**Alarms and Detection Systems**				
19.01	Fire Alarm Panels	Nr	£ 5,000.00	Nr	6,250.00
19.02	Fire Alarm Wiring System	gifa	£ 12.00		
19.03	Security Systems				
	Security: Access Control: Card entry systems including card slot systems, card monitor systems, and push/touch coded systems; automatic lock/release or open/close mechanisms	Nr	£ 1,000.00	Nr	£1,250.00
	Security: Alarm: Equipment including alarm points, bells, indicator panels and lamps	Nr	£ 1,000.00		
19.04	CCTV (Internal)	Nr	£ 3,000.00		
19.05	Panic Attack System				
19.06	Other Alarm Systems				
19.99	Other				

	Component	Replacement		Repair/Overhaul	
20.00	**Building Management Control System**				
20.01	Building Management System				
20.99	Other				

A52825963

Appendix 6: Condition Indicators

BUILDING ASSETS – WHAT TO LOOK FOR

ELEMENT	SUB-ELEMENT	CONDITION B	CONDITION C	CONDITION D
1. STRUCTURE	1.01 SUB-STRUCTURE	**INDICATORS** • No defect	**INDICATORS** • Partial subsidence noted • Major cost implications	**INDICATORS** • Significant subsidence noted • Replacement is the only option • Substantial/ significant cost implications • Areas of building unusable. Settlement/ deflection/ damage to element(s) is dramatic, immediate repair required
	1.02 FRAMES	**INDICATORS** • No distortion defect • Minimal insect infestation • Some minor repairs may be required • Minimal cost implications for minor repairs only	**INDICATORS** • Frame distortion noted • Insect infestation severe • Timber rot/corrosion evident in many areas • Major cost implications	**INDICATORS** • Significant failure/frame distortion/major rot/corrosion • Inadequate frame design • Significant safety concerns • Replacement is the only option • Significant cost implications
	1.03 FLOORS and STAIRS	**INDICATORS** • No distortion defect • Minimal insect infestation • Some minor repairs may be required • Minimal cost implications for minor repairs only • Crazing of the floor slab/screed/finish with no evidence of structural failure	**INDICATORS** • Floor distortion note/bowing of floor joists • Floor plates corroded/distorted • Insect infestation severe • Timber rot/corrosion evident in many areas • Major cost implications • Crazing of the floor slab/screed/finish, evidence of structural failing/sagging	**INDICATORS** • Significant failure/frame distortion/major rot/corrosion • Inadequate frame design • Significant safety concerns • Replacement is the only option • Substantial/significant cost implications • Cracking or spalling of concrete surfaces. Deterioration of sub-flooring that restricts/stops the use of the area
	1.04 ROOFS	**INDICATORS** • No distortion defect • Minimal insect infestation • Some minor repairs may be required • Minimal cost implications for minor repairs only	**INDICATORS** • Frame distortion noted • Bowing of roof timbers • Insect infestation severe • Timber rot/corrosion evident in many areas • Major cost implications	**INDICATORS** • Significant failure/frame distortion/major rot/ corrosion • Inadequate frame design • Significant safety concerns • Replacement is the only option • Substantial/significant cost implications

BUILDING ASSETS – WHAT TO LOOK FOR

ELEMENT	SUB-ELEMENT	CONDITION B	CONDITION C	CONDITION D
2. EXTERNAL FABRIC	2.01 EXTERNAL WALLS and FINISHES	**INDICATORS** • Minimal deterioration of brickwork rendering sound • Pointing good or minimal improvement required • Any defects repaired to provide continued life as new • Finish defects on wall surface requiring cosmetic repairs. Filling required • Minimal cost implications for minor repairs only	**INDICATORS** • Rendering loose and cracked • Extended areas of pointing required • Major cost implications	**INDICATORS** • Brickwork finishes failed • Significant areas of rendering loose/cracked/ missing • Substantial/significant cost implications • Holes through wall and major areas exposed to the weather. Damage to underlying structure, with materials loose and failing. Potentially unsafe condition
	2.02 WINDOW and IRONMONGERY	**INDICATORS** • Minimal deterioration, seals and mechanisms in good order • Some minor repairs may be required • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Frame and mechanisms showing obvious signs of fatigue • Rot/corrosion evident in many areas • Timber cracking and breaking up • Patch repairs becoming untenable • Some windows are broken or loose. Condition detracts from appearance. Potential risk to the security of building • Major cost implications	**INDICATORS** • Significant failure/major rot/corrosion • Significant safety concerns • Replacement is the only option • Major cost implications • Windows inadequate for intended function. Do not meet Building/Safety requirements. Unable to secure facility. Little of no protection offered from outside elements
	2.03 EXTERNAL DOORS and IRONMONGERY	**INDICATORS** • Minimal deterioration, seals and mechanisms in good order • Some minor repairs may be required • Minimal cost implications for minor repairs only	**INDICATORS** • Door and mechanisms showing obvious signs of fatigue • Physical impact/ damage obvious • Rot evident or door stiles weak • Major cost implications • Significant number of doors are broken or inoperable. Security risk exists. Components in need of repair	**INDICATORS** • Significant failure/major rot • Significant safety concerns • Replacement is the only option • Major cost implications • Doors inadequate for intended function. Does not meet Building/Safety requirements. Unable to secure facility. Little of no protection offered from outside element
	2.04 EXTERNAL CLADDING/ EAVES DETAIL	**INDICATORS** • Minimal deterioration • Some minor repairs may be required • Minimal cost implications for minor repairs only	**INDICATORS** • showing obvious signs of fatigue/ damage • Rot/cracking evident • Missing sections and fixings • Major cost implications	**INDICATORS** • Significant failure/major rot/damage • Significant safety concerns • Replacement is the only option • Major cost implications
	2.05 EXTERNAL DECORATION	**INDICATORS** • Recent décor within last six months	**INDICATORS** • Wear and tear obvious	**INDICATORS** • Significant peeling of paint/coatings or missing finish. Grubby wall finishes

BUILDING ASSETS – WHAT TO LOOK FOR

ELEMENT	SUB-ELEMENT	CONDITION B	CONDITION C	CONDITION D
3. ROOF	3.01 COVERINGS - PITCHED	**INDICATORS** • Minimal deterioration. Slates/ tiles generally all securely fixed • Cement pointing good and no improvement required • Sarking felt in good condition • 'Torching' mortar behind the slated in good condition • No indication of damp patches • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only • Coverings/Flashings showings signs of failure. Some replacement needed	**INDICATORS** • Roof leaks apparent • Cracked/looses/slipped slates/tiles • Tile fatigue beginning. Moderate safety concerns • Ridge tiles loose/missing • Gable edge cement finishes loose/cracked/ missing • 'Torching' mortar behind the slates crumbling • Sarking felt torn and deteriorating • Major cost implications • Covering defects allowing leakage through roof. Flashing failures with water penetration	**INDICATORS** • Serious level of roof leaks apparent • Significant cracked/loose/ slipped/missing slates/ tiles • Tile fatigue evident. Serious safety concerns • Ridge tiles loose/missing • Gable edge cement finishes loose/cracked/ missing • 'Torching' mortar behind the slates mostly missing • Sarking felt rotten • Replacement or removal/ reinstatement is the only option • Large areas of covering deterioration, leakage through roof. Flashing/ covering missing with water directly in contact with roof structure • Major cost implications
	3.02 COVERINGS - FLAT	**INDICATORS** • Minimal deterioration • Some minor repairs to rectify bubbles etc may be required • Reflective finish in place • Good provision of chippings to built-up felt roofs • Any defects repaired so as to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Roof leaks apparent • Cracking evident to roofing material • Increased level of bubbling to roofing material • Significant pooling of surface water • Bitumastic showing signs of breaking down • Recoating of reflective finish is required • Provision of chippings to built-up felt roofs sparse • Built-up felt edge lifting • Major cost implications	**INDICATORS** • Serious level of roof leaks apparent • Significant level of cracking evident to roofing material • Significant level of bubbling of roofing material • Badly distorted surface • Bitumastic broken down • Reflective finish worn completely away • No provision of chippings to built-up felt roofs • Built-up felt edge lifting • Replacement is the only option • Major cost implications
	3.03 ROOF LIGHT	**INDICATORS** • Minimal deterioration. Seals and any opening mechanisms in good order • Any defects repaired so as to provide continued life as new • Minimal cost implications	**INDICATORS** • Cracked or broken glazing • Partly discoloured/ warped polycarbonate • Leaks at joints apparent • Major cost implications	**INDICATORS** • Cracked or broken glazing • Blackened/discoloured/ warped polycarbonate • Leaks at joints apparent • Replacement in the only option • Major cost implication
	3.04 RAINWATER GOODS	**INDICATORS** • Minimal deterioration • Some minor repairs may be required • Any defects repaired	**INDICATORS** • Showing obvious signs of fatigue • Joints leaking • Mountings starting to	**INDICATORS** • Significant failure/missing sections • Joints failed • Mountings failed

BUILDING ASSETS – WHAT TO LOOK FOR

ELEMENT	SUB-ELEMENT	CONDITION B	CONDITION C	CONDITION D
		so as to provide continued life as new • Minimal cost implications for minor repairs only	fail • Broken/missing sections • Major cost implications	• Replacement in the only option • Major cost implication
	3.05 CHIMNEY STACKS and PARAPET WALLS	**INDICATORS** • Minimal deterioration • Some minor repairs may be required • Any defects repaired so as to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Evidence of deterioration, corrosion, cracking of brickwork/ stonework etc • Evidence of corrosion to base of chimney/flue • Gassing from base of chimney	**INDICATORS** • Evidence of significant deterioration, corrosion, cracking of brickwork/ stonework etc • Major cost implication
4. INTERNAL FABRIC	4.01 INTERNAL WALLS and FINISHES	**INDICATORS** • Minimal deterioration. Plaster and other finishes sound but minor repairs may be required • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Plaster and other finishes starting to fail. Bonding of finish loose • Some areas of bulging plasterwork • Wall cracks significant • Major cost implications	**INDICATORS** • Large areas of sub-standard finish • Bulging plasterwork • Wall cracks severe • Replacement is the only option • Major cost implications
	4.02 FLOOR COVERINGS	**INDICATORS** • Minimal deterioration. Normal wear and tear • Some minor repairs may be required to joints etc • Minimal cost implications for minor repairs only	**INDICATORS** • Extensive wear either in patches or overall • Patch repair • Non-slip function worn • Taped over cracks/ loose finishes • Major cost implications	**INDICATORS** • Significant failure – holes in floor coverings • Significant safety concerns. Non-slip function not evident • Replacement is the only option • Major cost implications
	4.03 CEILINGS FINISHES	**INDICATORS** • Minimal deterioration. Plaster and other finishes • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Plaster and other finishes starting to fail. Bonding of finish loose • Some areas of bulging plasterwork • Ceiling cracks significant • Major cost implications	**INDICATORS** • Large areas of sub-standard finish • Bulging plasterwork • Ceiling cracks severe • Replacement is the only option • Major cost implications
	4.04 CEILINGS – SUSPENDED Be aware of possible asbestos	**INDICATORS** • Minimal deterioration. Suspended tiles • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Suspended tiles starting to fail. Deformed tiles, broken edges • Over painted ceiling tiles • Major cost implications	**INDICATORS** • Large areas failing. Deformed tiles, broken edges • Replacement is the only option • Major cost implications
	4.05 INTERNAL DOORS and	**INDICATORS** • Door furniture of	**INDICATORS** • Door furniture failing or	**INDICATORS** • Significant failure

A52825963

BUILDING ASSETS – WHAT TO LOOK FOR

ELEMENT	SUB-ELEMENT	CONDITION B	CONDITION C	CONDITION D
	IRONMONGERY	good standard	failed in parts • Door surface has been damaged/holed. Door still operates • Mechanism showing obvious signs of fatigue	• Door operation present a clear and eminent hazard to building occupants • Ironmongery broken and requires replacement
	4.06 INTERNAL DECORATION	**INDICATORS** • Recent décor within last six months	**INDICATORS** • Wear and tear obvious	**INDICATORS** • Significant peeling of paint/coatings or missing finish. Grubby/torn wall finishes
5. INTERNAL FITTINGS and FIXTURES	5.01 SANITARY WARE/FITTINGS	**INDICATORS** • Minimal damage or faulty fittings • Drawing off points generally good shut-off • Minimal cost implications for minor repairs only	**INDICATORS** • Damaged of faulty fittings • Plastic cisterns tired and worn • External staining from overflows • Draw off points generally poor shut-off • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Broken fittings • Extensive failure of draw-off points • Parts obsolete • Replacement is the only option • Major cost implications
	5.02 UNIT FURNITURE	**INDICATORS** • Doors and worktops and fitted cupboards etc have minimal wear and tear • Minimal cost implications for minor repairs only	**INDICATORS** • Doors and fitted cupboards etc in poor condition damaged and/or hinges worn and loose • Worktops worn and damaged • Units tired • Major cost implications	**INDICATORS** • Significant damage to doors and fitted cupboards etc • Door hinges falling apart • Worktops worn and damaged • Units tired • Replacement is the only option • Major cost implications
	5.03 INTERNAL FITTINGS and FURNITURE	**INDICATORS** • Fittings and furniture have minimal wear and tear • Minimal cost implications for minor repairs only	**INDICATORS** • Fittings and furniture in poor condition damaged and/or hinges worn and loose • Furniture tired • Major cost implications	**INDICATORS** • Replacement is the only option • Furniture falling apart • Significant damage to internal fittings • Major cost implications
6. EXTERNAL GROUNDS and GARDEN	6.01 LANDSCAPING	**INDICATORS** • Some minor weeding and pruning required • Minimal cost implications for minor repairs only	**INDICATORS** • Significantly overgrown and excessive weeds • Major cost implications	**INDICATORS** • Poor condition creating potential hazard • Major cost implications
	6.02 WALLS, FENCING and GATES	**INDICATORS** • Walls and features have minimal defects • Some minor repairs may be required • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Wall and features have flaking/crumbling brickwork and showing significant signs of deterioration • Patch repairs becoming untenable • Major cost implications • Bent, damaged or rusty components	**INDICATORS** • Walls and features/ brickwork failed • Walls bulging/leaning and/or unstable • Significant areas of rendering loose/cracked/ missing • Significant safety concerns • Major cost implications • Significant failure/corrosion

BUILDING ASSETS – WHAT TO LOOK FOR

ELEMENT	SUB-ELEMENT	CONDITION B	CONDITION C	CONDITION D
			• Sections missing or failing with some missing sections • Distorted installation	• Collapsed fencing – large sections missing
	6.03 ROADS and CAR PARKS	**INDICATORS** • Minimal deterioration to surface finish • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Crumbling surface finish with potholes and severe damage to surface • Compressed stone finish badly distorted with heavy surface water pooling • Significant damage to kerbs and edgings – twisted/broken off or sunk • Major cost implications	**INDICATORS** • Surface totally disintegrated • Severe and significant damage to kerbs and edgings – missing/ twisted • Major cost implications
	6.04 PATHS AND PAVED AREAS	**INDICATORS** • Minimal deterioration to finished level • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Significant number of cracked/broken paving slabs • Surface level distorted with raised/sunk edges • Compressed stone finish badly distorted with heavy surface water pooling • Significant damage to kerbs and edgings – twisted/broken off or sunk • Major cost implications	**INDICATORS** • Severe and significant damage – cracked/ broken paving slabs • Surface totally disintegrated • Severe and significant damage to kerbs and edgings – missing/ twisted/broken off or sunk • Major cost implications
	6.05 EXTERNAL FITTINGS and FIXTURES	**INDICATORS** • Minimal deterioration • Some minor repairs may be required • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Excessively worn and tired fittings and fixtures • Significant signs of deterioration • Major cost implications	**INDICATORS** • Severe damage, requires replacement • Poor condition creating potential hazard • Major cost implications
	6.06 ANCILLARY BUILDINGS	**INDICATORS** • Minimal deterioration • Some minor repairs may be required • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Showing obvious signs of fatigue/damage • Rot/corrosion/cracking evident • Major cost implications	**INDICATORS** • Severe damage, requires replacement • Poor condition creating potential hazard • Major cost implications • Significant failure/frame distortion/major rot/ corrosion • Inadequate design • Significant safety concerns • Replacement is the only option

ENGINEERING ASSETS – WHAT TO LOOK FOR

ELEMENT	SUB-ELEMENT	CONDITION B	CONDITION C	CONDITION D
7. DRAINAGE and EXTERNAL SERVICES	7.01 DRAINAGE/ SEWERAGE	**INDICATORS** • Minimal deterioration • No indication of system problems • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Manholes/culverts – flaking/crumbling brickwork and showing signs of major deterioration • Corroded manhole frames • Collapsed sections giving rise to system problems – repeated jetting/unblocking required • Tree root invasion • Internal drainage systems leaking and failing • Major cost implications	**INDICATORS** • Failure of large sections of drainage system • Significant tree root invasion • Substantial/significant cost implications
	7.02 EXTERNAL UTILITIES INFRA-STRUCTURE	**INDICATORS** • No indication of system problems • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Electrical systems test certificates • Silt issues with incoming water supply	**INDICATORS** • Failure of electrical or water supply • Substantial/ significant cost implication
	7.03 SITE LIGHTING	**INDICATORS** • Visual observation indicated adequate lighting levels for safe working and movement • Lighting in corridors and circulation/waiting areas provides good coverage with no shadows (shadows can cause difficulties for partially sighted people) • Computer workstations – based on a risk assessment, LG3 compliant luminaires or diffusers have been provided Guidance on lighting levels is found in CIBSE guide – 'Code for lighting'	**INDICATORS** • Visual observation indicates work areas gloomy • Very old lighting • Luminaires diffusers discoloured • None or erratic provision of LG3 luminaires or diffusers at computer workstation • Likely impact of impending legislation	**INDICATORS** • Significant deviances from requirements
	7.04 LIGHTING PROTECTION	**INDICATORS** • Installation of BS6651 • Test records available • Adequate earth resistance path	**INDICATORS** • Poor reliability record • Corrosion evident at joints • Inadequate earth resistance path • Inadequate test records • Major cost implications	**INDICATORS** • System failed – not able to offer adequate protection in line with BS6651 • Major cost implications
	7.05 CCTV (EXTERNAL)	**INDICATORS** • Any defects repaired to provided continued as new life • Minimal cost implications for minor repairs only	**INDICATORS** • Repeated faults to wiring systems • Poor reliability record • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Wiring failed • Equipment failed • Replacement in the only option • Major cost

ENGINEERING ASSETS – WHAT TO LOOK FOR

ELEMENT	SUB-ELEMENT	CONDITION B	CONDITION C	CONDITION D
				implications
8. FUEL STORAGE and DISTRIBUTION	8.01 FUEL SUPPLY/ STORAGE/ DISTRIBUTION (GAS)	**INDICATORS** • Correctly installed (supports) • Minimal cost implications for minor repairs only • Test records on gas tightness up-to-date • Propane installation sound	**INDICATORS** • Evidence of pipework corrosion • Pipework supports failing • Major cost implications • Serious evidence of corrosion to pipework/ storage vessels	**INDICATORS** • Severe/significant evidence of pipework corrosion • Replacement in the only option • Major cost implications
9. BOILERS and CALORIFIERS	9.01 BOILER PLANT	**INDICATORS** • Good reliability record • Covers in place and components in working order • Service of plant noted – steam boiler inspection/water treatment information available • Maintenance of components may be required (e.g. leaking valves etc.) • Mountings fixings and flue guards are secure and in place • Any defects repaired to provided continued as new life • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Records indicate inadequate water treatment etc • Covers in poor condition (dented or missing) • Insulation missing • Leeks to boiler section • Repeated problems with burners • Flue mounting fixings are not secure – evidence of corrosion noted • Flue guards are damaged or missing • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Records indicate inadequate water treatment etc • Significant boiler leaks • Significant safety concerns – high production of carbon monoxide. Burners corroded and difficult to maintain combustion conditions • Replacement in the only option • Controls/parts obsolete • Major cost implications
	9.02 PRESSUR-ISATION PLANT	**INDICATORS** • Minimal deterioration • Any defects repaired to provided continued as new life • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Persistent failure • Major cost implications	**INDICATORS** • Very poor reliability record • Units failed • Major cost implications
	9.03 CALORIFIERS/ HEAT EXCHANGER	**INDICATORS** • Good reliability record • Maintenance of components may be required (e.g. leaking valves etc.) • Mountings, fixings and guards/insulation is secure and in place • Compliance with legionellae design guidance • Any defects repaired to provided continued as new life • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Mountings, fixings and guards/insulation not secure/missing • Persistent leaks • Non-compliance with legionellae design guidance, e.g. SHTM 2040 'The control of legionellae in healthcare premises' • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Plant in very poor condition with missing covers/ insulation etc • Repeated failure of heat exchanger bundle • Non-compliance with legionellae design guidance • Controls/parts obsolete • Replacement is the only option • Major cost implications

A52825963

ENGINEERING ASSETS – WHAT TO LOOK FOR

ELEMENT	SUB-ELEMENT	CONDITION B	CONDITION C	CONDITION D
	9.04 FLUES	**INDICATORS** • Minimal deterioration • Any defects repaired to provided continued as new life • Minimal cost implications for minor repairs only	**INDICATORS** • Evidence of deterioration, corrosion, cracking of brickwork/ stonework etc • Evidence of corrosion to base of chimney/flue • Gassing from base of chimney	**INDICATORS** • Evidence of significant deterioration, corrosion, cracking of brickwork/ stonework • Major cost implications
	9.05 CONTROLS/ METERS	**INDICATORS** • Good reliability record • Effective operation • Maintenance of components may be required (e.g. motorised valves etc) • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Controls on override – automatic control failed • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Total failure of control system – not operating within design parameters • Controls/parts obsolete • Replacement is the only option • Major cost implications
	9.06 INSULATION	**INDICATORS** • Insulation in good order • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Insulation damaged/ missing sections • Major cost implications	**INDICATORS** • Insulation severely damaged or missing completely • Replacement is the only option • Major cost implications
10. STEAM SYSTE,MS	10.01 DISTRIBUTION PIPEWORK	**INDICATORS** • Good reliability record • Maintenance of components may be required (e.g. leaking valves etc) • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Evidence of extensive pipework corrosion/ leaks • Major cost implications	**INDICATORS** • Very poor reliability record • Evidence of major system leaks • Replacement is the only option • Major cost implications
	10.02 VALVES	**INDICATORS** • Minimal deterioration • Maintenance of components may be required (e.g. leaking valves) • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only • Complies with legionellae design guidance	**INDICATORS** • Severe corrosion • Break-up of glass/ reinforced plastic • Failure of lining • Leaks at tank/joints or pipework connections • Non-compliance with legionellae design practice • Major cost implications	**INDICATORS** • Water storage tank failed • Replacement is the only option • Major cost implications

ENGINEERING ASSETS – WHAT TO LOOK FOR

ELEMENT	SUB-ELEMENT	CONDITION B	CONDITION C	CONDITION D
	10.03 CONTROLS	**INDICATORS** • Good reliability record • Effective operation • Maintenance of components may be required (e.g. motorised valves) • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Controls on override – automatic control failed • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Total failure of control systems – not operating within design parameters • Controls/parts obsolete • Replacement is the only option • Major cost implications
	10.04 METERS	**INDICATORS** • Good reliability record • Effective operation • Maintenance of components may be required (e.g. motorised valves) • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Controls on override – automatic control failed • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Total failure of control systems – not operating within design parameters • Controls/parts obsolete • Replacement is the only option • Major cost implications
	10.05 CONDENSATE SYSTEMS	**INDICATORS** • Good reliability record • Maintenance of components may be required (e.g. leaking valves) • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Evidence of extensive pipework corrosion/ leaks • Major cost implications	**INDICATORS** • Very poor reliability record • Evidence of major system leaks • Replacement is the only option • Major cost implications
	10.06 INSULATION	**INDICATORS** • Insulation in good order • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Insulation damaged/ missing sections • Major cost implications	**INDICATORS** • Insulation severely damaged or missing completely • Major cost implications
	11.01 DISTRIBUTION PIPEWORK	**INDICATORS** • Good reliability record • Maintenance of components may be required (e.g. leaking valves) • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Evidence of extensive pipework corrosion/ leaks • Major cost implications	**INDICATORS** • Very poor reliability record • Evidence of major system leaks • Replacement is the only option • Major cost implications

ENGINEERING ASSETS – WHAT TO LOOK FOR

ELEMENT	SUB-ELEMENT	CONDITION B	CONDITION C	CONDITION D
11. HEATING SYSYEMS	11.02 HEAT EMITTERS	**INDICATORS** • Good reliability record • Covers in place and components in working order • Fan convector noise levels within limits • Maintenance of components may be required (e.g. leaking valves etc) • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Covers in poor condition (dented or missing) • Fan convector noise levels excessive • Evidence of corrosion to heating elements • Partial replacement of heat emitters/pipework • Major cost implications	**INDICATORS** • Very poor reliability record • Significant leakage • Replacement is the only option • Major cost implications
	11.03 CONTROLS	**INDICATORS** • Good reliability record • Effective operation • Maintenance of components may be required (e.g. motorised valves etc) • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Controls in override – automatic control failed • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Total failure of control system – not operating within design parameters • Controls/parts obsolete • Replacement is the only option • Major cost implications
	11.04 HEATING PUMPS	**INDICATORS** • Good reliability record • Maintenance of pump seals may be required • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record. Motor windings failing (earth leakage) • Pump leaks evident • Part failure of pumping sets	**INDICATORS** • Very poor reliability record • Pump units failed/ seized/leaking • Replacement is the only option • Major cost implications
	11.05 INSULATION	**INDICATORS** • Insulation in good order • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Insulation damaged/ missing sections • Major cost implications	**INDICATORS** • Insulation severely damaged or missing completely • Replacement is the only option • Major cost implications

ENGINEERING ASSETS – WHAT TO LOOK FOR

ELEMENT	SUB-ELEMENT	CONDITION B	CONDITION C	CONDITION D
12. VENTILATIONS SYSTEMS	12.01 VENTILATION PLANT	**INDICATORS** • Good plant reliability record • Mountings fixings/guards are secure • Access door/seals acceptable • Maintenance of components may be required (e.g. drainage traps/leaking valves etc) • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Noisy fan units • Mounting fixings failing (anti-vibration mountings etc) • Access door/seals failed • Drainage traps failed/ inadequate design • Evidence of corrosion noted to plant • Air filter units failing (obvious pass-through) • Humidification systems failed • Significant leaks to heating/cooling systems • Parts difficult to obtain or obsolete • Does not comply with ventilation design guide SHTM 2025 • Does not comply with legionellae design guidance e.g. SHTM 2040 • Major cost implications	**INDICATORS** • Very poor reliability record • Significant safety concerns • Controls/parts obsolete • Replacement is the only option • Major cost implications
	12.02 DISTRIBUTION DUCTWORK	**INDICATORS** • Good reliability record • Maintenance of components may be required (e.g. leaking valves etc) • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Evidence of extensive leaks and sagging ductwork • Major cost implications • Does not comply with ventilation design guide SHTM 2025	**INDICATORS** • Very poor reliability record • Evidence of major system leaks – pressurisation problems • Replacement is the only option • Major cost implications
	12.03 AUTOMATIC FIRE DAMPERS and CONTROL PANEL	**INDICATORS** • Good reliability record • Effective operation • Maintenance of components may be required (e.g. motorised valves etc) • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Controls on override – automatic control failed • Parts difficult to obtain or obsolete • Major cost implications • Does not comply with ventilation design guide SHTM 2025	**INDICATORS** • Very poor reliability record • Total failure of control system • Controls/parts obsolete • Replacement is the only option • Major cost implications

ENGINEERING ASSETS – WHAT TO LOOK FOR

ELEMENT	SUB-ELEMENT	CONDITION B	CONDITION C	CONDITION D
	12.04 CONTROLS	**INDICATORS** • Good reliability record • Effective operation • Maintenance of components may be required (e.g. motorised valves etc) • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Controls on override – automatic control failed • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Total failure of control system • Controls/parts obsolete • Replacement is the only option • Major cost implications
	12.05 ROOM SPLIT/CHILLERS/ COMPRESSORS	**INDICATORS** • Good reliability record • Mounting fixings/guards are secure • Minimal vibration • Maintenance of components may be required (e.g. leaking chilled water valves etc) • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Unable to maintain set temperatures • Mounting fixings failing (e.g. anti-vibration mountings etc) • Persistent oil leaks • Significant leaks to chilled water cooling systems • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • General plant failure • Controls/parts obsolete • Replacement is the only option • Major cost implications
	12.06 CHILLERS/ COOLING SYSTEMS	**INDICATORS** • Good plant reliability record • Mounting fixings/guards are secure • Access door/seals acceptable • Water spray systems functioning correctly • Chemical closing equipment operating correctly • Maintenance of components may be required (e.g. leaking chilled water valves etc) • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Significant evidence of deterioration/corrosion • Access door/seals failing • Water spray systems corroding and ineffective • Repeated failure to maintain biocide levels at specific limits • Chemical closing equipment failing • Significant leaks • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Severe corrosion/ deterioration • General plant failure • Controls/parts obsolete • Replacement is the only option • Major cost implications
	12.07 COOLING TOWERS	**INDICATORS** • Good plant reliability record • Legionella testing shows system is unsuitable for purpose	**INDICATORS** • Poor reliability record • Legionella testing shows system is medium risk – not designed in accordance with SHTM 2040 • Major cost implications	**INDICATORS** • Very poor reliability record • Legionella testing shows system is high risk – not designed in accordance with SHTM 2040 • Major cost implications

ENGINEERING ASSETS – WHAT TO LOOK FOR

ELEMENT	SUB-ELEMENT	CONDITION B	CONDITION C	CONDITION D
13. MEDICAL GAS SYSTEMS	13.01 VACUUM INSULATER EVAPORATORS	**INDICATORS** • Installation to SHTM 2022 'Medical gas pipeline systems' • Mountings/fixings etc are secure and in place • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Installation not to SHTM 2022 • Failure of bursting disc • Failure of vaporiser • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Installation inappropriate for use • Replacement is the only option • Repeated failure of vaporiser • Significant cost implications
	13.02 DISTRIBUTION	**INDICATORS** • Installation to SHTM 2022 • Mountings/fixings etc are secure and in place • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Installation not to SHTM 2022 • Pipework installation badly distorted • Persistent leaks at valve units • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Installation inappropriate for use • Replacement is the only option • Major cost implications
	13.03 MANIFOLDS	**INDICATORS** • Good plant reliability record • Any defects repaired to provide continued life as new • Cylinder mounts provided with safety chains • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Tailpipes – repeated failure • Changeover valves controls – repeated failure • Persistent leaks • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • General plant failure • Controls/parts obsolete • Replacement is the only option • Major cost implications
	13.04 GAS CYLINDER STORAGE	**INDICATORS** • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Persistent leaks at outlets • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Persistent leaks at outlets • Controls/parts obsolete • Replacement is the only option • Major cost implications
	13.05 OUTLETS	**INDICATORS** • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Persistent leaks at outlets • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Persistent leaks at outlets • Controls/parts obsolete • Replacement is the only option • Major cost implications

A52825963

ENGINEERING ASSETS – WHAT TO LOOK FOR

ELEMENT	SUB-ELEMENT	CONDITION B	CONDITION C	CONDITION D
	13.06 ALARM SYSTEM	**INDICATORS** • Effective operation • Maintenance of components may be required • Any defects repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Alarm system repeated failure • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Total failure of alarm system • Controls/parts obsolete • Replacement is the only option • Major cost implications
	13.07 MEDICAL AIR COMPRESSORS/ VACUUM PUMPS	**INDICATORS** • Good plant reliability record • Mountings fixings/guards are secure • Minimal vibration • Maintenance of components may be required • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Unable to maintain set pressures • Mounting fixings failing (anti-vibration mountings etc) • Persistent oil leaks • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • General plant failure • Controls/parts obsolete • Replacement is the only option • Major cost implications
14. HOT and COLD WATER SYSTEMS	14.01 DHW/ WATER STORAGE and HEADER TANKS	**INDICATORS** • Minimal deterioration • Maintenance of components may be required (e.g. leaking valves etc) • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only • Complies with legionellae design guidance	**INDICATORS** • Severe corrosion • Break-up of glass/ reinforced plastic • Failure of lining • Leaks at tank/joints or pipework connections • Non-compliance with legionellae design guidance, not designed in accordance with SHTM 2040 and SHTM 2027 • Major cost implications	**INDICATORS** • Major storage tank failed • Replacement is the only option • Major cost implications
	14.02 WATER TREATMENT PLANT	**INDICATORS** • Good reliability record • Effective operation • Maintenance of components may be required • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Inability to maintain adequate levels of soft water output • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Unit failed. Cannot produce soft water • Replacement is the only option • Major cost implications
	14.03 DISTRIBUTION PIPEWORK	**INDICATORS** • Good reliability record • Maintenance of components may be required (e.g. leaking valves etc) • Minimal cost implications for minor repairs only	**INDICATORS** • Evidence of pipework corrosion • Pipework supports failing • Major cost implications	**INDICATORS** • Severe/significant evidence of pipework corrosion • Replacement is the only option • Major cost implications

ENGINEERING ASSETS – WHAT TO LOOK FOR

ELEMENT	SUB-ELEMENT	CONDITION B	CONDITION C	CONDITION D
	14.04 PUMPS	**INDICATORS** • Good reliability record • Maintenance of pump seals may be required • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record – motor windings failing (earth leakage) • Pumps leaking significantly • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Pump units failed/ seized/leaking • Replacement is the only option • Major cost implications
	14.05 VALVE CONTROLS	**INDICATORS** • Good reliability record • Effective operation • Maintenance of components may be required (e.g. motorised valves etc) • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Controls on override – automatic control failed • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Total failure of control system • Controls/parts obsolete • Replacement is the only option • Major cost implications
	14.06 WATER HEATERS	**INDICATORS** • Good reliability record • Effective operation	**INDICATORS** • Poor reliability record • Sentinel taps do not meet legionella regulations • Major cost implications	**INDICATORS** • Very poor reliability record • Major cost implications
	14.07 INSULATION	**INDICATORS** • Insulation in good order • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Insulation damaged/ missing sections • Major cost implications	**INDICATORS** • Insulation severely damaged or missing completely • Replacement is the only option • Major cost implications
15. LIFTS and HOISTS	15.01 PASSENGER LIFTS	**INDICATORS** • Installed to current guidance • Good plant reliability record • Minimal deterioration/ damage • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Significant wear and tear • Door mechanism slack/ badly worn • Safety gate mechanism badly worn • Frequent breakdowns • Persistent oil leaks • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Significant safety concern • Controls/parts obsolete • Replacement is the only option • Major cost implications

ENGINEERING ASSETS – WHAT TO LOOK FOR

ELEMENT	SUB-ELEMENT	CONDITION B	CONDITION C	CONDITION D
	15.02 GOODS LIFTS	**INDICATORS** • Good plant reliability record • Minimal deterioration/ damage • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Significant wear and tear • Door mechanism slack/ badly worn • Safety gate mechanism badly worn • Frequent breakdowns • Persistent oil leaks • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Significant safety concern • Controls/parts obsolete • Replacement is the only option • Major cost implications
	15.03 HOISTS	**INDICATORS** • Good plant reliability record • Minimal deterioration/ damage • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Significant wear and tear • Door mechanism slack/ badly worn • Safety gate mechanism badly worn • Frequent breakdowns • Persistent oil leaks • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Significant safety concern • Controls/parts obsolete • Replacement is the only option • Major cost implications
	15.04 CONTROL PANEL	**INDICATORS** • Good plant reliability record • Effective operation • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Repeated control failure • Parts difficult to obtain or obsolete • Poor electrical safety • Major cost implications	**INDICATORS** • Very poor reliability record • Total failure of control system • Controls/parts obsolete • Replacement is the only option • Major cost implications
16. FIXED PLANT / EQUIPMENT	16.01 STERILISERS	**INDICATORS** • Good reliability record • Covers in place and equipment in good working order • Minimal deterioration • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Equipment repeatedly failing • Repeated difficulty in meeting test requirements as detailed in current published guidance e.g. SHTM 2010 'Sterilization' • Covers in poor condition (dented or missing) • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Equipment failed • Replacement is the only option • Substantial/ significant cost implications

ENGINEERING ASSETS – WHAT TO LOOK FOR

ELEMENT	SUB-ELEMENT	CONDITION B	CONDITION C	CONDITION D
	16.02 BEDPAN DISPOSAL	**INDICATORS** • Good reliability record • Minimal deterioration • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Equipment repeatedly failing • Repeated difficulty in meeting test requirements as detailed in current published guidance e.g. SHTM 2030 'Washer-disinfectors' (not macerators) • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Equipment failed • Replacement is the only option • Major cost implications
	16.03 DISINFECTION EQUIPMENT	**INDICATORS** • Good reliability record • Minimal deterioration • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Equipment repeatedly failing • Repeated difficulty in meeting test requirements as detailed in current published guidance e.g. SHTM 2030 • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Equipment failed • Replacement is the only option • Major cost implications
	16.04 CATERING EQUIPMENT	**INDICATORS** • Good reliability record • Covers in place and equipment in good working order • Minimal deterioration • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Equipment repeatedly failing • Covers in poor condition (dented or missing) • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Equipment failed • Replacement is the only option • Major cost implications
	16.05 LAUNDRY EQUIPMENT	**INDICATORS** • Good reliability record • Covers in place and equipment in good working order • Minimal deterioration • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Equipment repeatedly failing • Covers in poor condition (dented or missing) • Parts difficult to obtain or obsolete	**INDICATORS** • Very poor reliability record • Equipment failed • Replacement is the only option • Major cost implications

ENGINEERING ASSETS – WHAT TO LOOK FOR

ELEMENT	SUB-ELEMENT	CONDITION B	CONDITION C	CONDITION D
	16.05 MISC-ELLANEOUS EQUIPMENT	**INDICATORS** • Good reliability record • Minimal deterioration • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Equipment repeatedly failing • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Equipment failed • Replacement is the only option • Major cost implications
17. ELECTRICAL SYSTEMS	17.01 HV NETWORK	**INDICATORS** • Good reliability record • Minimal deterioration • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Equipment failed • Replacement is the only option • Major cost implications
	17.02 GENERATORS	**INDICATORS** • Good reliability record • Minimal deterioration • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Generator repeatedly failing • Not able to maintain rated output • Oil leaks • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Equipment failed • Replacement is the only option • Major cost implications
	17.03 SWITCHGEAR	**INDICATORS** • Installation to BS7671 • Lockable provision • Circuit schedules up-to-date and posted • Electrical installation test records available • Adequate signs and signals • Evidence of bonding (non-invasive observation) • Minimal deterioration • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Installation not fully in accordance with BS7671 • Inadequate barriers • Switches not lockable • Circuit schedules out-of-date/missing • Electrical installation test records not available • Inadequate signs and signals • No evidence of bonding (non-invasive observation) • Major cost implications	**INDICATORS** • Installation not in accordance with BS7671 • Electrical installation test records not available • Major cost implications

ENGINEERING ASSETS – WHAT TO LOOK FOR

ELEMENT	SUB-ELEMENT	CONDITION B	CONDITION C	CONDITION D
	17.04 DISTRIBUTION BOARDS	**INDICATORS** • Installation to BS7671 • Lockable provision • Circuit schedules up-to-date and posted • Electrical installation test records available • Adequate signs and signals • Evidence of bonding (non-invasive observation) • Minimal deterioration • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Installation not fully in accordance with BS7671 • Inadequate barriers • Distribution boards not lockable • Circuit schedules out-of-date/missing • Electrical installation test records not available • Inadequate signs and signals • No evidence of bonding (non-invasive observation) • Major cost implications	**INDICATORS** • Installation not in accordance with BS7671 • Electrical installation test records not available • Major cost implications
	17.05 WIRING SYSTEM/ BONDING	**INDICATORS** • Installation to BS7671 • Electrical installation test records available • Evidence of bonding (non-invasive observation) • Minimal deterioration • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Installation not fully in accordance with BS7671 • Electrical installation test records not available • Bonding erratic • Major cost implications	**INDICATORS** • Installation not in accordance with BS7671 • Electrical installation test records not available • Major cost implications • No bonding
	17.06 FITTINGS	**INDICATORS** • Good reliability record • Minimal deterioration • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Equipment failed • Replacement is the only option • Major cost implications
	17.07 LUMINAIRES	**INDICATORS** • Installation to BS7671 • Electrical installation test records available • Minimal deterioration • Minimal cost implications for minor repairs only • Any defect repaired to provide continued life as new • Luminaire diffusers in place and not discoloured • Adequate signs and signals	**INDICATORS** • Poor reliability record • Luminaires failing with replacements notes over time • Luminaire diffusers part missing/discoloured • Controls/parts difficult to obtain or obsolete • Inadequate test records • Major cost implications	**INDICATORS** • Luminaire diffusers missing/discoloured/ damaged • Luminaires generally failed with replacements over time • Replacement is the only option • Controls obsolete • Components not available • Major cost implications

ENGINEERING ASSETS – WHAT TO LOOK FOR

ELEMENT	SUB-ELEMENT	CONDITION B	CONDITION C	CONDITION D
	17.08 EMERGENCY LUMINAIRES	**INDICATORS** • Installation to BS5266-1 • Operating within design parameters • Test records available • Minimal deterioration • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Still operating within design parameters but high maintenance requirements • Luminaires starting to fail • Diffusers discoloured • Controls/parts difficult to obtain or obsolete • Inadequate test records • Major cost implications	**INDICATORS** • Luminaires failed • Controls obsolete • Components not available • Major cost implications
18. COMMUNICATION SYSTEMS	18.01 TELEPHONE SYSTEMS	**INDICATORS** • Minimal deterioration • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Wiring failed • Equipment failed • Replacement is the only option • Major cost implications
	18.02 DATA TRANSMISSION	**INDICATORS** • Minimal deterioration • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Wiring failed • Equipment failed • Replacement is the only option • Major cost implications
	18.03 PAGING SYSTEM	**INDICATORS** • Minimal deterioration • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Wiring failed • Equipment failed • Replacement is the only option • Major cost implications
	18.04 NURSE CALL SYSTEM	**INDICATORS** • Minimal deterioration • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Wiring failed • Equipment failed • Replacement is the only option • Major cost implications

ENGINEERING ASSETS – WHAT TO LOOK FOR

ELEMENT	SUB-ELEMENT	CONDITION B	CONDITION C	CONDITION D
	18.05 RADIO and TELEVISION SYSTEMS	**INDICATORS** • Minimal deterioration • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Wiring failed • Equipment failed • Replacement is the only option • Major cost implications
	18.06 BEDHEAD SERVICES	**INDICATORS** • Good reliability record • Minimal deterioration • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Parts difficult to obtain or obsolete • Not designed in accordance with SHTM 2020 • Major cost implications	**INDICATORS** • Very poor reliability record • Equipment failed • Replacement is the only option • Major cost implications
19. ALARMS and DETECTION SYSTEMS	19.01 FIRE ALARM PANELS/ SYSTEMS/ DETECTORS	**INDICATORS** • Installation in accordance with HTM 82 'Alarm and detection systems'/ BS 5839-1* • Effective test regimes • Test records available • Minimal deterioration • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Installation not in accordance with HTM82/BS 5839-1 • Minimal provision of automatic detection – simple break glass units (BGU) and heat detectors* • Fire panels not to current standards. Poor reliability record • System deterioration with repeated failures • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Significant deviances from requirements • No fire alarm system installed* • Equipment failed • Major cost implications
	19.02 FIRE ALARM PANELS and WIRING SYSTEMS	**INDICATORS** • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Repeated faults to wiring systems • Poor reliability record • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Wiring failed • Equipment failed • Replacement is the only option • Major cost implications
	19.03 SECURITY SYSTEMS	**INDICATORS** • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Repeated faults to wiring systems • Poor reliability record • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Wiring failed • Equipment failed • Replacement is the only option • Major cost implications

ENGINEERING ASSETS – WHAT TO LOOK FOR

ELEMENT	SUB-ELEMENT	CONDITION B	CONDITION C	CONDITION D
	19.04 OTHER ALARM SYSTEMS (E.g. CCTV/PANIC ALARM)	**INDICATORS** • Any defect repaired to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Repeated faults to wiring systems • Poor reliability record • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Wiring failed • Equipment failed • Replacement is the only option • Major cost implications
20. BUILDING MANAGEMENT CONTROL SYSTEM	20.01 BUILDING MANAGEMENT SYSTEM – DISTRIBUTION NETWORK	**INDICATORS** • Good reliability record • Minimal deterioration • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Connections/ terminations/joints repeatedly failing • Cable supports/tray collapsing/corroding • Not designed in accordance with SHTM 2005 • Major cost implications	**INDICATORS** • Very poor reliability record • Wiring failed • Equipment failed • Not designed in accordance with SHTM 2005 • Replacement is the only option • Major cost implications
	20.02 BUILDING MANAGEMENT SYSTEM – HEAD END CONTROL	**INDICATORS** • Good reliability record • Any defects repaired as on-going maintenance to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Equipment repeatedly failing • Not designed in accordance with SHTM 2005 • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Equipment failed • Not designed in accordance with SHTM 2005 • Replacement is the only option • Major cost implications
	20.03 BUILDING MANAGEMENT SYSTEM – ZONE CONTROL PANELS (OUTSTATIONS)	**INDICATORS** • Good reliability record • Minimal deterioration • Any defects repaired as on-going maintenance to provide continued life as new • Minimal cost implications for minor repairs only	**INDICATORS** • Poor reliability record • Equipment repeatedly failing • Not designed in accordance with SHTM 2005 • Parts difficult to obtain or obsolete • Major cost implications	**INDICATORS** • Very poor reliability record • Equipment failed • Not designed in accordance with SHTM 2005 • Replacement is the only option • Major cost implications

Appendix 7: Example proforma

Urgent issues proforma

Site Name:		Block Name:	
Site Address:		Block No:	
Post Code:		Surveyor Name:	
Site Reference No (SRN):		Survey Date:	

Any urgent issues of note regarding Health and Safety, Maintenance etc which may affect the staff, patients or any others visiting or working in or around the property, or the Operational capacity of the property, should be notified as a matter of urgency, quoting Site name and detailed location of problem.

NHS Board: .....

Contact Name: .....

Telephone No:.....

Email Address: .....

Urgent Issues

	Date	Time	Surveyor
Urgent issues notified by telephone:			
Urgent issues notified by email:			

Proforma data collection sheet for Physical Condition: external areas

Site Name:		Block Name:		Surveyor Name:	
				Survey Date:	
Site Address:		Block No:		Build Year:	
		Block Type:		Block Historic Listing:	
Post Code:		Location Level (Survey Block):		Block Floor Area (GIA) m2	
Site Reference No (SRN):				Cost Base Date:	Quarter II 2010 (BCIS)
Site Type:		Contact Name:		Contact Email:	
NHS Board:		Contact Tel No:		Weather Conditions:	

CLASSIFICATION CATEGORY:

A	Excellent/as new condition (generally <2 years old) Expected to perform as intended over its expected useful life
B	Satisfactory condition with evidence of only minor deterioration Element/sub-element is operational and performing as intended
C	Poor condition with evidence of major defects Element/sub-element remains operational but is currently in need of major repair or replacement
D	Unacceptable condition, non-operational or about to fail Has reached end of its useful life
DX	Supplementary rating added to D only to indicate that it is impossible to improve without replacement

Element		Sub Element		ELEMENT RANK	SUB-ELEMENT CONDITION RANKING A, B, C, D OR DX	REMAINING LIFE (YEARS) FOR EACH SUB-ELEMENT WILL REMAIN IN CONDITION B	COSTS (£000's) TO UPGRADE SUB-ELEMENTS FROM C, D, OR DX TO CONDITIOIN RANKING B AND RANKING B <5 YEARS REMAINING LIFE	NOTES: INFORMATION ON THE NATUIRE NAD LOCATION OF THE REQUIRED RECTIFICATION WORK, AND QUALITY OF ANY REMEDIAL WORK	REMEDIAL ACTION – NO ACTION REQUIRED, OVERHAUL / REPAIR, REPLACE OR FURTHER INVESTIGATIOINS REQUIRED	URGENT ISSUE REPORTED (✓)	CONSEQUENCE (1-5) B (<5 YEARS), C, D, AND DX ONLY	LIKELIHOOD (1-5) B (<5 YEARS), C, D, AND DX ONLY
6.0	EXTERNAL GROUNDS and GARDENS	6.01	Landscaping									
		6.02	Walls, Fencing and Gates									
		6.03	Roads and Car Parks									
		6.04	Paths and Paved Areas									
		6.05	External Fittings and Furniture									
		6.06	Ancillary Buildings									
		6.99	Other									

RISK ASSESSMENT (RANKING B, C, D and DX ONLY)

CONSEQUENCE		LIKELIHOOD			
Score	Consequence	Score	Likelihood	Indicator	Estimated time to failure
1	Insignificant	1	Rare	No or minimal remedial action required and / or new / recent upgrade	Circa >10 years
2	Minor	2	Unlikely	Normal wear and tear; sound; operationally safe and exhibits only minor deterioration	Circa 4-6 years
3	Moderate	3	Possible	Reasonable physical damage/deterioration	Circa 2-4 years
4	Major	4	Likely	Major physical damage/deterioration failure apparent/assessed as imminent or unacceptable	Circa 1-2 years
5	Catastrophic	5	certain	Failure has occurred; unacceptable	Circa < 1 year

A52825963

Proforma data collection sheet for Physical Condition: building envelope

Site Name:		Block Name:		Surveyor Name:	
				Survey Date:	
Site Address:		Block No:		Build Year:	
		Block Type:		Block Historic Listing:	
Post Code:		Location Level (Survey Block):		Block Floor Area (GIA) m2	
Site Reference No (SRN):				Cost Base Date:	Quarter II 2010 (BCIS)
Site Type:		Contact Name:		Contact Email:	
NHS Board:		Contact Tel No:		Weather Conditions:	

CLASSIFICATION CATEGORY:

A	Excellent/as new condition (generally <2 years old) Expected to perform as intended over its expected useful life
B	Satisfactory condition with evidence of only minor deterioration Element/sub-element is operational and performing as intended
C	Poor condition with evidence of major defects Element/sub-element remains operational but is currently in need of major repair or replacement
D	Unacceptable condition, non-operational or about to fail Has reached end of its useful life
DX	Supplementary rating added to D only to indicate that it is impossible to improve without replacement

Element		Sub Element		ELEMENT RANK	SUB-ELEMENT CONDITION RANKING A, B, C, D OR DX	REMAINING LIFE (YEARS) FOR EACH SUB-ELEMENT WILL REMAIN IN CONDITION B	COSTS (£000's) TO UPGRADE SUB-ELEMENTS FROM C, D, OR DX TO CONDITIOIN RANKING B AND RANKING B <5 YEARS REMAINING LIFE	NOTES: INFORMATION ON THE NATUIRE NAD LOCATION OF THE REQUIRED RECTIFICATION WORK, AND QUALITY OF ANY REMEDIAL WORK	REMEDIAL ACTION – NO ACTION REQUIRED, OVERHAUL/ REPAIR, REPLACE OR FURTHER INVESTIGATIOINS REQUIRED	URGENT ISSUE REPORTED (✓)	CONSEQUENCE (1-5) B (<5 YEARS), C, D, AND DX ONLY	LIKELIHOOD (1-5) B (<5 YEARS), C, D, AND DX ONLY
1.0	STRUCTURE	1.01	Sub structure									
		1.02	Frames									
		1.03	Floors and stairs									
		1.04	Roofs									
		1.99	Other									
2.0	EXTERNAL FABRIC	2.01	External Walls and Finishes									
		2.02	Windows and Ironmongery									
		2.03	External doors and ironmongery									
		2.04	External cladding/ eaves details									
		2.05	External decoration									
		2.99	Other									
3.0	ROOF	3.01	Coverings – pitched									
		3.02	Coverings – flat									
		3.03	Roof lights									
		3.04	Rainwater goods									
		3.05	Chimney stacks and parapet walls									
		3.99	Other									

RISK ASSESSMENT (RANKING B, C, D and DX ONLY)

CONSEQUENCE		LIKELIHOOD			
Score	Consequence	Score	Likelihood	Indicator	Estimated time to failure
1	Insignificant	1	Rare	No or minimal remedial action required and / or new / recent upgrade	Circa >10 years
2	Minor	2	Unlikely	Normal wear and tear; sound; operationally safe and exhibits only minor deterioration	Circa 4-6 years
3	Moderate	3	Possible	Reasonable physical damage/deterioration	Circa 2-4 years
4	Major	4	Likely	Major physical damage/deterioration failure apparent/assessed as imminent or unacceptable	Circa 1-2 years
5	Catastrophic	5	certain	Failure has occurred; unacceptable	Circa < 1 year

A52825963

Proforma data collection sheet for physical condition: internal elements

Site Name:		Block Name:		Surveyor Name:	
				Survey Date:	
Site Address:		Block No:		Build Year:	
		Block Type:		Block Historic Listing:	
Post Code:		Location Level (Survey Block):		Block Floor Area (GIA) m2	
Site Reference No (SRN):				Cost Base Date:	Quarter II 2010 (BCIS)
Site Type:		Contact Name:		Contact Email:	
NHS Board:		Contact Tel No:		Weather Conditions:	

CLASSIFICATION CATEGORY:

A	Excellent/as new condition (generally <2 years old) Expected to perform as intended over its expected useful life
B	Satisfactory condition with evidence of only minor deterioration Element/sub-element is operational and performing as intended
C	Poor condition with evidence of major defects Element/sub-element remains operational but is currently in need of major repair or replacement
D	Unacceptable condition, non-operational or about to fail Has reached end of its useful life
DX	Supplementary rating added to D only to indicate that it is impossible to improve without replacement

Element		Sub Element		ELEMENT RANK	SUB-ELEMENT CONDITION RANKING A, B, C, D OR DX	REMAINING LIFE (YEARS) FOR EACH SUB-ELEMENT WILL REMAIN IN CONDITION B	COSTS (£000's) TO UPGRADE SUB-ELEMENTS FROM C, D, OR DX TO CONDITIOIN RANKING B AND RANKING B <5 YEARS REMAINING LIFE	NOTES: INFORMATION ON THE NATUIRE NAD LOCATION OF THE REQUIRED RECTIFICATION WORK, AND QUALITY OF ANY REMEDIAL WORK	REMEDIAL ACTION – NO ACTION REQUIRED, OVERHAUL/ REPAIR, REPLACE OR FURTHER INVESTIGATIOINS REQUIRED	URGENT ISSUE REPORTED (✓)	CONSEQUENCE (1-5) B (<5 YEARS), C, D, AND DX ONLY	LIKELIHOOD (1-5) B (<5 YEARS), C, D, AND DX ONLY
4.0	INTERNAL FABRIC	4.01	Internal walls and finishes									
		4.02	Floor coverings									
		4.03	Ceiling finishes									
		4.04	Ceilings – suspended									
		4.05	Internal doors and ironmongery									
		4.06	Internal decoration									
		4.99	Other									
5.0	INTERNAL FITTINGS and FIXTURES	5.01	Sanitary ware/ fittings									
		5.02	Unit furniture									
		5.03	Internal fittings and fixtures									
		5.99	Other									

RISK ASSESSMENT (RANKING B, C, D and DX ONLY)

CONSEQUENCE		LIKELIHOOD			
Score	Consequence	Score	Likelihood	Indicator	Estimated time to failure
1	Insignificant	1	Rare	No or minimal remedial action required and / or new / recent upgrade	Circa >10 years
2	Minor	2	Unlikely	Normal wear and tear; sound; operationally safe and exhibits only minor deterioration	Circa 4-6 years
3	Moderate	3	Possible	Reasonable physical damage/deterioration	Circa 2-4 years
4	Major	4	Likely	Major physical damage/deterioration failure apparent/assessed as imminent or unacceptable	Circa 1-2 years
5	Catastrophic	5	certain	Failure has occurred; unacceptable	Circa < 1 year

A52825963

Proforma data collection sheet for physical condition: engineering services

Site Name:		Block Name:		Surveyor Name:	
				Survey Date:	
Site Address:		Block No:		Build Year:	
		Block Type:		Block Historic Listing:	
Post Code:		Location Level (Survey Block):		Block Floor Area (GIA) m2	
Site Reference No (SRN):				Cost Base Date:	Quarter II 2010 (BCIS)
Site Type:		Contact Name:		Contact Email:	
NHS Board:		Contact Tel No:		Weather Conditions:	

CLASSIFICATION CATEGORY:

A	Excellent/as new condition (generally <2 years old) Expected to perform as intended over its expected useful life
B	Satisfactory condition with evidence of only minor deterioration Element/sub-element is operational and performing as intended
C	Poor condition with evidence of major defects Element/sub-element remains operational but is currently in need of major repair or replacement
D	Unacceptable condition, non-operational or about to fail Has reached end of its useful life
DX	Supplementary rating added to D only to indicate that it is impossible to improve without replacement

Element		Sub Element		ELEMENT RANK	SUB-ELEMENT CONDITION RANKING A, B, C, D OR DX	REMAINING LIFE (YEARS) FOR EACH SUB-ELEMENT WILL REMAIN IN CONDITION B	COSTS (£000's) TO UPGRADE SUB-ELEMENTS FROM C, D, OR DX TO CONDITIOIN RANKING B AND RANKING B <5 YEARS REMAINING LIFE	NOTES: INFORMATION ON THE NATUIRE NAD LOCATION OF THE REQUIRED RECTIFICATION WORK, AND QUALITY OF ANY REMEDIAL WORK	REMEDIAL ACTION – NO ACTION REQUIRED, OVERHAUL/ REPAIR, REPLACE OR FURTHER INVESTIGATIOINS REQUIRED	URGENT ISSUE REPORTED (✓)	CONSEQUENCE (1-5) B (<5 YEARS), C, D, AND DX ONLY	LIKELIHOOD (1-5) B (<5 YEARS), C, D, AND DX ONLY
7.0	DRAINAGE and EXTERNAL SERVICES	7.01	Drainage/ sewerage									
		7.02	External utilities infrastructure									
		7.03	Site lighting									
		7.04	Lighting protection									
		7.05	CCTV (External)									
		7.99	Other									
8.0	FUEL STORAGE and DISTRIBUTION	8.01	Fuel supply/ storage/distribution									
		8.02	DHW Storage/non-storage									
		8.99	Other									

RISK ASSESSMENT (RANKING B, C, D and DX ONLY)

CONSEQUENCE		LIKELIHOOD			
Score	Consequence	Score	Likelihood	Indicator	Estimated time to failure
1	Insignificant	1	Rare	No or minimal remedial action required and / or new / recent upgrade	Circa >10 years
2	Minor	2	Unlikely	Normal wear and tear; sound; operationally safe and exhibits only minor deterioration	Circa 4-6 years
3	Moderate	3	Possible	Reasonable physical damage/deterioration	Circa 2-4 years
4	Major	4	Likely	Major physical damage/deterioration failure apparent/assessed as imminent or unacceptable	Circa 1-2 years
5	Catastrophic	5	certain	Failure has occurred; unacceptable	Circa < 1 year

A52825963

Site Name:		Block Name:		Surveyor Name:	
				Survey Date:	
Site Address:		Block No:		Build Year:	
		Block Type:		Block Historic Listing:	
Post Code:		Location Level (Survey Block):		Block Floor Area (GIA) m2	
Site Reference No (SRN):				Cost Base Date:	Quarter II 2010 (BCIS)
Site Type:		Contact Name:		Contact Email:	
NHS Board:		Contact Tel No:		Weather Conditions:	

CLASSIFICATION CATEGORY:

A	Excellent/as new condition (generally <2 years old) Expected to perform as intended over its expected useful life
B	Satisfactory condition with evidence of only minor deterioration Element/sub-element is operational and performing as intended
C	Poor condition with evidence of major defects Element/sub-element remains operational but is currently in need of major repair or replacement
D	Unacceptable condition, non-operational or about to fail Has reached end of its useful life
DX	Supplementary rating added to D only to indicate that it is impossible to improve without replacement

Element		Sub Element		ELEMENT RANK	SUB-ELEMENT CONDITION RANKING A, B, C, D OR DX	REMAINING LIFE (YEARS) FOR EACH SUB-ELEMENT WILL REMAIN IN CONDITION B	COSTS (£000's) TO UPGRADE SUB-ELEMENTS FROM C, D, OR DX TO CONDITIOIN RANKING B AND RANKING B <5 YEARS REMAINING LIFE	NOTES: INFORMATION ON THE NATUIRE NAD LOCATION OF THE REQUIRED RECTIFICATION WORK, AND QUALITY OF ANY REMEDIAL WORK	REMEDIAL ACTION – NO ACTION REQUIRED, OVERHAUL/ REPAIR, REPLACE OR FURTHER INVESTIGATIOINS REQUIRED	URGENT ISSUE REPORTED (✓)	CONSEQUENCE (1-5) B (<5 YEARS), C, D, AND DX ONLY	LIKELIHOOD (1-5) B (<5 YEARS), C, D, AND DX ONLY
9.0	BOILERS and CALORIFIERS	9.01	Boiler Plant									
		9.02	Pressurisation Plant									
		9.03	Calorifiers / Heat Exchangers									
		9.04	Flues									
		9.05	Controls / Meters									
		9.06	Insulation									
		9.99	Other									
10.0	STEAM SYSTEMS	10.01	Distribution Pipework									
		10.02	Valves									
		10.03	Controls									
		10.04	Meters									
		10.05	Condense Systems									
		10.06	Insulation									
		10.99	Other									

RISK ASSESSMENT (RANKING B, C, D and DX ONLY)

CONSEQUENCE		LIKELIHOOD			
Score	Consequence	Score	Likelihood	Indicator	Estimated time to failure
1	Insignificant	1	Rare	No or minimal remedial action required and / or new / recent upgrade	Circa >10 years
2	Minor	2	Unlikely	Normal wear and tear; sound; operationally safe and exhibits only minor deterioration	Circa 4-6 years
3	Moderate	3	Possible	Reasonable physical damage/deterioration	Circa 2-4 years
4	Major	4	Likely	Major physical damage/deterioration failure apparent/assessed as imminent or unacceptable	Circa 1-2 years
5	Catastrophic	5	certain	Failure has occurred; unacceptable	Circa < 1 year

A52825963

Site Name:		Block Name:		Surveyor Name:	
				Survey Date:	
Site Address:		Block No:		Build Year:	
		Block Type:		Block Historic Listing:	
Post Code:		Location Level (Survey Block):		Block Floor Area (GIA) m2	
Site Reference No (SRN):				Cost Base Date:	Quarter II 2010 (BCIS)
Site Type:		Contact Name:		Contact Email:	
NHS Board:		Contact Tel No:		Weather Conditions:	

CLASSIFICATION CATEGORY:

A	Excellent/as new condition (generally <2 years old) Expected to perform as intended over its expected useful life
B	Satisfactory condition with evidence of only minor deterioration Element/sub-element is operational and performing as intended
C	Poor condition with evidence of major defects Element/sub-element remains operational but is currently in need of major repair or replacement
D	Unacceptable condition, non-operational or about to fail Has reached end of its useful life
DX	Supplementary rating added to D only to indicate that it is impossible to improve without replacement

Element		Sub Element		ELEMENT RANK	SUB-ELEMENT CONDITION RANKING A, B, C, D OR DX	REMAINING LIFE (YEARS) FOR EACH SUB-ELEMENT WILL REMAIN IN CONDITION B	COSTS (£000's) TO UPGRADE SUB-ELEMENTS FROM C, D, OR DX TO CONDITIOIN RANKING B AND RANKING B <5 YEARS REMAINING LIFE	NOTES: INFORMATION ON THE NATUIRE NAD LOCATION OF THE REQUIRED RECTIFICATION WORK, AND QUALITY OF ANY REMEDIAL WORK	REMEDIAL ACTION – NO ACTION REQUIRED, OVERHAUL/ REPAIR, REPLACE OR FURTHER INVESTIGATIOINS REQUIRED	URGENT ISSUE REPORTED (✓)	CONSEQUENCE (1-5) B (<5 YEARS), C, D, AND DX ONLY	LIKELIHOOD (1-5) B (<5 YEARS), C, D, AND DX ONLY
11.0	HEATING SYSTEMS	11.01	Distribution pipework									
		11.02	Heat emitters									
		11.03	Controls									
		11.04	Heating pumps									
		11.05	Insulation									
		11.99	Other									
12.0	VENTILATION SYSTEMS	12.01	Ventilation plant									
		12.02	Distribution ductwork									
		12.03	Automatic fire dampers and control panel									
		12.04	Controls									
		12.05	Room split/chillers/ compressors									
		12.06	Chillers/cooling system									
		12.07	Cooling towers									
		12.99	Other									

RISK ASSESSMENT (RANKING B, C, D and DX ONLY)

CONSEQUENCE		LIKELIHOOD			
Score	Consequence	Score	Likelihood	Indicator	Estimated time to failure
1	Insignificant	1	Rare	No or minimal remedial action required and / or new / recent upgrade	Circa >10 years
2	Minor	2	Unlikely	Normal wear and tear; sound; operationally safe and exhibits only minor deterioration	Circa 4-6 years
3	Moderate	3	Possible	Reasonable physical damage/deterioration	Circa 2-4 years
4	Major	4	Likely	Major physical damage/deterioration failure apparent/assessed as imminent or unacceptable	Circa 1-2 years
5	Catastrophic	5	certain	Failure has occurred; unacceptable	Circa < 1 year

A52825963

Site Name:		Block Name:		Surveyor Name:	
				Survey Date:	
Site Address:		Block No:		Build Year:	
		Block Type:		Block Historic Listing:	
Post Code:		Location Level (Survey Block):		Block Floor Area (GIA) m2	
Site Reference No (SRN):				Cost Base Date:	Quarter II 2010 (BCIS)
Site Type:		Contact Name:		Contact Email:	
NHS Board:		Contact Tel No:		Weather Conditions:	

CLASSIFICATION CATEGORY:

A	Excellent/as new condition (generally <2 years old) Expected to perform as intended over its expected useful life
B	Satisfactory condition with evidence of only minor deterioration Element/sub-element is operational and performing as intended
C	Poor condition with evidence of major defects Element/sub-element remains operational but is currently in need of major repair or replacement
D	Unacceptable condition, non-operational or about to fail Has reached end of its useful life
DX	Supplementary rating added to D only to indicate that it is impossible to improve without replacement

Element		Sub Element		ELEMENT RANK	SUB-ELEMENT CONDITION RANKING A, B, C, D OR DX	REMAINING LIFE (YEARS) FOR EACH SUB-ELEMENT WILL REMAIN IN CONDITION B	COSTS (£000's) TO UPGRADE SUB-ELEMENTS FROM C, D, OR DX TO CONDITIOIN RANKING B AND RANKING B <5 YEARS REMAINING LIFE	NOTES: INFORMATION ON THE NATUIRE NAD LOCATION OF THE REQUIRED RECTIFICATION WORK, AND QUALITY OF ANY REMEDIAL WORK	REMEDIAL ACTION – NO ACTION REQUIRED, OVERHAUL/ REPAIR, REPLACE OR FURTHER INVESTIGATIOINS REQUIRED	URGENT ISSUE REPORTED (✓)	CONSEQUENCE (1-5) B (<5 YEARS), C, D, AND DX ONLY	LIKELIHOOD (1-5) B (<5 YEARS), C, D, AND DX ONLY
13.0	MEDICAL GAS SYSTEMS	13.01	Vacuum insulated evaporators									
		13.02	Distribution									
		13.03	Manifolds									
		13.04	Gas cylinder storage									
		13.05	Outlets									
		13.06	Alarm systems									
		13.07	Medical air compressors/ vacuum pumps									
		13.99	Other									
14.0	HOT and COLD WATER SYSTEMS	14.01	Water storage and header tanks									
		14.02	Water treatment plant									
		14.03	Distribution pipework									
		14.04	Pumps									
		14.05	Valves/controls									
		14.06	Water heaters									
		14.07	Insulation									
		14.99	Other									

RISK ASSESSMENT (RANKING B, C, D and DX ONLY)

CONSEQUENCE		LIKELIHOOD			
Score	Consequence	Score	Likelihood	Indicator	Estimated time to failure
1	Insignificant	1	Rare	No or minimal remedial action required and / or new / recent upgrade	Circa >10 years
2	Minor	2	Unlikely	Normal wear and tear; sound; operationally safe and exhibits only minor deterioration	Circa 4-6 years
3	Moderate	3	Possible	Reasonable physical damage/deterioration	Circa 2-4 years
4	Major	4	Likely	Major physical damage/deterioration failure apparent/assessed as imminent or unacceptable	Circa 1-2 years
5	Catastrophic	5	certain	Failure has occurred; unacceptable	Circa < 1 year

A52825963

Site Name:		Block Name:		Surveyor Name:	
				Survey Date:	
Site Address:		Block No:		Build Year:	
		Block Type:		Block Historic Listing:	
Post Code:		Location Level (Survey Block):		Block Floor Area (GIA) m2	
Site Reference No (SRN):				Cost Base Date:	Quarter II 2010 (BCIS)
Site Type:		Contact Name:		Contact Email:	
NHS Board:		Contact Tel No:		Weather Conditions:	

CLASSIFICATION CATEGORY:

A	Excellent/as new condition (generally <2 years old) Expected to perform as intended over its expected useful life
B	Satisfactory condition with evidence of only minor deterioration Element/sub-element is operational and performing as intended
C	Poor condition with evidence of major defects Element/sub-element remains operational but is currently in need of major repair or replacement
D	Unacceptable condition, non-operational or about to fail Has reached end of its useful life
DX	Supplementary rating added to D only to indicate that it is impossible to improve without replacement

Element		Sub Element		ELEMENT RANK	SUB-ELEMENT CONDITION RANKING A, B, C, D OR DX	REMAINING LIFE (YEARS) FOR EACH SUB-ELEMENT WILL REMAIN IN CONDITION B	COSTS (£000's) TO UPGRADE SUB-ELEMENTS FROM C, D, OR DX TO CONDITIOIN RANKING B AND RANKING B <5 YEARS REMAINING LIFE	NOTES: INFORMATION ON THE NATUIRE NAD LOCATION OF THE REQUIRED RECTIFICATION WORK, AND QUALITY OF ANY REMEDIAL WORK	REMEDIAL ACTION – NO ACTION REQUIRED, OVERHAUL/ REPAIR, REPLACE OR FURTHER INVESTIGATIOINS REQUIRED	URGENT ISSUE REPORTED (✓)	CONSEQUENCE (1-5) B (<5 YEARS), C, D, AND DX ONLY	LIKELIHOOD (1-5) B (<5 YEARS), C, D, AND DX ONLY
15.0	LIFTS and HOISTS	15.01	Passenger lifts									
		15.02	Goods lifts									
		15.03	Hoists									
		15.04	Control panel									
		15.99	Other									
16.0	FIXED PLANT/EQUIPMENT	16.01	Sterilizers									
		16.02	Bedpan disposal									
		16.03	Disinfection equipment									
		16.04	Catering equipment									
		16.05	Laundry equipment									
		16.06	Miscellaneous equipment									
		16.99	Other									

RISK ASSESSMENT (RANKING B, C, D and DX ONLY)

CONSEQUENCE		LIKELIHOOD			
Score	Consequence	Score	Likelihood	Indicator	Estimated time to failure
1	Insignificant	1	Rare	No or minimal remedial action required and / or new / recent upgrade	Circa >10 years
2	Minor	2	Unlikely	Normal wear and tear; sound; operationally safe and exhibits only minor deterioration	Circa 4-6 years
3	Moderate	3	Possible	Reasonable physical damage/deterioration	Circa 2-4 years
4	Major	4	Likely	Major physical damage/deterioration failure apparent/assessed as imminent or unacceptable	Circa 1-2 years
5	Catastrophic	5	certain	Failure has occurred; unacceptable	Circa < 1 year

A52825963

Site Name:		Block Name:		Surveyor Name:	
				Survey Date:	
Site Address:		Block No:		Build Year:	
		Block Type:		Block Historic Listing:	
Post Code:		Location Level (Survey Block):		Block Floor Area (GIA) m2	
Site Reference No (SRN):				Cost Base Date:	Quarter II 2010 (BCIS)
Site Type:		Contact Name:		Contact Email:	
NHS Board:		Contact Tel No:		Weather Conditions:	

CLASSIFICATION CATEGORY:

A	Excellent/as new condition (generally <2 years old) Expected to perform as intended over its expected useful life
B	Satisfactory condition with evidence of only minor deterioration Element/sub-element is operational and performing as intended
C	Poor condition with evidence of major defects Element/sub-element remains operational but is currently in need of major repair or replacement
D	Unacceptable condition, non-operational or about to fail Has reached end of its useful life
DX	Supplementary rating added to D only to indicate that it is impossible to improve without replacement

Element		Sub Element		ELEMENT RANK	SUB-ELEMENT CONDITION RANKING A, B, C, D OR DX	REMAINING LIFE (YEARS) FOR EACH SUB-ELEMENT WILL REMAIN IN CONDITION B	COSTS (£000's) TO UPGRADE SUB-ELEMENTS FROM C, D, OR DX TO CONDITIOIN RANKING B AND RANKING B <5 YEARS REMAINING LIFE	NOTES: INFORMATION ON THE NATUIRE NAD LOCATION OF THE REQUIRED RECTIFICATION WORK, AND QUALITY OF ANY REMEDIAL WORK	REMEDIAL ACTION – NO ACTION REQUIRED, OVERHAUL/ REPAIR, REPLACE OR FURTHER INVESTIGATIOINS REQUIRED	URGENT ISSUE REPORTED (✓)	CONSEQUENCE (1-5) B (<5 YEARS), C, D, AND DX ONLY	LIKELIHOOD (1-5) B (<5 YEARS), C, D, AND DX ONLY
17.0	ELECTRICAL SYSTEM	17.01	HV Network									
		17.02	Generators									
		17.03	Switchgear									
		17.04	Distribution boards									
		17.05	Wiring systems/ bonding									
		17.06	Fittings									
		17.07	Luminaires									
		17.08	Emergency luminaires									
		17.99	Other									
18.0	COMMUNICATIONS SYSTEMS	18.01	Telephone systems									
		18.02	Data transmission									
		18.03	Paging system									
		18.04	Burse call system									
		18.05	Radio and television systems									
		18.06	Bedhead services									
		18.99	Other									

RISK ASSESSMENT (RANKING B, C, D and DX ONLY)

CONSEQUENCE		LIKELIHOOD			
Score	Consequence	Score	Likelihood	Indicator	Estimated time to failure
1	Insignificant	1	Rare	No or minimal remedial action required and / or new / recent upgrade	Circa >10 years
2	Minor	2	Unlikely	Normal wear and tear; sound; operationally safe and exhibits only minor deterioration	Circa 4-6 years
3	Moderate	3	Possible	Reasonable physical damage/deterioration	Circa 2-4 years
4	Major	4	Likely	Major physical damage/deterioration failure apparent/assessed as imminent or unacceptable	Circa 1-2 years
5	Catastrophic	5	certain	Failure has occurred; unacceptable	Circa < 1 year

A52825963

Site Name:		Block Name:		Surveyor Name:	
				Survey Date:	
Site Address:		Block No:		Build Year:	
		Block Type:		Block Historic Listing:	
Post Code:		Location Level (Survey Block):		Block Floor Area (GIA) m2	
Site Reference No (SRN):				Cost Base Date:	Quarter II 2010 (BCIS)
Site Type:		Contact Name:		Contact Email:	
NHS Board:		Contact Tel No:		Weather Conditions:	

CLASSIFICATION CATEGORY:

A	Excellent/as new condition (generally <2 years old) Expected to perform as intended over its expected useful life
B	Satisfactory condition with evidence of only minor deterioration Element/sub-element is operational and performing as intended
C	Poor condition with evidence of major defects Element/sub-element remains operational but is currently in need of major repair or replacement
D	Unacceptable condition, non-operational or about to fail Has reached end of its useful life
DX	Supplementary rating added to D only to indicate that it is impossible to improve without replacement

Element		Sub Element		ELEMENT RANK	SUB-ELEMENT CONDITION RANKING A, B, C, D OR DX	REMAINING LIFE (YEARS) FOR EACH SUB-ELEMENT WILL REMAIN IN CONDITION B	COSTS (£000's) TO UPGRADE SUB-ELEMENTS FROM C, D, OR DX TO CONDITIOIN RANKING B AND RANKING B <5 YEARS REMAINING LIFE	NOTES: INFORMATION ON THE NATUIRE NAD LOCATION OF THE REQUIRED RECTIFICATION WORK, AND QUALITY OF ANY REMEDIAL WORK	REMEDIAL ACTION – NO ACTION REQUIRED, OVERHAUL/ REPAIR, REPLACE OR FURTHER INVESTIGATIOINS REQUIRED	URGENT ISSUE REPORTED (✓)	CONSEQUENCE (1-5) B (<5 YEARS), C, D, AND DX ONLY	LIKELIHOOD (1-5) B (<5 YEARS), C, D, AND DX ONLY
19.0	ALARMS and DETECTION SYSTEMS	19.01	Fire alarm panels									
		19.02	Fire alarm wiring system									
		19.03	Security Systems									
		19.04	CCTV (internal)									
		19.05	Panic attack system									
		19.06	Other alarm systems									
		19.99	Other									
20.0	BUILDING MANAGEMENT CONTROL SYSTEM	20.01	Building management system									
		20.99	Other									

RISK ASSESSMENT (RANKING B, C, D and DX ONLY)

CONSEQUENCE		LIKELIHOOD			
Score	Consequence	Score	Likelihood	Indicator	Estimated time to failure
1	Insignificant	1	Rare	No or minimal remedial action required and / or new / recent upgrade	Circa >10 years
2	Minor	2	Unlikely	Normal wear and tear; sound; operationally safe and exhibits only minor deterioration	Circa 4-6 years
3	Moderate	3	Possible	Reasonable physical damage/deterioration	Circa 2-4 years
4	Major	4	Likely	Major physical damage/deterioration failure apparent/assessed as imminent or unacceptable	Circa 1-2 years
5	Catastrophic	5	certain	Failure has occurred; unacceptable	Circa < 1 year

A52825963

Proforma data collection sheet: statutory compliance

Site Name:		Block Name:	
Site Address:		Block No:	
		Block Type:	
Post Code:		Surveyor Name:	
Site Reference No (SRN):			
Site Type:		Survey Date:	
NHS Board:			

Element		Sub-element		Costs to upgrade to meet statutory requirements (£000s)	Notes: Information on the nature and location of the requirement rectification work	Urgent issue reported (P)	Consequence (1-5)	Likelihood (1-5)
1.0	PRESSURE SYSTEMS SAFETY REGULATIONS 2000	1.01	Written scheme of examination					
		1.02	Automatic controls					
		1.03	Pressure alarms					
		1.04	Fire proofing of rooms					
		1.05	Safe discharge area					
		1.06	Schematic diagrams					
		1.99	Other					
2.0	CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH (COSHH) REGULATIONS 2002	2.01	Is local exhaust Ventilation required?					
		2.02	Secure storage					
		2.03	PPE storage and changing					
		2.04	WHB available					
		2.05	Signage					
		2.99	Other					
3.0	ELECTRICITY AT WORK REGULATIONS 1989 (ONCORPORATING SHTM 2020 AND SHTM 2021)	3.01	Electrical system protected from unauthorised use					
		3.02	Protected from damage					
		3.03	Emergency lighting available					
		3.04	Earth bonding					
		3.05	Signage					
		3.99	Other					
4.0	LIFTING OPERATIONS and LIFTING EQUIPMENT (LOLER) 1998 (INCORPORATING SHTM 2024 (LIFTS))	4.01	Lifting operations and lifting equipment (LOLER) regulations 1998 (Incorp SHTM 2024 (Lifts))					
		4.99	Other					

RISK ASSESSMENT (RANKING B, C, D and DX ONLY)

CONSEQUENCE		LIKELIHOOD			
Score	Consequence	Score	Likelihood	Indicator	Estimated time to failure
1	Insignificant	1	Rare	No or minimal remedial action required and / or new / recent upgrade	Circa >10 years
2	Minor	2	Unlikely	Normal wear and tear; sound; operationally safe and exhibits only minor deterioration	Circa 4-6 years
3	Moderate	3	Possible	Reasonable physical damage/deterioration	Circa 2-4 years
4	Major	4	Likely	Major physical damage/deterioration failure apparent/assessed as imminent or unacceptable	Circa 1-2 years
5	Catastrophic	5	certain	Failure has occurred; unacceptable	Circa < 1 year

A52825963

Site Name:		Block Name:	
Site Address:		Block No:	
		Block Type:	
Post Code:		Surveyor Name:	
Site Reference No (SRN):			
Site Type:		Survey Date:	
NHS Board:			

Element		Sub-element		Costs to upgrade to meet statutory requirements (£000s)	Notes: Information on the nature and location of the requirement rectification work	Urgent issue reported (P)	Consequence (1-5)	Likelihood (1-5)
5.0	WORKPLACE (HEALTH, SAFETY and WELFARE) REGULATIONS 1992	5.01	Access					
		5.02	Environmental					
		5.03	Building elements					
		5.04	Engineering elements					
		5.05	Work equipment/machinery					
		5.06	Signage – H&S, equality and diversity					
		5.07	Gas storage					
		5.08	Roof lights					
		5.09	Safety glazing					
		5.10	Radiation protection					
		5.99	Other					
6.0	PERSONAL PROTECTIVE EQUIPMENT (PPE) AT WORK REGUALTIONS 1992	6.0	Personal protective equipment (PPE) at work regulations 1993					
		6.99	Other					
7.0	PROVISION AND USE OF WORK EQUIPMENT (PUWER) REGULATIONS 1992	7.0	Provision and use of work equipment (PUWER) regulations 1993					
		7.99	Other					
8.0	LIFTING OPERATIOINS and LIFTING EQUIPMENT (LOLER) REGULATIONS 1998 – (LIFTING EQUIPMENT)	8.0	Lifting operations and lifting equipment (LOLER) regulations 1998 – (Lifting Equipment)					
		8.99	Other					

RISK ASSESSMENT (RANKING B, C, D and DX ONLY)

CONSEQUENCE		LIKELIHOOD			
Score	Consequence	Score	Likelihood	Indicator	Estimated time to failure
1	Insignificant	1	Rare	No or minimal remedial action required and / or new / recent upgrade	Circa >10 years
2	Minor	2	Unlikely	Normal wear and tear; sound; operationally safe and exhibits only minor deterioration	Circa 4-6 years
3	Moderate	3	Possible	Reasonable physical damage/deterioration	Circa 2-4 years
4	Major	4	Likely	Major physical damage/deterioration failure apparent/assessed as imminent or unacceptable	Circa 1-2 years
5	Catastrophic	5	certain	Failure has occurred; unacceptable	Circa < 1 year

A52825963

Site Name:		Block Name:	
Site Address:		Block No:	
		Block Type:	
Post Code:		Surveyor Name:	
Site Reference No (SRN):			
Site Type:		Survey Date:	
NHS Board:			

Element		Sub-element		Costs to upgrade to meet statutory requirements (£000s)	Notes: Information on the nature and location of the requirement rectification work	Urgent issue reported (P)	Consequence (1-5)	Likelihood (1-5)
9.0	MANUAL HANDLING OPERATIONS REGULATIONS 1992 (AMENDED 2002)	9.0	Manual handling operations regulations 1992 (amended 2002)					
		9.99	Other					
10.0	ASBESTOS – THE CONTROL OF ASBESTOS AT WORK REGULATIONS 2006	10.01	Is there and asbestos register?					
		10.2	Encapsulation					
		10.03	Removal					
		10.04	Other					
11.0	MANAGEMENT OF HEALTH and SAFETY AT WORK REGULATIONS 1999 (INCORPORATING SHTM 2050)	11.0	Management of Heath and Safety at work regulations 1999 (incorporating SHTM 2050)					
		11.99	Other					
12.0	CONDTRUCTIONS. DESIGN and MANAGEMENT (CDM) REGULATIONS	12.0	Construction, design and management (CDM) regulations					
		12.99	Other					
13.0	NOISE AT WORK REGULATIONS (INCORPORATING SHTM 2014) ACOUSTICS	13.01	Building solutions					
		13.02	Engineering solutions					
		13.03	PPE solution					
		13.99	Other					
14.0	DISPLAY SCREEN EQUIPMENT (HEALTH and SAFETY) REGULATION 1992	14.0	Display screen equipment (Health and Safety) regulations 1993					
		14.99	Other					

RISK ASSESSMENT (RANKING B, C, D and DX ONLY)

CONSEQUENCE		LIKELIHOOD			
Score	Consequence	Score	Likelihood	Indicator	Estimated time to failure
1	Insignificant	1	Rare	No or minimal remedial action required and / or new / recent upgrade	Circa >10 years
2	Minor	2	Unlikely	Normal wear and tear; sound; operationally safe and exhibits only minor deterioration	Circa 4-6 years
3	Moderate	3	Possible	Reasonable physical damage/deterioration	Circa 2-4 years
4	Major	4	Likely	Major physical damage/deterioration failure apparent/assessed as imminent or unacceptable	Circa 1-2 years
5	Catastrophic	5	certain	Failure has occurred; unacceptable	Circa < 1 year

A52825963

Site Name:		Block Name:	
Site Address:		Block No:	
		Block Type:	
Post Code:		Surveyor Name:	
Site Reference No (SRN):			
Site Type:		Survey Date:	
NHS Board:			

Element		Sub-element		Costs to upgrade to meet statutory requirements (£000s)	Notes: Information on the nature and location of the requirement rectification work	Urgent issue reported (P)	Consequence (1-5)	Likelihood (1-5)
15.0	VENTILATIONS IN HEALTHCARE OREMISES (INCORPORATING SHTM 2025)	15.0	Ventilation in Healthcare premises (incorporating SHTM 2025)					
		15.99	Other					
16.0	MEDICAL GAS PIPELINE SYSTEMS (MGPS) (INCORPORATING SHTM 2022)	16.0	Medical gas pipeline systems (MGPS) (incorporating SHTM 2022)					
		16.99	Other					
17.0	OIL STORAGE – THE WATER ENVIRONMENT (SCOTLAND) REGULATIONS 2006	17.0	Oil storage – The water environment (Scotland) regulations 2007					
		17.99	Other					
18.0	ELECTRICAL SERVICES (ABATEMENT OF) (INCORPORATING SHTM 2014)	18.0	Electrical services (abatement of) (incorporating SHTM 2014)					
		18.99	Other					
19.0	ELECTRICAL SERVICES (EMERGENCY) (INCORPORATING SHTM 2011)	19.01	Standby generator (hospitals)					
		19.02	Emergency lighting					
		19.03	Signage					
		19.99	Other					
20.0	STERILISATION (SHTM 2010)	20.0	Sterilisation (SHTM 2010)					
		20.99	Other					

RISK ASSESSMENT (RANKING B, C, D and DX ONLY)

CONSEQUENCE		LIKELIHOOD			
Score	Consequence	Score	Likelihood	Indicator	Estimated time to failure
1	Insignificant	1	Rare	No or minimal remedial action required and / or new / recent upgrade	Circa >10 years
2	Minor	2	Unlikely	Normal wear and tear; sound; operationally safe and exhibits only minor deterioration	Circa 4-6 years
3	Moderate	3	Possible	Reasonable physical damage/deterioration	Circa 2-4 years
4	Major	4	Likely	Major physical damage/deterioration failure apparent/assessed as imminent or unacceptable	Circa 1-2 years
5	Catastrophic	5	certain	Failure has occurred; unacceptable	Circa < 1 year

A52825963

Site Name:		Block Name:	
Site Address:		Block No:	
		Block Type:	
Post Code:		Surveyor Name:	
Site Reference No (SRN):			
Site Type:		Survey Date:	
NHS Board:			

Element		Sub-element		Costs to upgrade to meet statutory requirements (£000s)	Notes: Information on the nature and location of the requirement rectification work	Urgent issue reported (P)	Consequence (1-5)	Likelihood (1-5)
21.0	FIRECODE, ALARM and DETECTION SYSTEMS (INCORPORATING SHTM 82)	21.01	Alarm detection					
		21.99	Other					
22.0	LEGIONELLAE (CONTROL OF) IN HEALTHCARE PREMESIS (INCORPORATING SHTM 2040 and HSE GUIDANCE DOCUMENT L8)	22.01	Supply					
		22.02	CW tank storage and distribution					
		22.03	Flushing provision					
		22.04	CW outlet temperature					
		22.05	HW Tank storage and distribution					
		22.06	Calorifier storage and flow temp.					
		22.07	Continuous distribution temp.					
		22.08	HW outlet temperature					
		22.09	Blended water pipework					
		22.10	Dead legs					
		22.11	Towel rails/DHWS radiators					
		22.12	Circulation pumps					
		22.13	Non-return valves					
		22.14	System flushing provision					
		22.15	Calorifier open vent					
		22.16	Calorifier temp. control sys					
		22.17	Temp. monitoring					
		22.18	Ductwork system					
		22.19	Steam humidification					
		22.20	Water bylaws					
		22.99	Other					

RISK ASSESSMENT (RANKING B, C, D and DX ONLY)

CONSEQUENCE		LIKELIHOOD			
Score	Consequence	Score	Likelihood	Indicator	Estimated time to failure
1	Insignificant	1	Rare	No or minimal remedial action required and / or new / recent upgrade	Circa >10 years
2	Minor	2	Unlikely	Normal wear and tear; sound; operationally safe and exhibits only minor deterioration	Circa 4-6 years
3	Moderate	3	Possible	Reasonable physical damage/deterioration	Circa 2-4 years
4	Major	4	Likely	Major physical damage/deterioration failure apparent/assessed as imminent or unacceptable	Circa 1-2 years
5	Catastrophic	5	certain	Failure has occurred; unacceptable	Circa < 1 year

A52825963

Site Name:		Block Name:	
Site Address:		Block No:	
		Block Type:	
Post Code:		Surveyor Name:	
Site Reference No (SRN):			
Site Type:		Survey Date:	
NHS Board:			

Element		Sub-element		Costs to upgrade to meet statutory requirements (£000s)	Notes: Information on the nature and location of the requirement rectification work	Urgent issue reported (P)	Consequence (1-5)	Likelihood (1-5)
23.0	HOT WATER and SURFACE TEMPERATURES (SAFE) SCOTTISH HEALTH GUIDANCE NOTE SHGN	23.01	Outlet temperature					
		23.02	Outlet physical precautions					
		23.03	Lower max. safe temp.					
		23.04	Thermostatic mixer – fail safe					
		23.05	Max. surface temperature (radiators)					
		23.06	Exposed pipework					
		23.99	Other					
24.0	FIRECODE – GENERAL (INCORPORATING SHTM 80-86 BAR 82)	24.01	Containment					
		24.02	Escape lighting					
		24.03	Signage					
		24.04	Manual fire fighting equipment					
		24.05	Sprinklers/automatic fire extinguisher system					
		24.06	Textiles and furniture					
		24.07	Fire Brigade access					
		24.08	Lighting conductors					
		24.09	Fire doors					
		24.10	Storage of flammable substances					
		24.11	Fire exits					
		24.12	Fire hydrants					
		24.99	Others					
25.0	CONFINED SOACES REGULATIONS 1997	25.0	Confined spaces regulations 1998					
		25.99	Other					

RISK ASSESSMENT (RANKING B, C, D and DX ONLY)

CONSEQUENCE		LIKELIHOOD			
Score	Consequence	Score	Likelihood	Indicator	Estimated time to failure
1	Insignificant	1	Rare	No or minimal remedial action required and / or new / recent upgrade	Circa >10 years
2	Minor	2	Unlikely	Normal wear and tear; sound; operationally safe and exhibits only minor deterioration	Circa 4-6 years
3	Moderate	3	Possible	Reasonable physical damage/deterioration	Circa 2-4 years
4	Major	4	Likely	Major physical damage/deterioration failure apparent/assessed as imminent or unacceptable	Circa 1-2 years
5	Catastrophic	5	certain	Failure has occurred; unacceptable	Circa < 1 year

A52825963

Site Name:		Block Name:	
Site Address:		Block No:	
		Block Type:	
Post Code:		Surveyor Name:	
Site Reference No (SRN):			
Site Type:		Survey Date:	
NHS Board:			

Element		Sub-element		Costs to upgrade to meet statutory requirements (£000s)	Notes: Information on the nature and location of the requirement rectification work	Urgent issue reported (P)	Consequence (1-5)	Likelihood (1-5)
26.0	PATIENT BEARING EQUIPMENT (INCLUDING SLINGS)	26.0	Patient bearing equipment (including slings)					
		26.99	Other					
27.0	WORKING AT HEIGHT REGULATIONS 2005	27.01	Restricted access					
		27.02	Barriers					
		27.03	Anchor points					
		27.04	Signage					
		27.99	Other					
28.0	STATUTORY/MANDATORY TRAINING	28.0	Statutory/mandatory training					
		28.99	Other					
29.0	GAS SAFETY (INST and USE) REGULATIONS 1998	29.0	Gas safety (inst and use) regulations 1999					
		29.99	Other					
30.0	CONTRACTORS (CONTROL OF) – (THE MANAGEMENT OF HEALTH and SAFETY AT WORK REGUALTIONS (1999)	30.0	Contractors (control of) – (The management of Health and safety at work regulations 1999)					
		30.99	Other					

RISK ASSESSMENT (RANKING B, C, D and DX ONLY)

CONSEQUENCE		LIKELIHOOD			
Score	Consequence	Score	Likelihood	Indicator	Estimated time to failure
1	Insignificant	1	Rare	No or minimal remedial action required and / or new / recent upgrade	Circa >10 years
2	Minor	2	Unlikely	Normal wear and tear; sound; operationally safe and exhibits only minor deterioration	Circa 4-6 years
3	Moderate	3	Possible	Reasonable physical damage/deterioration	Circa 2-4 years
4	Major	4	Likely	Major physical damage/deterioration failure apparent/assessed as imminent or unacceptable	Circa 1-2 years
5	Catastrophic	5	certain	Failure has occurred; unacceptable	Circa < 1 year

A52825963

Site Name:		Block Name:	
Site Address:		Block No:	
		Block Type:	
Post Code:		Surveyor Name:	
Site Reference No (SRN):			
Site Type:		Survey Date:	
NHS Board:			

Element		Sub-element		Costs to upgrade to meet statutory requirements (£000s)	Notes: Information on the nature and location of the requirement rectification work	Urgent issue reported (P)	Consequence (1-5)	Likelihood (1-5)
31.0	DECONTAMINATION OF EQUIPMENT	31.0	Decontamination of equipment					
		31.99	Other					
32.0	CONTINGENCY PLANNING (CIVIL CONTINGENCIES ACT 2004)	32.0	Contingency planning (civil contingencies act 2004)					
		32.99	Other					
33.0	SLIPS, TRIPS and FALLS – FLOORING HAZARDS	33.0	Slips, trips and falls – floor hazards					
		33.99	Other					
34.0	INFECTION CONTROL – HAI LEVEL 4	34.01	Finishes and floors, walls, ceilings, doors, windows, fixtures and fittings					
		34.02	Space around beds and isolation rooms					
		34.03	Provision of hand-wash basins, liquid soap dispensers, paper towels and alcohol gel dispensers					
		34.04	Provision of facilities for decontamination					
		34.05	Engineering services					
		34.06	Storage					
		34.07	Laundry and linen services					
		34.99	Other					
35.0	STEAM SYSTEMS	35.0	Steam systems					
		35.99	Other					

RISK ASSESSMENT (RANKING B, C, D and DX ONLY)

CONSEQUENCE		LIKELIHOOD			
Score	Consequence	Score	Likelihood	Indicator	Estimated time to failure
1	Insignificant	1	Rare	No or minimal remedial action required and / or new / recent upgrade	Circa >10 years
2	Minor	2	Unlikely	Normal wear and tear; sound; operationally safe and exhibits only minor deterioration	Circa 4-6 years
3	Moderate	3	Possible	Reasonable physical damage/deterioration	Circa 2-4 years
4	Major	4	Likely	Major physical damage/deterioration failure apparent/assessed as imminent or unacceptable	Circa 1-2 years
5	Catastrophic	5	certain	Failure has occurred; unacceptable	Circa < 1 year

A52825963

Site Name:		Block Name:	
Site Address:		Block No:	
		Block Type:	
Post Code:		Surveyor Name:	
Site Reference No (SRN):			
Site Type:		Survey Date:	
NHS Board:			

Element		Sub-element		Costs to upgrade to meet statutory requirements (£000s)	Notes: Information on the nature and location of the requirement rectification work	Urgent issue reported (P)	Consequence (1-5)	Likelihood (1-5)
36.0	DANGEROUS SUBSTANCES AND EXPLOSIVE ATMSPHERES REGULATIONS 2002	36.0	Dangerous substances and explosive atmospheres regulations 2003					
		36.99	Other					
37.0	WASHER INFECTIONS	37.0	Washer disinfectors					
		37.99	Other					
38.0	WINDOW SECURITY	38.0	Window security					
		38.99	Other					
39.0	SUICIDE RISK	39.0	Suicide risk					
		39.99	Other					
40.0	DISABILITY DISCRIMINATION ACT	40.01	Car parking					
		40.02	Toilets					
		40.03	Visual issues					
		40.04	Ramping and handrails					
		40.05	Entrances and doors					
		40.06	Reception areas					
		40.07	Signage					
		40.08	Horizontal and vertical circulation					
		40.09	Internal space					
		40.10	Evacuation management plan					
		40.99	Other					

RISK ASSESSMENT (RANKING B, C, D and DX ONLY)

CONSEQUENCE		LIKELIHOOD			
Score	Consequence	Score	Likelihood	Indicator	Estimated time to failure
1	Insignificant	1	Rare	No or minimal remedial action required and / or new / recent upgrade	Circa >10 years
2	Minor	2	Unlikely	Normal wear and tear; sound; operationally safe and exhibits only minor deterioration	Circa 4-6 years
3	Moderate	3	Possible	Reasonable physical damage/deterioration	Circa 2-4 years
4	Major	4	Likely	Major physical damage/deterioration failure apparent/assessed as imminent or unacceptable	Circa 1-2 years
5	Catastrophic	5	certain	Failure has occurred; unacceptable	Circa < 1 year

A52825963

Site Name:		Block Name:	
Site Address:		Block No:	
		Block Type:	
Post Code:		Surveyor Name:	
Site Reference No (SRN):			
Site Type:		Survey Date:	
NHS Board:			

Element		Sub-element		Costs to upgrade to meet statutory requirements (£000s)	Notes: Information on the nature and location of the requirement rectification work	Urgent issue reported (P)	Consequence (1-5)	Likelihood (1-5)
41.0	RADIATION PROTECTION	41.01	Additional walls (normal or lead lined)					
		41.02	Additional doors (normal or lead lined)					
		41.03	Local exhaust ventilation and associated ducting					
		41.04	Additional or higher rated power supply/junction boxes					
		41.05	Additional waste water/ sewerage treatment facilities isolated from mains					
		41.06	Creation of restricted access zones					
		41.07	Alterations to glass in functional unit					
		41.08	Additional security					
		41.09	Lining of rooms or screening built into walls					
		41.10	Additional change/storage facilities for personal protective equipment					
		41.99	Other					
42.0	OTHER	42.0	Other					
		42.99	Other					

RISK ASSESSMENT (RANKING B, C, D and DX ONLY)

CONSEQUENCE		LIKELIHOOD			
Score	Consequence	Score	Likelihood	Indicator	Estimated time to failure
1	Insignificant	1	Rare	No or minimal remedial action required and / or new / recent upgrade	Circa >10 years
2	Minor	2	Unlikely	Normal wear and tear; sound; operationally safe and exhibits only minor deterioration	Circa 4-6 years
3	Moderate	3	Possible	Reasonable physical damage/deterioration	Circa 2-4 years
4	Major	4	Likely	Major physical damage/deterioration failure apparent/assessed as imminent or unacceptable	Circa 1-2 years
5	Catastrophic	5	certain	Failure has occurred; unacceptable	Circa < 1 year

A52825963

Proforma data collection sheet: environmental management

Site Name:		Block Name:	
Site Address:		Block No:	
		Block Type:	
Post Code:		Surveyor Name:	
Site Reference No (SRN):			
Site Type:		Survey Date:	
NHS Board:			

Element		Sub-Element		Details	Costs (£000s)
1.0	APPRAISAL OF ENERGY MANAGEMENT (GJ/100m3)	1.01	ELECTRICITY CONSUMPTION		
		1.02	GAS CONSUMPTION		
		1.03	OIL CONSUMPTION		
2.0	ENERGY OERFORMANCE RATING (epc) – WHERE AVAILABLE	2.01	ENERGY RATING (CARBON NEUTRAL, A, B, C, D, E, F OR G)		
		2.02	CARBON DIOXIDE EMISSIONS (kg/m2 FLOOR AREA PER YEAR)		
		2.03	APPROXIMATE CURRENT ENERGY USE/m2 OF FLOOR AREA (kWh/m2)		
3.0	CLINICAL WASTE	3.01	CLINICAL WASTE PRODUCED AT SITE LEVEL (tonnes)		
4.0	ENERGY CONSUMPTION IMPROVEMENT SCHEMES	4.01	PROVIDE DETAILS OF ANY NHS BOARD SCHEMES TO IMPROVE ENERGY CONSUMPTION WITH ASSOCIATED COSTS		
5.0	WATER CONSUMPTION	5.01	PROVIDE DETAILS OF WATER CONSUMPTION FOR EACH SITE		

Proforma data collection sheet: space utilisation

Site Name:		Block Name:	
Site Address:		Block No:	
		Block Type:	
Post Code:		Surveyor Name:	
Site Reference No (SRN):			
Site Type:		Survey Date:	
NHS Board:			

LOCATION LEVEL (SURVEY BLOCK)	ASSESSMENT CRITERIA	RANKING	RANKING PROTOCOL		
		E	Empty or grossly underused at all times (excluding temporary closure)		
		U	Underutilised : utilisation could be significantly increased		
		F	Fully utilised: a satisfactory level of utilisation		
		O	Overcrowded: overloaded and facilities generally stretched		
				INDIVIDUAL RANKING E, U, F OR O	SURVEY BLOCK RANKING E, U, F OR O
	CURRENT USE OF SPACE				
	USE OF TIME OVER SPACE				
	COMPARISON OF SPACE WITH NATIONAL GUIDANCE				
	CURRENT USE OF SPACE				
	USE OF TIME OPVER SPACE				
	COMPARISON OF SPACE WITH NATIONAL GUIDANCE				
	CURRENT USE OF SPACE				
	USE OF TIME OPVER SPACE				
	COMPARISON OF SPACE WITH NATIONAL GUIDANCE				
	CURRENT USE OF SPACE				
	USE OF TIME OPVER SPACE				
	COMPARISON OF SPACE WITH NATIONAL GUIDANCE				
	CURRENT USE OF SPACE				
	USE OF TIME OPVER SPACE				
	COMPARISON OF SPACE WITH NATIONAL GUIDANCE				

Assessment process

Current use of space	How intensively is the space being used?
	Are there many rooms or areas under used?
Use of the space over time	Does the use vary over time?
	Do occupation levels change over the working week?
Comparison of space with national guidance	How does the space compare with national guidance e.g. the activity Database (ADB), Scottish Health Planning Notes and Scottish Health Building Notes

NHS National Services Scotland

Proforma data collection sheet: functional suitability

Site Name:		Block Name:	
Site Address:		Block No:	
		Block Type:	
Post Code:		Surveyor Name:	
Site Reference No (SRN):			
Site Type:		Survey Date:	
NHS Board:			

RANKING PROTOCOL

A	VERY SATISFACTORY IDEAL ACCOMMODATION NO CHANGE NEEDED	INDIVIDUIAL RANKING A, B, C, D OR DX	SURVEY BLOCK RANKING A, B, C, D OR DX	NOTES – TO INFORM ON THE NATURE AND SCOPE OF THE REMEDIAL WORKS	COST TO UPGRADE TO CATEGORY B (£000S) - OPTIONAL
B	SATISFACTORY WITH ONLY MINOR CHANGE NEEDED				
C	NOT SATISFACTORY WITH SIGNIFICANT CHANGE NEEDED				
D	UNACCEPTABLE IN ITS PRESENT CONDITION MAJOR CHANGE NEEDED				
DX	SUPPLEMENTARY RATING ADDED TO D ONLY TO INDICATE THAT IT IS IMPOSSIBLE TO IMPROVE WITHOUT REPLACEMENT				

LOCATION LEVEL (SURVEY BLOCK)	ASSESSMENT CRITERIA	INDIVIDUIAL RANKING A, B, C, D OR DX	SURVEY BLOCK RANKING A, B, C, D OR DX	NOTES – TO INFORM ON THE NATURE AND SCOPE OF THE REMEDIAL WORKS	COST TO UPGRADE TO CATEGORY B (£000S) - OPTIONAL
	INTERNAL SPACE RELATIONSHIPS				
	SUPPORT FACILITIES				
	LOCATION				
	INTERNAL SPACE RELATIONSHIPS				
	SUPPORT FACILITIES				
	LOCATION				
	INTERNAL SPACE RELATIONSHIPS				
	SUPPORT FACILITIES				
	LOCATION				
	INTERNAL SPACE RELATIONSHIPS				
	SUPPORT FACILITIES				
	LOCATION				
	INTERNAL SPACE RELATIONSHIPS				
	SUPPORT FACILITIES				
	LOCATION				

ASSESSMENT PROCESS

Elements	Broad assessment	Detailed Assessment
Internal Space Relationships	How efficient and effective are the relationships of the internal spaces to each other?	Does the accommodation allow safe and effective services delivery?
		Is the available accommodation sufficient for the department to function appropriately?
		Are critical rooms adequately sized?
		Is good observation of patients possible?
Support Facilities	Are there sufficient services supporting the function?	Are adequate toilet and bathroom facilities available?
		Is adequate storage space available?
		Is adequate seating and meeting space available?
		Are public areas accessible for all?
Location	Is the space well sited in relation to other departments and access points?	Is the space will sited and located close to inter-dependent departments?
		Is good access available for vertical and horizontal circulation (e.g. lifts stairs etc)?
		Is access sufficiently close to car parks/public transport?

Proforma data collection sheet: quality

Site Name:		Block Name:	
Site Address:		Block No:	
		Block Type:	
Post Code:		Surveyor Name:	
Site Reference No (SRN):			
Site Type:		Survey Date:	
NHS Board:			

RANKING PROTOCOL	
A	A FACILITY OF EXCELLENCE
B	A FACILITY OF SATISFACTORY QUALITY WITH ONLY GENERAL MAINTENANCE REQUIRED
C	A FACILITY OF LESS THAN SATISFACTORY QUALITY WITH INVESTEMENT NEEDED
D	A FACILITY OF POOR QUALITY WITH SIGNIFICANT INVESTMENT NEEDED
DX	IMPROVEMENTS ARE EITHER IMPRACTICAL OR TOO EXPENSIVE TO BE TENABLE – ONLY TOTAL REBUILD OR RELOCATION WILL SUFFICE

LOCATION LEVEL (SURVEY BLOCK)	ASSESSMENT CRITERIA	INDIVIDUIAL RANKING A, B, C, D OR DX	SURVEY BLOCK RANKING A, B, C, D OR DX	NOTES – TO INFORM ON THE NATURE AND SCOPE OF THE REMEDIAL WORKS
	AMENITY			
	COMFORT ENGINEERING			
	DESIGN			
	AMENITY			
	COMFORT ENGINEERING			
	DESIGN			
	AMENITY			
	COMFORT ENGINEERING			
	DESIGN			
	AMENITY			
	COMFORT ENGINEERING			
	DESIGN			

ASSESSMENT PROCESS		
Elements	Broad assessment	Detailed Assessment
AMENITY	Does the facility/accommodation offer attractive/pleasing area for patients and staff in terms of privacy, comfort, working conditions, signposting etc?	Attracts at the main entrance/reception area/departments?
		Privacy and dignity issues are addressed?
		Confidential conversations can be held satisfactorily?
		Toilet facilities are well provided?
		Appropriate storage provisions have been made?
		Disabled users are catered for?
		Appropriate facilities are provided for children
		Seating and waiting areas are sufficient?
		Appropriate safety and security measures are in place?
		Way finding is visible, legible and consistent?
COMFORT ENGINEERING	Does the facility/accommodation offer and acceptable environment? Is it well lit, adequately heated and cooled, noise and odour free?	Artificial lighting enhances the overall design?
		Comfort conditions are achieved in heating?
		Comfort conditions are achieved in ventilations?
		Acoustic privacy is achieved?
		Noise levels are acceptable?
		Persistent odours are absent?
DESIGN	Is the internal/external environment attractively designed in terms of good colour schemes, well furnished, enhanced by art, plants, landscaping, views etc?	Colour is created when therapeutically used for definition and variety?
		Landscaping is attractive?
		Planting is optimised for all seasons?
		Natural daylight is used to optimum effect?
		Appropriate finishes are used for floor, ceiling and walls?
		Furniture co-ordinates will with overall design?
		Art and craftwork is integrated into overall design?
		Interior is re-assuring and non-clinical where appropriate?
		Where possible, patients and staff have pleasing views from both inside and out?
		First impressions of the entrance/reception areas are welcoming?

Generic risk assessment

Site Name:		Block Name:	
Site Address:		Block No:	
		Block Type:	
Post Code:		Surveyor Name:	
Site Reference No (SRN):			
Site Type:		Survey Date:	
NHS Board:			

GENERIC RISKS: HAZARD	CONTROL MEASURE
REMOTE SITES	Some of the sites within the NHS estate are remotely located, particularly in the NHS Western Isles, NHS Orkney and NHS Shetland areas, These will create their own unique challenges in terms of carrying out inspections, and capita's surveys will require to be flexible and adaptable when scheduling visits to these locations as the staff may become storm or fog bound, despite the best intentions of the ferry or flight operators, as such all surveyors should carry the following items at all times for any remote locations.
	• Mobile phones and charges
	• Cash to facilitate unexpected additional overnight stays or delays
	• Spare warm clothing
	• Emergency rations, e.g. food, drinks, chocolate etc
	• Fully stocked first aid kit
	In addition, when inspecting remote sites, all surveyors should contact their office once survey is complete, and when back at main base
LONE WORKING	All inspections to be carried out by minimum 2 surveyors, although they can split up to cover various locations while on site
WORKING AT HEIGHT – ACCESS	All building appraisal will generally be undertaken from ground level, but where safe access is available, e.g. parapet walls or barriers over 1,100mm high, flat or pitched rood areas can be surveyed, access to these areas will be strictly in accordance with any roof permits issued by the local NHS Board
SITE ACCESS	All survey teams will be briefed in local health and safety matters by the local site contact and advised of any particular site specific hazards. All surveyors will strictly comply with these rules
POSSIBLE HAZARDOUS MATERIALS	All surveyors should obey any statutory signs at premises warning of hazardous materials and comply with all instructions and safety measures detailed
SUSPECT ASBESTOS CONTAINING MATERIALS (ACMs)	All surveyors should familiarise themselves with any available site asbestos management plan and be aware of any locations where asbestos may be present
PERSONAL PROTECTION EQUIPMENT (PPE)	All surveyors will be issued with appropriate PPE, e.g. high visibility vests etc. these should be worn at all appropriate times
RESTRICTED HOSPITAL AREAS	All surveyors will access any restricted areas, e.g. intensive care wards, operating theatres strictly by local agreement, and will wear any required additional clothing such as gowns, masks etc
INFECTION CONTROL	All surveyors will utilise hospital provided hand wash facilities before entering and leaving all ward areas. In addition, no ties will be worn during surveys to minimise risk of cross infection
	No surveyor will enter any wards where winter vomiting or similar are present
MANUAL HANDLING	No manual handling will be involved with this survey exercise
CLIENT VEHICLES	All surveyors should be aware that certain areas within the hospitals will have heavy vehicular traffic e.g. accident and emergency, delivery areas etc. as such they will require extra vigilance in these areas where electric powered vehicles are present. All surveyors will wear high visibility vests for all external area at all times
FIRE SUPPRESSION SYSTEMS	All surveyors should seek advice from local NHS contracts in the event of any areas having gaseous or similar fire suppression systems. All surveys should then be undertaken strictly in accordance with written procedures
GENERAL FIRE AND SAFETY PROCEDURES	When inspecting occupied buildings, all surveyors should familiarise themselves with local procedures, locations of fire exits, timing of weekly alarm test etc
SITE SPECIFIC RISKS: HAZARD	CONTROL MEASURE

SHEET TO BE REVIEWED AND SIGNED BY ALL SURVEYORS

DATE:	NAME:	SIGNATURE:
DATE:	NAME:	SIGNATURE:
DATE:	NAME:	SIGNATURE:
DATE:	NAME:	SIGNATURE:
DATE:	NAME:	SIGNATURE:
DATE:	NAME:	SIGNATURE:
DATE:	NAME:	SIGNATURE:

Proforma check sheet for Survey Team Leader and Survey Co-ordinator

Facet 1 – Physical Condition: Block Summary

Site Name:		Block Name:		Surveyor Name:	
				Survey date:	
Site Address:		Block No:		Build Year:	
		Block Type:		Block Historic Listing:	
Post Code:		NHS Board:		Block Floor Area (GIA) m2	
Site Reference No (SRN):		Contact Name:		Cost Base Date:	Quarter II – 2010 (BCIS)
Site Type:		Contact Tel No:		Contact Email:	

BLOCK DESCRIPTION

BLOCK FABRIC CONDITION GRADE	BLOCK FABRIC CONDITION EXECUTIVE SUMMARY
BLOCK ENGINEERING SERVICES CONDITION GRADE	BLOCK ENGINEERING SERVICES EXECUTIVE SUMMARY

Team Leader checklist

Site Name:		Block Name:		Team Leader Name:	
				Survey date:	
Site Address:		Block No:		Build Year:	
		Block Type:		Block Historic Listing:	
Post Code:		NHS Board:		Block Floor Area (GIA) m2	
Site Reference No (SRN):		Contact Name:		Cost Base Date:	Quarter II – 2010 (BCIS)
Site Type:		Contact Tel No:		Contact Email:	

SITE RISK ASSESSMENT COMPLETED AND REVIEWED BY ALL SURVEY TEAM MEMBERS	
ALL SURVEYS COMPLETE	
ALL SURVEY SHEETS COMPETE AND CHECKED	
ALL RELEVANT ITEMS QUANTIFIED / COSTED	
ALL RELEVANT ITEMS RISK ASSESSED	
STATUTORY COMPLIANCE SHEET COMPLETED AND CHECKED	
ENVIRONMENTAL MANAGEMENT SHEET COMPLETE AND CHECKED	
ANY URGENT ISSUES REPORTED	
BLOCK PHOTOGRAPH TAKEN	
BLOCK PHOTOGRAPH REFERENCE NUMBER	
ALL ELEVATION PHOTOGRAPHS TAKEN	
SPECIFIC DEFECTS PHOTOGRAPHS TAKEN	

Survey Co-ordinator checklist

Site Name:		Block Name:		Team Leader Name:	
				Survey date:	
Site Address:		Block No:		Build Year:	
		Block Type:		Block Historic Listing:	
Post Code:		NHS Board:		Block Floor Area (GIA) m2	
Site Reference No (SRN):		Contact Name:		Cost Base Date:	Quarter II – 2010 (BCIS)
Site Type:		Contact Tel No:		Contact Email:	

SITE RISK ASSESSMENT COMPLETED AND REVIEWED BY ALL SURVEY TEAM MEMBERS	
ALL SURVEYS COMPLETE	
ALL SURVEY SHEETS COMPETE AND CHECKED	
ALL RELEVANT ITEMS QUANTIFIED / COSTED	
ALL RELEVANT ITEMS RISK ASSESSED	
STATUTORY COMPLIANCE SHEET COMPLETED AND CHECKED	
ENVIRONMENTAL MANAGEMENT SHEET COMPLETE AND CHECKED	
ANY URGENT ISSUES REPORTED	
BLOCK PHOTOGRAPH TAKEN	
BLOCK PHOTOGRAPH REFERENCE NUMBER	
ALL ELEVATION PHOTOGRAPHS TAKEN	
SPECIFIC DEFECTS PHOTOGRAPHS TAKEN	
FACET 1 – ALL FABRIC DATA INPUT INTO SOFTWARE	
FACET 1 – ALL ENGINEERING SERVICES DATA INPUT INTO SOFTWARE	
FACET 1 – BLOCK SUMMARY SHEET COMPLETED	
FACET 2 – STATUTORY COMPLIANCE DATA INPUT INTO SOFTWARE	
FACET 3 – ENVIRONMENTAL MANAGEMENT DATA INOUT INTO SOFTWARE	

Proforma progress report

Ref	HEALTHBOARD	PROPERTY	BLOCK	INFORMATION REVEIVED FROM HEALTH BOARD	SURVEYS ORGANISED	FACET 1 – PHYSICAL CONDITION – FABRIC SURVEYS IN PROGRESS	FACET 1 – PHYSICAL CONDITIOIN – ENGINEERING SERVICES SURVEYS IN PROGRESS	FACET 1 – PHYSICAL CONDITION – FABRIC SURVEYYS COMPLETE	FACET 1 – PHYSICAL CONDITION – ENGINEERING SERVICES SURVEYS COMPLETE	FACET 2 – STATUTORY COMPLIANCE COMPLETE	FACET 3 – ENVIRONMENTAL MANAGEMENT COMPELTE	DATA INPUT INTO SOFTWARE	COSTING COMPLETE	QA CHECK	REPORT ISSUED

NSGH NEW SOUTHERN GLASGOW HOSPITAL - ADULTS & CHILDRENS

Brookfield MULTIPLEX BM

Environmental Data Sheet Review (following Board comments)

Room No	Board comment	Brookfield comment	Reviewed against ZBP Matrix	Comments to be incorporated & RDS updated	NA COMMENT
Department: ENDOSCOPY (NA-SZ-02-RD-400-END Rev 04)					
END-039 Lockers		Extract figure incorrect on RDS	Extract to be 6ac/hr	Update RDS	**NA to provide matrix for ZBP update**
Department: ACCIDENT & EMERGENCY (NA-SZ-00-RD-400-EMA Rev 04)					
EMC-016 Nappy Change	Extract Air change rate missing		Extract to be 10 as on matrix	Update RDS	**NA to provide matrix for ZBP update**
EMC-026 Police Office		Remove safety temp & temp notes - N/A	Not on matrix	Update RDS	**NA to provide matrix for ZBP update**
EMC-036 Supplies Base		Remove safety temp & temp notes - N/A	Not on matrix	Update RDS	**NA to provide matrix for ZBP update**
EMC-046 Switchgear Cupboard		Remove Temp notes, Mec Vent notes, Temp & water safety/temp notes - N/A	Not on matrix	Update RDS	**NA to provide matrix for ZBP update**
EMC-049 Treatment Room	Positive pressure but extract @10ac and supply @6 ac	Incorrect on RDS - should read negative	Extract 10 and Supply 6 as on matrix	Update RDS	**NA to provide matrix for ZBP update**
EMC-050 Treatment Room	Positive pressure but extract @10ac and supply @6 ac	Incorrect on RDS - should read negative	Extract 10 and Supply 6 as on matrix	Update RDS	**NA to provide matrix for ZBP update**
EMC-061 Store Equipment & Supplies		Extract @ 1.5 ac incorrect	Remove extract figure - should be 1.5 ac Supply only as on matrix	Update RDS	**NA to provide matrix for ZBP update**
EMC-068 Staff & Communications Base	Board querying ventilation details	Staff base within corridor parameters and general ventilation - no change	No vent details included		**NA to provide matrix for ZBP update**
EMC -074 Plaster Store		Extract rate of 1.5ac missing; sink in room but water temp and safety notes missing	Extract to be 1.5ac; include water / temp notes	Update RDS	**NA to provide matrix for ZBP update**
EMC-080 Corridor	Board querying Service Illumination Night Lux	Inconsistencies with Night lux on number of corridors e.g. EMC-088, EMC-140 & 140_1 have 50 lux night illum but 069, 080 & 127 do not?	General query on all departments - not consistent with night lux illumination in corridors - please clarify position		**NA to provide matrix for ZBP update**
EMC-091 Switchgear Cupboard		Remove Temp notes, Mec Vent notes, Temp & water safety/temp notes - N/A	Not on matrix	Update RDS	**NA to provide matrix for ZBP update**
EMC-100 Service Room Equipment		Extract (1.5 ac) and Supply (1.5 ac) rate incorrect - room negative pressure. WHB in room - Water temp and safety notes missing	Extract should be 10 ac as on matrix; add water temp & safety notes	Update RDS	**NA to provide matrix for ZBP update**
EMC-103 Staff WC	Extract Air change rate missing		Extract to be 10 as on matrix	Update RDS	**NA to provide matrix for ZBP update**
EMC -102 Electrical Cupboard		Remove Temp notes, Mec Vent notes, Temp & water safety/temp notes - N/A	Not on matrix	Update RDS	**NA to provide matrix for ZBP update**
EMC - 115 Body Viewing/ Bier room		Extract (1.5ac) and Supply (1.5ac) the same but room to be negative	Extract should be 6 ac as on matrix	Update RDS	**NA to provide matrix for ZBP update**
EMC - 116 Body Viewing/ Bier room		Extract (1.5ac) and Supply (1.5ac) the same but room to be negative	Extract should be 6 ac as on matrix	Update RDS	**NA to provide matrix for ZBP update**
EMC - 117 Shower ambulant	Extract Air change rate missing		Extract to be 10 ac as on matrix	Update RDS	**NA to provide matrix for ZBP update**
EMC - 118 Shower ambulant	Extract Air change rate missing		Extract to be 10 ac as on matrix	Update RDS	**NA to provide matrix for ZBP update**
EMC - 125 Rest: Office with shower	Board have noted change room name to Staff Room with Pantry (equipment appears to be consistent with use)	Following notes to be added - consistent with Staff room areas and area provision to be updated to accommodate ventilation etc 'Summer temp 26 deg. Air volume to suit occupancy at 10 litres per second per person. Local extract ventilation at food prep. Area. Lux level 200 lux working plane'	Matrix as it stands not applicable to room. NOTE: ZBP VENTILATION LAYOUT DRAWING (ZBP-ZD-00-PL-524-004 Rev E) shows supply and extract provision.	ZBP- Update RDS in accordance with drawing ventilation provision and confirm appropriate.	**NA update Room Name in database**
EMC-137 Store: ambulance equipment		Extract missing; Trough in room water temp/safety notes missing	Extract to be 1.5 ac as on matrix	Update RDS	**NA to provide matrix for ZBP update**
EMC-149 Decontamination Capsule	Board notes area to be updated to reflect new layout & no. Of rooms		No details on ZBP matrix - to be advised	Update RDS	**External Spaces should not be reported - remove from RDS**
EMC-161 Detention room		Service Illumination Night Lux notes Floor. 1 Bedhead and Service Illumination Local lux 150 at Bedhead appear inappropriate as there is only a Seat Bench in the room.	Please review details on matrix and update accordingly	Update RDS	**NA to provide matrix for ZBP update**
E,MC-162 Dirty & Clean Hold AGV		Activities require updating - cannot carry out all of these in this room - no sink no disposal facilities etc. Also Mech Vent notes missing (should read prep area to suit design. Remove Safety temp notes - no water services in the room.	Add mech vent notes as on matrix and remove safety temp notes (not on matrix)	Update RDS	**Advise on activities**
Department: CRITICAL CARE WARD (NA-SZ-01-RD-400-CCW Rev 04)					
CCW-014 Relatives Room		Remove Water temp/safety notes - no water services in this room	Matrix states water temp/safety notes but N/A	Update RDS	**NA to provide matrix for ZBP update**
CCW-014 Relatives Room		Remove Water temp/safety notes - no water services in this room	Matrix states water temp/safety notes but N/A	Update RDS	**NA to provide matrix for ZBP update**
CCW-017 Cleaners room	Extract rate missing		Extract should be 6 ac as on matrix	Update RDS	**NA to provide matrix for ZBP update**
CCW-026 Patients En-suite WC & Wash	Extract rate missing		Extract should be 10 ac as on matrix	Update RDS	**NA to provide matrix for ZBP update**
CCW-044 Patients En-suite WC & Wash	Extract rate missing		Extract should be 10 ac as on matrix	Update RDS	**NA to provide matrix for ZBP update**
CCW-066 Status Lab	Extract & Supply both at 5ac		Extract should be 6 ac as on matrix	Update RDS	**NA to provide matrix for ZBP update**
CCW-072 Dirty Utility with Urine testing	Board querying addition of Supply @ 8ac/hr	CCW-072 consistent with CCW-023, 126, 148, 188 therefore no change required.			**NA to provide matrix for ZBP update**
CCW-075 Clean Utiltiy		Would expect to see 200 lux working plane in a Clean Utility - 150 lux is low		Can lux levels be raised; this applies to all Clean Utilities	**NA to provide matrix for ZBP update**
CCW-101 Dirty Utility with Urine testing		Supply of 8 ac incorrect - not on matrix and not consisent with other DU - remove		Update RDS	**NA to provide matrix for ZBP update**
CCW-113 Housekeepers (cleaners) room	Extract missing		Extract should be 6 as on matrix	Update RDS	**NA to provide matrix for ZBP update**
CCW-114 Store room 2 of 4	Supply & Extract @ 1.5ac on rds?		Remove extract - only supply on matrix of 1.5 ac - consistent with other stores	Update RDS	**NA to provide matrix for ZBP update**
CCW-024 Store room 1 of 4		Supply & Extract @ 1.5ac on rds	Remove extract - only supply on matrix of 1.5 ac - consistent with other stores	Update RDS	**NA to provide matrix for ZBP update**
CCW-128 Relatives room		Remove Water temp/safety notes - no water services in this room	Matrix states water temp/safety notes but N/A	Update RDS	**NA to provide matrix for ZBP update**
CCW-129 Relatives room		Remove Water temp/safety notes - no water services in this room	Matrix states water temp/safety notes but N/A	Update RDS	**NA to provide matrix for ZBP update**
CCW-130 Equipment Services room		WHB in room - water temp/safety notes missing	Matrix states 10 ac Extract - to be added; also water temp/safety notes to add	Update RDS	**NA to provide matrix for ZBP update**

CCW-131 Pharmacy Support Area	Board querying ventilation requirements as internal room	Whilst matrix does not have ventilation provision for this room; ZBP drawing ZBP-ZD-01-PL-524-014 Rev E has both supply and extract. Therefore matrix incorrect.	Add supply and extract as vent drawings; also requires water temp/safety notes adding	Update RDS	**NA to provide matrix for ZBP update**
CCW-141 Patients En-suite WC & Wash	Extract missing		Extract should be 10 ac as on matrix		**NA to provide matrix for ZBP update**
CCW-145 Relatives room		Remove Water temp/safety notes - no water services in this room	Matrix states water temp/safety notes but N/A	Update RDS	**NA to provide matrix for ZBP update**
CCW-146 Relatives room		Remove Water temp/safety notes - no water services in this room	Matrix states water temp/safety notes but N/A	Update RDS	**NA to provide matrix for ZBP update**
CCW-148 Dirty Utility with Urine Testing	Board querying addition of Supply @ 8ac/hr	Remove Supply @ 8ac - not consistent with requirements. Matrix only details Extract.	Remove supply	Update RDS	**NA to provide matrix for ZBP update**
CCW-149 Patient Pantry	Ventilation requirements need amending	Not in line with requirements on Matrix	Change Extract to 6ac and add Supply 5ac as on matrix	Update RDS	**NA to provide matrix for ZBP update**
CCW-159 Patients En-suite WC & Wash		Extract missing	Extract to be 10 as on matrix	Update RDS	**NA to provide matrix for ZBP update**
CCW-180 Status Lab	Extract & Supply both at 5ac		Extract should be 6 ac as on matrix	Update RDS	**NA to provide matrix for ZBP update**
CCW-188 Dirty Utility with Urine Testing	Board querying consistency of ventilation across all DU's.	Remove Supply @ 8ac - not consistent with requirements. Matrix only details Extract.	Remove supply	Update RDS	**NA to provide matrix for ZBP update**
CCW-205 Female Staff Changing facilities	Board querying ventilation rates - incorrect extract on RDS; also querying lux levels.	Extract should be 6 ac; Lux levels generally would be up to 150 lux Floor	Extract should be 6 ac as on matrix	Update RDS; confirm if lux levels can be amended	**NA to provide matrix for ZBP update**
CCW-214 Male Staff Changing facilities	Query on lux levels & mech vent notes	Lux levels generally would be up to 150 lux Floor	Mech Vent notes missing: Extract air change rate can include sanitary accommodation associated with changing room.	Update RDS; confirm if lux levels can be amended	**NA to provide matrix for ZBP update**
CCW-243 Store room 3 of 4	Board querying extract provision	This store is consistent with supply @ 1.5ac as the other stores in theatre.	Correct as matrix - no change		**NA to provide matrix for ZBP update**
Department: RENAL DIALYSIS (NA-SZ-02-RD-400-RENO Rev 03)					
RENO-011 Clean Utility		Would expect to see 200 lux working plane in a Clean Utility - 150 lux is low		Can lux levels be raised; this applies to all Clean Utilities	**NA to provide matrix for ZBP update**
RENO-033 Clean Utility		Would expect to see 200 lux working plane in a Clean Utility - 150 lux is low		Can lux levels be raised; this applies to all Clean Utilities	**NA to provide matrix for ZBP update**
RENO-045 WC Wash AmbulantShower		Extract missing	Extract should be 10ac as on matrix		**NA to provide matrix for ZBP update**
RENO-066 Seminar Room	Board querying Dimmable lighting provision	Dimmable light switch is included on components page - no change			**NA to provide matrix for ZBP update**
Department: NSGH CCU (NA-SZ-01-RD-400-CCU Rev 04)					
CCU-002 Disposal Hold	Extract missing		Extract should be 10ac as on matrix	Update RDS	**NA to provide matrix for ZBP update**
Cccu-004 Patients Pantry	Extract & Supply the same?	Change extract to 6 ac/hr to provide negative relative pressure	Extract should be 6 ac as on matrix	Update RDS	**NA to provide matrix for ZBP update**
CCU-005 Clean Utility		Would expect to see 200 lux working plane in a Clean Utility - 150 lux is low		Can lux levels be raised; this applies to all Clean Utilities	**NA to provide matrix for ZBP update**
CCU-008 Relatives Room		Remove Water temp/safety notes - no water services in this room	Matrix states water temp/safety notes but N/A	Update RDS	**NA to provide matrix for ZBP update**
CCU-019 Status Lab		Extract and Supply the same - extract to be higher to give negative relative pressure	Extract should be 6 ac as on matrix	Update RDS	**NA to provide matrix for ZBP update**
CCU-020 Dirty Utility with Urine Testing	Extract missing		Extract should be 10 ac as on matrix	Update RDS	**NA to provide matrix for ZBP update**
CCU-030 Clean Utility /Store	Extract & Supply the same?	Remove extract of 6ac - not on matrix		Update RDS	**NA to provide matrix for ZBP update**
CCU-250 Bulk supplies store		Extract and Supply the same - extract to be removed to give positive relative pressure	Extract not on matrix	Update RDS	**NA to provide matrix for ZBP update**
Department: OPD Pre-OP ASSESSMENT (NA-SZ-01-RD-400-POA Rev 03)					
POA-019 Clean Utility & Store		Would expect to see 200 lux working plane in a Clean Utility - 150 lux is low		Can lux levels be raised; this applies to all Clean Utilities	**NA to provide matrix for ZBP update**
Department: NCH CRITICAL CARE PICU (NA-SZ-01-RD-400-PICU Rev 04)					
NCH-01-CCW-010 Electrical Cupboard	Query Mech Vent notes : 15l/s extract	Remove mech vent notes N/A		Update RDS	**NA to provide matrix for ZBP update**
NCH-01-CCW-015 ECMO/Haem Filtration Service		Trough in room but water temp and safety notes missing	Add water temp / safety notes	Update RDS	**NA to provide matrix for ZBP update**
NCH-01-CCW-022 Staff On Call Rest Room		Remove Water temp/safety notes - no water services in this room		Update RDS	**NA to provide matrix for ZBP update**
NCH-01-CCW-025 Staff Changing		3 WHB's in room but water temp/safety notes missing	Add water / temp notes	Update RDS	**NA to provide matrix for ZBP update**
NCH-01-CCW-033 Fluid Store (previously Disposal Hold & Recycling Point)	Amend environmentals	RDS states Extract 10ac only; drawing review indicates supply and extract provision.		Update RDS in line with ZBP drawing (ZBP-ZB-01-PL-524-012 Rev A)	**NA to provide matrix for ZBP update**
NCH-01-CCW-036 Staff Changing		3 WHB's in room but water temp/safety notes missing	Add water / temp notes	Update RDS	**NA to provide matrix for ZBP update**
NCH-01-CCW-045 MDT Room/Clinical Conference Room	Dimmable Lighting	Dimmable light switch is included on components page - no change			**ZBP confirm at M&E co-ordination**
NCH-01-CCW-047 Equipment Bay	Linen Bay	Remove Temperature notes and relative pressure note		Update RDS	**NA to provide matrix for ZBP update**
NCH-01-CCW-092 Dirty Utility with Urine testing	Not consistent with other DU	**Remove mech vent notes as N/A; NOTE both ZBP and MERCURY drawings (ZBP-ZA-01-PL-524-011 Rev A & ME-ZA-01-PL-332-517 Rev A) show Supply and Extract provision - whilst this is not consistent with other Dirty Utilities in terms of RDS and the matrix information - drawings indicate otherwise - what is the provision for Dirty Utilities??**		**Update RDS but ZBP to confirm actual provision please - is it as the RDS i.e. Extract @10ac/hr OR is it as the drawings which appear all to have Supply and Extract provision**	**NA to provide matrix for ZBP update**
NCH-01-CCW-093 Medicines Management room	Ventilation requirements?	Review of ZBP & Mercury drawings (as noted above) indicate both Supply and Extract provision		Update RDS in line with ZBP & Mercury drawing ZBP-ZA-01-PL-524-011 Rev A & ME-ZA-01-PL-332-517 Rev A	**NA to provide matrix for ZBP update**
NCH-01-CCW-103 Clean Utility inc blood bank area		Would expect to see 200 lux working plane in a Clean Utility - 150 lux is low		Can lux levels be raised; this applies to all Clean Utilities	**NA to provide matrix for ZBP update**
NCH-01-CCW-120 Workstation & X-ray Viewing area		Remove Water temp/safety notes - no water services in this room		Update RDS	**NA to provide matrix for ZBP update**
NCH-01-CCW-121 Workstation & X-ray Viewing area		Remove Water temp/safety notes - no water services in this room		Update RDS	**NA to provide matrix for ZBP update**
Department: NCH EMERGENCY DEPARTMENT (NA-SZ-00-RD-400-EMC Rev 04)					
NCH-00-EMC-014 Ofice 3 Staff		Remove Water temp/safety notes - no water services in this room		Update RDS	**NA to provide matrix for ZBP update**
NCH-00-EMC-024 Sitting & Body Viewing room	Dimmable lighting	Remove Water temp/safety notes - no sink in this room. Remove Mech Vent notes (Local Extract ventilation at food prep area - N/A). Would expect lighting to be dimmable - include dimmer switch		Update RDS - ADD Dimmer switch	**ZBP confirm at M&E co-ordination**
NCH-00-EMC-027 Seminar/Training room	Dimmable lighting	Would expect lighting to be dimmable - include dimmer switch		Update RDS - ADD Dimmer switch	**ZBP confirm at M&E co-ordination**

NCH-00-EMC-029 Rest & Dining room		Remove Water temp/safety notes - no water services in this room		Update RDS	**NA to provide matrix for ZBP update**
NCH-00-EMC-030 Near Patient testing/status laboratory		WHB in room but water temp/safety notes missing		Update RDS	**NA to provide matrix for ZBP update**
NCH-00-EMC-032 Dirty Utility:bedpan disposal & urine test		**AGAIN BOTH ZBP and Mercury drawings (ZBP-ZD-00-PL-524-004 Rev E & ME-SZ-00-PL-332-519 Rev F) indicate both supply and extract provision which contradicts the RDS.**		**Update RDS but ZBP to confirm actual provision please - is it as the RDS i.e. Extract @10ac/hr OR is it as the drawings which appear all to have Supply and Extract provision**	**NA to provide matrix for ZBP update**
NCH-00-EMC-053 Dirty Utility:bedpan disposal & urine test		**AGAIN BOTH ZBP and Mercury drawings (ZBP-ZD-00-PL-524-004 Rev E & ME-SZ-00-PL-332-519 Rev F) indicate both supply and extract provision which contradicts the RDS.**		**Update RDS but ZBP to confirm actual provision please - is it as the RDS i.e. Extract @10ac/hr OR is it as the drawings which appear all to have Supply and Extract provision**	**NA to provide matrix for ZBP update**
NCH-00-EMC-076 Staff Changing room		3 WHB's in room but water temp/safety notes missing	Add water / temp notes	Update RDS	**NA to provide matrix for ZBP update**
Department: NSCH THEATRES (NA-SZ-02-RD-400-THEA Rev 05)					
THE-006 Porters Base	Lighting - increase lux levels to 300 from 150 lux	WHB in room - water temp/safety notes missing	Add water/temp notes	Increase lux levels to 300 lux / update RDS.	**NA to provide matrix for ZBP update**
THE-009 Store Bulk Supplies		Extract 1.5ac - not on matrix; however drawings show both supply & extract? Relative pressure should read BAL		**Update RDS in line with drawing. ZBP matrix should match their drawings.**	**NA to provide matrix for ZBP update**
THE-019 Store		Extract rate 1.5ac/hr missing	Extract on matrix	Add extract to RDS	**NA to provide matrix for ZBP update**
THE--017 Female Staff changing room inc boot change	Lighting - 100 - 150 lux recommended	Agreed generally Staff change would be 100 to 150 lux Floor; increase Extract to 6 as on matrix	Extract on matrix	Update RDS and increase lux level	**NA to provide matrix for ZBP update**
THE-019 Shower: ambulant	Extract rate missing	Add extract	Extract on matrix @ 10ac	Update RDS	**NA to provide matrix for ZBP update**
THE-020 Shower: ambulant	Extract rate missing	Add extract	Extract on matrix @ 10ac	Update RDS	**NA to provide matrix for ZBP update**
THE-021 Shower: ambulant	Extract rate missing	Add extract	Extract on matrix @ 10ac	Update RDS	**NA to provide matrix for ZBP update**
THE-022 Shower: ambulant	Extract rate missing	Add extract	Extract on matrix @ 10ac	Update RDS	**NA to provide matrix for ZBP update**
THE-023 Shower: ambulant	Extract rate missing	Add extract	Extract on matrix @ 10ac	Update RDS	**NA to provide matrix for ZBP update**
THE-024 Shower: ambulant	Extract rate missing	Add extract	Extract on matrix @ 10ac	Update RDS	**NA to provide matrix for ZBP update**
THE-025 Utility Footwear washing	Extract rate missing	Add extract	Extract on matrix @ 10ac	Update RDS	**NA to provide matrix for ZBP update**
THE--039 Male Staff changing room inc boot change	Lighting - 100 - 150 lux recommended	Agreed generally Staff change would be 100 to 150 lux Floor; increase Extract to 6 as on matrix	Extract on matrix	Update RDS and increase lux level	**NA to provide matrix for ZBP update**
THE-041 Shower :ambulant	Extract rate missing	Add extract	Extract on matrix @ 10ac	Update RDS	**NA to provide matrix for ZBP update**
THE-042 Shower :ambulant	Extract rate missing	Add extract	Extract on matrix @ 10ac	Update RDS	**NA to provide matrix for ZBP update**
THE-043 Shower :ambulant	Extract rate missing	Add extract	Extract on matrix @ 10ac	Update RDS	**NA to provide matrix for ZBP update**
THE-044 Male Handwash Area		Remove mech vent notes N/A - this room is not part of the theatre suite where pressure regimes need to be met.		Update RDS	**NA to provide matrix for ZBP update**
THE-049 Utility Footwear washing	Extract rate missing	Add extract	Extract on matrix @ 10ac	Update RDS	**NA to provide matrix for ZBP update**
THE-055 Electrical Cupboard		Remove Mech Vent Notes, Hot water temp and Safety notes as N/A	Not on matrix	Update RDS	**NA to provide matrix for ZBP update**
THE-079 WC & Wash:ambulant		Extract rate missing 10ac	Extract on matrix @ 10ac	Update RDS	**NA to provide matrix for ZBP update**
THE-084 Shared Theatre Exit/Parking Bay		No supply or extract indicated on RDS but ZBP drawing indicates both (ZBP-ZH-02-PL-524-028 Rev C)		Update RDS in line with drawing. ZBP matrix should match their drawings	**NA to provide matrix for ZBP update**
THE-087 Preparation Room (Daily use store)		WHB in room - water temp/safety notes missing	Add water/temp notes; also add Mech Vent notes to state Design in accordance with SHTM 03-01	Update RDS	**NA to provide matrix for ZBP update**
THE-098 Shared Theatre Exit/Parking Bay		No supply or extract indicated on RDS but ZBP drawing indicates both (ZBP-ZH-02-PL-524-028 Rev C)		Update RDS in line with drawing. ZBP matrix should match their drawings	**NA to provide matrix for ZBP update**
THE-101 Preparation room (Daily use store)		WHB in room - water temp/safety notes missing	Add water/temp notes; also add Mech Vent notes to state Design in accordance with SHTM 03-01	Update RDS	**NA to provide matrix for ZBP update**
THE-111 Equipment Bay		Supply and extract indicated but matrix shows only Supply at 1.5ac. Remove extract	Supply on matrix @ 1.5ac	Update RDS	**NA to provide matrix for ZBP update**
THE 119 Shared Theatre Exit/Parking Bay		No supply or extract indicated on RDS but ZBP drawing indicates both (ZBP-ZH-02-PL-524-028 Rev C)		Update RDS in line with drawing. ZBP matrix should match their drawings	**NA to provide matrix for ZBP update**
THE 136 Shared Theatre Exit/Parking Bay		No supply or extract indicated on RDS but ZBP drawing indicates both (ZBP-ZH-02-PL-524-028 Rev C)		Update RDS in line with drawing. ZBP matrix should match their drawings	**NA to provide matrix for ZBP update**
THE 139 Preparation room (Daily use store)		WHB in room - water temp/safety notes missing	Add water/temp notes; also add Mech Vent notes to state Design in accordance with SHTM 03-01	Update RDS	**NA to provide matrix for ZBP update**
THE-149 Shared Theatre Exit/Parking Bay		No supply or extract indicated on RDS but ZBP drawing indicates both (ZBP-ZH-02-PL-524-028 Rev C)		Update RDS in line with drawing. ZBP matrix should match their drawings	**NA to provide matrix for ZBP update**
THE-152 Preparation room (Daily use store)		WHB in room - water temp/safety notes missing	Add water/temp notes; also add Mech Vent notes to state Design in accordance with SHTM 03-01	Update RDS	**NA to provide matrix for ZBP update**
THE-162 Shared Theatre Exit/Parking Bay		No supply or extract indicated on RDS but ZBP drawing indicates both (ZBP-ZH-02-PL-524-028 Rev C)		Update RDS in line with drawing. ZBP matrix should match their drawings	**NA to provide matrix for ZBP update**
THE-165 Preparation room (Daily use store)		WHB in room - water temp/safety notes missing	Add water/temp notes; also add Mech Vent notes to state Design in accordance with SHTM 03-01	Update RDS	**NA to provide matrix for ZBP update**
THE-169 Dirty Utility		Supply provided @ 8 ac/hr - incorrect. Room only has Extract @ 10ac. Drawings only indicate extract.	Not on matrix or drawings - remove extract	Update RDS	**NA to provide matrix for ZBP update**
THE-110 Parking Bay (Bronch)		ZBP drawing (ZBP-ZD-02-PL-524-024 Rev A) shows room not bay; supply and extract provision	Not on matrix?	**Update RDS in line with drawing. ZBP matrix should match their drawings?**	**NA to provide matrix for ZBP update**
THE-179 Parking Bay (Bronch)		ZBP drawing (ZBP-ZD-02-PL-524-024 Rev A) shows room not bay; supply and extract provision	Not on matrix?	**Update RDS in line with drawing. ZBP matrix should match their drawings?**	**NA to provide matrix for ZBP update**
THE-180 Store: bulk supplies		Supply provided @ 8 ac/hr - incorrect. Room only has Extract @ 10ac. Drawings only indicate extract.	Not on matrix or drawings - remove SUPPLY	Update RDS	**NA to provide matrix for ZBP update**
THE-183 Dirty Utility		Supply provided @ 8 ac/hr - incorrect. Room only has Extract @ 10ac. Drawings only indicate extract.	Not on matrix or drawings - remove SUPPLY	Update RDS	**NA to provide matrix for ZBP update**

THE-184 Shared Theatre Exit/Parking Bay		No supply or extract indicated on RDS but ZBP drawing indicates both (ZBP-ZH-02-PL-524-024 Rev A)		Update RDS in line with drawing. ZBP matrix should match their drawings	**NA to provide matrix for ZBP update**
THE-187 Preparation room (Daily use store)		WHB in room - water temp/safety notes missing	Add water/temp notes; also add Mech Vent notes to state Design in accordance with SHTM 03-01	Update RDS	**NA to provide matrix for ZBP update**
THE-191 Dirty Utility		Supply provided @ 8 ac/hr - incorrect. Room only has Extract @ 10ac. Drawings only indicate extract.	Not on matrix or drawings - remove SUPPLY	Update RDS	**NA to provide matrix for ZBP update**
THE-196 Dirty Utility		Supply provided @ 8 ac/hr - incorrect. Room only has Extract @ 10ac. Drawings only indicate extract.	Not on matrix or drawings - remove SUPPLY	Update RDS	**NA to provide matrix for ZBP update**
THE-197 Shared Theatre Exit/Parking Bay		No supply or extract indicated on RDS but ZBP drawing indicates both (ZBP-ZH-02-PL-524-024 Rev A)		Update RDS in line with drawing. ZBP matrix should match their drawings	**NA to provide matrix for ZBP update**
THE-200 Preparation room (Daily use store)		WHB in room - water temp/safety notes missing	Add water/temp notes; also add Mech Vent notes to state Design in accordance with SHTM 03-01	Update RDS	**NA to provide matrix for ZBP update**
THE-204 Dirty Utility		Supply provided @ 8 ac/hr - incorrect. Room only has Extract @ 10ac. Drawings only indicate extract.	Not on matrix or drawings - remove SUPPLY	Update RDS	**NA to provide matrix for ZBP update**
THE-216 Small Rest room	Service Illumination 50 lux? 50 to 200 recommended	Lux levels too low at 50 lux for activities - dimmable switch included. Increase lux level		Update RDS	**NA to provide matrix for ZBP update**
THE-217 Utility: cleaning & Store room		Extract incorrect; change to 10ac/hr	Extract 10ac on matrix	Update RDS	**NA to provide matrix for ZBP update**
THE-184 Shared Theatre Exit/Parking Bay		No supply or extract indicated on RDS; ZBP drawing indicates both (ZBP-ZH-02-PL-524-024 Rev A)		Update RDS in line with drawing. ZBP matrix should match their drawings	**NA to provide matrix for ZBP update**
THE-265 Visitors & Patients WC	Extract rate missing	Add extract	Extract @ 10ac	Update RDS	**NA to provide matrix for ZBP update**
THE-266 Visitors & Patients WC	Extract rate missing	Add extract	Extract @ 10ac	Update RDS	**NA to provide matrix for ZBP update**
THE-289 Corridor		6 WHB in corridor - add water temp/safety notes to RDS		Update RDS	**NA to provide matrix for ZBP update**
THE-292 Dirty Utility		Supply provided @ 8 ac/hr - incorrect. Room only has Extract @ 10ac.	Not on matrix or drawings - remove SUPPLY	Update RDS	**NA to provide matrix for ZBP update**
THE-295 Clean Utility	Query provision of extract	Matrix only has Supply @6ac; drawings also only provision of supply (ZBP-ZH-02-PL-524-028 Rev C)	No change		**NA to provide matrix for ZBP update**
THE-322 Clean Utility		Extract provided - incorrect remove. Drawings (ZBP-ZH-02-PL-524-028 Rev C) and matrix do not show extract.	Remove extract from RDS	Update RDS	**NA to provide matrix for ZBP update**
THE-328 Corridor		6 WHB in corridor - add water temp/safety notes to RDS		Update RDS	**NA to provide matrix for ZBP update**
THE-349 Shared Theatre Exit/Parking Bay		Same comments as previously under THE197 etc			**NA to provide matrix for ZBP update**
THE-352 Preparation room (Daily use store)		WHB in room - water temp/safety notes missing	Add water/temp notes; also add Mech Vent notes to state Design in accordance with SHTM 03-01	Update RDS	**NA to provide matrix for ZBP update**
THE-356 Dirty Utility	Query inconsistencies in ventilation - clarify which is correct	Dirty Utilities to have Extract only. On matrix and drawings as extract only.	Remove Supply from RDS	Update RDS	**NA to provide matrix for ZBP update**
THE-361 Store Bulk Supplies		Extract 1.5ac - not on matrix; however drawings show both supply & extract? Refer to dwg ZBP-ZH-02-PL-524-028 Rev C	Amend matrix?	**ZBP matrix should match their drawings**	**NA to provide matrix for ZBP update**
THE-367 Electrical Cupboard		Remove Mech Vent Notes, Hot water temp and Safety notes as N/A	Not on matrix	Update RDS	**NA to provide matrix for ZBP update**
THE-370 Service room Equipment		Extract missing - add 10ac/hr; WHB in room water temp/safety notes missing.	Extract on matrix; add water temp and safety notes	Update RDS	**NA to provide matrix for ZBP update**
Department: NSCH OPD DERMATOLOGY & Day Case (NA-SZ-02-RD-400-DOPD Rev 03)					
DMW-006 Treatment Room	Exam Lamp	Exam lamp service illumination & Local lux on Environmental page but no Exam Lamp on Components page NA to add?		Nightingales to confirm if Exam Lamp to be added	**BM confirm with Mercury/NHS**
DMW-009 Treatment Room	Exam Lamp	Exam lamp service illumination & Local lux on Environmental page but no Exam Lamp on Components page NA to add?		Nightingales to confirm if Exam Lamp to be added	**BM confirm with Mercury/NHS**
DMW-010 Treatment Room	Exam Lamp	Exam lamp service illumination & Local lux on Environmental page but no Exam Lamp on Components page NA to add?		Nightingales to confirm if Exam Lamp to be added	**BM confirm with Mercury/NHS**
DMW-051 Electrical Cupboard		Remove Mech Vent Notes, Hot water temp and Safety notes as not applicable		Update RDS	**NA to provide matrix for ZBP update**
DMW-069 Dirty Utility/Disposal Hold		Remove Hot water temp/safety notes - no water services in this room		Update RDS	**NA to provide matrix for ZBP update**
DMW-081 Switchgear Cupboard		Remove Mech Vent Notes, Hot water temp and Safety notes as not applicable		Update RDS	**NA to provide matrix for ZBP update**
DMW-083 Regen Kitchen	Board want confirmation that environmentals are in line with CDS requirements - inconsistencies with environmentals across all regen kitchens			Confirm CDS requirements and update RDS accordingly	
Department: NSCH MEDICAL DAY UNIT (NA-SZ-01-RD-400-MDUA Rev 03)					
MDU-006 Electrical Cupboard		Remove Mech Vent Notes, Hot water temp and Safety notes as not applicable		Update RDS	**NA to provide matrix for ZBP update**
MDU-0058 Corridor		2 WHB in this area - add water temp/safety notes		Update RDS	**NA to provide matrix for ZBP update**
Department: NSCH OPD DERMATOLOGY & DAY CASE (NA-SZ-02-RD-400-DOPD Rev 03)					
DOPD-005 Leg Ulcer Treatment room	Service Illumination Lux notes amendments -	Change Desk to CHAIR; add Service Illumination local Lux 1000 lux; Service illumination Local Lux Notes - Examination Light		Nightingales to confirm if Exam Lamp to be added	**BM confirm with Mercury/NHS**
DOPD-015 Treatment room		Exam lamp service illumination & Local lux on Environmental page but no Exam Lamp on Components page - NA to add?		Nightingales to confirm if Exam Lamp to be added	**NA to provide matrix for ZBP update**
DOPD-018 Treatment room		Exam lamp service illumination & Local lux on Environmental page but no Exam Lamp on Components page - NA to add?		Nightingales to confirm if Exam Lamp to be added	**NA to provide matrix for ZBP update**
DOPD-027 Disabled Change	Board change to MOH Waiting with environmental to be amended	Need to amend Temp (to 21), remove Extract (6ac currently); change Mech Vent notes to Air Volume to suit occupancy @ 10 l/s per person; Service Illumination to increase from 100 lux to 200 lux		ZBP to confirm changes ok and update RDS accordingly	**NA update Room Name ZBP update matrix**
Department: NSCH STROKE WARD (NA-SZ-01-RD-400-STW Rev 04)					
STW-006 Riser	Board querying lux level of 300 for riser	Correct		No change	
STW-042 Pantry/Beverage making area + Regen & Wash up	Board have deleted Pantry/Beverage making area and left Regen. Request RDS be updated in terms of equipment environmentals to reflect equipment for FM Regen Kitchen & Wash Up area	ZBP to advise changes with additional equipment as noted on RDS and Nightingale also		Nightingales and ZBP to confirm changes ok and update RDS accordingly.	**NA update Room Name in database**
Department: NCH RADIOLOGY (NA-SZ-01-RD-400-RCF & RCI Rev 03)					

NCH-01-RCF-017 CT Scanner room		Service Ilumination Notes requests Dimming facilities are required (10-100 variable Couch) - no dimmer switch on components page.		Nightingales please confirm if can add Dimming facitilities. Update RDS.	ZBP added SWC026 during M&E co-ordination
NCH-01-RCF-023 Control room		Service Ilumination Notes requests that the remote switching of lighting in the MRI room to be dimmable - no dimmer switch on components page.		Nightingales please confirm if can add Dimming facitilities. Update RDS.	ZBP added SWC026 during M&E co-ordination
NCH-01-RCF-024 MRI Scanner Room (3T)		Service illumination notes - Trolley ; Dimming facilities are required		Nightingales please confirm if can add Dimming facitilities. Update RDS.	ZBP added SWC026 during M&E co-ordination
NCH-01-RCF-025 Controlled Lobby		Why is HBN 04-01 Supplement 1 (Isolation Facilties in Acute Settings) being quoted under Mech Vent Notes section? Activities section appears incorrect; CWHB with associated water temp/safety notes when there is no WHB in the lobby - Not applicable.		Please clarify HBN 04 requirements, amend as appropriate and update RDS including Nightingales - please confirm activities	BM confirm activities with NHS
NCH-01-RCF-027 Prep & Store Room		Activities appear to be incorrect to start - this is not a prep area for radiopharmaceuticals - needs revising (use appears to be as a Clean Utility); Ventilation notes need amending - there is no BSC or Fume Hood?. Design to HBN 14-01 (which is pharmacy & Radio pharmacy aseptic prep) is also not applicable to this room? Ventilation therefore needs amending. Supply & Extract balanced (see Drawing ZBP-ZE-01-PL-524-015 Rev A); Relative Pressure should be BAL (not POS)		Please clarify HBN 04 requirements, amend as appropriate and update RDS including Nightingales - please confirm activities	BM confirm activities with NHS
NCH-01-RCF-029 Resus Bay		Activities incorrect (not secure holding of personal belongings); Extract & Supply incorrect; temp incorrect for this area if being consistent with rest of resus bays in hospital; Lux levels incorrect		Amend RDS; Winter temp = 16 deg; Remove supply & Extract (supply grille on drawing belongs to Corridor space); remove NEG relative pressure; Amend lighting to 200 lux Service Illumination; Notes to read average at floor 1; max point illuminance 350 lux. Please confirm including Nightingales	BM confirm activities with NHS
NCH-01-RCI-009 Rrep Room		Activities appear incorrect - this is not a patient wait post radio isotope - it is a Clean Utility; Mech Vent notes appear incorrect (supply ok) but air voume to suit heat gains from equipment? Also why Medical Gas scavenging required. This is not on the Medical Gas Drawing (ZBP-ZE-01-PL-512-015 Rev A) - there is an AVSU outside of the prep room in the exit bay.		Please amend environmental page to correct requirements and update RDS accordingly including Nightingales	BM confirm activities with NHS
NCH-01-RCI-019 Rrep Room		Activities appear incorrect - this is not a patient wait post radio isotope - it is a Clean Utility; Mech Vent notes appear incorrect (supply ok) but air voume to suit heat gains from equipment? Also why Medical Gas scavenging required. This is not on the Medical Gas Drawing (ZBP-ZE-01-PL-512-015 Rev A) - there is an AVSU outside of the prep room in the exit bay. Water temp/safety notes also missing.		Please amend environmental page to correct requirements and update RDS accordingly	BM confirm activities with NHS
Department: NCH RADIOLOGY Ground floor (NA-SZ-00-RD-400-RCG Rev 03)					
RCG-007 Seminar room	Board request dimmable lighting	Would expect lighting to be dimmable - include dimmer switch		Nightingales please confirm if can add Dimming facitilities. Update RDS.	ZBP confirm at M&E co-ordination
RCG-009 Radiologists Communal Reporting area		Service Ilumination Notes requests Dimming facilities are required - no dimmer switch on components page.		Nightingales please confirm if can add Dimming facitilities. Update RDS.	NA to provide matrix for ZBP update
RCG-023 Image Analyis lab & Reporting room		Service Ilumination Notes requests Dimming facilities are required - no dimmer switch on components page.		Nightingales please confirm if can add Dimming facitilities. Update RDS.	NA to provide matrix for ZBP update
RCG-044 Computed Radiography imaging film processing/viewing area & equipment store	Board have made comment - redraw - requires new RDS?	Also note: water temp notes/ safety notes - no sink in room?		Please clarify requirements and update RDS as required.	NA to provide matrix for ZBP update
RCG-046 Disable Wheelchair pts / Changing Cubicle		This room is a WC not a changing cubicle - ventilation needs to be 10ac/hr; remove Mech Vent notes. Add water temp/safety temp notes		Update RDS	NA to provide matrix for ZBP update
RCG-053 General Computed Radiography x-ray room inc control cubicle		Add water temp/safety temp notes - missing		Update RDS	NA to provide matrix for ZBP update
RCG-063 Control Room		Service Ilumination Notes requests that the remote switching of lighting in the MRI room to be dimmable - no dimmer switch on components page.		Nightingales please confirm if can add Dimming facitilities. Update RDS.	ZBP confirm at M&E co-ordination
RCG-064 MRI Scanner room (3T)		Service illumination notes - Trolley ; Dimming facilities are required		Nightingales please confirm if can add Dimming facitilities. Update RDS.	ZBP confirm at M&E co-ordination
RCG-065 MRI Scanner engineering/technical room		Activities incorrect - not a patient area?			BM confirm activities with NHS
RCG-066 Controlled Lobby		Why is HBN 04-01 Supplement 1 (Isolation Facilties in Acute Settings) being quoted under Mech Vent Notes section? Activities section appears incorrect; CWHB with associated water temp/safety notes when there is no WHB in the lobby - Not applicable.		Please clarify HBN 04 requirements, amend as appropriate and update RDS inc Nightingales	BM confirm activities with NHS
RCG-071 Patient Prep & Store room		Activities appear incorrect - this is not a prep area for radiopharmaceutical prep under laminar flow and holding of radio-isotopes - needs revising? ; Ventilation notes need amending - there is no BSC or Fume Hood?. Design to HBN 14-01 (which is pharmacy & Radio pharmacy aseptic prep) is also not applicable to this room? Ventilation therefore needs amending. According to ZBP Drawing (ZBP-ZE-00-PL-524-005 Rev A) Extract is 38 l/s with Supply 58 l/s therefore extract and supply cannot be 6ac/hr as on RDS. Needs amending etc etc		Please clarify exact vent requirements and update RDS inc Nightingales	BM confirm activities with NHS
RCG-077 General Computed Radiography x-ray room inc control cubicle		Add water temp/safety temp notes - missing; Mech Vent notes missing - mechanical ventilation (supply): Up to 6ac/hr depending on local conditions. Mech Ventilation (extract): to suit overall design of area.		Update RDS	NA to provide matrix for ZBP update
RCG-081 Image Analyis lab & Reporting room		Service Ilumination Notes requests Dimming facilities are required - no dimmer switch on components page.		Nightingales please confirm if can add Dimming facitilities. Update RDS.	ZBP confirm at M&E co-ordination
RCG-090 Hot Reporting Room		Service Ilumination Notes requests Dimming facilities are required - no dimmer switch on components page.		Nightingales please confirm if can add Dimming facitilities. Update RDS.	ZBP confirm at M&E co-ordination
RCG-098 Gneral Ultrasound Examination room		Service Ilumination Notes requests Dimming facilities are required - no dimmer switch on components page. Also states Exam Lamp with Service illumination @ 1000 lux. No exam lamp on components page (same room RCG-101 has a LIG053).		Update RDS - Nightingales please confirm if can add Dimmer switch. Confirm if exam lamp is required.	ZBP confirm at M&E co-ordination
RCG-101 General Ultrasound Examination room		Service Ilumination Notes requests Dimming facilities are required - no dimmer switch on components page		Nightingales please confirm if can add Dimming facitilities. Update RDS.	ZBP confirm at M&E co-ordination
RCG-102 Counselling/Interview room	Board have changed this to a General Ultrasound Examination room			NA & ZBP need to confirm if they are taking this on board	BM confirm, NA not yet instructed of change.

RCG-105 Switchgear Cupboard		Remove Winter temp; summer temp; Temperature notes; mechanical vent; Hot surface temperature notes; Water temp & Safety temp notes - not applicable to a switchgear cupboard		Update RDS	**NA to provide matrix for ZBP update**
Department: NCH THEATRES (NA-SZ-01-RD-400-THEC Rev 04)					
THE-004 Assess/Pre-op/Changing		Add water temp/safety temp notes - missing		Update RDS	**NA to provide matrix for ZBP update**
THE-005 Assess/Pre-op/Changing		Add water temp/safety temp notes - missing		Update RDS	**NA to provide matrix for ZBP update**
THE-006 Assess/Pre-op/Changing		Add water temp/safety temp notes - missing		Update RDS	**NA to provide matrix for ZBP update**
THE-007 Assess/Pre-op/Changing		Add water temp/safety temp notes - missing		Update RDS	**NA to provide matrix for ZBP update**
THE-008 Assess/Pre-op/Changing		Add water temp/safety temp notes - missing		Update RDS	**NA to provide matrix for ZBP update**
THE-015 Assess/Pre-op/Changing		Add water temp/safety temp notes - missing		Update RDS	**NA to provide matrix for ZBP update**
THE-016 Assess/Pre-op/Changing		Add water temp/safety temp notes - missing		Update RDS	**NA to provide matrix for ZBP update**
THE-017 Assess/Pre-op/Changing		Add water temp/safety temp notes - missing		Update RDS	**NA to provide matrix for ZBP update**
THE-021 Pre-Op Playroom		Add water temp/safety temp notes - missing		Update RDS	**NA to provide matrix for ZBP update**
THE-024 Adolescents Mess room		Mech vent notes state local extract ventilation at food prep area - there is nothing stated on the components sheet that suggests there is a food prep area; water temp / safety notes but there is no sink / whb in room. ZBP Drawing details supply and extract which is not on rds.		Clarify requirements & update RDS accordingly	**NA to provide matrix for ZBP update**
THE-032 Holding Area	Board have changed to holding area for theatre trolleys/patients	ZBP drawing indicates extract which is included at 10ac/hr on RDS already. However temperature will need to be increase to 21 degrees for patient holding area. Vent notes should ideally be air volume to suit occupancy at 10 litres per second or cooling requirement, whichever is the greater.		Can ZBP confirm this can be accommodated without too much impact	**NA to provide matrix for ZBP update**
THE-033 Holding Area	Board have changed to holding area for theatre trolleys/patients	ZBP drawing indicates extract which is included at 10ac/hr on RDS already. However temperature will need to be increase to 21 degrees for patient holding area. Vent notes should ideally be air volume to suit occupancy at 10 litres per second or cooling requirement, whichever is the greater.		Can ZBP confirm this can be accommodated without too much impact	**NA to provide matrix for ZBP update**
THE-034 Holding Area	Board have changed to holding area for theatre trolleys/patients	ZBP drawing indicates extract which is included at 10ac/hr on RDS already. However temperature will need to be increase to 21 degrees for patient holding area. Vent notes should ideally be air volume to suit occupancy at 10 litres per second or cooling requirement, whichever is the greater.		Can ZBP confirm this can be accommodated without too much impact	**NA to provide matrix for ZBP update**
THE-042 Female Staff change		As previously noted in NSGH Theatres, generally Staff change would be 100 to 150 lux Floor;		Can ZBP accommodate this?	**NA to provide matrix for ZBP update**
THE-044 Male Staff change		As previously noted in NSGH Theatres, generally Staff change would be 100 to 150 lux Floor;		Can ZBP accommodate this?	**NA to provide matrix for ZBP update**
THE-048 Prep room		Add water temp/safety temp notes - missing		Update RDS	**NA to provide matrix for ZBP update**
THE-058 Prep room		Add water temp/safety temp notes - missing		Update RDS	**NA to provide matrix for ZBP update**
THE-067 Seminar room	Dimmable lighting	Light switch dimmable on components sheet		Add dimmable to service illumination notes	**Dimmer switch SWC026 already on drawing**
THE-069 Near Patient testing/status labs		Add water temp/safety temp notes - missing		Update RDS	**NA to provide matrix for ZBP update**
THE-078 Prep		Add water temp/safety temp notes - missing		Update RDS	**NA to provide matrix for ZBP update**
THE-086 Prep		Add water temp/safety temp notes - missing		Update RDS	**NA to provide matrix for ZBP update**
THE-091 Prep		Add water temp/safety temp notes - missing		Update RDS	**NA to provide matrix for ZBP update**
THE-099 Prep		Add water temp/safety temp notes - missing		Update RDS	**NA to provide matrix for ZBP update**
THE-108 Prep		Add water temp/safety temp notes - missing		Update RDS	**NA to provide matrix for ZBP update**
THE-115 Prep		Add water temp/safety temp notes - missing		Update RDS	**NA to provide matrix for ZBP update**
THE-120 Prep		Add water temp/safety temp notes - missing		Update RDS	**NA to provide matrix for ZBP update**
THE-103 Store room - flexible endoscope		Add water temp/safety temp notes - missing		Update RDS	**NA to provide matrix for ZBP update**
THE-152 Corridor		Add water temp/safety temp notes - missing; WHB in area		Update RDS	**NA to provide matrix for ZBP update**
THE-130 Satellite Pharmacy		Activities incorrect - is Linen Bay (this is actually THE-162 which is also named Satellite Pharmacy but is equipment bay on drawings). Environmentals page consistent with right room number		Update RDS ROOM names and activities	**NA update Room Name in database**
THE-162 Satellite Pharmacy		See notes above			**NA update Room Name in database**
THE-173 IPS		Remove temperature notes - not applicable		Update RDS	**NA to provide matrix for ZBP update**
Department: NSCH RENAL IN-PATIENTS & DAY UNIT (NA-SZ-04-RD-400-REMW REV 03)					
RENW-002 Relatives room		Add water temp/safety temp notes - missing		Update RDS	**NA to provide matrix for ZBP update**
RENW-039 Patients ensuite & wash	Not consistent with other en-suites	Remove temperature notes; remove mech vent notes		Update RDS	**NA to provide matrix for ZBP update**
RENW-071 Electrical Cupboard		Remove temperature notes; remove mech vent notes & water temp/safety notes N/A		Update RDS	**NA to provide matrix for ZBP update**
RENW-177 Electrical Cupboard		Remove temperature notes; remove mech vent notes & water temp/safety notes N/A		Update RDS	**NA to provide matrix for ZBP update**
RENW-179 Store	Service Illumination Lux 150 lux	Add 150 lux		Update RDS	**NA to provide matrix for ZBP update**
RENW-220 Switchgear Cupboard		Remove temperature notes; remove mech vent notes & water temp/safety notes N/A		Update RDS	**NA to provide matrix for ZBP update**
RENW-288 Electrical Cupboard		Remove temperature notes; remove mech vent notes & water temp/safety notes N/A		Update RDS	**NA to provide matrix for ZBP update**
RENW-294 Dirty Utility/Disposal hold		Remove water temps/safety notes - no water services in room		Update RDS	**NA to provide matrix for ZBP update**
Department: NSCH ACUTE ASSESSMENT UNIT (NA-SZ-04-RD-400-AAW REV 04)					
AAW-004 Staff Locker		Extract should be 6ac not 5ac	Extract 6ac on matrix	Update RDS	**NA to provide matrix for ZBP update**

AAW-013 Electrical cupboard		Remove temperature notes; remove mech vent notes & water temp/safety notes N/A		Update RDS	**NA to provide matrix for ZBP update**
AAW-014 Dirty Utility/Sluice		Only Extract stated on ZBP matrix but drawing indicates both supply and extract (ZBP-ZH-00-PL-524-008 REV B)		RDS correct	**NA to provide matrix for ZBP update**
AAW-031 Clean Utility		Only Supply (6ac) stated on ZBP matrix but drawing indicates both supply and extract (ZBP-ZH-00-PL-524-008 REV B). Supply @ 62l/s & Extract @ 42 l/s - therefore relative pressure POS (correct on rds). Remove 5% RH?		Update RDS	**NA to provide matrix for ZBP update**
AAW--048 Staff Locker room		Add water temp/safety temp notes - missing		Update RDS	**NA to provide matrix for ZBP update**
AAW--054 Staff Locker room		Add water temp/safety temp notes - missing		Update RDS	**NA to provide matrix for ZBP update**
AAW-059 Staff Base	Board querying that components are consistent with a 2 person office?	Agree - unlikely that that amount of furniture could fit into a bay as part of the corridor; Nightingales - please check and confirm		Update RDS as appropriate	**NA update Room Name in database**
AAW-169 Bulk fluids & clean dressing		ZBP matrix does not include extract - supply only. Remove extract. Drawings only show Supply		Update RDS as appropriate	**NA to provide matrix for ZBP update**
AAW-077 Clean Utility		Only Supply (6ac) stated on ZBP matrix but drawing indicates both supply and extract (ZBP-ZH-00-PL-524-008 REV B). Supply @ 47l/s & Extract @ 31 l/s - therefore relative pressure POS (correct on rds).		Update RDS as appropriate	**NA to provide matrix for ZBP update**
AAW-106 Electrical Cupboard		Remove temperature notes; remove mech vent notes & water temp/safety notes N/A		Update RDS	**NA to provide matrix for ZBP update**
AAW-117 Clean Utilty		Only Supply (6ac) stated on ZBP matrix but drawing indicates both supply and extract (ZBP-ZH-00-PL-524-008 REV B). Supply @ 60 l/s & Extract @ 40 l/s - therefore relative pressure POS (correct on rds). Remove 5% RH?		Update RDS as appropriate	**NA to provide matrix for ZBP update**
AAW-164 Store		Both Extract and Supply on RDS but ZBP drawing (ZBP-ZH-00-PL-524-008 Rev B) only show supply - consistent with other store areas.	ZBP matrix states supply only @ 1.5ac	Remove Extract from RDS	**NA to provide matrix for ZBP update**
AAW-170 Automated Pharmacy Area		Balanced supply and extract indicated on ZBP drawing (ZBP-ZH-00-PL-524-008 Rev B). Nothing on RDS		Update RDS as appropriate	**NA to provide matrix for ZBP update**
AAW-190 Switchgear Cupboard		Remove Mech Vent notes - not applicable		Update RDS	**NA to provide matrix for ZBP update**
AAW-194 Pantry/Beverage Making area		Supply and extract incorrect on RDS; Extract is at 5 and should be 6ac/hr; supply is missing.	Change extract to 6 ac as on matrix and supply at 5ac	Update RDS	**NA to provide matrix for ZBP update**
AAW-197 Clean Utility with clinical store/CD		Drawing and ZBP matrix are not consistent with each other again; matrix states Supply only; drawing shows Supply (55 l/s) and Extract (31 l/s) - ZBP-ZG-00-PL-524-007 Rev H). RDS also has 5% RH ??	Matrix incorrect in line with drawing.	Update RDS	**NA to provide matrix for ZBP update**
AAW-229 Staff Locker Bay		Extract should be 6ac not 5ac		Update RDS	**NA to provide matrix for ZBP update**
AAW-230 Seminar/Hospital at Night	Board requesting dimmable lighting	Dimmer switch included on components page		Add Dimmable lighting to RDS	**Dimmer switch SWC026 already on drawing.**
AAW-319 Clean Utility with clinical store/CD		Drawing and ZBP matrix are not consistent with each other again; matrix states Supply only; drawing shows Supply (55 l/s) and Extract (31 l/s) - ZBP-ZG-00-PL-524-007 Rev H). RDS also has 5% RH ??	Matrix incorrect in line with drawing.	Update RDS	**NA to provide matrix for ZBP update**
AAW-366 Clean Utility with clinical store/CD		Drawing and ZBP matrix are not consistent with each other again; matrix states Supply only; drawing shows Supply (57 l/s) and Extract (34 l/s) - ZBP-ZG-00-PL-524-007 Rev H). RDS also has 5% RH ??	Matrix incorrect in line with drawing.	Update RDS	**NA to provide matrix for ZBP update**
AAW-384 Electrical Cupboard		Remove temperature notes; remove mech vent notes & water temp/safety notes N/A		Update RDS	**NA to provide matrix for ZBP update**
Department: NCH CHILD PROTECTION UNIT (NA-SZ-00-RD-400-CPS REV 04)					
CPS-001 Controlled Lobby	Activities incorrect - please amend to Access & Waiting	Remove Water temp/safety notes - no water services in lobby		Update RDS (ZBP & NA)	**NA update database**
CPS-005 Observation Room	Activities incorrect - please amend to Observing and family interactions (currently states post mortem findings). Change service illumination lux from 150 to 300 lux Desk	Lux levels too low for computer / desk work. Increase as recommended		Update RDS (ZBP & NA)	**NA update database**
CPS-006 Shower	Supply & Extract the same @ 8ac/hr but negative relative pressure	ZBP drawing (ZBP-ZA-00-PL-524-001 Rev A) indicates Extract @ 34 l/s with Supply @24 l/s - amend RDS to reflect.		Update RDS (ZBP)	**NA to provide matrix for ZBP update**
Department: NSGH MAIN ENTRANCE & PUBLIC AREAS (NA-SZ-00-RD-400-ENTA REV 03)					
ENT-033 Voluntary Services - allowance		Remove water temps/safety notes - no water services in room		Update RDS	**NA to provide matrix for ZBP update**
ENT-037 Electrical cupboard		Remove temperature notes; remove mech vent notes & water temp/safety notes N/A		Update RDS	**NA to provide matrix for ZBP update**
Department: NSGH DISCHARGE LOUNGE (NA-SZ-00-RD-400-DLO REV 03)					
DLO-008 Consulting/Exam room		Service Illumination Local lux 1000 lux with local lux Exam Lamp - exam lamp on components list		Confirm if Nightingales are to add Exam Lamp or remove Lighting notes?	**BM confirm with Mercury/NHS**
Department: NSGH OPD First Floor (NA-SZ-00-RD-400-OPDA1 REV 02)					
OPD1-001 Entrance Corridor		Activities incorrect - states patient on treatment trolley; minor surgical procedures etc!! ZBP - Remove Water temp notes - no water services; amend Winter temp to 22; Summer temp to 20; remove temp notes; Supply and Extract @ 10 ac/hr;	ZBP please confirm requirements - not consistent with other corridor areas. Matrix states as previous column + lux levels at 300 lux Couch?	Amend RDS - Nightingales. ZBP to confirm requirements and amend RDS as appropriate	**BM confirm activities with NHS**
OPD1-015 Nurse Base		SPA1046 Space Leak Detection on components sheet - this is incorrect - believe this should be in OPD1-014 IT Hub.		Amend RDS - Nightingales.	**NA update Equipment List**
OPD1-030 Visual Acuity testing/cons room	Add dimmable lighting	Add dimmable lighting facility		Nightingales - please amend light switch to dimmer switch on components page	**NA to provide matrix for ZBP update**
OPD1-033 Audiometric Test room	Add dimmable lighting & increase lux levels to 300 lux	Add dimmable lighting facility & increase lux levels		Nightingales - please amend light switch to dimmer switch on components page; ZBP to increase lux level	**NA to provide matrix for ZBP update**
OPD1-035 Audiometric Test room	Add dimmable lighting & increase lux levels to 300 lux	Add dimmable lighting facility & increase lux levels		Nightingales - please amend light switch to dimmer switch on components page; ZBP to increase lux level	**NA to provide matrix for ZBP update**
OPD1-038 Interview/Hearing aid/Consulting room	Increase lux level to 300 lux	Amend lux levels		Update RDS	**NA to provide matrix for ZBP update**
OPD1-039 Interview/Hearing aid/Consulting room	Increase lux level to 300 lux	Amend lux levels		Update RDS	**NA to provide matrix for ZBP update**
OPD1-040 Consult/Exam		Add 1000 lux to Service Ilumination Local Lux (Exam Lamp)		Update RDS	**NA to provide matrix for ZBP update**

OPD1-046 Height & Weight bay		Add water temp/safety temp notes - missing - sink in room		Update RDS	**NA to provide matrix for ZBP update**
OPD1-056 Electrical Cupboard		Remove temperature notes; remove mech vent notes & water temp/safety notes N/A		Update RDS	**NA to provide matrix for ZBP update**
OPD1-057 Interview/Hearing aid/Consulting room	Increase lux level to 300 lux	Amend lux levels		Update RDS	**NA to provide matrix for ZBP update**
OPD1-058 ENT Treatment / consulting room	Increase lux level to 300 lux	Amend lux levels		Update RDS	**NA to provide matrix for ZBP update**
OPD1-060 ENT Treatment / consulting room	Increase lux level to 300 lux	Amend lux levels		Update RDS	**NA to provide matrix for ZBP update**
OPD1-069 Consult/Exam - Pre-op Assessment		Exam lamp & service illumination @ 1000 lux but reading light on components page		Nightingales please confirm if this is to be an exam lamp or reading light and amend if incorrect. ZBP to amend RDS as appropriate	**BM confirm with NHS**
OPD1-071 Consult/Exam - Pre-op Assessment		Exam lamp & service illumination @ 1000 lux but reading light on components page		Nightingales please confirm if this is to be an exam lamp or reading light and amend if incorrect. ZBP to amend RDS as appropriate	**BM confirm with NHS**
OPD1-072 Consult/Exam		Exam lamp & service illumination @ 1000 lux but reading light on components page		Nightingales please confirm if this is to be an exam lamp or reading light and amend if incorrect. ZBP to amend RDS as appropriate	**BM confirm with NHS**
OPD1-076 Consult/Exam		Exam lamp & service illumination @ 1000 lux but reading light on components page		Nightingales please confirm if this is to be an exam lamp or reading light and amend if incorrect. ZBP to amend RDS as appropriate	**BM confirm with NHS**
OPD1-081 Electrical Cupboard		Remove temperature notes; remove mech vent notes & water temp/safety notes N/A		Update RDS	**NA to provide matrix for ZBP update**
OPD1-088 Technical Area		Activities appear incorrect - is an office type area not patient arriving on trolleys, examination etc. Please amend. ZBP environmental data appears incorrect if not patient area e.g. Couch, Examination lamp; 1000 lux, Hot water temp/safety notes (no sink) etc. Please review		Nightingales to review and amend Activities; ZBP to review and amend accordingly.	**BM confirm activities with NHS**
OPD1-095 Physical Measurement Bay		Add water temp/safety temp notes - missing - sink in room		Update RDS	**NA to provide matrix for ZBP update**
OPD1-113 Physical Measurement Bay		Add water temp/safety temp notes - missing - sink in room		Update RDS	**NA to provide matrix for ZBP update**
OPD1-127 Consult/Exam		Exam lamp & service illumination @ 1000 lux but reading light on components page		Nightingales please confirm if this is to be an exam lamp or reading light and amend if incorrect. ZBP to amend RDS as appropriate	**BM confirm with NHS**
OPD1-128 Electrical Cupboard		Remove temperature notes; remove mech vent notes & water temp/safety notes N/A		Update RDS	**NA to provide matrix for ZBP update**
OPD1-137 Sterile Supplies & Equipment Store		Supply & Extract on RDS but matrix and drawing (ZBP-ZJ-01-PL-524-019 Rev A) show only Supply. Please amend RDS		Update RDS	**NA to provide matrix for ZBP update**
Department: NSGH RADIOLOGY Ground floor (NA-SZ-00-RD-400-RAG REV 04)					
RAG-020 CT scanner room		Add water temp/safety temp notes - missing - sink in room		Update RDS	**NA to provide matrix for ZBP update**
RAG-023 CT scanner room		Add water temp/safety temp notes - missing - sink in room		Update RDS	**NA to provide matrix for ZBP update**
RAG-024 Radiologists Office/Reporting Area		Dimmable lighting facility required but no dimmer switch on components page		Nightingales - please amend light switch to dimmer switch on components page	**ZBP to add at M&E co-ordinatio.**
RAG-035 CT Prep room (2 bays)		Add water temp/safety temp notes - missing - sink in room		Update RDS	**NA to provide matrix for ZBP update**
RAG-043 Switchgear room		Remove temperature notes; remove mech vent notes & water temp/safety notes N/A		Update RDS	**NA to provide matrix for ZBP update**
RAG-044 Pass through changing cubicle		Remove water temp/safety temp notes no sink in room		Update RDS	**NA to provide matrix for ZBP update**
RAG-045 Pass through changing cubicle		Remove water temp/safety temp notes no sink in room		Update RDS	**NA to provide matrix for ZBP update**
RAG-048 Pass through changing cubicle		Remove water temp/safety temp notes no sink in room		Update RDS	**NA to provide matrix for ZBP update**
RAG-049 Pass through changing cubicle		Remove water temp/safety temp notes no sink in room		Update RDS	**NA to provide matrix for ZBP update**
RAG-051 Pass through changing cubicle		Remove water temp/safety temp notes no sink in room		Update RDS	**NA to provide matrix for ZBP update**
RAG-058 QA room		Remove water temp/safety temp notes no sink in room also softened or filtered water supply and drainage to take account of chemical waste?		Update RDS	**NA to provide matrix for ZBP update**
RAG-059 QA room		Query water temp 60 degrees - should be 41 degrees as clinical wash hand basin?. Also softened or filtered water supply and drainage to take account of chemical waste?		Update RDS	**NA to provide matrix for ZBP update**
RAG-066 Mobile Xray equipment maint/service workshop		RDS states both supply and extract but matrix only has extract. Remove supply		Update RDS	**NA to provide matrix for ZBP update**
RAG-013 Prep and Store room		Believe Activities are incorrect - no laminar flow/aseptic techniques/holding of radio-isotopes/radioactive materials?	Please review matrix	Nightingales please review activities and amend. ZBP to amend environmentals e.g. BSC Fume hood etc & design to HBN 14-01?	**BM confirm with NHS**
RAG-106 Controlled Lobby/Corridor		Why is HBN 04-01 Supplement 1 (Isolation Facilties in Acute Settings) being quoted under Mech Vent Notes section? Activities section appears incorrect; CWHB with associated water temp/safety notes when there is no WHB in the lobby - Not applicable.	Drawing does not appear to show any pressure regimes etc only CVG (ZBP-ZE-00-PL-524-005)	Please clarify HBN 04 requirements, amend as appropriate and update RDS inc Nightingales	**BM confirm with NHS**
RAG-110 MRI Scanner engineering/tech room		Activities incorrect - not a patient area - please amend.	ZBP matrix does not match drawing only supply (matrix states supply & extract)? ZBP-ZE-00-PL-524-005 Rev A	Nightingales please review activities and amend. ZBP to amend environmentals and update RDS	**BM confirm with NHS**
RAG-111 Control room - shared by 2 scanner rooms		Dimmable lighting facility required but no dimmer switch on components page		Nightingales - please amend light switch to dimmer switch on components page	**ZBP to add at M&E co-ordinatio.**
RAG-117 Reporting		Dimmable lighting facility required but no dimmer switch on components page		Nightingales - please amend light switch to dimmer switch on components page	**ZBP to add at M&E co-ordinatio.**
RAG-121 Switchgear room		Remove temperature notes; remove mech vent notes & water temp/safety notes N/A		Update RDS	**NA to provide matrix for ZBP update**
RAG-123 MRI Scanner engineering/tech room		Activities incorrect - not a patient area - please amend.	ZBP matrix does not match drawing only supply (matrix states supply & extract)? ZBP-ZE-00-PL-524-005 Rev A	Nightingales please review activities and amend. ZBP to amend environmentals and update RDS	**BM confirm with NHS**
RAG-126 Electrical cupboard		Remove temperature notes; remove mech vent notes & water temp/safety notes N/A		Update RDS	**NA to provide matrix for ZBP update**
Department: NSGH RADIOLOGY First floor (NA-SZ-01-RD-400-RAF REV 04)					
RAF-035 General Ultrasound Examination Room		Add water temp/safety temp notes - missing - sink in room		Update RDS	**NA to provide matrix for ZBP update**
RAF-045 Radiologists Office/Reporting Area		Dimmable lighting facility required but no dimmer switch on components page		Nightingales - please amend light switch to dimmer switch on components page	**ZBP added SWC026 during M&E co-ordination**

RAF-046 CT Prep room (2 bays)		Add water temp/safety temp notes - missing - sink in room		Update RDS	NA to provide matrix for ZBP update
RAF-075 CT Scanner room		Add water temp/safety temp notes - missing - sink in room		Update RDS	NA to provide matrix for ZBP update
RAF-078 CT Scanner room		Add water temp/safety temp notes - missing - sink in room		Update RDS	NA to provide matrix for ZBP update
RAF-080 Radiological/Surgical Endovascular Lab theatre		Remove water temp/safety temp notes no sink in room		Update RDS	NA to provide matrix for ZBP update
RAF-081 Laboratory Theatre computer/engineering services room		Activities appear incorrect for area?		Nightingales please review activities and amend	BM to confirm acivities with NHS
RAF-083 Laboratory Theatre computer/engineering services room		Activities appear incorrect for area?		Nightingales please review activities and amend	BM to confirm acivities with NHS
RAF-084 Radiological review/reporting areas: 6 place		Dimmable lighting facility required but no dimmer switch on components page		Nightingales - please amend light switch to dimmer switch on components page	ZBP added SWC026 during M&E co-ordination
RAF-085 Machine rooms		Activities appear incorrect for area?	ZBP remove water safety temperature notes - no water services in area	Nightingales please review activities and amend; ZBP amend RDS	BM to confirm acivities with NHS
RAF-092 Machine rooms		Activities appear incorrect for area?	ZBP remove water safety temperature notes - no water services in area	Nightingales please review activities and amend; ZBP amend RDS	BM to confirm acivities with NHS
RAF-096 IT Hub		Components sheet has SPA1042 Space Panel; AVSU Medical Gas Control panel - incorrect. Please amend		Nightingales please review and amend RDS	ZBP confirm SPA1042 (AVSU) or SPA1046 (Leak Detection)
RAF-103 Radiological review/reporting areas: 3 place		Dimmable lighting facility required but no dimmer switch on components page		Nightingales - please amend light switch to dimmer switch on components page	ZBP added SWC026 during M&E co-ordination
RAF-105 Radiological review/reporting areas: 3 place		Dimmable lighting facility required but no dimmer switch on components page		Nightingales - please amend light switch to dimmer switch on components page	ZBP added SWC026 during M&E co-ordination
RAF-109 Library/study area : 10 places	Dimming required	Add dimmable lighting facility		Nightingales - please amend light switch to dimmer switch on components page	ZBP added SWC026 during M&E co-ordination
RAF-112 Seminar room	Dimming required	Dimmer switch already included on components page - no change			ZBP added SWC026 during M&E co-ordination
RAF-113 Radiological review/reporting areas: 6 place		Dimmable lighting facility required but no dimmer switch on components page		Nightingales - please amend light switch to dimmer switch on components page	ZBP added SWC026 during M&E co-ordination
RAF-119 PACS (2 person)		Dimmable lighting facility required but no dimmer switch on components page		Nightingales - please amend light switch to dimmer switch on components page	ZBP added SWC026 during M&E co-ordination
RAF-123 Interview Area (10 people)		Add water temp/safety temp notes - missing - sink in room		Update RDS	NA to provide matrix for ZBP update
RAF-125 QA Room		Query water temp 60 degrees - should be 41 degrees as clinical wash hand basin?. Also softened or filtered water supply and drainage to take account of chemical waste?		Update RDS	NA to provide matrix for ZBP update
RAF-137 Switchgear Cupboard		Remove temperature notes; remove mech vent notes & water temp/safety notes N/A		Update RDS	NA to provide matrix for ZBP update
Department: NSGH OPD Ground Floor (NA-SZ-00-RD-400-OPDA0 Rev 02)					
OPD0-002 Lockers/Changing Male		Add water temp/safety temp notes - missing - sink in room		Update RDS	NA to provide matrix for ZBP update
OPD0-005 Lockers/Changing Female		Add water temp/safety temp notes - missing - sink in room		Update RDS	NA to provide matrix for ZBP update
OPD0-010 Gym/Main exercise area	Board quering supply & extract as same value	Correct as matrix and drawing (ZBP-ZJ-00-PL-524-009 Rev 01); therefore no change			NA to provide matrix for ZBP update
OPD0-018 Retinal Screening	Board requesting dimmable lighting	Dimmer switch already on components page - no change. ZBP to add hot water temp/safety notes - missing WHB in room		Update RDS	NA to provide matrix for ZBP update
OPD0-020 Physical Measurement Bay		Add water temp/safety temp notes - missing - sink in room		Update RDS	NA to provide matrix for ZBP update
OPD0-021 Physical Measurement Bay		Add water temp/safety temp notes - missing - sink in room		Update RDS	NA to provide matrix for ZBP update
OPD0-029 Clean Utility / Store		Matrix states only Supply but drawing (ZBP-ZJ-00-PL-524-009 Rev 01) has both supply (55l/s) and extract (46l/s) - please amend.	Matrix does not match ZBP drawing	Update RDS	NA to provide matrix for ZBP update
OPD0-030A Touch down base		Activities incorrect - this is not a linen store		Nightingales to update RDS?	BM to confirm acivities with NHS
OPD0-031 Electrical Cupboard		Remove temperature notes; remove mech vent notes & water temp/safety notes N/A		Update RDS	NA to provide matrix for ZBP update
OPD0-063 Meetings/Seminar	Board requesting dimmable lighting	Add dimmable lighting facility - would expect facility in a seminar room		Nightingales - please amend light switch to dimmer switch on components page	NA to provide matrix for ZBP update
Department: NSGH REHAB & THERAPY OPD (NA-SZ-00-RD-400-ORT Rev 04)					
ORT-006 Treatment Cubicles: 2 patients		Service Illumination Local lux 1000; notes Exam Lamp however there is no exam lamp on the components page?		Nightingales please confirm if there is to be an exam lamp or is this an error - amend if incorrect. ZBP to amend RDS as appropriate	BM confirm with NHS
ORT-007 Treatment Room : 1 patient		Service Illumination Local lux 1000; notes Exam Lamp however there is no exam lamp on the components page?		Nightingales please confirm if there is to be an exam lamp or is this an error - amend if incorrect. ZBP to amend RDS as appropriate	BM confirm with NHS
ORT-008 Treatment Room : 1 patient		Service Illumination Local lux 1000; notes Exam Lamp however there is no exam lamp on the components page?		Nightingales please confirm if there is to be an exam lamp or is this an error - amend if incorrect. ZBP to amend RDS as appropriate	BM confirm with NHS
ORT-009 Treatment Room : 1 patient		Service Illumination Local lux 1000; notes Exam Lamp however there is no exam lamp on the components page?		Nightingales please confirm if there is to be an exam lamp or is this an error - amend if incorrect. ZBP to amend RDS as appropriate	BM confirm with NHS
ORT-010 Treatment Room : 1 patient		Service Illumination Local lux 1000; notes Exam Lamp however there is no exam lamp on the components page?		Nightingales please confirm if there is to be an exam lamp or is this an error - amend if incorrect. ZBP to amend RDS as appropriate	BM confirm with NHS
ORT-012 Treatment cubicles: Physio 10 patients		Service Illumination Local lux 1000; notes Exam Lamp however there is no exam lamp on the components page?		Nightingales please confirm if there is to be an exam lamp or is this an error - amend if incorrect. ZBP to amend RDS as appropriate	BM confirm with NHS
ORT-026 Conference/ Meeting room: 10 persons		Dimmable lighting facility required but no dimmer switch on components page		Nightingales - please amend light switch to dimmer switch on components page	BM confirm with NHS
ORT-027 Treatment Room : 1 patient		Service Illumination Local lux 1000; notes Exam Lamp however there is no exam lamp on the components page?		Nightingales please confirm if there is to be an exam lamp or is this an error - amend if incorrect. ZBP to amend RDS as appropriate	BM confirm with NHS
ORT-028 Treatment Room : 1 patient		Service Illumination Local lux 1000; notes Exam Lamp however there is no exam lamp on the components page?		Nightingales please confirm if there is to be an exam lamp or is this an error - amend if incorrect. ZBP to amend RDS as appropriate	BM confirm with NHS
ORT-040 Treatment Room : 1 patient		Service Illumination Local lux 1000; notes Exam Lamp however there is no exam lamp on the components page?		Nightingales please confirm if there is to be an exam lamp or is this an error - amend if incorrect. ZBP to amend RDS as appropriate	BM confirm with NHS
Department: NCH OBSERVATION WARD (NA-SZ-00-RD-400-OBW Rev 04)					
OBW-042 Pantry: serving ward & regen & wash up		RDS states under Mech Notes, min air changes per hour (AC/hr): 6. Extract only states 5. ZBP drawing (ZBP-ZA-00-PL-524-001) shows both supply (47l/s) and extract (57l/s). Please amend RDS		Update RDS	NA to provide matrix for ZBP update
OBW-046 Parking Bay: resus trolley		This is not consistent with other resus bays - which state Average at floor 1. Max floor illuminance 350 lux		Update RDS	NA to provide matrix for ZBP update
Department: NSGH MEDICAL RECORDS (NA-SZ-00-RD-400-HR Rev 03)					

HR-006 General Receipt/Sorting & Scanning	Board have amended number of persons on front sheet from 3 to 8; room layout is for 8 persons			Update RDS	NA update database
HR-009 Main Records Staff area	Board have amended number of persons on front sheet from 5 to 48; room layout is for 48 persons			Update RDS	NA update database
HR-012 Open Plan office for 20 persons	Board have amended number of persons on front sheet from 20 to 18; room layout is for 18 persons			Update RDS	NA update database
Department: NCH ASEPTIC SUITE (NA-SZ-00-RD-400-ASU Rev 04)					
ASU-008 Primary Storage		Activities incorrect - this is not for worshipping & meditation?		Update RDS	BM confirm activities with NHS
ASU-015 Change	Service Illumination reduced to 100 lux	All other Change areas are at 100 lux not 200		Update RDS	NA to provide matrix for ZBP update
ASU-019 Lam Flow- type II		Remove water temp/safety temp notes no sink in room		Update RDS	NA to provide matrix for ZBP update
ASU-020 Lobby		Activities incorrect - there is no sink for clinical hand washing or other activities		Update RDS	BM confirm activities with NHS
ASU-030 Lobby		Activities incorrect - there is no sink for clinical hand washing or other activities		Update RDS	BM confirm activities with NHS
ASU-039 Change		Add water temp/safety temp notes - missing - sink in room		Update RDS	NA to provide matrix for ZBP update
ASU-040 Lobby		Activities incorrect - there is no sink for clinical hand washing or other activities		Update RDS	BM confirm activities with NHS
ASU-042 Corridor		Add water temp/safety temp notes - missing - sink in area		Update RDS	NA to provide matrix for ZBP update
Department: NCH 23 HOUR UNIT (NA-SZ-01-RD-400-23HU Rev 04)					
23HU-014 Observation Room		Activities appear incorrect - room is not for recording of post mortem findings?		Nightingales to update RDS	BM confirm activities with NHS
23HU-015 Parents room		Remove water temp/safety temp notes no sink in room		Update RDS	NA to provide matrix for ZBP update
23HU-032 Step Down Playroom (supervised)		Add water temp/safety temp notes - missing - sink in area		Update RDS	NA to provide matrix for ZBP update
23HU-049 Clean Utility		Add water temp/safety temp notes - missing - sink in area		Update RDS	NA to provide matrix for ZBP update
Department: NSGH SECOND FLOOR COMMUNICATIONS (NA-SZ-02-RD-400-CA2 REV 02)					
CA2-056 Switchgear Cupboard		Remove temperature notes; remove mech vent notes & water temp/safety notes N/A		Update RDS	
Department: NCH FIRST FLOOR COMMUNICATIONS (NA-SZ-01-RD-400-CC1 REV 02)					
CC1-002_1 Core G Smoke Vent		Not consistent with other smoke vent areas - Service illumination Lux 50 missing, Service Illum Lux notes Floor missing; Colour Rendering ; RA85; Standby Lighting grade, etc		Amend and update RDS	
CC1-052 Core J IPS		Not consistent with other IPS areas - Mech Vent extract @ 15 l/s		Amend and update RDS	
Department: NSGH/NCH NUCLEAR MEDICINE (NA-SZ-01-RD-400-RNM REV 04)					
RNM-008 Interview Room		Add water temp/safety temp notes - missing - sink in area		Update RDS	NA to provide matrix for ZBP update
RNM-012 Lobby for Blood Cell Labelling room		Add water temp/safety temp notes - missing - sink in area		Update RDS	NA to provide matrix for ZBP update
RNM-014 Reporting Room		Dimming facilities are required		Nightingales - please add dimmer switch to components sheet	ZBP added SWC026 during M&E co-ordination
RNM-023 Bed/Trolley wait - post admin (Hot)		Add water temp/safety temp notes - missing - sink in area		Update RDS	NA to provide matrix for ZBP update
RNM-027 Radionuclide admin room		Add water temp/safety temp notes - missing - sink in area		Update RDS	NA to provide matrix for ZBP update
RNM-041 Radionuclide store & dispensary		Mech Vent Notes: ventilation to be balanced with BSC or Fume Hood - no facilities in this room; please review		Update RDS	NA to provide matrix for ZBP update
RNM-045 Therapy Room		Add water temp/safety temp notes - missing - sink in area		Update RDS	NA to provide matrix for ZBP update
RNM-048 Consultant Physicist		Remove water temp/safety temp notes no sink in room. Also no couch - service illumination should be at Desk.		Update RDS	NA to provide matrix for ZBP update
Department: NCH FIRST FLOOR FM FACILITIES (NA-SZ-01-RD-400-FMC1 Rev 03)					
FMC1-003 Core H IT Hub		Leak Detection missing (SPA1046) : Please review		ZBP please advise if this is missing; Nightingales to add to components sheet	
Department: NSGH HAEMATOLOGY-ONCOLOGY WARD (NA-SZ-04-RD-400-HOW Rev 03)					
HOW-003 Consulting/Examination (or Treatment) room	Board have added an activity - Use of nebulised pentamidine. High air change rate required Board have stated 10 ac/hr	Guidance suggests 15 ac/hr	ZBP please review and amend - can this be accommodated?	Update RDS	NA to provide matrix for ZBP update
HOW-004 Intrathecal Chemotherapy treatment	Board have added an activity - Administration of intrathecal chemotherapy. Also noted need 10ac/hr but this is already accommodated (both Supply & Extract are at 10 ac/hr)			Nightingales - please amend activity list	NA to update database
HOW-005 Charge Nurse/Sisters Office	Board have amended Deskwork for 1 person to Deskwork for 2 persons; Room is already laid out for 2 persons.			Nightingales to amend text on RDS	NA to update database
HOW-034 Electrical cupboard		Remove temperature notes; remove mech vent notes & water temp/safety notes N/A		Update RDS	NA to provide matrix for ZBP update
HOW-042 Pantry/Beverage making area		RDS states under mech notes miminum air changes per hour : 6 but supply and extract are balanced. Drawing (ZBP-ZE-04-PL-524-045 Rev A)shows Extract @ 54l/s and Supply at 45l/s. Please amend Extract to 6ac/hr.		Update RDS	NA to provide matrix for ZBP update
HOW-049 Spare Space	Board have amended this to a Store with services for a store required	Drawing (ZBP-ZE-04-PL-524-045 Rev A) shows Supply @ 10l/s but area is bubbled. Matrix states 1.5 ac/hr Supply . Consistent with other store areas.		Please confirm requirements and update RDS accordingly.	NA to update Room Name
Department: NCH-OPD (NA-SZ-00-RD-400-OPDC Rev 03)					
OPD-002 OPD Manager		Remove water temp/safety temp notes no sink in room		Update RDS	NA to provide matrix for ZBP update
OPD-003 OPD Sister		Remove water temp/safety temp notes no sink in room		Update RDS	NA to provide matrix for ZBP update
OPD-008 Consult/Exam room		Add 1000 lux Service Illumination Local Lux & Exam Lamp notes		Update RDS	NA to provide matrix for ZBP update
OPD-014 Observation Room		Activities incorrect - not for reporting Post Mortem findings		Update RDS	BM to confirm acivities with NHS
OPD-017 Clinical Consult Room		Add water temp/safety temp notes - missing - sink in area		Update RDS	NA to provide matrix for ZBP update
OPD-018 Family room		Remove water temp/safety temp notes no sink in room		Update RDS	NA to provide matrix for ZBP update
OPD-019 Consult/Exam room		Add 1000 lux Service Illumination Local Lux & Exam Lamp notes		Update RDS	NA to provide matrix for ZBP update

OPD-020 Consult/Exam room		Add 1000 lux Service Illumination Local Lux & Exam Lamp notes		Update RDS	**NA to provide matrix for ZBP update**
OPD-023 Reporting/Viewing room		Dimming facilities are required		Add Dimmer Switch to RDS	**ZBP confirm in M&E co-ordination**
OPD-029 Consult/Exam room		Add 1000 lux Service Illumination Local Lux & Exam Lamp notes		Update RDS	**NA to provide matrix for ZBP update**
OPD-033 Medicines Management		Add water temp/safety temp notes - missing - sink in area		Update RDS	**NA to provide matrix for ZBP update**
OPD-083 Lobby & Control areas (Audiology)		Mech Vent notes refer to HBN 04-01 Isolation Facilities - do not believe this is appliable to this area? Also remove water temp/safety notes - no sink in room		ZBP please confirm and update RDS as applicable	**NA to provide matrix for ZBP update**
OPD-084 Audiometric Test room		Remove water temp/safety temp notes no sink in room		Update RDS	**NA to provide matrix for ZBP update**
OPD-085 Audiometric Test room		Remove water temp/safety temp notes no sink in room		Update RDS	**NA to provide matrix for ZBP update**
OPD-083 Lobby & Control areas (Audiology)		Mech Vent notes refer to HBN 04-01 Isolation Facilities - do not believe this is appliable to this area? Also remove water temp/safety notes - no sink in room		ZBP please confirm and update RDS as applicable	**NA to provide matrix for ZBP update**
OPD-087 Audiometric Test room		Remove water temp/safety temp notes no sink in room		Update RDS	**NA to provide matrix for ZBP update**
OPD-090 Workshop		Add water temp/safety temp notes - missing - sink in area		Update RDS	**NA to provide matrix for ZBP update**
OPD-092 Consulting:Exam bay:Hearing test		Add water temp/safety temp notes - missing - sink in area		Update RDS	**NA to provide matrix for ZBP update**
OPD-093 Hearing Test		Add water temp/safety temp notes - missing - sink in area		Update RDS	**NA to provide matrix for ZBP update**
OPD-094 Hearing Test		Add water temp/safety temp notes - missing - sink in area		Update RDS	**NA to provide matrix for ZBP update**
OPD-095 Consult/Exam room		Add 1000 lux Service Illumination Local Lux & Exam Lamp notes		Update RDS	**NA to provide matrix for ZBP update**
OPD-101 Physical Measurement Bay: Baby		Add water temp/safety temp notes - missing - sink in area		Update RDS	**NA to provide matrix for ZBP update**
OPD-109 Consult/Exam Single Sided		Exam lamp on environmental page but reading luminare LIG003 on components page. Which is correct please - is the lamp supposed to be an exam lamp - in which case components page needs amending; if a reading lamp then the environmental page needs adjusting.		Please confirm requirements and update RDS accordingly	**BM confirm with Mercury/NHS**
OPD-114 Consult/Exam : double sided		Dimming facilities are required; add dimmer switch to components page. Add 1000 lux Service illumination & Exam lamp notes		Nightingales please add dimmer switch. ZBP to amend other notes	**ZBP confirm in M&E co-ordination**
OPD-115 Consult/Exam		Dimming facilities are required; add dimmer switch to components page. Add 1000 lux Service illumination & Exam lamp notes		Nightingales please add dimmer switch. ZBP to amend other notes	**ZBP confirm in M&E co-ordination**
OPD-118 Consult/Exam Single Sided		Exam lamp on environmental page but reading luminare LIG003 on components page. Which is correct please - is the lamp supposed to be an exam lamp - in which case components page needs amending; if a reading lamp then the environmental page needs adjusting.		Please confirm requirements and update RDS accordingly	**BM confirm with Mercury/NHS**
OPD-126 Near Patient Testing lab		Add water temp/safety temp notes - missing - sink in area		Update RDS	**NA to provide matrix for ZBP update**
OPD-128 Orthoptic Exam Room		Dimming facilities required at test station -add dimmer switch to components page; also Exam lamp on environmental page but reading lamp LIG003 on components page. Which is correct please - is it supposed to be an exam lamp or reading lamp. Components page or environmental data need confirming. Remove Couch - there is no couch		Nightingales please add dimmer switch. ZBP to amend other notes	**ZBP confirm in M&E co-ordination**
OPD-129 Orthoptic Exam room		Dimming facilities required at test station -add dimmer switch to components page; also Exam lamp on environmental page but reading lamp LIG003 on components page. Which is correct please - is it supposed to be an exam lamp or reading lamp. Components page or environmental data need confirming.		Nightingales please add dimmer switch. ZBP to amend other notes	**ZBP confirm in M&E co-ordination**
OPD-130 Orthoptic Exam room		Dimming facilities required at test station -add dimmer switch to components page; also Exam lamp on environmental page but reading lamp LIG003 on components page. Which is correct please - is it supposed to be an exam lamp or reading lamp. Components page or environmental data need confirming.		Nightingales please add dimmer switch. ZBP to amend other notes	**ZBP confirm in M&E co-ordination**
OPD-131 Electrophysiology room		Service Illumination lux notes states bed - there is no bed in the room or desk or couch.		Please confirm requirements and update RDS accordingly	**NA to provide matrix for ZBP update**
OPD-135 Opthalmic Consult/Exam room		Dimming facilities are required; add dimmer switch to components page. Add 1000 lux Service illumination & Exam lamp notes		Nightingales please add dimmer switch. ZBP to amend other notes	**ZBP confirm in M&E co-ordination**
OPD-138 Audiometric Test room		Remove water temp/safety temp notes no sink in room		Update RDS	**NA to provide matrix for ZBP update**
OPD-145 Dental Lab		Vent states NEG - drawing (ZBP-ZB-00-PL-524-002 Rev A)_ indicates equal supply and extract - should read BAL		Update RDS	**NA to provide matrix for ZBP update**
OPD-146 Physical Measurement Bay: Baby		Add water temp/safety temp notes - missing - sink in area		Update RDS	**NA to provide matrix for ZBP update**
OPD-190 Ensuite to Bathroom/WC to Treatment room		Activity 7 states 'using electric shaver - there is no shaver socket in the room?		Please confirm requirements and update RDS accordingly	**NA update database**
Department: NSGH THIRD FLOOR FM FACILITIES (NA-SZ-03-RD-400-FM3A Rev ?)					
FM3-002 Studies Area		Dimming facilities are required		Add Dimmer Switch to RDS	**ZBP confirm at M&E co-ordination**
FM3-003 Junior Doctors Office	Board have amended name to include Common Room; also reduced lux levels from 500 lux to 300 lux			Please amend RDS	**NA update Room Name** **NA to provide matrix for ZBP update**
FM3-007 Radiological Support		Dimming facilities are required		Add Dimmer Switch to RDS	**ZBP confirm at M&E co-ordination**
FM3-031 Male Handwash area	Board have increased service illumination from 100 lux to 200 lux			Please amend RDS	**NA update Room Name** **NA to provide matrix for ZBP update**
FM3-037 Female Handwash Area	Board have increased service illumination from 100 lux to 200 lux			Please amend RDS	**NA update Room Name** **NA to provide matrix for ZBP update**
Department: NCH SANCTUARY (NA-SZ-00-RD-400-SANC Rev 03)					
SAN-005 Washing Area		No equipment output - is there not to be a sink? FURTHER ISSUE OF RDS 21/5/12 components page now has equipment listed.		No comments now	
Department: NSGH MEDICAL PHYSICS (NA-SZ-02-RD-400-MP Rev 03)					
MP-004/05/006 Adult Workshop		Add water temp/safety temp notes - missing - sink/ WHB in area		Update RDS	**NA to provide matrix for ZBP update**

MP-008 Clinical Skills lab & Library	Lighting notes details incorrect	Lighting notes do not appear relevant for the room; remove water temp/safety notes also as no WHB in room		Review & amend lighting notes as relevant. Update RDS	**NA to provide matrix for ZBP update**
MP-011 Paediatric Devices		Add water temp/safety temp notes - missing - Sink/WHB in area		Update RDS	**NA to provide matrix for ZBP update**
MP-020 Adult Devices Library		Add water temp/safety temp notes - missing - Sink/WHB in area		Update RDS	**NA to provide matrix for ZBP update**
Department: NSGH FOURTH FLOOR FM FACILITIES (NA-SZ-04-RD-400-FMC4 Rev 02)					
FMC4-003 Core H IT Hub		No Leak Detection - missing		Add and amend RDS	**NA update drawing**
Department: NSGH ELEVENTH FLOOR COMMUNICATIONS (NA-SZ-11-RD-400-CA11 Rev 02)					
CA11-036 Core C FM Clean		Activities listed but no equipment in the room to carry these out? Only 1 x PIR and a OUT1005. Looks like a repeat of a lift lobby RDS?		Please confirm if this is correct and there is no equipment to go into this room.	
Department: NSGH TENTH FLOOR COMMUNICATIONS (NA-SZ-10-RD-400-CA10 Rev 02)					
CA10-031_1 Smoke Vent		Missing info - not consistent with other Smoke Vent RDS (Service Illum lux 50 lux Floor etc)		Update RDS	**NA to provide matrix for ZBP update**
CA-10-036 Core C FM Clean		Activities listed but no equipment in the room to carry these out? Only 1 x PIR and a OUT1005. Looks like a repeat of a lift lobby RDS?		Please confirm if this is correct and there is no equipment to go into this room.	
Department: NSGH EIGHTH FLOOR COMMUNICATIONS (NA-SZ-08-RD-400-CA8 Rev 02)					
CA8-031_1 Smoke Vent		Missing info - not consistent with other Smoke Vent RDS (Service Illum lux 50 lux Floor etc)		Update RDS	**NA to provide matrix for ZBP update**
CA-8-036 Core C FM Clean		Activities listed but no equipment in the room to carry these out? Only 1 x PIR and a OUT1005. Looks like a repeat of a lift lobby RDS?		Please confirm if this is correct and there is no equipment to go into this room.	
Department: NSGH NINTH FLOOR COMMUNICATIONS (NA-SZ-09-RD-400-CA9 Rev 02)					
CA9-031_1 Smoke Vent		Missing info - not consistent with other Smoke Vent RDS (Service Illum lux 50 lux Floor etc)		Update RDS	**NA to provide matrix for ZBP update**
CA-9-036 Core C FM Clean		Activities listed but no equipment in the room to carry these out? Only 1 x PIR and a OUT1005. Looks like a repeat of a lift lobby RDS?		Please confirm if this is correct and there is no equipment to go into this room.	
Department: NSGH SEVENTH FLOOR COMMUNICATIONS (NA-SZ-07-RD-400-CA9 Rev 02)					
CA7-001 to CA7-038		NO ENVIRONMENTAL RDS - MISSING			**NA update**
Department: NSGH SIXTH FLOOR COMMUNICATIONS (NA-SZ-06-RD-400-CA6 Rev 02)					
CA6-031_1 Smoke Vent		Missing info - not consistent with other Smoke Vent RDS (Service Illum lux 50 lux Floor etc)		Update RDS	**NA to provide matrix for ZBP update**
Department: NSGH KITCHEN BASEMENT(NA-SZ-B1-RD-400-KIT Rev 04)					
KIT-001 Training/Meeting room	Board have reduced summer temp limit to 25 degrees				**NA to provide matrix for ZBP update**
KIT-004 Female Change	Board have added restriction on the summer temp to 25 degrees although have not done so for the Male Change area (038)				**NA to provide matrix for ZBP update**
KIT-008 Equipment Store		Extract rate missing from RDS - should be 1.5ac/hr		Update RDS	**NA to provide matrix for ZBP update**
KIT-012 Corridor A		Add water temp/safety temp notes - missing - sink/ WHB in area		Update RDS	**NA to provide matrix for ZBP update**
KIT-013 Hygiene Bay		Add water temp/safety temp notes - missing - sink/ WHB in area		Update RDS	**NA to provide matrix for ZBP update**
KIT-014 Hygiene Bay		Add water temp/safety temp notes - missing - sink/ WHB in area		Update RDS	**NA to provide matrix for ZBP update**
KIT-017 Hygiene Bay		Add water temp/safety temp notes - missing - sink/ WHB in area		Update RDS	**NA to provide matrix for ZBP update**
KIT-026 Meal Picking & Packing		Add water temp/safety temp notes - missing - sink/ WHB in area		Update RDS	**NA to provide matrix for ZBP update**
KIT-027 Meal Assembly		Add water temp/safety temp notes - missing - sink/ WHB in area		Update RDS	**NA to provide matrix for ZBP update**
KIT-031 AGV/Trolley returns		Add water temp/safety temp notes - missing - sink/ WHB in area		Update RDS	**NA to provide matrix for ZBP update**
Department: NSGH FM FACILITIES FIRST FLOOR (NA-SZ-01-RD-400-FMA1 Rev 02)					
FMA1-003 Core A IT Hub	Board have reduced summer temp limit to 21 degrees - this is not consistent with all other IT Hub - leave as 25 degrees.			No change	**NA to provide matrix for ZBP update**
Department: NSGH FM FACILITIES BASEMENT (NA-SZ-B1-RD-400-FMB Rev 04)					
FMB-008 Bed/Trolley/Chair Maintenance		Amend Hot Water temp to 41 degrees (from 60 degrees); amend notes signage etc as not required - clinical hand wash basin in room not sink with 60 degree water supply.		Update RDS	**NA to provide matrix for ZBP update**
FMB-010 Decontamination area		Mech Vent notes appear incorrect - extract from woodworking machine, adhesives bay etc??		Update RDS	**NA to provide matrix for ZBP update**
FMB-015 Disposal Hold		Ventilation Extract missing - should be 10ac/hr		Update RDS	**NA to provide matrix for ZBP update**
FMB-021 Domestic Equipment Store		Add water temp/safety temp notes - missing - sinks/ WHB in area		Update RDS	**NA to provide matrix for ZBP update**
Department: NSGH COMMUNICATIONS BASEMENT (NA-SZ-01-RD-400-COMMS Rev 02)					
CCB-006 Corridor		Please confirm winter temp - other corridors have 18 degree limit			**NA to provide matrix for ZBP update**
CCB-024 Core K Bed/Patient Lift Lobby		Please confirm winter temp - other lobby's have 18 degree limit			**NA to provide matrix for ZBP update**
Department: NSGH RESTAURANT (NA-SZ-01-RD-400-RES Rev 04)					
RES-003 Dining/Servery	Board questioned heat gain from equipment but there is no significant equipment in this room. Also querying air change.	Drawing (ZBP-ZK-01-PL-524-020 Rev A) shows Supply & Extract correct		No change	**NA to provide matrix for ZBP update**

RES-009 COSSHH/SDR room		Add water temp/safety temp notes - missing - sink/ WHB in area		Update RDS	**NA to provide matrix for ZBP update**
RES-017 Electrical Cupboard		Remove temperature notes; remove mech vent notes & water temp/safety notes N/A		Update RDS	**NA to provide matrix for ZBP update**
RES-029 Coffee Lounge	Board request increase in lux level to 300 lux			Update RDS	**NA to provide matrix for ZBP update**
Department: NCH DCFP (NA-SZ-04-RD-400-DCFP Rev 03)					
DCFP-008 MDT Room		Activities incorrect - this is not for carrying out clinical procedures. Remove water//safety notes - no WHB in room		Update RDS	**BM confirm activities with NHS**
DCFP-011 Therapy rooms		Remove water temp/safety temp notes no WHB in room		Update RDS	**NA to provide matrix for ZBP update**
DCFP-012 Therapy rooms		Remove water temp/safety temp notes no WHB in room		Update RDS	**NA to provide matrix for ZBP update**
DCFP-014 Therapy rooms		Remove water temp/safety temp notes no WHB in room		Update RDS	**NA to provide matrix for ZBP update**
DCFP-023 Therapy rooms		Remove water temp/safety temp notes no WHB in room		Update RDS	**NA to provide matrix for ZBP update**
DCFP-024 Quiet room		Activities incorrect - this is not for worshipping and meditation or hand rinsing		Update RDS	**BM confirm activities with NHS**
Department: NCH MAIN ENTRANCE (NA-SZ-00-RD-400-ENTC Rev 03)					
ENT-022 Childrens Therapy room		Add water temp/safety temp notes - missing - WHB in area		Update RDS	**NA to provide matrix for ZBP update**
ENT-028 Family Info & resource centre		Remove water temp/safety temp notes no WHB in room		Update RDS	**NA to provide matrix for ZBP update**
ENT-029 Office 2 P		Remove water temp/safety temp notes no WHB in room		Update RDS	**NA to provide matrix for ZBP update**
ENT-037 Dis Change/WC		Increase lux to 200 lux as other Dis WC		Update RDS	**NA to provide matrix for ZBP update**
Department: NSGH PHARMACY DISPENSARY (NA-SZ-00-RD-400-PHA Rev 03)					
PHA-007 Electrical Cupboard		Remove temperature notes; remove mech vent notes & water temp/safety notes N/A		Update RDS	**NA to provide matrix for ZBP update**
PHA-008 Clinical Trials Prep		Add water temp/safety temp notes - missing - WHB in area		Update RDS	**NA to provide matrix for ZBP update**
Department: NCH DAY CASE UNIT (NA-SZ-02-RD-400-DCU Rev 03)					
DCU-007 Day Stay Ward		Drawing (ZBP-ZB-02-PL-524-022 Rev A) shows Supply @ 80 l/s with minimal extract - RDS states Supply and Extract at 6 ac/hr - Please check and confirm requirements.		Update RDS	**NA to provide matrix for ZBP update**
Department: NCH GROUND FLOOR COMMUNICATIONS (NA-SZ-00-RD-400-CCO Rev 02)					
CLO-002_1 Smoke Vent		Missing info - not consistent with other Smoke Vent RDS (Service Illum lux 50 lux Floor etc)		Update RDS	
Department: NSGH DECONTAMINATION UNIT (NA-SZ-00-RD-400-DCT Rev 02)					
	Board - overall comment that the whole department should be negative to ED.			Any response?	**NA to provide matrix for ZBP update**
DCU-002 Storage		RDS states BAL relative pressure - drawing (ZBP-ZD-00-PL-524-004 Rev F) shows Extract 81 l/s and Supply 71 l/s - relative pressure should therefore be NEG		Update RDS	**NA to provide matrix for ZBP update**
DCU-004 Robing/Treatment		RDS states POS but drawing (as above) shows Supply 125 l/s and Extract 95 l/s therefore should be POS		Update RDS	**NA to provide matrix for ZBP update**
DCU-006 Assembley & Packing		Add water temp/safety temp notes - missing - WHB in area		Update RDS	**NA to provide matrix for ZBP update**
DCU-021 Discharge Lobby		Either activities and therefore environmentals incorrect or components page incorrect - desk, trunking, worktop etc suggests office facilities not receipt of contaminated trolleys etc. If this is an work office space then environmentas are not appropriate in terms of temp, vent and lux.		Please confirm correct requirements for use of space and upate RDS	**BM to confirm acivities with NHS**
Department: NCH CARDIOLOGY TESTING (NA-SZ-00-RD-400-CAR Rev 04)					
OPD-036 Patient Trolley/Chairs Bay		Activities suggest this is for parking trolleys however components page has curtain for surrounding trolley and medical gases so this is a patient area. In this case the temperature is too low. Please review and confirm requirements		Please confirm correct requirements for use of space and upate RDS	**BM to confirm acivities with NHS**
OPD-038 Exercise ECG Room		No exam lamp in room - please remove notes		Update RDS	**NA to provide matrix for ZBP update**
OPD-053 Cardiac Workstations		Dimming facilities required		Nightingales - please add dimmer switch	**ZBP confirm**
Department: NCH REHABILITATION (NA-SZ-00-RD-400-REH Rev 03)					
REH-002 Interview room		Remove water temp/safety temp notes no WHB in room. Activities incorrect		Update RDS	**BM to confirm acivities with NHS**
REH-007 Nursery		Remove water temp/safety temp notes no WHB in room		Update RDS	**NA to provide matrix for ZBP update**
REH-014 Consult/Exam room : SALT		No exam lamp in room - please remove notes; no couch		Update RDS	**NA to provide matrix for ZBP update**
REH-015 Consult/Exam room : PSY Type 1		No exam lamp in room - please remove notes; no couch. Query WHB1001 Space for WHB - provide infrastructure. Why only provision of infrastructure when all other C/E rooms have CWHB?		Update RDS	**NHS request for future provision**
REH-016 Consult/Exam room : PSY Type 1		No exam lamp in room - please remove notes; no couch		Update RDS	**NA to provide matrix for ZBP update**
REH-017 Consult/Exam room : PSY Type 2		No exam lamp in room - please remove notes; no couch		Update RDS	**NA to provide matrix for ZBP update**
REH-018 Consult/Exam Dietetics		No exam lamp in room - please remove notes; no couch only DESK		Update RDS	**NA to provide matrix for ZBP update**
REH-019 Consult/Exam : Casting/Physio		No exam lamp in room - please remove notes;		Update RDS	**NA to provide matrix for ZBP update**
REH-020 Consult/Exam : Flexible		No exam lamp in room - please remove notes;		Update RDS	**NA to provide matrix for ZBP update**
REH-021 Consult/Exam : Casting/Physio		No exam lamp in room - please remove notes;		Update RDS	**NA to provide matrix for ZBP update**
REH-022 Consult/Exam : Flexible		No exam lamp in room - please remove notes;		Update RDS	**NA to provide matrix for ZBP update**
REH-035 Casting Rooms		Add water temp/safety temp notes - missing - SINK / WHB in area		Update RDS	**NA to provide matrix for ZBP update**

REH-039 Casting Rooms		Add water temp/safety temp notes - missing - SINK / WHB in area		Update RDS	NA to provide matrix for ZBP update
REH-041 Flexible treatment/consulting rooms		No exam lamp in room - please remove notes;		Update RDS	NA to provide matrix for ZBP update
REH-042 Consult/Exam Single side		No exam lamp in room - please remove notes;		Update RDS	NA to provide matrix for ZBP update
REH-044 Patient Changing Cubicles		Add water temp/safety temp notes - missing - Drench shower & WHB in room		Update RDS	NA to provide matrix for ZBP update
REH-045 Electrical Cupboard		Components page has drinking water cooler, outlet for drinking water, cups etc - incorrect. Please remove - believe this is a duplicate for REH-055		Update RDS	NA update database
REH-053 ADL Kitchen		Add water temp/safety temp notes - missing - sink in room		Update RDS	NA to provide matrix for ZBP update
Department: NCH EMERGENCY LINEN (NA-SZ-02-RD-400-FMC2 Rev 03)					
TPS-001 Telephone Services	Board have requested reduction inlux level from 500 lux to 300 lux. Should be at Desk not floor			Update RDS	NA to provide matrix for ZBP update
TPS-001_2 Telecom Workshop	Board have requested winter temp @ 21 deg and summer limit @ 26 deg. Can this be achieved?			Please confirm if requirements can be met and update RDS	NA to provide matrix for ZBP update
Department: NCH TRANSPORT BASE (NA-SZ-02-RD-400-TPB Rev 03)					
TPB-001 Clincial Workroom		Add water temp/safety temp notes - missing - sink & WHB in room		Update RDS	NA to provide matrix for ZBP update
Department: NCH ACUTE RECEIVING UNIT (NA-SZ-02-RD-400-ARU Rev 04)					
ARU-113 Dining room + playroom 10-15 patients		Add water temp/safety temp notes - missing - sink & WHB in room		Update RDS	NA to provide matrix for ZBP update
Department: NCH SCHIEHALLION WARD (NA-SZ-02-RD-400-SCH Rev 03)					
SCH-021 Chemotherapy room		Activities incorrect - is not for prep and disposal of radio-active products.		Update RDS	BM confirm activities with NHS
SCH-062 Play Room/Dining room		Add water temp/safety temp notes - missing - sink & WHB in room		Update RDS	NA to provide matrix for ZBP update
Department: NCH MEDICAL DAY UNIT / CLINICAL INVESTIGATIONS (NA-SZ-01-RD-4000-MDUC Rev 03)					
MDU-009 Patient Trolley area - 10 trolley cubicles		Service Illumination local lux 1000 lux; Exam lamp. There are 10 Reading lamps on the components page not exam lamps.		Please confirm reading lamps correct and not exam lamps - amend RDS lux as appropriate	BM confirm with Mercury/NHS
MDU-018 Prep room /Clean store		Add water temp/safety temp notes - missing - sink & WHB in room		Update RDS	NA to provide matrix for ZBP update
MDU-019 Treatment Bathroom		Add Service Illumination 1000 lux and notes - Exam lamp in room		Update RDS	NA to provide matrix for ZBP update
MDU-026 Interview Room		Add water temp/safety temp notes - missing - WHB in room		Update RDS	NA to provide matrix for ZBP update
Department: NCH GENERIC IN-PATIENTS WARD 2 (NA-SZ-03-RD-400-GBW Rev 03)					
GW2-036 Dining room + playroom: 10-15 patients		Add water temp/safety temp notes - missing - WHB in room		Update RDS	NA to provide matrix for ZBP update
Department: NCH GENERIC IN-PATIENTS WARD 1 (NA-SZ-03-RD-400-GWA Rev 03)					
GW1-046 Dining room + playroom: 10-15 patients		Add water temp/safety temp notes - missing - WHB in room		Update RDS	NA to provide matrix for ZBP update
Department: NCH GENERIC IN-PATIENTS WARD 3 (NA-SZ-03-RD-400-GWC Rev 03)					
GW3-043 Dining room + playroom: 10-15 patients		Add water temp/safety temp notes - missing - WHB in room		Update RDS	NA to provide matrix for ZBP update
Department: NCH WARD SUPPORT (NA-SZ-03-RD-400-GWS Rev 04)					
GW3-049 Snoozelum Room		Remove water temp/safety temp notes no WHB in room.		Update RDS	NA to provide matrix for ZBP update
GW3-015 Office		Remove water temp/safety temp notes no WHB in room.		Update RDS	NA to provide matrix for ZBP update
Department: NSGH TENTH FLOOR WARD SUPPORT 10 (NA-SZ-10-RD-400-WS10 Rev 02)					
WS10-002 Core A Computer Communication: IT Hub Room		SPA1042 AVSU Control panel - incorrect - this should be SPA1046 Space Leak Detection.		Amend and update RDS	ZBP confirm SPA1042 (AVSU) or SPA1046 (Leak Detection)
WS10-018 Regen Kitchen & Wash Up	Board notes that CDS spec should be referred to for equipment and activities and environmentals		Please confirm if RDS reflects CDS spec	Amend accordingly and update RDS	
Department: NSGH SEVENTH FLOOR WARD SUPPORT 7 (NA-SZ-07-RD-400-WS7 Rev 02)					
WS7-002 Core A Computer Communication: IT Hub Room		SPA1042 AVSU Control panel - incorrect - this should be SPA1046 Space Leak Detection.		Amend and update RDS	ZBP confirm SPA1042 (AVSU) or SPA1046 (Leak Detection)
WS7-018 Regen Kitchen & Wash Up	Board notes that CDS spec should be referred to for equipment and activities and environmentals		Please confirm if RDS reflects CDS spec	Amend accordingly and update RDS	
Department: NSGH EIGHTH FLOOR WARD SUPPORT 8 (NA-SZ-08-RD-400-WS8 Rev 02)					
WS8-002 Core A Computer Communication: IT Hub Room		SPA1042 AVSU Control panel - incorrect - this should be SPA1046 Space Leak Detection.		Amend and update RDS	ZBP confirm SPA1042 (AVSU) or SPA1046 (Leak Detection)
WS8-018 Regen Kitchen & Wash Up	Board notes that CDS spec should be referred to for equipment and activities and environmentals		Please confirm if RDS reflects CDS spec	Amend accordingly and update RDS	
WS8-016 Core C Clean Hold		Extract rate missing from RDS - should be 10 ac/hr		Amend accordingly and update RDS	NA to provide matrix for ZBP update
Department: NSGH ELEVENTH FLOOR WARD SUPPORT 11 (NA-SZ-11-RD-400-WS11 Rev 02)					
WS11-002 Core A Computer Communication: IT Hub Room		SPA1042 AVSU Control panel - incorrect - this should be SPA1046 Space Leak Detection.		Amend and update RDS	ZBP confirm SPA1042 (AVSU) or SPA1046 (Leak Detection)
WS8-018 Regen Kitchen & Wash Up	Board notes that CDS spec should be referred to for equipment and activities and environmentals		Please confirm if RDS reflects CDS spec	Amend accordingly and update RDS	
Department: NSGH SIXTH FLOOR WARD SUPPORT 6 (NA-SZ-06-RD-400-WS6 Rev 02))					
WS6-002 Core A Computer Communication: IT Hub Room		SPA1042 AVSU Control panel - incorrect - this should be SPA1046 Space Leak Detection.		Amend and update RDS	ZBP confirm SPA1042 (AVSU) or SPA1046 (Leak Detection)
WS6-018 Regen Kitchen & Wash Up	Board notes that CDS spec should be referred to for equipment and activities and environmentals		Please confirm if RDS reflects CDS spec	Amend accordingly and update RDS	
Department: NSGH FIFTH FLOOR WARD SUPPORT 5 (NA-SZ-05-RD-400-WS5 Rev 03)					
WS5-002 Core A Computer Communication: IT Hub Room		SPA1042 AVSU Control panel - incorrect - this should be SPA1046 Space Leak Detection.		Amend and update RDS	ZBP confirm SPA1042 (AVSU) or SPA1046 (Leak Detection)
WS5-018 Regen Kitchen & Wash Up	Board notes that CDS spec should be referred to for equipment and activities and environmentals		Please confirm if RDS reflects CDS spec	Amend accordingly and update RDS	
WS5-029 Core D Trolley Hold		Extract rate missing from RDS - should be 10 ac/hr		Update RDS	NA to provide matrix for ZBP update
Department: NSGH NINTH FLOOR WARD SUPPORT 9 (NA-SZ-09-RD-400-WS9 Rev 02)					

WS9-002 Core A Computer Communication: IT Hub Room		SPA1042 AVSU Control panel - incorrect - this should be SPA1046 Space Leak Detection.		Amend and update RDS	**ZBP confirm SPA1042 (AVSU) or SPA1046 (Leak Detection)**
WS9-018 Regen Kitchen & Wash Up	Board notes that CDS spec should be referred to for equipment and activities and environmentals		Please confirm if RDS reflects CDS spec	Amend accordingly and update RDS	

HOSPITALS CONSTRUCTION PROGRESS MEETING: No17

Notes from meeting held on 10th September at 3.30pm in the Boardroom, Top Floor

Action Note

Present:	Peter Moir (PM)	Alan Keeley (AK)	Alasdair Fernie (AFe)	Andrew Bebbington (AB)
Darren Pike (DP)	David Hall (DH)	Frances Wrath (FW)	Grant Wallace (GW)	Hugh McDerment (HMc)
John Redmond (JR)	John Wales (JW)	Wullie Roxburgh (WR)	Shiona Frew (SF)	
Apologies:	Allan Follett (AFo)	Dave Jordan (DJ)	Graeme Thomson (GT)	John Ballantyne (JB)

Item No	Item	Discussion / Information	Action	Action by whom
1.	Action Note from Previous meeting	Accepted as an accurate record.	-	-
2.	Matters Arising			
	Final Fencing Proposal	PM noted that he was still to be provided with the final fencing proposals. AK advised that he was awaiting Nightingale's to provide a drawing with the gate in its final position. PM noted that he was still to be provided with the design of the fencing. AK advised that drawings of the fence design would be provided to PM in due course however the fence would not now have mesh as palisade was proposed. The drawing to be provided to the NHS would also pick up the visibility splay detail as requested by HMc. AK noted that the drawing should be available in the next 2 weeks.	Provide fencing drawing to PM	AK
	Drawing Register	PM noted that he and Capita had not received a drawing register as yet. AK advised that DSmith had sent an email to BCML Document Control asking that a register of all T3 drawings be sent to Capita asap. JR commented that he had not received any drawing register. AK agreed to follow this up with DSmith.	Provide drawing register to NHS Team/Capita	AK
	Programme for Commissioning/Testing of mothballed areas	DP advised that the programmes for the Commissioning/Testing of mothballed areas was in development. The programme for plantrooms 21 and 31 was nearing completion however the work to incorporate the commissioning and testing programme with the construction works was still to take place. DP had offered AS to meet with the NHS to discuss the principles of the commissioning/testing programme. AK noted that Capita had raised this as an observation however the programme would not be available for another few months and suggested that another vehicle should be used for requesting information. JR agreed to close the Capita observation.	Item closed	-
	RDD	DH advised that all outstanding RDD for M&E had been returned to BMCL with the exception of the Medical Gas drawings as the Medical Gas comments had been provided as a report. FW advised that a further meeting to discuss the Medical Gases would be required. DH noted that the NHS could return the drawings back to BMCL as a C Status with a cover note if desired. FW advised that the NHS Team were awaiting G Dunne's comments in the form of the drawings. DP agreed to meet with DH/FW to discuss the comments. DH would return the reviewed 2nd set of reflective Ceiling Plans asap. DH noted that he would review and update the tracker as soon as possible.	Provide updated tracker asap	DH
		PM enquired if there was any RDD information outstanding which was preventing BMCL from progressing. DP advised that there was no outstanding RDD information awaited however BMCL were still proceeding at risk regarding the medical gases. DH noted that he had asked for the department isolation valves to be included on the drawings. DP advised this was not possible as the same drawing was already in a workflow. DH requested that BMCL provide the drawing numbers.	Provide drawing nos for Medical Gas workflow	DP

Item No	Item	Discussion / Information	Action	Action by whom
2.	Matters Arising			
	Concrete Slab 20mm lip	WR noted that Capita had not seen anything in writing re the 20mm lip finishes. AF advised that BMCL will be achieving SR2 and SR3 finishes where required. WR suggested that the same issue was happening in a few areas i.e zone e and zone j. WR had been verbally told that the fillet is for partitions. WR suggested that the slab was out of tolerance locally and will need to be addressed. AF advised that he would investigate this issue.	Investigate 20mm lip	AF
	Drainage	JR advised that Capita had witnessed more open ends as had been already raised. AF agreed to investigate and ensure this issue was addressed.	Investigate ends being left open	AF
	Programmes	DH suggested that there may have been a bit of delay in Zone B acknowledging that Zone D had been progressed.	-	-
	Programme for testing of wet systems	DP noted that this item related to the programmes for commissioning/testing of mothballed areas (plant-rooms) as previously discussed. BMCL were undertaking pre-tests/air tests however BMCL would offer full systems to the NHS for witness testing. AB suggested that the floor slabs had been pushed back due to the atrium link bridge works and tower crane usage. Line 591 of the programme was linked to the Zone A ground floor slabs being completed which had now been pulled into the Zone E works. There was currently ¾ of a slab available for fit out.	-	-
	Samples	PM noted that the NHS Team had signed off quite a few samples since the last meeting and it was expected that BMCL would liaise with PM as and when further samples were needing signed off. PM advised that the next sample to be reviewed would be the desks on level G. PM requested that BMCL give notice for when the desks would be available for review as it was proposed to invite some Nurse Reps to be involved in this review. AF suggested that the IPSs was also available for sign-off. PM requested that BMCL provide a date for the review. PM suggested that it would be useful to get some 3d images and sample boards available for the nurses when reviewing the desks on site. FW noted that she had reception desk 3d images.	Provide date for IPS and desk review on site	AF/DP
	Courtyard Drawings	PM advised that he had received a set of drawings from Jim Murray which he would review and return asap.	Return courtyard drawings asap	PM
	Link Bridges	PM suggested that the NHS needed to understand the timeline for the link bridge works so that the Users can have advance warning. AK advised that the design proposals were awaited however it was proposed to lift the link bridge for Neuro into place fully clad. AF suggested that the timescale for the Neuro Link Bridge works should be available before the end of September 2012. AB advised that BMCL were going to delay the link bridge procurement date to minimise the impact on site logistics as the install of the Neuro link bridge will prevent curtain sided lorries from going underneath and round the site.	Provide programme for Link Bridges	AF
	Water Pipes – Capita Communication	DP advised that a response was awaited by BMCL from Mercury however the Mercury QA Manager was currently on leave. DP noted that once response had been received from Mercury a formal response would be provided to Capita.	Provide response to Capita re water pipes	DP
	Labs Defects	AK advised that he would be reviewing the sedum roof in advance of discussing with Prater. AK acknowledged that the marks to the blockworks were still to be remediated.	-	-

Item No	Item	Discussion / Information	Action	Action by whom
2.	Matters Arising *Labs Defects (cont;d)*	PM enquired about the 2 areas of roof where the waterproofing course was open. HMc noted that there were 2 areas of the roof where the waterproofing layer had been left uncovered so that it is proved that there are no further leaks before re-installing the insulation, etc.	-	-
	Residue on Basement Walls	PM enquired about the discovery of residue on the basement walls. HMc suggested that the residue appeared to be salt from the concrete which was being caused due to the area not being ventilated. AK agreed to review this issue.	Review residue on basement walls	AK
3.	Contractor Report	The Contractor Report was circulated in advance of the meeting. AF highlighted the following key points from the report: **Health & Safety** • There had been 1 reportable incident as discussed at the August meeting. i.e. operative who had sustained a back injury. BMCL have had a review of the gates to minimise the risk of this injury potentially happening again. BMCL will be getting gates specifically manufactured for other areas as required. • There had been 3 yellow cards issued on site over the reporting period • There had been 2 potential near misses over the reporting period a)banksman was distracted and took attention off the forklift driver and was almost injured by forklift truck. BMCL are monitoring the speed of plant/vehicles on site and checking bansksmen/forklift driver operations, b) forklift was navigating into an area which was too tight and caught the side of an excavator and the tyre burst. • AK noted that BMCL had recently carried out observations on the crane operations/lifts. Observations will be carried out on the fork lift operations so can gather evidence of any issues which need to be addressed. Going forward observations will be used to target areas regularly i.e. ppe. The HSE had advised during a recent visit that there are more banksmen run over than anyone else. • There had been 1 incident of damage to property as a tele-handler knocked into a walkway scaffold pole which then damaged cladding. • Managers have undergone MEWP training • The monthly H&S focus is on the use of hammers • Drug and Alcohol testing is ongoing. The latest onsite testing had identified 2 operatives who had non-negative test results. The subsequent Labs Analysis confirmed that the 2 operatives did have some form of drugs in their system. BMCL were satisfied with the testing being carried out and that the testing was sending out the correct message to the site operatives. • Focus for the coming weeks is the starpipe installation, atrium bridge installation, temporary SUDS, Demolition of Biochemistry. **Quality (JW)** • 182 NCRs raised overall. Most NCRs are being closed out very quickly. • 3 month lookahead – DW and JW finalising the Completion Criteria and hoping to be able to offer to the NHS late September. • Sub-contractor Quality Audits were carried out on Mercury, Prater and BMCL Design Managers during this reporting period. • BMCL are continuing to work with Capita to close out any observations. To date there have been 32 observations raised of which 26 are now closed and the remaining 6 are work in progress. • BMCL are continuing to work with Capita to close out any defect notifications. To date there have been 7 defects raised of which 4 are now closed and 3 are nearing close-out.	- - - - - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - - - - -

Item No	Item	Discussion / Information	Action	Action by whom
3.	Contractor report (cont)	**Quality cont'd (AF)** • BMCL proposing to commence the IDMS on site later that week and the focus will be above ceiling connections. • O&M – BMCL are continuing to upload information to the Zutec system. **Progress (AF)** • There were no matters likely to affect the completion date at this time **Weather Record (AF)** • There had been a 1 in 10 event during the month of August. GW advised that there was an anomaly between the site records and the Met Office records (site records advising no 1 in 10 events but Met Office advising one 1 in 10 year event. It had been agreed that the project would continue to use the site records until end of August and from September 2012 will revert back to the Met Office records.) **Construction Progress** • Piling – a further pile had been identified w/c 3rd September as being out of tolerance. A mini-piling solution has been designed and a mini-piling rig will be on site w/c 17th September 2012. This further pile was not in the batter therefore had not been picked up in the previous surveys. BMCL were now surveying all the remaining piles. AK intimated that there was enough information to suggest that this latest out of tolerance pile was related to the batter issue. The latest information will be provided to WSP so as can advise the pile cap detail and Dunne's had been advised. BMCL had requested that the same mini-piling rig and operatives as before to ensure continuity. B and C were the only areas left to be surveyed (circa 30 piles to be surveyed). WR enquired if this further out of tolerance pile had been discovered when setting out the foundation and this was confirmed. There is a small number of pile caps to be completed for B & C. • Underslab drainage – complete in zones G and D and commenced in zones H & E • Concrete Ground floor slab – Zones G and D now complete and works due to commence to E & H during September. • Cores – K stairs ongoing • Concrete Frame – a pour schedule has been included in the report. DH enquired about the basement pours and AF advised that the basement is largely complete. • Atrium Link Bridge – progressing well and on programme to complete within the 10 week programme • SFS and Boarding – progressed into courtyard 7 levels 1 & 2. Courtyard 7 is being used as the main feeder point. • Roofing works – progressing well • M&E – fit-out continuing to progress well and to a good quality. Level 2 fit out remains on programme. The ground floor is continuing to keep progress with the slab pours and the fit-out works on the ground floor will accelerate soon. AF noted that there was no real time delay between final pours and fit-out (circa 1 week). BMCL were having workshops with Astins. Service Risers – next tranche delivered and continuing to be installed. Plantroom 21 – first air handling units are being installed and the remaining are expected to be delivered to site in 2 weeks' time. The switchgear and transformers were due to be delivered to the site w/e 21st September 2012. DH enquired if there was any off-site witness testing required and DP advised that A Smith	- - - - - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - - - - -

Item No	Item	Discussion / Information	Action	Action by whom
3.	Contractor report cont'd	had attended the off-site witness testing of the switchgear and it was not intended to have any further off-site witness testing. AK noted that there was circa 700 operatives on site.	-	-
		• Tower Crane No 7 was due to be dismantled 27th September 2012. BMCL were carrying out crane operation workshops with Astins and Mercury. AF advised that he had prepared a series of drawings of the crane set-out .for the NHS review.	Provide crane set-up for review by NHS	AF
		6 week lookahead (AK)		
		• Demolition works – there had been some issues with the vibration from breaking out a slab works which had caused the works to be stopped however as there was a little amount of works to be done to complete the break-out of the slab these were completed on the Saturday morning. Sufficient works have been completed to allow the install of the drainage to allow the MTHW works to follow on and in the longer term it is proposed to get the road completed. A series of drawings for the transition of the biochemistry area are being prepared for discussion with the NHS.	-	-
		• Temporary SUDS – progressing well and no great pressures on the works	-	-
		• BT/IT Cables – BMCL have carried out a further site walkround and can confirm that the preferred route is the lower route. The lower route would enable future connections to be carried out easier. BMCL were obtaining Method Statements and costing for discussion with the NHS Team and agreement on the route. The route at Ortho Theatres and the Decontamination Unit needed to be further detailed. HMc advised that if BMCL were considering new Trunking that a refurbishment asbestos survey would be required by BMCL. DP advised that the initial programme had been abandoned however it was hoped to have everything in place by the end of September. BMCL were trying to ensure that the BMCL works fit in with K McSweeney. FW suggested that asbestos would be identified in the building. DP advised that BMCL wanted to have a look at the roof void. DH suggested that the route should be agreed first and then any associated programme can be carried agreed.	-	-
		• Neighbouring Properties – the resurveys on all the 10 properties had been carried out. The noise and vibration equipment had been installed on site. Consideration was now being given to the letters to be issued to the householders/J Lamont.	-	-
		• Site – the site was becoming sterilised as vehicles are now running round the perimeter. The north yard area would become a storage area for cladding, etc.	-	-
		• Multi-storey Car Park – consideration was being given to the start date for the mulit-storey car park.	-	-
		• Energy Centre – works remain on programme for 31st October 2012 A-side handover. The majority of the small power and Fire Alarm works had been completed. The switchgear and transformers had been delivered to site. The fuel oil was expected to be delivered on 24th September 2012. BMCL would be providing the fuel oil for the testing and commissioning only. The current focus of the works was on completing the small power works and these works were back on programme. AK noted that AS had raised concern regarding the B-side transformers and switchgear being required for the A-side handover and BMCL were focussed on ensuring that there were no items in the B-side required at A-side handover.	-	-
		• Construction activities – focus on works coming completing the concrete works in E&H and coming across into B. The peri slipping system had been reviewed in Germany. BMCL had also procured full K guard system for round the tower.	-	-
		• Concrete to the link bridge will be ongoing.	-	-
		• The mast climbers will be arriving on site in due course	-	-

Item No	Item	Discussion / Information	Action	Action by whom
3.	Contractor report cont'd	• Cladding to core K will be commencing The first of the early use lifts will be installed end September/beginning October. DH enquired what lifts were being installed early and AF advised that it was the beneficial use in Core C.	-	-
		• Fit out – continuing. 2 areas focused for works i.e Core H level 1 and Core E level 1	-	-
		• Basement – area had been cleaned out. A design is in place and BMCL will be ensuring that the Board are satisfied with the proposals for encapsulating the drainage in this area	-	-
		• Capping slab – will take account of the AGV movements	-	-
		• Trim and grid to be installed in the exemplar areas	-	-
		• Desks available for inspection and AK will advised of date for inspection.	-	-
		AK noted that additional Managers would be starting on site very soon in line with the increase in fit-out works. A new Manager had started that day on the new Children's Hospital. AK Noted that a new Ground Floor Manager had started on site at the beginning of the month.	-	-
		RDD DP acknowledged that the NHS Team had signed off a lot of RDD in the last few weeks. DP appreciated that the NHS Team were continuing to work with BMCL to ensure urgent drawings are returned asap. FW noted that the 1:50 drawings are generally ahead of programme as FW was meant to have waited until the Nightingale mark-ups have been received.	-	-
		Procurement (GW)		
		• Helipad – design under review and in discussion with Mercury re M&E elements	-	-
		• Level 4 Plant room steel - out to tender	-	-
		• Adult Atrium finishes – tender awarded to Clad UK	-	-
		• Internal Doors and Ironmongery –re-priced tenders have been received and are under review	-	-
		• Glazed screens – tenders under review	-	-
		• Suspended ceiling – tenders under review	-	-
		• Flooring – tenders under review	-	-
		• Painting and decorating – tenders under review	-	-
		• Furniture – contract awarded to JTC	-	-
		• Courtyard furniture – ongoing discussions with the NHS	-	-
		• Children's Atrium – design cost plan exercise underway	-	-
4.	Project Supervisor's Report	The Project Supervisors Reports were circulated in advance of the meeting. JR highlighted the following items from the report:		
		• Onsite construction and procedures being carried out in accordance with the Employer's Requirements	-	-
		• Standard & Quality of workmanship- generally good	-	-
		• Capita had recently witnessed drainage test and 85 point partition checks –which were successful	-	-
		• Work had progressed in the exemplar rooms which will be benchmark for all future rooms in the contract	-	-
		• Capita had also inspected Roofwork, cladding and windows- the works were continuing to progress in line with the specifications	-	-

Item No	Item	Discussion / Information	Action	Action by whom
4.	Project Supervisor's Report (cont'd)	**Structural (WR)** • Zones E & J – floor slab finishes not as good as expected. • Concern re 20mm lip – as previously covered during the meeting • Soffit cracks – acknowledged that BMCL keeping the soffit cracks under review • Pile Caps – Zone D, ground floor – protruding links, out of shape – some have been repaired. WR enquired whether the links were needed. Capita had asked for sight of some reinforcement sign-off sheets before BMCL pour the slab • Concern raised that some slab pours are being commenced in advance of the joiner/steel fixing works have been completed. AK acknowledged that some slab pours are being commenced prior to joiner/steel fixing works not completed. Consideration was being given to how large the pours are, etc. AK advised that he was satisfied with the works on site as being carried out in a controlled manner. • The standard through-out is generally high • Insitu columns – some of the finishes not as good as previous. Noted that some have grout loss or a small lip at the bottom of the column • Structural link bridge – works appear to be good and Capita will inspect the works and remedial paintwork when available for inspection. AK noted that some paint remedial works will be carried out from the mast climber. WR advised that Capita wanted to check that the painting specs are compatible. JW advised that he was liaising with JD Pierce and had requested the paint spec information. • Sub-slab drainage – there had been a couple of areas tested with normal rods where straight drainage lies had not been possible. The rodding tests had so far been successful. **M&E (JR)** • Capita were satisfied with the M&E Installation to date • The concerns raised by Capita in August had been dealt with however there were a couple of issues still to be closed out i.e. dead-legs in level 1 in excess of 3m. The package managers had also identified deadlegs with an excessive length. PM enquired if the deadleg issue had been raised with Mercury. DP advised that there appeared to be a different interpretation of the SHTM and BMCL were in discussion with Mercury and were reviewing internally. BMCL are checking a) why the lengths over 3m are thought to be ok, b) is it still acceptable. DP confirmed that there was no blended water in excess of 3m only hot water pipework. • Pressure testing of pipework – hydraulic testing. Now a programme developed for the carrying out of the hydraulic and pressure testing. D Wilson would be providing Capita with the proposed testing process. • 4 Supervisor Communications had been raised in August • 1 Defect remains as outstanding • Capita continue to be assisted by the Project Team and Site Managers	- - - - - - - - - - Provide feedback re deadlegs - - - -	- - - - - - - - - DP - - - -
5.	EWN/PMI	It was noted that there were no EWN/PMIs requiring discussion.	-	-
6.	RFIs	It was noted that there were no EWN/PMIs requiring discussion. DH advised that a cross check of Aconex RFIs had been undertaken and the historic RFIs had been closed off. The focus was now on closing out current RFIs.	-	-

Item No	Item	Discussion / Information	Action	Action by whom
7.	Equipment Co-ordination	FW advised that a number of meetings had been arranged to review Pharmacy Aseptic (Robot/Dispensary) and Medicinema. Information was awaited from G Burnett re the Audiology booths in order that a meeting could be set up with Users. FW noted that the Unistrut details were with the Users for review and it was expected that the Users would return this information by the end of the current week. FW noted that generally the Unistrut details were satisfactory however she had received comments re the Hybrid Theatres and the 2 Interventional Theatres. FW would be organising to meet with G Burnett to go through the comments. FW noted that some of the manufacturer spec was differing (height). FW would provide the initial feedback to G Burnett. DH enquired if the Commercial Information had been provided and GW agreed to provide this information. DP noted that feedback had been received re the pendants. DP advised that BMCL knew the intent re the canopies. GW sought confirmation that there was only 12 canopies required i.e. 11of one kind and a different 1 for the NCH Orthopaedic Theatres. DH advised that an PMI confirming the number of canopies would be provided in due course. GW suggested that Mercury had procured 13 canopies. DP suggested that Mercury had only issued a letter of intent. GW advised that the Equipment List identified 13 canopies. FW advised that the information provided to Mercury was only for 12 canopies. FW suggested that there were too many lights (1000lux). DP advised that he was expecting the light information later that day and would provide to FW asap thereafter. FW noted that there was a meeting to review the Patient Entertainment System on 12th September 2012. DP noted that there was a meeting to discuss the Renal System w/c 17th September 2012.DP would meet with FW and DH to discuss what is wanted on the panels. Elgar was the preferred supplier. The initial meeting with DH & FW would focus on the schematics, type, number of outlets. AF enquired about the delivery date for existing stock. FW advised that at the Equipment Meeting w/c 3rd September BMCL had been asked to provide dates of when they would want the Group 2 equipment as R Stewart could procure group 2 items on this basis. FW noted that she had provided the dates for the 5 big pieces of equipment. FW enquired whether MS would be having a further meeting to discuss the Equipment Transfer and DP suggested that MS was keen to have further meetings and it had been proposed to jointly meet every 4/6 weeks. DP requested that FW provide dates of when the NHS wants to move equipment for BMCL to identify key dates and any critical dates.	- - - - - - - Provide dates of when the NHS wants to move equipment	- - - - - - - FW
8.	AOCB	• Landscape Verge at Labs Access Road – HMc advised that the Labs Facility was due a visit from the Minister for Health and enquired if BMCL had any plans to tidy-up/cut the grass of the landscaped verge at the Labs Access Road. AK advised that he would undertake a site walkround with D Jordan. DH enquired about the temporary roads order/lining around the entrance to the site. AK advised that the drawing produced had identified loading bays and lining from More Than and feedback from GCC was awaited. DP advised that BMCL would liaise with D Campbell for an update on the progress of the temporary order.	Confirm grass verge will be tidied up	-

Item No	Item	Discussion / Information	Action	Action by whom
8.	AOCB	• Oil Delivery – AK noted that BMCL had organised for an oil delivery for commissioning and that as the yard was still to be concreted the NHS Team would need to co-ordinate with BMCL re oil deliveries. DP requested that BMCL provide dates on when the oil tanks will not be accessible. HMc advised that he would share these dates with the Estates Dept. HMc noted that he would ask for the Oil Tanker rep to visit the site to discuss whether the oil tanks can be filled from the other side. • HV Cable – AF noted that the HV cable from the sub-station down the south elevation to the tower mast. This would enable BMCL to have power on to zones D & G. DH suggested that discussion would need to be required re containment of heat. DP advised that it was the intention to use the MTHW at full temperature and use the hair handling units. AF noted that BMCL would be heating a couple of areas so can store the flooring to ensure malleable for install.	BMCL and NHS to liaise re oil tanker deliveries -	HMc/AK -
9.	Date and Time of Next Meeting	Monday 8th October 2012 at 3.30pm.	For info	ALL

HOSPITALS CONSTRUCTION PROGRESS MEETING: No18

Notes from meeting held on 8th October at 3.30pm in the Boardroom, Top Floor

Action Note

Present:	Peter Moir (PM)	Allan Follett (AFo)	Alasdair Fernie (AFe)	Andrew Bebbington (AB)
Darren Pike (DP)	Derek McFarlane (DMF)	Frances Wrath (FW)	Graeme Thomson (GT)	Hugh McDerment (HMc)
John Redmond (JR)	John Wales (JW)		Shiona Frew (SF)	
Apologies:	Alan Keeley (AK)	David Hall (DH)	Grant Wallace (GW)	John Ballantyne (JB)
Wullie Roxburgh (WR)				

Item No	Item	Discussion / Information	Action	Action by whom
1.	Action Note from Previous meeting	Accepted as an accurate record.	-	-
2.	Matters Arising			
	Final Fencing Proposal	PM noted that he was still to be provided with the final fencing proposals. AF advised that a set of drawings would be provided to PM by COP 9th October 2012.	Provide fencing drawing to PM	AFe
	Drawing Register	JR advised that he had received a list of drawings. It was agreed this item could be closed.	Item closed	-
	RDD Tracker	PM advised that the RDD Tracker would be returned to DS noting that the majority of actions would be closed out by 19th October 2012.	-	-
	Medical Gases	DP advised that the first set of marked up drawings had been processed through the workflow. The second marked up drawings would be processed through the workflow. FW noted that a meeting to discuss the Medical Gases with G Dunne had been arranged to take place on 26th October 2012. DP suggested that the meeting on the 26th October was to advise G Dunne that his previous comments had been taken on board. FW suggested that the only potential change would be to the pipework. PM enquired if BMCL still had the pipework pieces and whether anyone from the NHS Team had inspected the pieces/welds. DP advised that he still had the pipework pieces and would bring these to the meeting on the 26th October 2012 for G Dunne to see. DP reported that for each zone there would be a random sample of pipe cut out for inspection. DP noted that there had been no faults identified in the first batch of samples.	Ensure pipework pieces available for 26th October 2012.	DP
	20mm Lip in Concrete Slab	AF reported that it was very difficult to create a 20mm lip/step down and stop the concrete from rising up at the other side of the lip. BMCL proposed no change to the current 20mm lip formation and that BMCL would continue to scrabble back to achieve the desired levels. It was agreed this item could be closed.	Item closed	-
	Drainage	PM noted that ends were being left open to ductwork, etc. AF advised that the issue re open ends had been raised with Dunne's, Mercury. BMCL had undertaken further work on the QA procedures. AFo acknowledged that there were still a few occasions where open ends had been identified however there was now a lesser occurrence of ends being left open. DP reported that BMCL were focused on eradicating ends being left open and the BMCL and Mercury Floor Managers to monitor.	Continue to monitor	AFe/DP/Capita

Item No	Item	Discussion / Information	Action	Action by whom
2.	Matters Arising			
	IPS/Desk - NHS Review	PM noted that the NHS Team had reviewed the IPS and Desks. AFe noted that he had received a comments re a sharp edge to the IPS. AFe reported that the furniture was being installed therefore the NHS Team would be able to review this on-site soon. It was agreed this item could be closed.	Item closed	-
	Courtyard Drawings	AFe advised that he had queried the courtyard drawings and a Landscaping Sub-contractor had fed back comments on the courtyard proposals such as a) they would be difficult to maintain i.e. too many trees and b) that the aluminium/stainless trim would add no value to the finished scheme as the planting would grow over and therefore trim not seen. BMCL had liaised with Gillespies who have taken on board the Landscape Sub-contractor comments and would be providing a set of revised drawings for NHS Review.	Provide revised courtyard plans Review revised Courtyard plans when available	AFe PM
	Programme for Link Bridge	AFe noted that WSP were designing the Link Bridges into sections so can be lifted into place. The install of the link bridges had been re-programmed. AFe would provide dates/programme to the NHS Team in due course so that the NHS Team can liaise with the relevant building users timeously.	Provide dates for link bridge works	AFe
	Water Pipes – Capita Communication	DP advised that he had provided a response to Capita Communication re water pipes. It was agreed this item was closed.	Item closed	-
	Residue identified on basement walls	HMc advised that HMC and WR had inspected the residue on the basement walls earlier that day. It appeared that the residue was becoming more of an issue. WR would be liaising with BMCL formally and would be suggesting that BMCL obtain the view of a specialist. HMc has asked the Estates Dept to open up the fire doors at the ground floor entrance yard in order to ventilate the area as it had been noticed that the further away from the vents the worse the residue was. DP noted that the NHS should be mindful of opening these doors as there was a risk of dust getting into the New Lab.	Provide feedback re residue	AFe
	Crane Removal	AFe noted that tower crane no 7 had now being taken down. AFe sought confirmation of the NHS request for a crane strategy. HMc noted that the NHS Team wished to understand the strategy for any works outwith the perimeter fence/use the main road.	-	-
	Pipework – Deadlegs	DP advised that BMCL had reviewed this issue and remedial works to ensure that the deadlegs were within requirements were being undertaken.	-	-
	Equipment transfer programme	FW advised that the NHS Team could not provide dates/programme for the transfer of existing equipment. The NHS Team should be able to provide information for some of the Group 2 items identified on the AB Programme. FW noted that the NHS Team do no currently have a link into BMCL as D Cartwright is no longer working on the project. FW was currently providing all information directly to DSmith. FW noted that there were no further dates scheduled for the Joint Equipment Sub-group meeting. DP reported that he would identify a date for the next meeting as BMCL were keen to have an understanding of how the rooms should like at different phases of the project. FW acknowledged that the transfer equipment dates were a moving target as the NHS Team were awaiting NHS approval of the Migration Plan.	Provide Group 5 Equipment Info to DS	FW

Item No	Item	Discussion / Information	Action	Action by whom
2.	Matters Arising *Labs – Landscaping* *Oil Deliveries*	PM noted that remedial works to the grass verge at the New Lab Building had been undertaken i.e. had been grass seeded. HMc noted that the Landscape Contractor had damaged a lamp-post which would be replaced. HMc advised that ASmith had met with the Oil Delivery driver who had confirmed that he can get access to the tanks. DP requested that future deliveries be checked against the BMCL construction programme.	- Check future oil delivery dates against BMCL Construction programme	- HMc/AS
3.	Contractor Report	The Contractor Report was circulated in advance of the meeting. AF highlighted the following key points from the report: **Health & Safety (AFe)** • There had been no reportable incidents in the period. • There had been 12 minor injuries. BMCL were trying to understand how the neck injury occurred. • Method Statement and Risk Assessments continue to be reviewed. • Giraffe system will be used at Courtyard 4/5. AFe had experience of using this system before. The final construction of the giraffe system would be concluded in due course. • There had been a slight increase to the number of yellow cards issued in the period. BMCL had tightened up the process for ensuring that operatives are wearing appropriate PPE. • A new safety campaign had just been launched • MEWP for Managers Training Course ongoing • Train the Trainer (Mental Health) training ongoing • Blue Vest Training is ongoing • Monthly safety focus is on Planning of tasks – Safe Start process. Reinforcing safety i.e. not removing K Guards, etc. Liaised with all the supply chain. • High risk activities due to take place over the coming month included a) mast climbers starting to be installed in the atrium and b) working close to the blue light. The full edge protection system would be installed on site in due course. **Quality (JW)** • NCRs – a few further NCRs had been raised since the circulation of the report therefore the number of NCRs were in excess of 82. • Completion Criteria – a hard copy of completion criteria was provided to PM. The A&C Completion Criteria was the same format as that used for the Labs Project but includes everything from the ER's. JW enquired if PM would want the criteria issued by Aconex and this was confirmed. There were 5 different schedules of which one was for the exemplar rooms. PM advised that he would review the completion criteria and provide comments to BMCL. • Energy Centre A-side – JW had prepared a Completion Criteria for the A-side of the Energy Centre and this would be provided to the NHS in due course. • Audits – Recently had a LRQA Audit everything was satisfactory. There had been no sub-contractor audits in the period however an audit had been arranged for Astins. A Skanska Commercial audit had also been organised. • 49 observations raised and 39 were closed, 4 open and 6 ongoing. • 9 Defects notifications raised of which 6 were closed and 1 was ongoing • Snagging – there had been a few IT teething problems with the IDMS however it was anticipated that use of the IDMS would commence October 2012.	- - - - - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - - - -

Item No	Item	Discussion / Information	Action	Action by whom
3.	Contractor report (cont)	**Quality cont'd (JW)** • O&M – up and running. BMCL have started inputting as much information as possible. The sub-contractors had also been asked to load as much info as possible so that there would be no requirement for a purge at the end of the job. DP noted that BMCL and the sub-contractors were trying to load information once available.	-	-
		Progress (AF) • There were no matters likely to affect the completion date at this time	-	-
		Weather Record (AF) • There had been no 1 in 10 event during the month of September 2012.	-	-
		Construction Progress • Piling – it had been disappointing finding out that there had been further piles identified requiring remedial works. These piles were out-with the batter therefore had not been surveyed with the at risk piles in the batter which when Loys had undertaken the previous survey. AF noted that there had been no subsequent delay in getting the mini-piling rigs on site or design. The programme had been moved out 4 weeks to accommodate the extra remedial works however BMCL have procured additional temporary tables to bring the works back on programme. Some areas had not been impacted as badly as others. It was interesting no note how close the two hospitals are and the size. AF stressed that all piles had now been excavated and surveyed and the pile cap works were nearing completion.	Ensure all piling/mini-piling records and associated drawings are uploaded to Zutec	AFe
		• Underslab drainage – works in zone H were going well and works in zones E & A were underway. PM enquired if BMCL were providing the NHS Team drawings for comment/sign-off. AF agreed to check and feedback the drawing sign-off process. PM acknowledged that BMCL had taken notice of the NHS comments re bendy drainage.	Confirm process for sign-off of drainage	AFe
		• Concrete Ground floor slab – Zones G and D finished, H and E are 20% complete and K is 85% complete	-	-
		• Cores – as per the report	-	-
		• Main Concrete Frame – the wind had been the biggest impact on the works i.e. can't lift the shutters in windy conditions. Time had been lost on the podium works due to the windy conditions however it was anticipated that there was still time to complete the works within programme but that BMCL may need to move out the M&E fit out, Structal works. AFe acknowledged how close the trades were working together. Full guard edge protection was being installed to allow the service modules to be installed asap. BMCL were trying to accommodate any losses by putting in primary service modules as soon as possible. There was pressure on place to get the Mechanical riser are installed as soon as the unitised cladding had been installed. BMCL were continuing to push to get pours when possible.	-	-
		• Atrium Link Bridge – concrete slabs due to commence during October 2012 from level 4.	-	-
		• Cladding – the south elevation works were nearing completion with the louvres going in. The next focus was on getting the windows installed and the 'store enders' started. The cill detail would be pieced in. PM enquired if the apertures would be closed off. AFe noted that there were still deliveries to be brought into H&E and BMCL is feeding in at the corner of Zone J. BMCL were mindful that critical care was still open and that it was anticipated to close the aperture feeding this area in the next 4-6 weeks.	-	-

Item No	Item	Discussion / Information	Action	Action by whom
3.	Contractor report cont'd	**Construction Progress (cont'd)** • Roofing – PM raised concern about the roof being messy and AFe acknowledged that the roof area had been tidied up. PM suggested that there had been a cage with gas bottles. JR noted that there were 3 skips currently in that area. HMc suggested that the cage had caused damage to the membrane. PM noted that he was concerned that stones had been poured onto the roof and were being walked into the polystyrene. PM advised that he thought that the site was not as tidy as it had been previously. AF advised that he walked round the site the previous week and picked up some of the items for improvement and reinforced with the team that site/areas need to be kept tidier. BMCL were pushing on with the works and getting the partitions in as soon as the concrete had been poured. PM raised concern about the amount of waste and enquired if Astins were on a fixed price contract and this was confirmed. AF noted that if a pallet of plasterboard gets damaged then there is no replacement cost to the NHS. AF advised that wasted plasterboard was being recycled. DP noted that BMCL were focusing on the waste targets for BREEAM and that the waste was being very closely monitored. DP reported that AK had met recently with the supply chain to raise concern re wastage on site. Driving down the amount of waste was being driven by A Keeley. On site walk-rounds BMCL were focusing on waste and Health & safety. AF advised that a green room had been set-up to try and increase recycling/reduce waste. AF noted that Baxter and Gillespie would be carrying out the painting works and that every tin would be recycled by Dulux and consideration was being given to using a recycling paint centre and paint houses (500litre tank which is wheeled in, paint used and refilled as necessary by Dulux.)	Continue to monitor roof works untidiness Continue to monitor waste	AFe AFe
		• Fit-out – works being driven on in the ground floor, level 1 fit-out starting to progress into H & E, level 2 fit-out going relatively well, plant-room fit out being progressed. Modular risers and service risers are continuing to be delivered in advance of the fit-out works.	-	-
		• Lifts - Installation of 2 lifts underway in (1xC&G). Schindler were on-site to progress these works. These 2 lifts will be used for the BMCL vertical logistics strategy. (Lift No 20 and lift 10).	-	-
		• External Works – below ground pipework continuing to be installed. The NCH temporary SUDS had been completed. BT and IT containment was being installed. HMc reported that there were 6 x 100mm ducts from multi-storey position and the duct works were started on 5th October and due to complete 26th October. Quotes for the elevational duct works were expected on 11th October with the start on site as the 12th October and completion by 31st October 2012.	-	-
		• Energy Centre – DP noted that works were continuing to the progress to achieve the 31st October handover date. An initial review of the Fire Strategy and Locking Strategy had been undertaken. A walkround with NHS Reps had been scheduled to take place on 9th October. BMCL were finalising the handover criteria. The generator fuel has been delivered. BMCL were running 2 paths for the ENMS a) for a full/final system and b) for the 5 generators as standalone from the full ENMS There were a couple of alterations to be done to the Hawkeye Sidley Board in the 33kv sub-station. BMCL were keeping the pressure on to get the ENMS works completed. The work required retrospectively by BMCL if the ENMS is not fully in place is a minimum 3- 4 weeks work to do connections, etc. BMCL had met to discuss the Fire Alarms BMCL proposed to install a full fire alarm into side A and a full alarm system and detectors in the core to mitigate the number of false calls from works on-going in the B-side. DP noted that the proposal was still to be ratified by the NHS Team and it was hoped that the Fire Alarm Strategy could be agreed at the scheduled walk-round. PM enquired if the NHS Generator would be disconnected once the BMCL generators are up and running and DP advised that it would be advantageous to keep the BMCL generator for a further 2 weeks post the BMCL generators being operational. The retaining the generator would also assist with the ENMS.	- Provide proposals to NHS re Fire Alarm strategy	- DP

Item No	Item	Discussion / Information	Action	Action by whom
3.	Contractor report cont'd	**6 week lookahead (AFe)** • Continuing to pour concrete – looking to pour 14-16,000cube of concrete per week. Concrete pours continue to be completed within timeframes. There had been no noise or vibration complaints from neighbouring residents during the period. Concrete pours to be carried out to link bridges • Fit out of basement area – mist coating started • Continuing works to courtyards 4 and 5 – pushing to get complete by end of November 2012 • Turret steelwork to level 2/3 roof • Fit-out to 20+ zones – varying from installing headtrack, decoration, doors (January), internal screens (January). • Pushing to get the sample areas completed • Temporary heating – the basis of a scheme has been identified and is being worked up. Expecting temporary heating on mid to end of November (Mains power to be brought up the tower). **Procurement (AFe)** • Atrium Pods – JDP • Atrium cladding – Clad UK (starting w/c 15th October to do backing works) • Atrium Link Glazing – Charles Henshaw (local company) • Decoration – Baxter & Decoration • Flooring/Vinyl – procurement process nearing completion • Courtyards and Ceilings - procurement process nearing completion **RDD** • PM noted that the NHS were scheduled to review fitted furniture samples during the current week.	- - - - - - - - - - - - - -	- - - - - - - - - - - - - -
4.	Project Supervisor's Report	The Project Supervisors Reports were circulated in advance of the meeting. JR highlighted the following items from the report: • Onsite construction and procedures being carried out in accordance with the Employer's Requirements • Standard & Quality of workmanship- generally good • BMCL continue to carry out quality assurances, inspection and tests and Capita reviewing on a random basis. Over the period Capita have witnessed 85 point partition test, air pressure tests, below ground drainage and electrical tests. • Exemplar rooms progressing quite well however concern raised regarding the redundant medical gases still being in-situ and the trim now going in. DP noted that it had been agreed that the pipework could be left in as long as identified as 'redundant' and it was not BMCLs intention to remove this pipework. PM advised that ASeabourne did not recollect any agreement to keep the pipework in and it was PMs view that he did not want anything left in that was not going to be used. DP agreed to organise for the pipework to be removed.	- - - - -	- - - - -

Item No	Item	Discussion / Information	Action	Action by whom
4.	Project Supervisor's Report (cont'd)	• Observations: Capita had been unable to locate a roof coating spec (Redline/Permaquick) that related to the drawings. JW advised that he was dealing with this item and he received a response from Prater. JW would liaise with Stuart Andrews before providing to Capita. Redmat had been on site the previous week. **Structural (JR)** • Energy Centre – largely complete. Quality continues to be satisfactory. Only minor snagging being identified. Mini-piles – full as built details and all piling records remain to be provided by BMCL on Zutec. PM requested that the mini-pile item be closed out in advance of TBaillie leaving the project. • A&C Hospitals – concreting works progressing to 2nd floor D, E and H, 1st floor F&G and ground floor slab in A. The quality continued to be generally good however the workmanship to the 20mm lip was of concern. • Structural Steelwork Fire protection coating to the Atrium – Capita would be requesting BMCL provide pre-fire certification for the structure and the repair coating. JW advised that he had liaised with JDPierce and a response was awaited. **Communications (JR)** • 16 communications had been raised in the period and all had been responded to with the exception of 4. JW advised that he had a response from Praters and Dunne's to provide to Capita. • 2 Defects had been issued in the period **M&E (AFo)** • Well satisfied with the M&E Installation to date, noting that works are progressing at a pace to both the A&C Hospitals and the Energy Centre. • Communications are being responded to timeously • Uncapped ends were still being observed on site and Capita would continue to monitor this acknowledging that the number of uncapped ends had improved. DP advised that this was a focus for BMCL. • Access hatches to ductwork being blocked by pipework had been observed • Attending off-site witness testing of generator tests which had been successful. Simulation provided on basis of not using ENMS. If ENMS is to be used then Capita would need to witness on site. • Unsupported cables – issues being picked up and noticed that in the next areas of work issues are not being carried through • Excessive water pipe drops - issue picked up in first area however issue not being observed the next areas of work. • Insulation of pre-fabricated sections – DP advised that he had sent through the off-site procedures and enquired if Capita would wish to visit Newcastle to witness the pre-fabrication process. AFo agreed to discuss this with DP after the meeting. • Stud wall cut – AFe advised that all the sub-contractors had been told not to cut studs. JR advised that he had further communication to be provided to BMCL.	- - - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - -
5.	EWN/PMI	It was noted that there were no EWN/PMIs requiring discussion.	-	-

Item No	Item	Discussion / Information	Action	Action by whom
6.	RFIs	JW advised that Nightingale's had reviewed and signed-off some pre-cast columns and BMCL were considering how best to present this to the NHS. FW suggested that this had already been carried out to levels 5/6 and above. JW suggested that this was lower level columns. AFe advised that it was columns which had already been cast in the NCH which were due to be clad however the polished finish was potentially good enough to not need clad. PM advised that he would review and advise BMCL. JW advised that he had a drawing marked up with the columns to be reviewed and would provide this to PM.	Provide marked up drawing re insitu columns to PM	JW
7.	Equipment Co-ordination	Equipment Group 5 – AB advised that the dates for the group 5 equipment information being passed to BMCL had passed. FW advised that she had the information ready to provide to DS as there was no-one else identified to co-ordinate the Specialist Equipment. FW noted that DS had agreed to reschedule the 3 meetings which had been cancelled.	-	-
8.	AOCB	Stairs – PM noted that the NHS were awaiting a proposal from BMCL level of finish of stairs at a higher level and advised that the NHS had discussed earlier the need to sheet out the stairs. PM suggested that AFe should include the non-sheeting of stairs in the proposal to be provided. PM advised that the NHS Team would consider proposals to any stairs that would be hardly used as long as they were appropriately coated i.e. portaflec. PM suggested that the proposal would provide a cost and time saving.	Provide proposal for stairs	AFe
9.	Date and Time of Next Meeting	Monday 5th November 2012 at 3.30pm.	For info	ALL

HOSPITALS CONSTRUCTION PROGRESS MEETING: No 24

Notes from meeting held on 8th April 2013 at 3.30pm in the Boardroom, Top Floor

Action Note

Present:	Peter Moir (PM)	Alan Keeley (AK)	Alasdair Fernie (AFe)	Allan Follett (AFo)
Andrew Bebbington (AB)	David Hall (DH)	Darren Pike (DP)	Frances Wrath (FW)	Gavin Burnett (GB)
Graeme Thomson (GT)	Grant Wallace (GW)	Hugh McDerment (HMc)	John Ballantyne (JB)	John Redmond (JR)
John Wales (JW)	Leanne Edwards (LE)	Shiona Frew (SF)		
Apologies:	Jim Murray (JM)	Willie Roxburgh (WR)		

Item No	Item	Discussion / Information	Action	Action by whom
1.	Action Note from Previous meeting	Accepted as an accurate record.	-	-
2.	Matters Arising			
	Link Bridges	AK advised that BMCL were progressing letting the package for the link bridges and that it was anticipated that BMCL would be getting costs back later that week. The design for the link bridges had been further developed. It had been discussed at the Construction Interface Meeting the importance of ensuring that BAM leave BMCL enough space to carry out the link bridge works. BMCL were looking at the potential to bring the link bridge works forward in the programme after the demolitions being complete. DH noted that it had been mentioned in a meeting earlier that day that there was no load bearing capacity on the existing structure to take anything from the Teaching & Learning Facility. DH had asked whether there was anything that could be done at this time. AK suggested that the NHS could do an independent design. DH advised that the NHS were looking to identify the most advantageous route for the NHS i.e. is BMCL design and procurement was beyond the ability to modify the design in order to do anything to accommodate the light weight T&L structure. DS advised that he had provided an email to DH regarding this query.	- -	- -
	Column Finishes	JW noted that the provision of sample column finishes was work in progress. PM noted that the floor to floor columns looked satisfactory without needing too much work however the NHS would review the samples to be provided by BMCL before confirming the way forward.	Provide column finishes	JW
	Stair Cores	PM advised that he had reviewed the stair core finishes and had provided a schedule of finishes to BMCL. JB acknowledged receiving the stair core schedule and advised that BMCL were reviewing/working through the schedule. DH noted that the NHS Team were awaiting samples of the correct shade of colour and AFe advised that this was work in progress.	Provide paint finishes	AFe
	Completion Criteria	JW noted that BMCL had an internal meeting to finalise the Completion Criteria to agree responsibilities. The NHS comments had been taken on board. The final completion criteria would be rolled out thereafter.	-	-
	Craneage	DS advised that the maintenance and access strategy had been considered however BMCL could not progress the strategy in relation to Car Park 2 any further. PM noted that the NHS were trying to take the large parking bay into the design of car park 2.	Item closed	-

Item No	Item	Discussion / Information	Action	Action by whom
2.	Matters Arising			
	Govan Road Service Diversions	GT advised that Virgin Media have submitted their way-leave application to which a response had been provided and feedback from Virgin Media was awaited. It was expected that Cable & Wireless would submit their way-leave application by cop 12th April 2013. GW noted that after the way leave applications have been received that discussions re the programme would be progressed. GT continued to push for the August date. GW enquired whether one of the companies had a 1 year notification process and GT advised that the rep was progressing the notification process. GT suggested that the August date may be tight.	-	-
	Equipment Co-ordination Group 2	PM noted that he had received no adverse comments re the NHS delivery of group 2 equipment. PM advised that a PMI had been submitted to BMCL to remove dispensers. PM reported that the dispensers with the lugs on the side already delivered to site were to be returned to the NHS in order that they could be provided to the supplier. AFe enquired if the number of cages had been agreed. PM reported that the no of cages had not been agreed but that there was 40 cages.	Return dispensers to NHS	AFe
	Helipad	PM noted that a PMI had been issued re the Helipad loadings therefore this item was now closed.	Item closed	-
	Cleaner Cupboard pattress supports for lockers	PM advised that he had not reviewed the cleaner cupboards on site as yet. FW advised that the support was on the IPS. GB suggested that some racks had been moved on to the IPS. GB agreed to check the drawings.	Check drawings for pattress support	GB
	HV Cable separation	DP advised that this was work in progress. The BMCL rep who had been progressing this was on sick leave. Plantrooms 21, 31 and 33 had been reviewed and there were no issues. BMCL had plotted as installed sprinkler heads onto drawings which would be provided to the NHS asap. DH enquired about the timescale for providing the drawings to the NHS Team as he was on leave w/c 15th April 2013. DP suggested that the drawing for plantroom 21 could be available for later in the current week and it would be beneficial for DP to meet with DH on 12th April 2013. DH suggested that a small section could be discussed on 12th April 2013 which would allow the standard to be set for BMCL to progress the other areas for discussion with DH on return from leave.	Provide as installed sprinkler head drawings to NHS	DP
	Value Engineering	PM acknowledged receipt of the revised BMCL VE sheet and suggested that he meet with JB to discuss and this was agreed. PM noted that he had provided a response to BMCL regarding a couple of items i.e. paint on basement floor. JB advised that Swisslog would dictate the paint/floor finish for the AGV	-	-
		FW advised that the review of handrails was WIP.	-	-
		AFe enquired about the floor painting in plantrooms which was continuing to be progressed. AFe noted that the painting of the floors removed the imperfections for the plant to sit on however BMCL were proposing to cease painting the floors and to scrabble the floors to minimise any imperfections and once the plant was installed then BMCL would paint in the walkways.	-	-
		PM noted that BMCL had provided samples of the Veneer Faced panels (Gustav) but that neither the cherry nor the oak were of preference. The NHS had asked what the price difference between the veneer faced panels and real oak i.e. is there any real savings to be obtained. AFe advised that it was important to ensure that an external product is chosen as will be fitted in an external environment.	-	-

Item No	Item	Discussion / Information	Action	Action by whom
2.	Matters Arising			
	VIE	PM noted that a meeting to discuss the VIE had taken place and that the proposals were WIP. PM noted that if the NHS were not to build the car park that an accessible VIE would still be required. AK advised that he had requested 2 drawings i.e. 1 with the car park and 1 without the car park.	Provide confirmation of service diversion works	AK/GT
	Balustrade review	FW advised that a review of the balustrading was being undertaken and that the NHS did not think that all the double handrails in the Adult Hospital would be required. GB noted that some of the samples provided for sign-off may not be used. FW noted that there was a lot of timber and the NHS would likely be proposing that BMCL use all plastic.	-	-
	Adult Sanctuary	LE confirmed that the Adult Sanctuary proposals were WIP.	-	-
	Window mock-up	AK confirmed that the window mock-up had been removed.	Item closed	-
	Car Park 1 Design Team meetings	AK agreed to confirm the Car Park 1 Design Team meeting arrangements to PM. PM advised that he wanted an NHS rep to be in attendance at these meetings so that any BMCL/NHS issues can be picked up. DH noted that the next design team meeting had been scheduled to take place on 10th April 2013 at 1.30pm.	Provide schedule of meetings	AK
	Damaged cladding	AFe advised that he had a contractor with the appropriate guarantees to carry out the remedial works to the damaged cladding and AFe had liaised with JW regarding the appropriate warranties. BMCL would organise for a sample to be provided for the NHS Team. JW advised that the contractor is Kingspan approved and had been used on the Peterborough Project.	Provide sample of remedial works	AFe
	Gas Meter	PM noted that the NHS had purchased the gas meter. DH advised that the aesthetic issues still needed to be concluded. DP advised that BMCL had asked for the housing details and once received would be provided to the NHS. DH reported that a high quality housing was required.	Provide gas meter housing details when available	DP
	Phasing of Handover	AK advised that he had undertaken further work on the proposal for the phasing of handover. AK would add some notes re issues to be considered (i.e. access from car park onto Hardgate Road) and dates to the current drawing. AK noted that he proposed to organise a meeting for early w/c 15th April 2013.	-	-
3.	Design Items	GB advised that there were no major design issues to be raised. GB noted that the NHS Team had renal panel housing returns which BMCL required to be returned asap and FW advised that she was currently reviewing these drawings. GB advised that the last final sweep-up meeting was scheduled to take place with FW later that week. It was noted that the RDD was progressing.	Return renal panel housing drawings	FW
		LE tabled a summary of the minutes from the last Design Team meeting. PM suggested that if LE wished to provide these notes in advance to SF then these notes could be circulated in advance so these can be circulated with the other meeting papers.	Summary to be circulated in advance of meetings	SF/LE
		LE noted that there were no major issues to date. Nightingale had received notice from BMCL to review the Labs Health & Safety File. Nightingales were in discussion with BMCL regarding the as-built process and Nightingale was gearing up to inspect the exemplar areas.	-	-

Item No	Item	Discussion / Information	Action	Action by whom
3.	Design Items (cont'd)	LE reported that she had not seen the CDMC rep for some time therefore was unable to provide a CDMC update at this time. DS enquired if there was a reason why the CDMC rep had not been on site recently and DH advised that the CDMC rep had been off sick however had recently returned back to work. LE advised that the CDMC rep was still expected to attend the Design Team meetings. DH agreed to liaise with the CDMC Rep regarding attending the BMCL Design Team meetings.	Liaise with CDMC rep	DH
		LE provided the following Design Team progress: • the RDD Access & Maintenance had taken place in January and Nightingale were working through the comments and the formal RDD had been issued to BMCL w/c 5th April 2013 and would be provided to the NHS Team in due course. • 23 of the 47 Building Control warrants had been approved, 8 warrant applications were current with GCC for review and 16 warrant applications were still to be submitted.	- -	- -
		GB noted that the submission in respect to the Fire Warrant was with Strathclyde Fire & Rescue (21 day review process). DS suggested that the outcome of this warrant application was anticipated to be mid May 2013.	-	-
		• Nightingale had completed the setting out of the partitions for the full building now and these drawings would now be revised subject to any issues being identified on site. • Drawing release to the NHS Team was currently Production Group 10 drawings • Doors was currently at Production Group 15 • Reflective Ceiling Plans – levels 7, 9 and 10 were in progress • Ceiling heights – advised that there is a request to change the ceiling heights in the interventional theatres • The sweep up process was nearing conclusion and PG 08 and 09 were due to go through the formal system • Atrium design – Nightingale had an extracted programme of construction to ensure that the design stayed on track • NCH atrium - the new design was starting to be included on the revised drawings • Site inspections – Nightingale have commenced site inspections of completed works – (not as built review). The site inspections were to identify any issues on site. • PMI progress – DCFP – scope agreed and clarified the previous week, Sinks – been reviewed and discussed with BMCL the previous week (not believed that the codes on the drawings would need to change), Patient Entertainment – awaiting information. DP advised that he had not seen the return of the Patient Entertainment information and DH advised that the information had been provided the previous week.	- - - - - - - - - -	- - - - - - - - - -
		M&E • M&E meetings on-going on a Thursday • Still co-ordinating MEP with the slab, drainage works. DH enquired what comments were awaited from Capita. DP advised that in terms of Wallace Whittle drawings there was nothing which was outstanding.	- - -	- - -
		Structural • Main frame design complete and steel work ongoing. • Link bridge design – ongoing and co-ordinating with WSP	- -	- -

Item No	Item	Discussion / Information	Action	Action by whom
3.	Design Items (cont'd)	Other Items: • Section 56 – ongoing and nearing completion • Helipad design – ongoing • Tower Crane 3 was due to be coming down soon • Landscaping progress – no issues to report • BREEAM- only 3 credits needed and additional evidence being gathered for resubmission. Project still on course to achieve BREEAM • Sustainability Report – recent report identifies that 27% recycled content achieved	- - - - - -	- - - - - -
4.	Contractor Report	The Contractor Report was circulated in advance of the meeting. AF highlighted the following key points from the report: **Health & Safety (AF)** • 1 RIDDOR – crush to hand. Operative worked outside of the method statement as did the driver. Crush to hand was due to the forks pushing the hand of the operative against the vehicle whilst off-loading materials. The operative has been off-site for more than 1 week as had damaged his tendons. AK advised that AS was on the distribution list and should therefore have received a copy of the BMCL Accident/Incident report. Both operatives were chosen to undertake drug & alcohol testing and both operatives passed the test i.e. no drugs or alcohol present in the test results • Due to the above RIDDOR, the AFR increased to 0.9 (0.11 for the yearly rolling average) • Minor injuries occurred on site were dust in eyes, sprains, etc. • 4 yellow cards and 3 red cards issues over the period. Red cards were for a) 1 operative not wearing a harness/using edge protection when working at height moving cabins, b) operative working in a riser with no harness edge protection, c) operative came to site to remove machinery from the top of the Speedy Cabin and stepped onto roof without a harness. BMCL carry out investigation into red card occurrences and identify what could have been done better. The Monthly H&S meetings were open to anyone from the NHS Team to attend. BMCL were still delivering Health & Safety, access/egress and facilities are being delivered to a high standard. AK noted that there was good integration as Paul Mooney is running the Workforce Group. AFe has emphasised to teams and sub-contractors that the number of accidents/incidents needed to reduce. • Drug & Alcohol testing – recent tests were carried out by Astins to a group of 10 and to a group of 8 Astins operatives and there were no operatives who failed the test (the testing the previous month had 1 Astins operative who had failed the test). Dunnes are carrying out their own alcohol testing and are planning to extend the testing to plant operatives. AC Flooring have indicated that they will be introducing testing on site for their operatives. All operatives were fully aware that they should not be turning up to the site if there was any risk of them failing the drug & alcohol testing.	- - - -	- - - -

Item No	Item	Discussion / Information	Action	Action by whom
4.	Contractor Report	**Quality (JW)**		
		• Extra resource had been into identifying the NCR status/reviewing Aconex which was 331 NCRs raised of which 258 were closed and 1/2 were to be closed out internally.	-	-
		• Completion Criteria – JW noted that an internal meeting to discuss the Completion Criteria had been scheduled to take place w/c 15th April 2013.	-	-
		• As built process – just completed the first inspection with Capita to Zone 527 that afternoon.	-	-
		• Internal Audits – a full programme of audits for 2013 had been identified. A full audit of all functions had taken place during February. A number of sub-contractors audits had taken place during March. The had been no consultant audits carried out during the reporting period however an audit of the BMCL Design Manager function had been carried out in the period. There had been no commercial audits carried out in the period. LRQA Lloyds had carried out an audit on BMCL at the end of March which had went very well with only minor areas for improvement identified.	-	-
		• Observations – 111 raised to date of which 88 were closed 10 were open and 13 were ongoing (mostly M&E with some just awaiting the photographic evidence of the remedial works in order to close out).	-	-
		• Engagement with Capita continues and there were 10 drainage and a few 85-point partition Supervisor inspections carried out during the reporting period with no failures.	-	-
		• Defects – 44 raised to date of which 37 were closed, 4 were open and 3 were ongoing	-	-
		• IDMS – well up and running – stats included in the report	-	-
		• Zutec – now well up and running and have 15 sub-contractors uploading their information to Zutec. There was no further Zutec training carried out over the period. PM enquired if the Skanska information had been uploaded to Zutec and JW confirmed that all the information had been uploaded in advance of TBaillie leaving the project and that he had received confirmation from WR that he was satisfied with the information which had been uploaded. JW noted that he and DW had a tracker to monitor the upload of information to Zutec.	-	-
		• DP noted that BMCL wanted to invite Board Reps and Capita to see the Air Handling Units so can get everyone's comments in one visit. DP advised that he would liaise with ASmith & IPowrie directly to arrange the air handling unit review.	Liaise with ASmith and IPowrie re reviewing Air Handling Units	DP
		Progress (AFe)		
		• There was a 1 in 10 year event in March in terms of days with air frost. The cold weather was making the screeding work difficult and keeping up the operatives morale on site was also difficult.	-	-
		• Under Slab drainage – no issues with progress to date going well and works progressing forward with zones C& F. The first pour on zone c was programmed for the coming weekend. PM enquired about the connection to the Maternity Foul over the previous weekend. AFe provided an overview of the foul diversion works which had taken place.	-	-
		• Concrete Ground floor slab - progress to date on the ground floor slab was very good. AF confirmed that there was enough labour to carry out the fit out programme	-	-
		• Cores – final capping slab nearing completion	-	-
		• Stairs – progressing in core L	-	-
		• Main Concrete Frame – progress has been good on all fronts and there was a level 12 pour scheduled for later that day. It was expected that all 4 top floors would be poured by mid June. Framework overall going well. AK noted that TC 1 had been removed over the weekend.	-	-

Item No	Item	Discussion / Information	Action	Action by whom
4.	Contractor Report (cont'd)	**Progress (AFe) – cont'd** • Link Bridge – the deflection/concrete pour information was being issued to WSP however it was thought that the deflection was less than expected. • Cladding insulation – continuing to be installed and under review by BMCL • Adult Atrium – mast climbers being installed to allow the elevational treatments to be installed. The Pods were currently in manufacture off-site. AFe enquired whether the NHS would like to review the Pods and PM confirmed that this would be of benefit. Podium Curtain Walling – the curtain walling should start to be installed very soon, the shoes were currently being installed. • Cladding – on-going to cores B & D • Windows – due imminently on site • Externals – no quality issues to be reported other than those previously known i.e. damaged panels • Prater are progressing in most areas that can with exclusion zones set-up i.e. NCH • The cold weather had been kind in respect to their being no water damage • Structal unitised cladding – installing panels in zones H & E and substantially complete to C. • General Fit out – continuing to progress well. The programme had been moved due to lessons learned through carrying out the level 4 works. Level 7 & 8 will be used as benchmark areas. The quality of product being installed on the site was good. • M&E Fit-out (podium) – generally going well however time had been lost to some of the lead-lined areas – will lose 3-4 weeks to some rooms. BMCL have advised the supply chain so can deal with the impact of this delay. • NCH – progressing well, fit out going well. Elevation works held back until complete the steelwork. JD Pierce steelworks progressing well. The area at the front of the NCH will start to be shored up. NCH plantroom – NHS to review floor paint finish. • Tower – 2nd stage fit out progressing well and headtrack being fitted to H9, F6 , J6, etc. The windy conditions had a big impact on the works to install head track and early walls. BMCL are using wind rated MEWPS. • Level 12 concrete first pour –mid April with completion off level 12on all four ward fingers by mid June. • Lift – Core G operational as of earlier that day. DH enquired what the process for using the lift was. AFe advised that there would be an operative stationed in the lifts in order to take lifts up/down the building. • Externals – drainage works at the rear of the maternity, configuration of the compound and preparation for Car Park 1 piling – underway. Works progressing satisfactorily at the VIE, created new ramps for access to the VIE and decontamination, cut the VIE during the previous week. The hoarding will be extended and the hub road will be extended round then the final hoarding will be installed. Service yard to the north at the Energy Centre has the HV cable being installed and then the concrete yard works will be commenced asap after the HV works are complete. • Energy Centre – Thursday/Friday containment to be installed. FES were due in site during w/c 15th April 13. It was noted that there were no major external works going on. The footpath at the back of the standby generators at A&E would be extended. The new foul drainage works at the NCH were due to commence with the connection to the manhole also to be done. Works on course to handover the A-side of the Energy Centre on the 18th April 13 however this was dependent on a satisfactory black-start test (scheduled for 15th April). AK noted that the adverse weather during March had impacted on the ability to have the Scottish Power reps on site. M&E works to level 2 substantially complete with the exception of lagging and commissioning. Strategy for escape being considered. Roof works nearing completion with some penetrations through the roof to be completed. Building control due to visit the Energy Centre w/c 15th April 13 and BMCL had not identified any issues in advance of the Building Control meeting.	- - Provide info re visit to see Pods - - - - - - - Review Plantroom floor finish - - - - -	- - AFe - - - - - - - PM - - - - -

Item No	Item	Discussion / Information	Action	Action by whom
4.	Contractor Report (cont'd)	**Progress (AFe) – cont'd** • Car Park 1 – WSP and Skanska are liaising regarding the design of Car Park 1 and works remained on course for start of piling at the start of May 2013. AK proposed to carry out some trial pits at the VIE and would provide a schedule of the Car Park 1 meetings to the NHS Team. The design of the post tension frame was progressing well. AK proposed to set up a range of workshops to discuss the car park works. PM noted that the NHS Team expected that the Car Park drawings would be submitted to the NHS Team through the RDD process and AK agreed to organise for the drawings to be provided.	- Workshop arrangements to be advised to the NHS	- AK
		Procurement (GW) • Dental chairs – GW noted that he understood that FW had comments back from the Dental Hospital reps and requested a discussion with FW to review some details in order that GW could check that the procurement was correct. FW noted that the NHS Rep had advised that they have no personal experience of seeing nitrous as part of the chair. GW advised that BMCL were progressing the spec for the dental chair with a pendant. GW advised that he would liaise with FW. • Audiology - ADL be issued. • Aseptic – further discussion scheduled for later that week. GW wished to discuss the audiology requirements with DH. GW noted that there were certain pieces of equipment i.e. fume cupboards, which were identified as group 3 equipment and it was thought that this equipment should be listed as group 1 equipment in order that the aseptic suite could be certified. GW had received a price from Machair to supply all with the aseptic suite. • Structural steel: level 12 issued, level 13 & 14 & 15 ongoing • Helipad – ongoing however BMCL now have a design which is nearing conclusion • Glazed canopies – ongoing however it was thought that the final design solution now available • Link bridge – design at final review stage • Fire Stopping – contract to be awarded to Stopfire • Wall protection - ATL due to be issued to Gradus later that week • Car Park- Dunnes procurement concluded. • Piling contract – procurement nearing conclusion • Lifts - procurement nearing conclusion	- - - - - - - - - - -	- - - - - - - - - - -
		RDD/Samples (GB/DS) • Helipad - BMCL received confirmation of the way forward. • Stage 8 warrant submission – currently with Strathclyde Fire & Rescue for their statutory review • 1:50 Sweep –ups – ongoing • NCH Atrium – presentation feedback received by BMCL • DCFP – PMI from NHS Team received by BMCL • Other specialist areas – meetings with Robert Nethery going well. FW noted that the next meeting was scheduled for 10th April 2013. • ATPG design report – DP advised that the final formal report was to issued in advance of the next low carbon meeting	- - - - - - -	- - - - - - -

Item No	Item	Discussion / Information	Action	Action by whom
4.	Contractor Report (cont'd)	• Section 56 – walk about with GCC took place and the marked up drawing will be provided to WSP for provision to GCC. DH requested that the NHS see the drawing before it is provided to GCC and GW confirmed that he would organise for the drawing to be provided.	Provide marked up drawing in advance of providing to GCC	GW
		AFe reported that he needed to understand the NHS requirements for a banner for the topping out. It was agreed that a separate meeting would be organised.	Organise meeting to discuss banners	AFe/SF
		PM enquired when the NHS Team would receive the commissioning programme. DP advised that BMCL were reviewing plant-rooms 21 sand 31 which would be provided asap and the remained of the M&E systems commissioning programmes would be provided to the NHS on a rolling basis as soon as possible thereafter.	-	-
		AFe noted that he had reviewed the NHS comments regarding Critical Care and that he satisfied that there was only minor comments.	-	-
5	Project Supervisor's Report	The Project Supervisors Reports were circulated in advance of the meeting. JR highlighted the following items from the report:		
		• Construction procedures - continue to be satisfactory	-	-
		• Standard & Quality – works continue to be to a good standard and in accordance with the ERs	-	-
		• BMCL are continuing to carry out quality checks on site		
		• Capita continue to carry out inspections and witness testing. Witness testing undertaken in the period includes below ground drainage and 85 point partitions and that there had been no failures. AFo had also witnessed a number of electrical tests during the period and there had been no failures.	-	-
		• Capita had inspected the critical care area that day and the standard was generally high. The number of snags identified had risen from 6 to 10.	-	-
			-	-
		• External blockwork and Sto render – generally good however Capita were awaiting the spec for the cladding paintwork.		
		• Energy Centre – satisfactory however a general tidy up was required	-	-
		• Zutec – as built drawings awaited for the A&C piling		
		• Link Bridge deflections – All slabs had been cast and Capita awaiting a formal response from WSP re deflection. AFe advised that John Beryl was liaising with WSP to close out the link bridge deflection issue/report.		
		• Concrete slab – appear to be of a good quality throughout. Capita had witnessed a crack in a concrete slab – Zone G – WSP advised BMCL that the 1mm crack is acceptable and Capita are awaiting a formal response from WSP.	-	-
		M&E(AFo)	-	-
		• M&E installation continues to progress to a good and compliant standard		
		• Inspections – carried out to level 8, first fix being carried out in some areas	-	-
		• Energy Centre well advanced and Capita expecting to carry out their final inspection later that week		
		• The joint inspection/site walkround process with BMCL continued to work well	-	-
			-	-

Item No	Item	Discussion / Information	Action	Action by whom
5	Project Supervisor's Report	• Sprinkler head issues – it was acknowledged that DP would provide a proposal to resolve the sprinkler head issues later that week. • Generally, Capita were comfortable with what was being observed on site. • AFo acknowledged that going forward their would be a bigger focus on commissioning Supervisor Communications (JR) • A number of communications and defect notifications had been raised during the period i.e. a) debris being left on flat roofs (communication now closed) and lead lined rooms – fit out deviates from the drawings therefore BMCL requested to provide clarification re deviation and for the new details to be provided to the NHS, b) Back to Back backboxes – BMCL have been repositioning the back boxes, c) obstructed hatches, d) backboxes where the screws have penetrated the partitions – issue remediated. Energy Centre- due to be handed-over on 18th April and Capita would like to see the completion criteria.	- - - - Provide completion criteria for EC	- - - - JW
6.	EWN/PMI	It was noted that there were no EWN/PMIs requiring discussion.	-	-
7.	RFIs	It was noted that there were no RFI's requiring discussion. JB noted that he wished to discuss the VE list with PM	-	-
8.	Equipment Co-ordination	PM noted that there had been an Equipment meeting earlier that day. GW enquired why a bariatric hoist test was being requested. FW advised that the test was so that the Moving & Handling rep could sign off the hoist. GW suggested that testing the bariatric hoist may pose an issue as Arjo currently only had 2 samples which were already out on hire to the NHS. FW advised that the Moving & Handling rep had been organised to visit the site on 11th April to sign off the hoist. PM enquired whether either of the samples were on hire to NHS GG&C.	- -	- -
9.	AOCB	Material Storage – JB advised that there had been an email exchange between the NHS and BMCL regarding NHS Observations on material storage and enquired if this had been resolved. PM advised that this issue had been dealt with. Topping Out – AFe requested that SF organise a joint meeting to discuss the NHS Banner/Signage requirements for the topping out. PM noted that there had been a discussion a while back re NHS GG&C having high level branding on site. AK advised that BMCL had proposed to install more high level banners but that the banners needed to be erected by abseilers and there was a Health & Safety concern. AFe advised that consideration should be given to incorporating an NHS Banner in plantoom E. Closing Off Areas – PM advised that he wanted a discussion re closing off areas. The critical care area was clearly being used as an exemplar area to allow for any issues to be picked up now but that he would want the wider NHS Team (nursing and infection control reps) to have a walkround to ensure that all the team is comfortable with the exemplar. PM acknowledged that there was a formal process and that he would review the document provided to JR earlier that day but that he was not sure whether there was a rubber stamping exercise required. JR suggested that agreement re the fit out package installation is agreed as the way forward for all other depts. (cont'd)….	Confirm date NHS accommodation structure required by - -	AFe - -

Item No	Item	Discussion / Information	Action	Action by whom
9.	AOCB	BMCL had used zone 527 as this showed a large proportion of components within this area. AFe suggested that there was 2 aspects of the close off process to be considered i.e. a) validation of the systems and b) perception of zone. AFe enquired what the Board expected to do re snagging. PM noted that the locked up areas would still have people accessing them i.e. M&E therefore was the current sign-off focused on the fabric, materials, fittings. JW advised that the sign off was to sign off the materials and components as agreement in principle. AFe advised that BMCL had internal discussions regarding handing the building over as a clean building. PM requested that BMCL provide an indication of how they expect the Board sign-off process to work for review. DP suggested that BMCL could propose that the NHS review all 7000 rooms 1 week before. AFe reported that when handing over the Victoria ACH they had used a call centre to log any issues, people advised the call centre that the room was not clean, switch in the wrong place, etc and this was not a good process. DH noted that the NHS were keen to understand that they weren't signing of aspects twice. DH acknowledged that the number of exemplar rooms covered a wider range than previously planned for. AFe noted that there 29 rooms available for sign-off just now, this would increase to 79 in the next four months, then circa 200, and so on. DH noted that he understood that BMCL only wanted the exemplar components, materials signed off. AFe noted that it was to provide the Board with surety that BMCL have not handed over a room/area that is not suitable and that BMCL understand that they need to work out how to clean 7000 rooms to a finish for handover. AK suggested that if the NHS are bringing reps into review the exemplar then B<CL would want to know over what time period /programme so that the area can be kept clean. PM suggested that the building sign-off by the NHS needed to be process mapped. AFe noted that BMCL have a schedule and dates that are becoming more fixed. JW suggested that there would be circa 1500 rooms to be completed this year peaking at 1100 rooms available in March. JW noted that at the moment the exemplar area is under lock & key however if it was to be undisturbed for 1 week it would be dusty. The package managers for each floor would be responsible for ensuring that completed rooms do not become damaged and that all snagging is completed. AFe advised that it would be helpful for BMCL to understand the NHS moving in programme and FW advised that this detail was not known at this stage. JW advised that each of the areas would have a pack which would have a 3 page document that listed all the drawings for the room/area, exclusions/exceptions, RFIs/PMIs, etc and all the back-up info. PM suggested that it would be worthwhile having a further discussion once he had reviewed the document provided to JR. Unite – PM enquired if there had been any further activity from Unite the Union and AK noted that Unite had failed to turn up for the surgery.	Provide view of how BMCL see NHS signing off rooms to PM -	AFe/DP -
10.	Date and Time of Next Meeting	Monday 13th May 2013 at 3.30pm.	For info	ALL

DRAFT

QPC(M)13/04
Minutes: 65 - 88

NHS GREATER GLASGOW AND CLYDE

**Minutes of the Meeting of the
Quality and Performance Committee at 9.00 am
on Tuesday, 2 July 2013 in the
Board Room, J B Russell House
Gartnavel Royal Hospital, 1055 Great Western Road,
Glasgow, G12 0XH**

P R E S E N T

Mr I Lee (Convener)

Dr C Benton MBE
Mr I Fraser
Cllr M Kerr (from Minute 69)
Cllr A Lafferty
Ms R Micklem
Cllr J McIlwee
Mr D Sime
Mr K Winter

O T H E R B O A R D M E M B E R S I N A T T E N D A N C E

Dr J Armstrong
Mr R Calderwood (to Minute 78)
Ms R Crocket
Dr L De Caestecker (to Minute 70)
Dr R Finnie
Mr P James
Mr R Reid
Mr A O Robertson OBE (to Minute 78)
Rev Dr N Shanks

I N A T T E N D A N C E

Mrs E Borland	..	Head of Planning & Performance, Glasgow CHP – North West Sector (to Minute 79)
Ms C Curtis	..	Health Improvement Lead – Acute (to Minute 70)
Mrs J Grant	..	Chief Operating Officer
Mr J C Hamilton	..	Head of Board Administration
Mrs A Hawkins	..	Director, Glasgow CHP (Minute 79)
Mr D Loudon	..	Director, Facilities (to Minute 78)
Ms T Mullen	..	Acting Head of Performance and Corporate Reporting (to Minute 69)
Mrs J Murray	..	Director, East Renfrewshire CHCP (to Minute 79)
Ms C Renfrew	..	Director of Corporate Planning & Policy
Mr D Ross	..	Director, Currie & Brown UK Limited (to Minute 78)
Ms H Russell	..	Audit Scotland
Mr A Seabourne	..	Director, New South Glasgow Hospitals Project (to Minute 78)
Dr D Stewart	..	Lead Director for Acute Medical Services

65. APOLOGIES

Apologies for absence were intimated on behalf of Ms M Brown, Mr P Daniels OBE and Mr B Williamson.

66. DECLARATIONS OF INTEREST

No declarations of interest were raised in relation to the agenda items to be discussed.

ACTION BY

67. MINUTES OF PREVIOUS MEETING

On the motion of Mr D Sime and seconded by Mr K Winter, the Minutes of the Quality and Performance Committee Meeting held on 21 May 2013 [QPC(M)13/03] were approved as a correct record.

68. MATTERS ARISING

(a) Rolling Action List

(i) In relation to Minute 49 – Capital Plan 2013/14 – 2015/16 – the Convenor advised that the Outline Business Case for Eastwood Health and Care Centre contained information which confirmed that revenue-funded Hub initiatives were included in the balance sheet. The Director of Finance confirmed this to be the case.

NOTED

(b) EQIA for NHSGGC Access Policy – Actions Update Report

In relation to Minute 25 – Integrated Quality and Performance Report – a request had been made for an update on the equalities issues raised in the Patient Access Policy and how these were being addressed. There was submitted a paper [Paper No 13/52] by the Director of Corporate Planning and Policy which set out an Action Plan on how these issues were being taken forward within defined timescales.

In addition, a further process was underway through the GP Interface Group to improve referral processes between Primary Care and Secondary Care. This would include enabling GPs to target support to patients who they believe may be likely to not attend appointments.

Ms Micklem welcomed the report and ongoing monitoring and enquired as to what the information was telling us about services and asked that this be included in a follow-up report to the Committee. Ms Renfrew agreed to include this aspect in a follow-up report to the Committee in six months' time.

Director of Corporate Performance & Policy

(c) Western Infirmary Site B: Progress Update

In relation to Minute 4(b) – Western Infirmary: Site B: Update – the Chief Executive advised that the final Heads of Agreement had been exchanged with the University of Glasgow and he expected the sale to conclude during the course of this month. He would confirm the outcome at the next meeting of the Committee.

Chief Executive

NOTED

69. INTEGRATED QUALITY AND PERFORMANCE REPORT

There was submitted a paper [Paper No. 13/53] from the Acting Head of Performance and Corporate Reporting setting out the integrated overview of NHS

ACTION BY

Greater Glasgow and Clyde's performance. As had been reported previously, from 1 April 2013, the tolerance level applied to the performance status had been reduced from 10% to 5%. This meant that performance that was 5% outwith meeting the trajectory/target was rated as red and performance that was within 5% of trajectory was rated as amber. Of the 42 measures which had been assigned a performance status based on their variance from trajectory and/or targets, 25 were assessed as green; 9 as amber (performance within 5% of trajectory) and 8 as red (performance 5% outwith meeting trajectory). The areas of key performance change since the last report included:-

- Suspicion of cancer referrals (62 days) had moved from green to amber;
- Carbon emissions had moved from amber to red;
- New outpatients; maximum 12 week wait had moved from red to green;
- Freedom of Information requests completed within 20 days had moved from amber to green.

Ms Renfrew advised that it was intended to bring a more detailed to report to the Committee at the next meeting in relation to waiting times for access to psychological therapy, especially in light of the improved data highlighting variances in performances and, in some areas, excessive waits. This was welcomed. **Director of Glasgow CHP**

Mr Finnie asked about the impact of the Change Fund in relation to delayed discharges and acute bed days lost to delayed discharge, particularly in relation to the likelihood of the Change Fund not being sustained at current levels. Mr Calderwood advised that an initial allocation across Scotland amounted to £70m and an additional £10m was added to this in the second year and the overall intention was that the Change Fund be a three year programme. A Ministerial Task Force had been established to consider how the £80m per annum could be best used in future and these discussions were underway. Current monitoring within NHSGGC in relation to the use of the Change Fund was undertaken at local CH(C)P Committee level and at the Organisational Performance Review meetings which were held twice per annum. Benefits had been realised by utilisation of the Change Fund as had been noted in the reports to Committee on improving performances under delayed discharges. In addition the Fund had also been used to improve the quality of services, capacity building and other similar initiatives. If any decision was made to withdraw or redirect the funds, the NHS Board would need to consider the implications in terms of financial planning and consideration of priorities. On a separate point, it was reported that the SGHD were clarifying the intention that there be no reduction in Elderly Care beds for the over-75s at a time of increasing demand and a growing elderly population.

Mr Finnie also raised his concerns at the only actions identified within the Carbon Emissions exemption report as they seemed to relate to future capital investment decisions. Mr Calderwood acknowledged this point and indicated that a paper would be brought to the Committee shortly on the full range of actions being undertaken within the Carbon Management Plan in order that members could scrutinise the different individual actions being undertaken and the moves to achieve the carbon reduction target of 15% by March 2016. **Director of Facilities**

Mr Winter raised the increasing use of overtime and bank staff in recent months. Mr Calderwood indicated that the Corporate Management Team monitored this area and would be concerned if excessive use was being made of bank staff or overtime which masked concerns about staffing levels. The issues to date in relation to the additional overtime and use of bank staff had related to service redesign changes and unscheduled demand. He agreed that he would ask the **Director of Human Resources**

Director of Human Resources to pull together a more detailed report from Operational Directors for further scrutiny by the Committee.

Councillor Lafferty asked if there was more detail available on where the sickness absences were occurring within the organisation. It had been acknowledged that the HEAT target was unlikely to be achieved although whilst it was a tough target, it had focussed attention on this area and had resulted in a lot of significant work in improving absence management arrangements and sickness levels within the organisation. Mr Sime reminded members that the Staff Governance Committee had been remitted to review and take all action in relation to the sickness absence rate.

Dr Armstrong advised that the MRSA target of 26 cases per 100,000 acute occupied bed days would be narrowly missed by NHSGGC as it seemed its validated figure would be 26.8 bringing it into the amber category of performance status.

Members welcomed again the detailed analysis made possible by the information contained within the Integrated Quality and Performance Report.

NOTED

70. HEALTH PROMOTING HEALTH SERVICE: ACTION IN HOSPITAL SETTING (CEL 01 2012) – ANNUAL REPORT

There was submitted a paper [Paper No: 13/58] from the Director of Public Health providing a copy of the Annual Report – 2012/13 on Health Promoting Health Service: Action in Hospital Setting. The Annual Report had been submitted to Health Scotland on behalf of the Government on 30 April 2013 and the document provided a summary of the year 1 position and identified priorities for progression in year 2.

The report had provided comprehensive evidence in relation to SGHD's performance measures in relation to core actions i.e. smoking; alcohol; breast feeding; healthy working lives; sexual health; food and health; physical activity and active travel within hospital sites. In addition further detail was provided in relation to a staff management programme and research to engage with hard-to-reach staff groups. Ms Claire Curtis, Acute Health Improvement Lead, attended to assist with members' questions.

Mr Finnie welcomed the successful launch of the campaign to stop smoking but he would like further information on how these initiatives could be sustained. Dr de Caestecker advised that a lot of work was ongoing with the media to ensure continued publicity within this area and the intention was that on a quarterly basis to look at the impact of the initiatives, evaluate their success and make changes going forward. This would include changing posters and messages within hospital entrances and clinic/ward areas and she highlighted that regrettably, three smoke-free wardens had recently resigned from their posts following unacceptable behaviour from members of the public who had been approached within hospital sites to stop smoking. No smoking was a key target for the NHS Board and therefore it would be a priority to ensure a sustained effort over a long period of time would be maintained.

Rev Dr Shanks asked for more information about the acute patient panels and Ms Curtis explained that they comprised of 20-30 patient representatives and were

 ACTION BY

subject to six monthly reviews to ensure effective public engagement was maintained in trying to ensure that every healthcare contact was a health improvement opportunity.

Members welcomed sight of the first Annual Report.

NOTED

71. CLINICAL RISK MANAGEMENT REPORT: SURVEILLANCE OF ADVERSE CLINICAL INCIDENTS

There was submitted a paper [Paper No. 13/54] by the Medical Director on Adverse Clinical Incidents. The report on Adverse Clinical Incidents had been displayed on two separate charts in order to highlight the position within Acute Services and separately within Partnerships.

Dr Armstrong highlighted the recent case where valuable lessons had been learned and drew members' attention to the active Fatal Accident Enquiries, in particular to a current case involving a [redacted]

NOTED

72. REVIEWING SIGNIFICANT CLINICAL INCIDENTS POLICY AND PRACTICE

There was submitted a paper [Paper No: 13/55] by the Medical Director providing sight of the Significant Clinical Incidents Policy and giving an update on Healthcare Improvement Scotland's approach.

It had been previously stated that the Significant Clinical Incidents Policy would be submitted to the Quality and Performance Committee in July for approval. However as has been previously recognised, this was also dependent on Healthcare Improvement Scotland (HIS) publishing the new National Clinical Incident Framework. The Framework has not yet been published and therefore the Significant Clinical Incidents Policy would be brought back to the September meeting, revised as appropriate, for formal Committee approval. Dr Armstrong tabled a paper setting out the process undertaken in conducting the policy review and implementation plan.

Dr Armstrong had previously reported that NHSGGC had provided extensive feedback through the national consultation from HIS on building a national approach to learning from adverse events through reporting and review. Complementary to this development process, HIS had now completed their inspection visit to review NHSGGC's arrangements and to audit samples of significant clinical incidents. This report was now due for publication and comments had been fed back on an embargoed version of the report to ensure accuracy and proper clarity around some issues.

Dr Armstrong will provide NHS Board members with a copy of this report once available. **Medical Director**

Ms Micklem commented that the policy on the management on Significant Clinical Incidents was helpfully balanced in terms of the appropriate rigour and

ACTION BY

transparency required together with informing and involving patients and relatives. She believed that it was crucially important to maintain and retain the public's confidence in our services particularly with the processes which are then undertaken when something does go wrong.

Mr Finnie enquired about the Non-Executive member engagement particularly in relation to what form, what level and who would decide. Dr Armstrong advised that national work was currently underway to define the Non-Executive member involvement; currently that role was undertaken on a strategic basis at the Quality and Performance Committee and she fully understood members' comments previously that it would not be possible for Non-Executive member involvement in all circa 200 cases of significant clinical incidents per annum. It was likely that a summary of the key areas, key risks and trends and outcomes would be a possible way forward however once the national group had reported. It would then be for Non-Executive members to determine what role they would like to undertake against whatever national framework is set for member involvement. Mr Sime welcomed the attempts to ensure that there were no surprises by producing regular updates to members, particularly via the Communications Team. This had been very helpful and welcomed by members.

DECIDED

(1) That the Policy on the Management of Significant Clinical Incidents be noted, revised in light of the publication of the National Clinical Incident Framework and thereafter submitted to the next Committee meeting for approval. **Medical Director**

(2) That the Report by HIS on their inspection visit to review NHSGGC arrangement associated with significant clinical incidents be forwarded to NHS Board members. **Medical Director**

73. BOARD CLINICAL GOVERNANCE FORUM MINUTES (DRAFT) AND SUMMARY OF MEETING HELD ON 10 JUNE 2013

There was submitted a paper [Paper No: 13/56] in relation to the Board Clinical Governance Forum meeting held on 10 June 2013.

NOTED

74. REPORT OF THE NHSGGC FRANCIS REVIEW TEAM

There was submitted a paper [Paper No. 13/57] from the Medical Director and Nurse Director setting out NHSGGC's Review Team report into the recommendations of the Francis Report of the Mid-Staffordshire NHS Foundation Trust Public Enquiry. The Francis Report was published in February 2013 and included a description of appalling standards of care which had prevailed in the Mid-Staffordshire Hospital for a number of years. NHSGGC had set up a Review Team to undertake a comprehensive review of all 292 recommendations and take stock and reflect on the NHS Board's arrangement and practices. This was with a view to learning lessons and ensuring that the care provided by NHSGGC was of the highest quality, safe and centred on the needs of patients.

The report submitted had been reviewed by the Corporate Management Team and a facilitated event for Executive Directors, Senior Managers and Senior Clinicians

ACTION BY

had been arranged to review the report in detail on 4 July 2013.

Ms Micklem advised that as one of the team members she had been able to attend the away-day held on 11 April 2013 and had been impressed with the depth and level of process undertaken in trying to identify the gaps and actions in order to be assured such issues could not happen within NHSGGC. It had highlighted to her the possible weaknesses in the dual role of commissioner and provider; how patient feedback was reviewed by the Quality and Performance Committee and the need to tackle the defensive culture as highlighted by previous Ombudsman reports, in handling complaints and to consider the external scrutiny role.

Mr Calderwood felt the report had been a fair distillation of the work undertaken by the team and a range of gaps and opportunities had been identified. Some issues would require a national view and some would require a more strategic and wider approach to be taken by the NHS Board in considering how best to take forward specific aspects of the report. Topics had been agreed for the facilitated event on 4 July and he looked forward to the outcome of that event. There were, however, issues that could be taken forward now, particularly around the complaints management issues and he supported early progress in such areas.

Nurse Director

Members welcomed the report and Rev Dr Shanks was pleased to see the areas of values, culture and caring and compassionate behaviours and the leadership role being highlighted as important although he recognised all were difficult to measure.

Dr Armstrong welcomed the comments and looked forward to the event on 4 July, together with good visibility with staff on the report. She would consider the issues raised and also give further thought to the external scrutiny arrangements.

NOTED

75. MEDICAL WORKFORCE PLANNING 2013/14

There was submitted a paper [Paper No. 13/59] by the Medical Director and Chief Operating Officer which described some of the key drivers which were changing the shape of the medical workforce and contributing to additional pressures which the NHS Board was experiencing. This paper was introduced by Dr David Stewart, the Lead Director for Acute Medical Services. Those key drivers were:-

- Introduction of the new junior doctors training scheme, Modernising Medical Careers in 2007;
- A change in the pattern of seniority of trainees distributed to NHS Boards via the Regional Workforce Planning Group;
- Change in the demographics of the medical workforce with more demand for flexible working practices;
- Inability to fill increasing numbers of junior doctor vacancies.

In 2012/13 the NHS Board had agreed to resource additional medical staff (consultants and specialty doctors) in the following areas, which had seen the disestablishment of 34.5 junior medical posts:-

- Emergency Medicine – 8 consultants and 1 specialty doctor;
- Anaesthetics – 16 consultants;
- Obstetrics and Gynaecology – 7 consultants.

The reductions in 2013/14 would impact on NHSGGC in paediatrics, emergency

ACTION BY

medicine and anaesthetics and the Chief Executive and Medical Director have approved the following posts to minimise the risk to service provision:-

- 1 specialty grade doctor, 1 ANNP – Princess Royal Maternity
- 1 post-certificate of completion training clinical fellow
- 4 consultant neonatology posts
- 1 consultant – paediatric emergency medicine
- 10 locum appointments for training posts for maternity

The additional cost would be £800,000 per annum.

It was recognised that it was likely that further reductions in the junior doctors cohort would apply to the next two years. Efforts would be made to work with services in order to merge rotas, consider opportunities for shift working and reassess the overall medical workforce numbers and skill mix to mitigate any further medical workforce challenges. Members noted the actions taken to date to minimise any risk to service provision to patients.

Dr Stewart also highlighted a difficulty in terms of out-of-hours coverage for general practitioner services. This had been exacerbated during the summer months due to differential pay rates which had been offered to general practitioners to work elsewhere. As it was the NHS Board's responsibility to ensure a safe and effective service for patients in terms of GP's out-of-hours services, it had been necessary to match the differential pay rates to retain the existing GPs on the out-of-hours rotas. This had been an unfortunate outcome but the need to ensure safe and sustainable services was the Board's priority. Challenges lay ahead as the workforce now had greater choices around work life balances and workforce planning needed to take account of this moving forward. Ms Hawkins advised that there was work underway looking at the roles and responsibilities of GPs and currently within the area of the Prison Health Services, some posts have had to be filled by agency staff.

It was Mr Calderwood's intention to raise the issues highlighted by differential pay rates being used by west of Scotland NHS Boards with the west of Scotland Chief Executives to ensure a better and more effective co-operative approach was taken in future.

Chief Executive

NOTED

76. LOCAL DELIVERY PLAN – NHS BOARD CONTRIBUTION TO COMMUNITY PLANNING PARTNERSHIP

There was submitted a paper [Paper No. 13/60] from the Director of Corporate Planning and Policy highlighting the additional guidance issued by SGHD in relation to local delivery plan (LDP) contributions to community planning and single outcome agreements. NHS Boards had now been asked to reflect on the outcome of the current quality assurance of single outcome agreements and in particular the key areas for development or improvement arising from that process. This would lead to the sign-off of an additional LDP submission setting out the NHS Board's contribution to community planning single outcome agreements to be shared with SGHD by the end of September 2013. Ms Renfrew advised that a draft report on community planning therefore, would be submitted to the next meeting of the Quality and Performance Committee.

Director of Corporate Planning and Policy

Mr Finnie enquired about the role of Non-Executive members in relation to this

area and Ms Renfrew advised that this oversight was undertaken by Non-Executive members being members of the CH(C)P Committees, who reviewed these matters at a local level.

NOTED

77. (a) PERSON CENTREDNESS: HEALTHCARE FRAMEWORK – IMPROVING THE PATIENT EXPERIENCE AND PROVIDING CARE WHICH IS SAFE CLINICALLY AND COST EFFECTIVE

(b) NHS SCOTLAND PERSON-CENTRED HEALTH & COLLABORATIVE SUMMARY REPORT

There were submitted two papers [Papers No: 13/61a and 13/61b] by the Nurse Director setting out the proposed framework to deliver person-centred health and care across NHSGGC together with the National Person-centred Health and Care Collaborative which was launched in November 2012 by SGHD. Members agreed to link both papers together in terms of their consideration and discussions.

The approach taken in improving the patient experience had been developed by the Quality Policy Development Group following a wide consultation across the NHS Board together with detailed discussions with Directors. It was intended that the launch would be backed up by an extensive programme of communication. A simplified version would be made available to all staff; local badging and process for local implementation which would include engaging with public partnership forums, patient panels and managed clinical networks; integration with the "Our Patients" theme of the Facing the Future Together programme and a series of key messages to staff to ensure that the right balance was struck between posing the improvement challenge, recognising the pressure many staff feel under, encouraging engagement and feedback, acknowledging the many examples of very good practice and encouraging staff to share what makes their job hard.

The paper highlighted under patient experience issues of access, older people's services, patient feedback, whole system experience reporting, clear quality standards and engaging staff on improving services. The area of patient feedback was highlighted in relation to the read-across to the Francis Report and recommendations and the need to capture feedback to bring about improvements in services and report this to scrutiny Committees including the Quality and Performance Committee.

In addition, the launch of the National Person-centred Health and Care Collaborative challenged health and care systems to put the person at the centre of the service. The aim of the programme was that by 2015, health and care services were more person-centred, as demonstrated by improvements in three workstreams – care experience; staff experience and co-production underpinned by a fourth workstream of leadership at all levels.

Rev Dr Shanks recognised the connections to the messages contained within the Francis Report and welcomed the additional information which would be gathered in relation to patient feedback. He had attended with other members the Board Members visit to the Interpreting Service and had been impressed with how the service was conducted and responded to the needs of patients.

Ms Micklem welcomed this important report and was keen to see it not just as another initiative but linked into an integral part of day-to-day ongoing services.

ACTION BY

Creative approaches to obtaining patient feedback would be welcomed and collecting patient stories was a very helpful way of sharing experiences and where relevant, identifying any inequality issues.

Ms Crocket welcomed members' comments and would report back to the Committee on the progress made in using the Person-centred Healthcare Framework to improve the patient experience. **Nurse Director**

NOTED

78. NEW SOUTHSIDE GLASGOW HOSPITALS – PROJECT UPDATE – STAGES 2 & 3

There was submitted a paper [Paper No: 13/68] by the Project Director of the New South Glasgow Hospitals Project setting out the progress against Stage 2 (design and development of the new hospitals) and Stage 3 (construction of the adult and children's hospitals).

In relation to Stage 2, Mr Seaborne advised that good progress has continued in finalising the remaining 1:50 design issues which were now generally limited to those items which were influenced by the procurement of specialist equipment. The project team had engaged with medical physics staff and the procurement team to undertake an exercise to identify the group 5 equipment which was to be installed in the first half of 2014. Other design work undertaken in the recent period included finalisation of floor and wall finishes, sign-off of reflected ceiling plans and the development of specialist areas and systems including aseptic, renal and medical gases. The links to both neuro and neo-natal were currently in the detailed design stage. Approval had been given to changes to be made to provide the infrastructure to support patient self check-in and patient calling technology. This involved additional data and electrical points to be installed within the adult atria.

In relation to Stage 3, as at 2 June 2013, 114 weeks of the 205 week contract had been completed and the project remained within timescale and budget. Mr Seaborne provided members with further images highlighting the progress of both hospitals over the last 12 months. The structure of the adult hospital had now been completed with the final concrete pour on the last ward leg having taken place in week commencing 21 June 2013. A "Topping Out" ceremony to mark this event took place on 24 June 2013 and was attended by Alex Neil, Cabinet Secretary for Health and Wellbeing.

In relation to Car Park 1, piling work commenced on 7 May 2013 and substructure work commenced on 3 June 2013. In relation to Car Park 2, a radar survey of the build site had been completed and had not conclusively identified the location of a mineshaft but had identified other ground conditions which needed to be investigated further. Members would be kept advised of progress and any possible re-evaluation of site options in relation to Car Park 2. **Project Director**

In relation to the Teaching and Learning Centre, work continued to be on programme and was progressing well, with planning approval expected in July 2013, formal target price agreement in August 2013 and the full business case would be submitted to the Quality and Performance Committee at its next meeting on 17 September 2013. **Project Director**

Mr Ross updated members on the change control process and compensation events and in particular highlighted the changes to group 1 and 2 equipments lists; the decision taken at the last Committee meeting in relation to the transfer of risk for future inflation liability and the installation of additional data and power to support patient calling and patient self check-in.

Mr Seaborne then referred to Appendix A of the paper in connection with the re-provision of administration support on the South Glasgow Hospital site. He set out the outline of the proposals to re-provide administration support facilities which were currently on the Western Infirmary, Victoria Infirmary, Southern General and Yorkhill Hospital sites. These sites will close following the transfer of services to the new Southside Glasgow Hospital in 2015 and the proposed project was to re-provide 1,200 workdesks and associated facilities to support the clinical work of consultants, heads of department and other staff.

There were two options for the re-provision of the administration support, namely a new-build administration office block or the refurbishment of vacated buildings. The option appraisal undertaken with the company employed to develop design work to identify the capital costs had given early indications of a far higher capital cost for the refurbishment of the retained estate than the capital costs required for a new office block. Mr Calderwood explained the funding arrangements to support a circa £20m capital investment in a new build and a site had been identified close to the Teaching and Learning Centre which could accommodate the office block.

Mr Lee enquired about the existing office accommodation if the decision was to proceed with the new build option. Mr Seaborne advised that the intention would be to demolish the buildings, some of which dated back to the 1870s and others were of a prefabricated nature dating from the 1960/70s. Consideration would be given to the position with regard to any buildings listed within that area.

The Committee were being asked to approve the submission of the initial agreement document to the Capital Investment Group for consideration at their meeting on 13 August 2013 and also to approve the development of an outline business case for the new office block.

Dr Armstrong and Ms Grant then highlighted Appendix B which was a paper on haematology and haemato-oncology at the new Southside Hospital. Currently there were 52 designated haematology inpatient beds across NHSGGC – 38 at the Beatson West of Scotland Cancer Centre (BOC) and 14 at the Southern General Hospital (SGH). Currently there was an issue of sustaining the Bone Marrow Transplant Unit (BMT) at the Beatson as new standards indicated that the Unit should be collocated with an Intensive Care Unit. In addition, there were ongoing discussions with the haematologists as part of the Clinical Services Review to look at the clinical model for this service across NHSGG&C. There has been discussion regarding the need to develop non acute and acute services for this speciality.

It was proposed that the Bone Marrow Transplant Unit at the BOC together with the haemato-oncology beds at the SGH transfer to the new Southside Hospital in 2015. In addition, the haemato oncology team will conclude the debate concerning acute and non acute haematology. The capital cost would be [redacted] with no revenue cost implications. There was an opportunity at this stage to introduce this change to the contract at the new Southside Glasgow Hospital without disrupting the ongoing work and would be funded as a client instructed change for the new hospital. The clinical case was strong, with clinical support provided to the Medical Director for the relocation of the BMT Unit and in relation to the vacated beds at the Beatson West of Scotland Cancer Centre, Mr Calderwood advised that

ACTION BY

with the annual increases affecting cancer services, it was likely that the freed up capacity would be utilised going forward.

Mr Winter, who was the Non-Executive member involved with the new Southside Hospitals contract, took the opportunity to pay tribute to Mr Alan Seaborne for managing so effectively and professionally the £842m publically-funded new Southside Hospitals and Laboratory project. Mr Seaborne was attending his last meeting prior to his retirement at the end of the month. Mr Winter wished it recorded that the Committee acknowledged the significant contribution he had made to managing all aspects of this huge contract. The contract remained within budget and on time, and many additional benefits had been realised during the length of the contract. The Committee endorsed these views and thanked Mr Seaborne and wished him well for a long and happy retirement.

DECIDED

1. That the progress of Stage 2 (design development of the new hospitals) and Stage 3 (construction of the adult and children's hospitals) be noted.

2. That the initial agreement document be approved for submission to the Capital Investment Group for consideration and the development of an outline business case for the new office block be agreed and submitted to a future meeting of the Committee for consideration. **Project Director**

3. That the changes in the Service Model for haematology and haemato-oncology be approved at a cost of [redacted] to be funded as a client instructed change and that it form part of the construction of the new Southside Hospital. **Project Director**

79. EASTWOOD HEALTH AND CARE AND MARYHILL HEALTH CENTRES OUTLINE BUSINESS CASES

There was submitted a paper [Paper No: 13/69] by the Director of Glasgow City CHP summarising the outline business cases (OBCs) for the development of a new Eastwood Health and Care Centre and a new Maryhill Health Centre. Both projects were proposed to be bundled into one contract to be provided by Hub West of Scotland as part of the Scottish Government's approach to the delivery of new community infrastructure. A copy of the full OBC had been electronically sent to members of the Committee. Ms Hawkins advised that a land ownership issue at the site identified for the Maryhill Health Centre may slow down the process however steps were being taken with the Central Legal Office to find an acceptable way forward in order to replace the existing Maryhill Health Centre as a new build at Gairbraid Avenue.

Ms J Murray, Director of East Renfrewshire CHCP, took members through the proposal for a new build Health and Care Centre at Drumby Crescent, Clarkston. The project would provide a range of health and social care services for the population of Eastwood and would provide space for five GP practices as well as 250 CHCP staff. Councillor Lafferty commented that the proposals built on the success of the recently opened Barrhead Health and Social Care Centre and had also followed an extensive public consultation exercise.

Mr Winter enquired about the continuing revenue support that would be required if the scheme was not completed by the stipulated date within 2015. Ms Hawkins advised that assurances had been given around this point by SGHD but she would

ACTION BY

seek a more formal level of assurance to mitigate this possible risk. She was hopeful that this point would be covered by the time of the submission of the full business case to the Committee for approval. **Director, Glasgow CHP**

The initial capital estimate for the Eastwood Health and Care Centre was £14, 675,415 and East Renfrewshire Council was an equal partner in the project with £6.13m of capital funding secured for the project. The revenue costs (unitary – capital, lifecycle and hard facilities management) would be mainly funded by the Scottish Government and the funding was set at 85% of the cost. The OBCs were subject to value for money assessment within SGHD and plans were in place to ensure that additional operating revenue costs would be met from within the existing East Renfrewshire CHCP budget.

In relation to the Maryhill Health Centre proposal, Ms E Borland, Head of Planning and Performance, Glasgow CHP, North-West Sector, advised that the current Health Centre had been built in the 1970s and was now of a poor fabric and had been identified as a priority for replacement in the National Scottish Health Department Property and Asset Management Survey. The building of the new Health Centre in Gairbraid Avenue, within an area of deprivation, was a tangible example of the NHS Board's commitment to tackling health inequalities and the building would house four GP practices and a range of community health services including community dental services and a pharmacy. The new Health Centre would also be adjacent to the Maryhill Burgh Halls and Councillor Kerr gave his support for the joint working being undertaken in developing this Health Centre and believed it would be an asset to the area of Maryhill.

The initial capital cost estimated for the new Maryhill Health Centre was £12,105, 977. The revenue costs would be mainly funded by the Scottish Government and the funding was set at 85% of the cost. The Outline Business Cases were subject to value for money, assessment within SGHD and plans were in place to ensure that the additional operating revenue costs would be met within existing Glasgow CHP budgets.

Mr Winter highlighted that some time ago agreement had been reached that the summaries of outline business cases would cover a standard format and provide information on predetermined areas such as capital, revenue, site implications, services, etc. He had been disappointed that this standard format had not been covered on this occasion. Ms Hawkins agreed that she would discuss further with Mr Winter a standard format/template which would be acceptable for all future summaries of outline business cases being submitted to the Quality and Performance Committee for approval. **Director, Glasgow CHP**

DECIDED

1. That the outline business case for the Eastwood Health and Care Centre be approved for submission to the Scottish Government's Capital Investment Group. **Director, East Renfrewshire CHCP**

2. That the outline business case for the new Maryhill Health Centre be approved for submission to the Scottish Government's Capital Investment Group. **Director, Glasgow CHP**

80. CAPITAL PLANNING AND PROPERTY GROUP MINUTES OF MEETING HELD ON 30 APRIL 2013

There was submitted a paper [Paper No: 13/70] enclosing the minutes of the Capital Planning and Property Group meeting of 30 April 2013.

NOTED

81. FOOD, FLUID AND NUTRITIONAL CARE UPDATE

There was submitted a paper [Paper No. 13/62] from the Nurse Director providing an annual update in relation to the implementation of the Food, Fluid and Nutrition Care across NHSGGC. Significant progress had been made in relation to compliance with national guidelines for catering standards and best practice in nutritional care within all inpatient services. Challenges remained in relation to consistency of application. Detailed monitoring was now routinely undertaken in the form of patient feedback and engagement, audits and clinical quality indicators to ensure local action plans were developed in relation to any identified shortfalls. Lessons from national improvement reports and inspections were routinely used to drive further improvements. While patient satisfaction scores were higher than in previous surveys, expectations required further improvement and new targets of 90% compliance were proposed.

Dr Benton enquired about training for volunteers and Ms Crocket advised that their primary focus was to support patients around mealtimes in the form of assisting with menu selection, decluttering bedside tables and assisting patients with washing their hands. They did not feed patients, particularly those with swallowing difficulties. This was a task for the nursing staff.

Ms Crocket advised that Speech and Language Therapy staff had been involved in the review and in terms of their availability within ward areas, they worked from Mondays to Fridays.

Mr Lee enquired about the hospitals within partnerships and Ms Crocket advised that progress was being made within mental health hospital settings and ongoing catering satisfaction monitoring of mental health services sites was included as part of the Board satisfaction survey.

NOTED

82. SERVICES TO TRANSGENDER PEOPLE

There was submitted a paper [Paper No: 13/63] by the Director of Corporate Planning and Policy setting out the progress to ensure NHSGGC had a patient pathway between the GID and regional acute services which was clinically appropriate and compliant with equalities legislation and the Board's wider public sector equality duty.

The two stage review process was underway with the Medical Director bringing together the appropriate GID and regional services clinical teams to review the current clinical pathway for transgender patients and thereafter an equalities focussed review would be commissioned post-clinical pathway including input from transgender patients. Ms Micklem welcomed the work underway to ensure these services were appropriately delivered to this group of patients.

NOTED

ACTION BY

83. QUALITY POLICY DEVELOPMENT GROUP MINUTES OF MEETING HELD ON 30 APRIL 2013

There was submitted a paper [Paper No: 13/64] enclosing the minutes of the Quality Policy Development Group meeting of 30 April 2013.

NOTED

84. STAFF GOVERNANCE COMMITTEE – MINUTES OF MEETING HELD ON 21 MAY 2013

There was submitted the minutes of the Staff Governance Committee meeting of 21 May 2013.

NOTED

85. REVIEW OF REMIT OF QUALITY AND PERFORMANCE COMMITTEE

There was submitted a paper [Paper No. 13/65] by the Head of Board Administration asking the Committee to consider whether any changes were required to the remit and arrangements for supporting the Quality and Performance Committee. The review conducted at the July 2012 Committee meeting had concluded that a further review be held in one year's time and the two issues which had been highlighted during that year had been matters relating to clinical governance and public involvement.

There was recognition that the high level strategic operation of the Committee together with the scrutiny and challenging function was being met by the Quality and Performance Committee. However, carrying out these functions through a single committee was a challenge in terms of manageable agendas, appropriate scrutiny to all papers and issues, the length of the meeting and some members concerns that the integrated approach which was desired in setting up the Quality and Performance Committee was not being achieved.

There was a recognition that the person-centredness and patient experience responsibilities had not been adequately covered in the current remit of the committee and these responsibilities would be set out in a revised remit.

Head of Board Administration

Mr James, in relation to a comment that there was no finance report at the July meeting, advised that the month 2 figures showed an overspend of £780,000 and this had been in line with the similar period last year. He was aware that there was no template to integrate finance into the range of papers considered by the Committee and that this was possibly one of the areas to be considered in trying to achieve a more integrated approach to the responsibilities of ensuring quality, patient safety, patient experience and financial planning and decision making processes. Mr Lee acknowledged this point and mentioned that the intention had been to receive a one-page summary of all papers for this meeting in order to assist members understanding of the issues to be discussed and approved. This new initiative had not been universally followed by authors of papers submitted.

Mr Sime suggested that the Committee give consideration to approving the current remit, with the addition of responsibilities for person-centredness, patient experience, and thereafter, discuss the remit and the standing committee

ACTION BY

arrangements at the NHS Board members' away day. Members sought a range of options so that full consideration could be given to any possible alterations to the current committee arrangements. Ms Renfrew added that the integration of Health and Social Services would also have an impact on the accountability of the Board and would also result in further changes.

DECIDED

That the remit of the Quality and Performance Committee be approved subject to the addition of responsibilities for person-centredness and patient experience matters and that the remit and Committee arrangements be discussed at the next NHS Board members' away day.

Head of Board Administration

86. DATIX SHORT LIFE WORKING GROUP

There was submitted a paper [Paper No 13/66] by the Medical Director setting out a proposal to undertake a review of Datix functionality to ensure that it was fit for purpose and able to support full compliance with the Incident Management Policy, Significant Clinical Incident Policy and other applications.

Datix was the IT system used to support the management of the incident reporting, complaints, legal claims and freedom of information processes. A number of concerns and issues about the use and functionality of Datix had recently been reported through various channels throughout the NHS Board and these concerns included IT/technical issues, wider process issues and the need to ensure that the functionality of Datix was fit for purpose going forward.

A Short Life Working Group was being formed which would report jointly to the Clinical Governance Forum and the Health and Safety Forum and thereafter, the Corporate Management Team and Audit Committee.

NOTED

87. MEDIA COVERAGE OF NHSGGC MAY/JUNE 2013

There was submitted a paper [Paper No: 13/67] by the Director of Corporate Communications highlighting outcomes of media activity for the May/June 2013 period. The report supplemented the weekly media roundup which was provided to NHS Board members every Friday afternoon and summarised media activity including factual coverage, positive coverage and negative coverage.

NOTED

88. DATE OF NEXT MEETING

9.00am on Tuesday 17 September 2013 in the Board Room, J B Russell House, Gartnavel Royal Hospital, 1055 Great Western Road, Glasgow, G12 0XH.

The meeting ended at 12:55pm

WEEKLY INTERFACE WITH BMCE REPORT

Client: **NHS Greater Glasgow & Clyde**	
Project: **New South Glasgow Hospital**	**Job No**: CS/044672-01-01
Type of Visit: Site Inspections, testing and witnessing.	
Week ending; 1st August 2013	

Major Activities Noted:

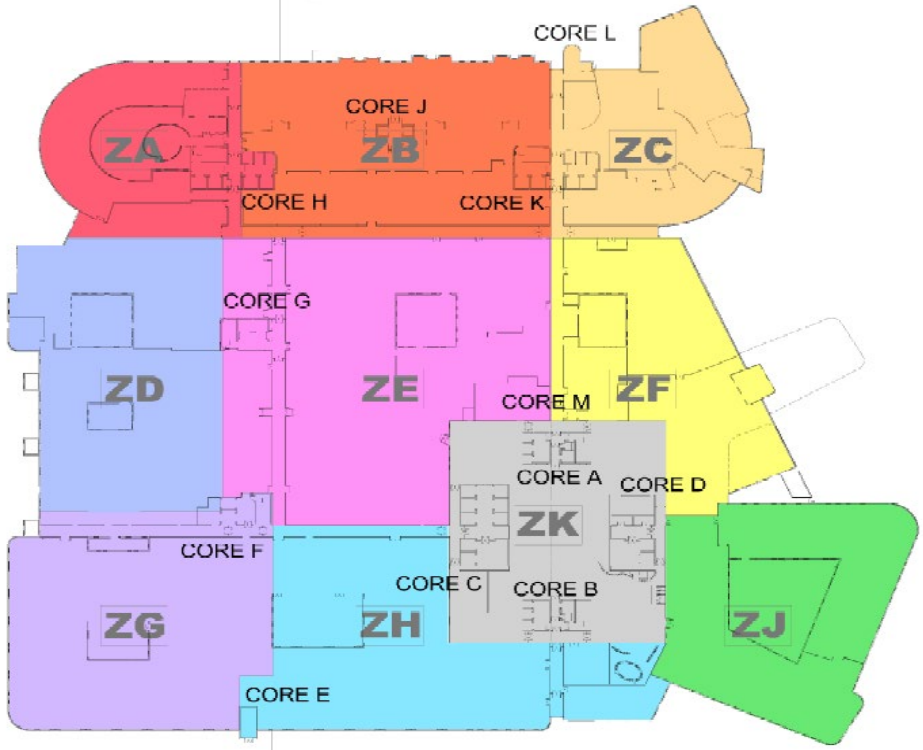
Ref	Title	Test Date
1	In attendance during supply and extract airflow testing of AHU's 24 & 25 within plant room 21 and levels 1 & 2 of zones D&G, and dirty extract fan 39. All airflows witnessed agreed with commissioning sheets and within design criteria.	22/07/2013
2	In attendance during fire alarm loop test at panels 22, 59 & 60.	26/07/2013
3	In attendance during lighting control testing within Level 1 Zone D.	26./07/2013
4	In attendance during structural cable testing between Hubs 128 & 117 and various outlets.	29/07/2013
5	Carried out quality inspection within Level 0 – 528. Several minor defects were noted which BM were to action.	30/07/2013

Comments

Work Inspected During Visit:

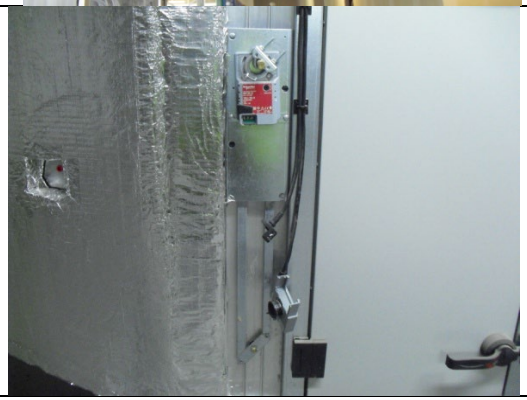
Main Building	A	B	C	D	E	F	G	H	J	K
Level B										
Level G	X	X	X	X	X	X	X	X	X	X
Level 1	X	X	X	X	X	X	X	X	X	
Level 2	X	X	X	X	X	X	X	X	X	
Level 3	X	X	X	X	X	X	X	X	X	
Level 4				X	X	X	X	X		
Level 5					X	X	X	X		
Level 6					X	X	X	X		
Level 7					X	X	X	X		
Level 8					X	X	X	X		
Level 9					X	X	X	X		
Level 10					X	X	X	X		
Level 11					X	X	X	X		
Level 12					X	X	X	X		

Energy Centre	
Level G	X
Level 1	X
Level 2	X
Roof	



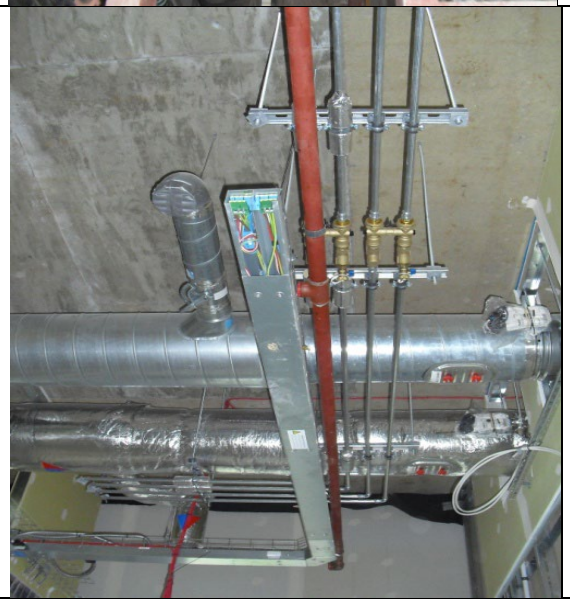
Zone A – Levels 0,1,2,3 & Roof	
Zone B – Levels 0,1,2,3 & Roof	
Zone C – Levels 0,1,2,3 & Roof	
Zone D – Levels -1,0,1,2,3,4 & Roof	
Zone E – Levels -1,0,1,2,3,4 & Roof	
Zone F – Levels -1,0,1,2,3,4,5,6,7,8,9,10,11,12	
Zone G – Levels -1,0,1,2,3,4,5,6,7,8,9,10,11,12	
Zone H – Levels -1,0,1,2,3,4,5,6,7,8,9,10,11,12	
Zone J – Levels -1,0,1,2,3,4,5,6,7,8,9,10,11,12	
Zone K – Level 0	

Ref	Level/ Zone	Comment	Photographs	BMCE COMMENTS
1.0	L2 ZDG PR 21	Broken air sampler on AHU 04. Confirm when the sampler is replaced.		
2.0	L2 ZDG PR 21	Damaged pipe on heater battery served by AHU 03. Confirm when heater battery is repaired / replaced.		

Ref	Level/ Zone	Comment	Photographs	BMCE COMMENTS
3.0	L2 EH Atrium corridor	Unprotected open ended pipe work. Confirm when all unfinished pipe work will be protected.		
4.0	L2 ZDG PR21	Un coupled / broken damper motor on AHU 04 Confirm when damper motor will be repaired / replaced.		

Ref	Level/ Zone	Comment	Photographs	BMCE COMMENTS
5.0	L3 ZDG PR 31	Extract fan PR31 64EF02 has been installed on the floor of the plantroom with the service access on the underside of the unit making servicing impossible. Confirmation that EF will be installed in a manner which will allow unrestricted maintenance.	 -	
6.0	L2 ZF Riser at GL17 / AG-AF	Ductwork inspection hatches on side of ductwork are sandwiched between other installed ductwork. Confirmation required that ductwork hatches will be accessible.		

Ref	Level/ Zone	Comment	Photographs	BMCE COMMENTS
7.0	L0 ZC	In several instances, Bandseal rain water pipe collars are proud of concrete. Confirm that collars will be fitted in the same manner as fitted in other locations. See attached photo	 	

Ref	Level/ Zone	Comment	Photographs	BMCE COMMENTS
8.0	L1 ZF Riser M27	Open ends of ductwork not sealed / protected within riser M27 Photographed from level 2. Confirm when ducts are sealed.		
9.0	L2ZF Rooms DMW044 & DMW045	Electrical trunking / sprinkler pipe clash. Confirm when this will be addressed.		

Ref	Level/ Zone	Comment	Photographs	BMCE COMMENTS
10.0	L2ZB AFD 004 office	Electrical trunking / sprinkler pipe clash. Confirm when this will be addressed.		
11.0	L4ZG Riser RE63	Outer sheath of two SWA cables damaged. Confirm when cables will be repaired / replaced.		

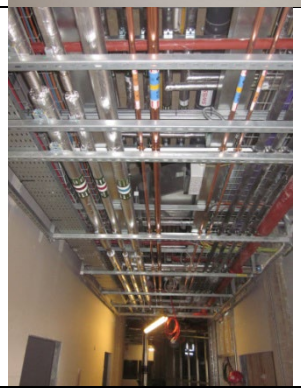
Ref	Level/ Zone	Comment	Photographs	BMCE COMMENTS
				
12.0	L4 ZC	Damaged door, door handle and isolator on 41AHU19 SUPPLY Fan. Confirm when door handle, door and isolator will be repaired / replaced.		

Ref	Level/ Zone	Comment	Photographs	BMCE COMMENTS
13.0	General	Confirm that combined Wago electrical trunking / basket tray is being installed as per manufacturers installation instructions and as per spacing recommendations.		
14.0	4/F	Ductwork installed with no covers. Confirm when protection when will be fitted.		

Ref	Level/ Zone	Comment	Photographs	BMCE COMMENTS
				
15.0	4/K	Ductwork stored with no covers. Confirm when protection will be fitted.		

Ref	Level/ Zone	Comment	Photographs	BMCE COMMENTS
			 	

Ref	Level/ Zone	Comment	Photographs	BMCE COMMENTS
16.0	Energy centre level 2	Degasser (fed from MCCA2/17L3) had an internal double pole spur, which required the cover to be taken off. The cover read 'isolate before removal of this cover'. Is this panel able to be suitably isolated at the distribution board without disrupting other circuits?		
17.0	1/D	All bedrooms (and some other rooms such as CCU-019). Smoke detectors adjacent ventilation supply grilles. Should these be 1000mm away?		
18.0	Level 1 riser M15A	CCU - 010. Fire detector installed at high level with blue overshoe acting as cover. Also, detector not positioned on ceiling but below. Is this compliant?		

Ref	Level/ Zone	Comment	Photographs	BMCE COMMENTS
19.0	1/D	CCU - 073 - Regen kitchen. Access control installed at approx 1600mm AFFL (apparently to avoid clash with kitchen equipment). Is this acceptable?		
20.0	2/J	Services modules main corridor. 600mm clearance not afforded to lower service runs for access to upper service runs.		

Ref	Level/ Zone	Comment	Photographs	BMCE COMMENTS
				
21.0	2/J	IT hub room (DOPD 41). DBs installed along with earth bar. No separate clean earth bar noted. How will cabinets be earthed?		

Ref	Level/ Zone	Comment	Photographs	BMCE COMMENTS
22.0	2/D?	Area 525. 2 off access hatches adjacent riser access restricted. Please confirm access is possible or relocate.	 	

Ref	Level/ Zone	Comment	Photographs	BMCE COMMENTS
23.0	2/B	Access hatch in corridor access restricted. Please confirm access is possible or relocate.		
24.0	4/C	Plant room 41. Boarding underside of roof is underway, which has resulted in sprinklers hard up against boards. Is there a minimum clearance above sprinklers and is the board exerting any downward pressure on pipe work (board appears to have been slid into place as scuff marks on the board from the sprinkler head were evident)		

Ref	Level/ Zone	Comment	Photographs	BMCE COMMENTS
25.0	4/B	Plant room 41. Sprinkler heads mounted immediately adjacent structural elements. Is there a minimum clear distance required around the heads?	 	

Ref	Level/ Zone	Comment	Photographs	BMCE COMMENTS
				
26.0	4/B	Plant room 41. Ductwork left uncovered. Dust /debris evident in ductwork. Please clean ductwork/ dampers and provide suitable covers as soon as possible.		

Ref	Level/ Zone	Comment	Photographs	BMCE COMMENTS
				
27.0	3/J	Plant room 33. Access to hatch appears impeded by structural supports. Please demonstrate the hatch is accessible, or relocate to a suitable position.		

Signature: Douglas Wilson	**Date**: 1st August 2013

September 2013
Enc - 12

Acute Services Strategy Board Meeting
September 2013

NSGH Development - Review of Core Project Team Resources

The core project management team comprises a complimentary blend of NHS GG&C staff and external consultants. The team structure operates on the principle of a 'one team' ethos and does not distinguish between traditional public/private sector roles and relationships. A copy of the current project management organisational structure is attached to this paper.

This paper focuses on the core project management team and excludes the significant managerial and operational resources required for both the commissioning and migration phases of the project. However, in should be noted that in parallel to the construction programme, work stream strategies are already underway for commissioning and migration.

Within the 'one team' culture, processes and procedures are in place to ensure that knowledge transfer is carefully managed between the team members to ensure that continuity of services remains unaffected during periods of sickness absence or holiday leave. For example, the team managing the procurement of equipment attend regular progress meetings to ensure effective and efficient sharing of information. In addition, the Project Resource Plan was updated during August 2013 to take cognisance of the project programme and changes in personnel. The Project Resource Plan provides clear details of the project team's roles and responsibilities. Each member of the project team has received a copy of the document. A copy of the document has been circulated electronically to members of the ASSB.

Project management of the Teaching and Learning Building, the CRF Project and the Office Accommodation building operates a separate project management structure that is distinct from the adult and children's hospitals. However, in terms of overall governance, these projects fall under the umbrella of the NSGH structure.

It should be noted that the current project manager for the Teaching and Learning Building, the Office Accommodation Building and the CRF project has tendered her resignation and leaves NHS Greater Glasgow and Clyde at the end of August 2013. In the interim, the Deputy Project Director will oversee the projects with support from the appointed external Project Manager. It is intended to recruit a replacement for the outgoing project manager to ensure that the project management team employed on the adult and children's hospitals is not over burdened.

In summary, the current project management structure and related resources are considered to be adequate at present and will be subject to review as the project moves towards the detailed planning for the commissioning and migration phases.

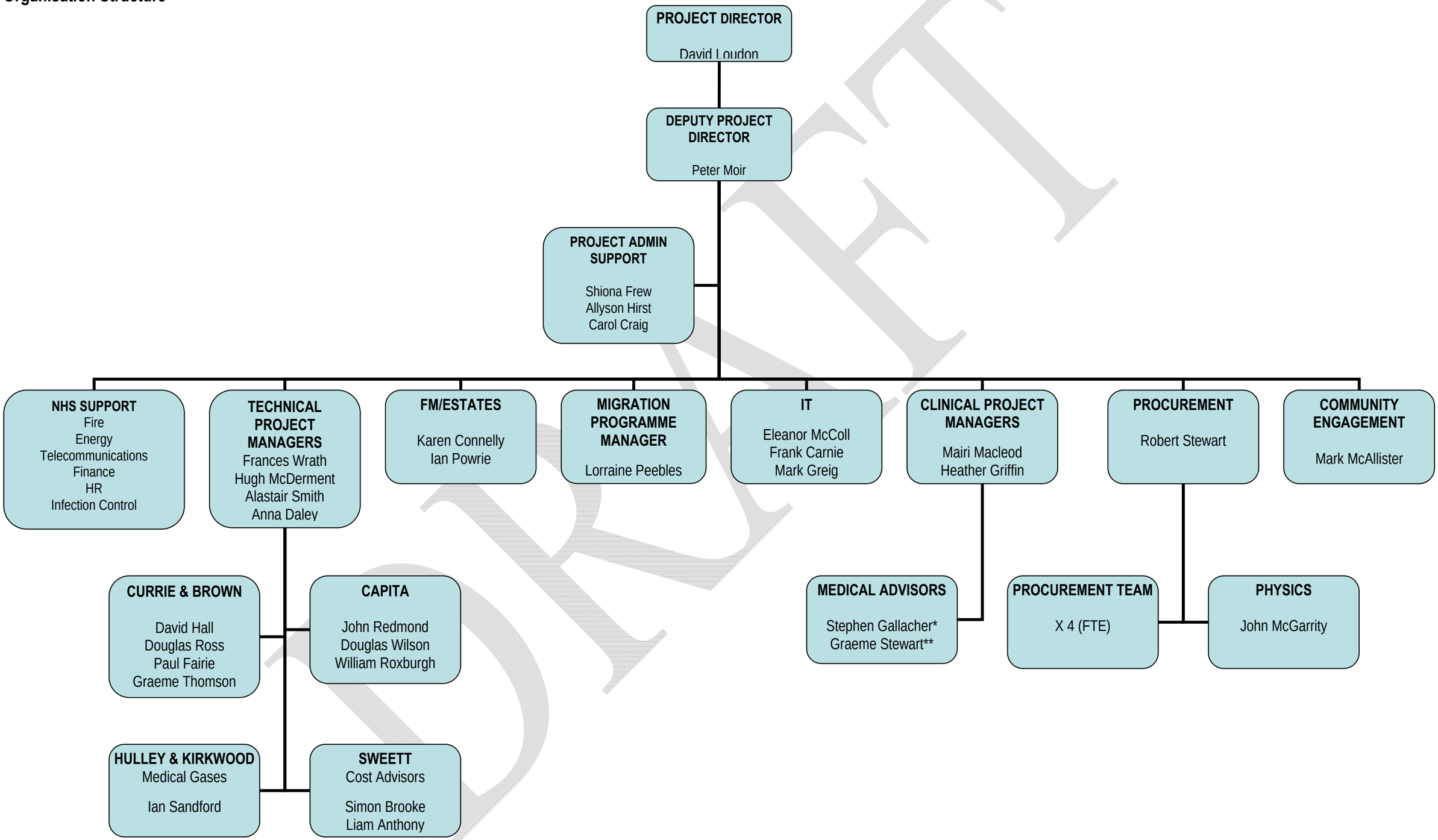
Recommendation:

Members of the ASSB are requested to note and approve the content of this paper.

David W Loudon
Project Director
NSGH Development

NHS Greater Glasgow and Clyde

New South Glasgow Hospitals Development – Core Project Team Organisation Structure



*Reports to Health Board Medical Director
**Reports to Associate Medical Director
Paediatrics

AE2825963

1st August 2013

RESOURCE TASK SCHEDULE

2013-2014 (Revised – August 2013)

NEW SOUTH GLASGOW HOSPITALS DEVELOPMENT

Summary of the Project Team's key tasks, roles and responsibilities for the next operational period for all projects that are under development on site at the Southern General Hospital and form part of the NSGH project budget.

A52825963

NHS Staff	Initials	Designation		Consultants	Initials	Company - Designation
David Loudon	DWL	Project Director		Douglas Ross	DR	C&B – Director (Commercial Management)
Peter Moir	PM	Deputy Project Director		David Hall	DH	C&B – Director (Project Management)
Heather Griffin	HG	Project Manager – Adult		Graeme Thomson	GT	C&B – Senior Project Manager
Mairi Macleod	MML	Project Manager – Children's		Paul Fairie	PF	C&B Divisional Director (PM)
Karen Connelly	KC	FM Advisor		John Redmond	JR	Capita – Associate Direct, Lead NEC3 Supervisor
Anna Daley	AD	Project Manager – T&L Building and Office Building		Willie Roxburgh	WR	Capita – Civil and Structural Supervisor
Frances Wrath	FW	Capital Planning Manager		Douglas Wilson	DW	Capita - NEC Supervisors
Fiona McCluskey	FMC	Senior Nurse Advisor		Ian Sandford	IS	Hulley and Kirkwood – Medical Gas Advisor
Ian Powrie	IP	Sector Estates Manager		Susan Logan	SL	Ecoteric – BREEAM Advisor
Hugh McDerment	HMD	Senior Project Manager		Simon Brooke	SB	
Mark McAllister	MMA	Community Engagement		Liam Anthony	LA	Sweett – Cost Manager
Alastair Smith	AGS	Technical Manager				
Stephen Gallagher	SG	Medical Advisor – Adult				
Shiona Frew	SF	Project Administrator				
Jackie Stewart	JS	Infection Control				
John McGarrity	JMG	Technical Manager – Medical Physics				
Gibby Donnelly	GDo	Fire Offices – NHS				
Eleanor McColl	EM	HI&T Programme Manager				
Frank Carnie	FC	Network Lead				
Mark Grieg	MG	Infrastructure Development Manager				
Alan McCubbin	AMC	Head of Finance Capital and Planning				
Tony Cocozza	TC	Capital and Planning ASR Accountant				

Jim Magee	JM	Portering Manager				
Robert Stewart	RS	Deputy Head of Procurement				
Alex McIntyre	ASM	Director – Facilities				
Moira Anderson	MA	Property Manager				
Niall McGrogan	NMG	Head of Community Engagement and Transport				
Karen McSweeney	KMcS	Telecoms General Manager				
Lynda Hamilton	LH	Acting Head of Acute Planning				
Organisations and Committee's						
Glasgow City Council	GCC					
Acute Services Strategy Board	ASSB					
Quality & Performance Group	QPG					
University of Glasgow	UoG					
Brookfield Multiplex	BMCL					
Currie & Brown UK Ltd	C&B					
Capita Symonds	CS					
BAM Construction Ltd	BAM					

1.0	ADULT AND CHILDREN'S HOSPITALS (Lead: DWL/PM Support: HG – Adult, MM – Children's)				
	Activity	Sub-Group	Leader	Support	Key Tasks and Timescale
1.1	**Reporting**				
	1.1.1	Quality & Performance	DWL	PM/DR/SF	
	1.1.2	ASSB (Board / sub group)	DWL	PM/DR/SF	
	1.1.3	On the Move	DWL	PM/MML/HG/PM/FMC/SF	
	1.1.4	Monthly Report	PM	SF	DWL to approve
	1.1.5	SG Infrastructure Portal	PM / AMC		
	1.1.6	SG Finance	AMC/DR	DWL/PM	
1.2	**Publicity / Comms / FOI's**				
	1.2.1	Key link for Board Comms	DWL	PM/HG/MML/SF	
	1.2.2	Community Engagement	DWL/MMA	PM/HG/MML	
	1.2.3	FOI Enquiries	DWL	PM/SF	
	1.2.4	Media	DWL	Project Team	
1.3	**Project Governance Structure**				
	1.3.1	Project Steering Group	DWL	PM/SF	
	1.3.2	Project Management Group	DWL	PM/DH/DR	
	1.3.3	Commercial Group	DWL	PM/DH/DR	DR to Chair
	1.3.4	Early Warning Meeting	PM	DH/DR/SF	DWL in attendance
	1.3.5	Construction Management	PM	DH/GT	
	1.3.6	Site Logistics Group	HMcD	GT	
	1.3.7	IT/Equipment Groups			See separate sections below.
	1.3.8	Gateway Review	DWL /MML	PM/HG	
	1.3.9	Budget and Cashflow	AMC/DR	DWL /PM	

	1.3.10	Project Team Meetings	DWL/PM	SF	
1.4					
	1.4.1	Monthly Assessments	PM	DR/DH	DWL to be kept informed
	1.4.2	EWN / PMI / CE	DWL/ PM	DR/DH/SF	
	1.4.3	Programme review	PM	GT	DWL to be kept informed
	1.4.4	Management of Sypro	SF	PM	
	1.4.5	CHEOP's audit	DR	C&B	DWL / PM to be kept informed
	1.4.6	Change control	DWL /PM	DR/HG/MML/SF	
	1.4.7	Risk management	DWL /PM	DR/DH/SF/Project Team	
1.5	**Town Planning /Masterplan/Transportation Interface**				
	1.5.1	Planning consent	DWL/PM	DH	
	1.5.2	Purification conditions	JM (BMCL)	PM/DH	
	1.5.3	Transportation	DWL / NMG	PM/HG	
	1.5.4	Section 75	DWL/ NMG/MMA	PM	
	1.5.5	Section 56 & RCC	DWL/PM/BMCL	DH	
1.6	**Design Management**				
	1.6.1	Room layout reviews	FW	DH/PM/SF	
	1.6.2	RDS review	FW	DH/SF/Project Team	
	1.6.3	RDD - samples	PM	Project Team	
	1.6.4	RDD drawings and spec	FW/PM	DH/Project Team	
	1.6.5	Value engineering	DWL/PM	DH/DR/FW	
	1.6.6	Art strategy	HG/MML	PM	
	1.6.7	Control of infection	JS/FMC	DH/ FW	

1.7	**Quality Management & Compliance**				
	1.7.1	Review of fabric & services	PM/JR/WR/DW	DH/GT/Project Team	
	1.7.2	Exemplar rooms	PM/JR/WR/DW	DH/GT/Project Team	
	1.7.3	Compliance review	PM/JR/WR/DW	DH/GT/Project Team	
	1.7.4	Monthly reporting	PM/JR/WR/DW	DH/GT/Project Team	
	1.7.4	Defects and sign off	PM/JR/WR/DW	DH/GT/Project Team	
	1.7.5	Completion	PM/JR/WR/DW	DH/GT/Project Team	
1.8	**Adult Hospital**				
	1.8.1	Service design	HG		
	1.8.2	Migration Plan	SG/FMC/HG	KC/PM/Project Team	
	1.8.3	Equipment reviews	MML/HG/FW/RS	DH/PM/Project Team	
	1.8.4	Transfer owners	HG	FW/DH/FMC/KC	
	1.8.5	Exemplar rooms	HG	C&B/CS/Project Team	
	1.8.6	Commissioning input	HG	PM/DH/KC	
	1.8.7	FM input	KC	HG/PM/IP	
	1.8.8	Review built dept/rooms	PM/JR/WR/DW	DH/GT/Project Team	
	1.8.9	Patient entertainment	HG/PM	DH/EM	
	1.8.10	Signage and wayfinding	HG/KC/FMC	PM	
1.9	**Children's Hospital**				
	1.9.1	Service design	ML		
	1.9.2	Migration plans	?/FMC/MML	KC/PM/Project Team	Clinical Input required
	1.9.3	Equipment reviews	MML/HG/FW/RS	DH/PM/Project Team	
	1.9.4	Transfer owners	MML	FW/DH/KC	
	1.9.5	Exemplar rooms	MML	C&B/CS/Project Team	
	1.9.6	Commissioning input	MML	PM/DH/KC	
	1.9.7	FM input	KC	MM/PM/IP	
	1.9.8	Review built dept/rooms	PM/JR/WR/DW	DH/GT/Project Team	
	1.9.9	YCF integration	MML/FW	PM/DH	
	1.9.10	Signage and wayfinding	MML/KC/FMC	PM	

1.10	**Equipment**				
	1.10.1	Equipment list	RS	FW/DH/PM/JMG	
	1.10.2	Group 5 - new	RS/FW	MML/JMG/HG	Predominantly imaging equipment, cath labs, MRI/CT, interventional radiology. Continue regular meetings with BMCL.
	1.10.3	Group 5 - transfer	RS/FW	MML/ JMG/HG	Imaging kit (7 locations)
	1.10.4	Group 2 list	RS	DH/MML/FW	Ensure lists are issued to Board well in advance of due date, await final eq.list.
	1.10.5	Group 2 delivery process	RS	MML/DH	Agree process for first delivery in March 2013.
	1.10.6	Specialist areas/rooms	RS	DH/FW/MML	Aseptic suite, dental chairs and audiology rooms
	1.10.7	Cold rooms	RS	DH/MML/KC	Confirm any requirement for test/commission.
	1.10.8	Bed hoists	RS	DH/FMC	Check totals in final eq.list and sign off samples for both standard and bariatric through RDD process.
	1.10.9	Medical gas install	FW/ PM	DH/IS	I Sandford providing specialist input
	1.10.10	Group 1, 2, 3 & 4 Equipment List conclusion	RS	FW/DH	
1.11	**Facilities Management**				
	1.11.1	AGV's	KC	DH/FC	Karen to confirm input and additional tasks
	1.11.2	Catering design/equip	KC/FW	PM/DH	
	1.11.3	Pneumatic tube	KC	DH/FW	
	1.11.4	Food waste	KC/PM	DH/FW	
	1.11.5	CCTV / security	KC	DH/Project Team	
	1.11.6	Fire safety review	KC/GD	DH	
	1.11.7	Lifts	KC/IP	DH/PM	

	1.11.8	Helicopter Operational Plan	KC/ASM	HG	
	1.11.9	Transport/deliveries/stores	KC	JM	
	1.11.10	Parking strategy	KC	PM/DH/HG	
	1.11.11	Porters / staffing	KC		
	1.11.12	Decontamination	KC	JS	
	1.11.13	Telecoms	KC/KMcS	EM/MG/FC	
	1.11.14	Internal Communications	KC/KMcS	HG/MML/FMC/EM	
	1.11.15	Restaurant/cafe	KC/PM	DH	
	1.11.16	Retail areas	KC	PM/DH	
	1.11.17	Access & Maintenance Strategy	DH	KC/IP/FW	
	1.11.18	Access Controls	KC	Project Team	
	1.11.19	Key Suiting	KC	Project Team	
	1.11.20	Ground Maintenance	KC		
1.12	**Estates Management**				
	1.12.1	BMS	IP	AGS/HMD/FC	
	1.12.2	Zutec set up	IP	PM	Confirm folder structure
	1.12.3	Workforce plan/training	IP		
	1.12.4	Building Management Plan	IP		
	1.12.5	Review of M&E system design /RDD/ equipment	DH/DW/JR/FW	IP/PM/ASM/HMD	
	1.12.6	Site Wide Strategy (Electrical and Mechanical – Retained Estate)	DWL/PM	IP/ASM/HMD	
	1.12.7	Energy Centre Handover	PM	IP/ASM/HMD/DH	
	1.12.8	Commissioning systems	CS	IP/PM/ASM/DH	
	1.12.9	Estates Equipment Transfer	IP		

1.13	IT				
1.13					
	1.13.1	LAN Infrastructure Installation	FC/MG	EM	
	1.13.2	Computer rooms design and kit	MG/FC	EM	
	1.13.3	Wireless network	BMCL	IT Team	
	1.13.4	Surgeons panels (IT links)	EM/MG	FC	
	1.13.5	PAC's interface	EM/MG	FC	
	1.13.6	Config of network	MG/FC	EM	
	1.13.7	IT linkage across site	FC/MG	EM	
	1.13.9	AV/Video conferencing kit	Kathy McFall	MG/FC/EM	
	1.13.10	Comms (inter staff)	EM/HG	MM/FMC	
1.14	**Commissioning and Migration Group**				
	1.14.1	Clinical Migration Sub-group	DWL	SG/FMC/HG/LH/KC/MML/EM	
	1.14.2	Develop Clinical Risk Matrix	DWL	SG/FMC/HG/ASM/MML	
	1.14.3	Recommend Hospital Transfer Order	SG/FMC	ASM/DWL	
	1.14.4	Commissioning & Migration Structure	DWL	SG/FMC/KC/MML	
	1.14.5	Technical Commissioning	PM	Project Team	
	1.14.6	Programme Management	DWL	SF/LH/FMC?MML	
	1.14.7	Develop and Maintain Governance Documents	DWL	Migration Team	

1.**15**	**Laboratory Block – Close out**				
	1.15.1	Metering	IP/DH	SL	
	1.15.2	BMS/Schneider	IP/BMCL	DH	
	1.15.3	Heating/cooling	IP	AGS	10 rooms
	Activity	Sub	Lead	Support	Key Tasks and Timescale
	1.15.4	Memcor install	IP/HMD	AGS	
	1.15.5	Mortuary intercom	IP	AGS	
	1.15.6	ERM config on web	IP	DH	
	1.15.7	Zutec content	IP	AGS	
	Activity	Sub	Lead	Support	Key Tasks and Timescale
2.0	**CAR PARK 1 (Lead: DWL/PM Support: HMD)**				
	Note: all reporting and Project Management functions (e.g construction, supervisor, programme and change management) for this project will be undertaken as part of Main Build project. Items listed below will be project specific.				
2.1	**General Actions**				
	2.1.1	Traffic flow review	PM/HMD	DH/HG/NMG	Review by WSP
	2.1.2	Air quality assessment	PM/JM	KC/HMD	Survey by IOM
	2.1.3	Agree % staff to visitor spaces	HG	NMG/KC/HMD	
	2.1.4	Agree parking space management equipment	PM	KC/HMD	
	2.1.5	Agree all parts of compensation event and issue.	PM	DR	Issue by 18th January 2013. Linked to item 2.2.1 below.
2.2	**Local Authority Approvals**				
	2.2.1	Planning variation	PM	HMD	Hypostyle drawings submitted 19 November 2012.
2.3	**Design Management**				
	2.3.1	Set up periodic design team meetings.	HMD/DS	DH	

	2.3.2	RDD and sample review.	PM/HMD	KC	
	Activity	Sub	Lead	Support	Key Tasks and Timescale
3.0	**TEACHING AND LEARNING FACILITY (Lead: DWL/PM Support: AD)** Note this is a separate project to the Main Build for PM purposes.				
					Anna to review and comment
3.1	**Reporting**				
	3.1.1	Quality & Performance	DWL	AD/SF	
	3.1.2	ASSB (Board / Sub group)	DWL	AD/SF	
	3.1.3	On the Move	DWL	AD/SF	
	3.1.4	Monthly Report	PM	AD/SF	
	3.1.5	SG Infrastructure Portal	AD / AMC	PM	
	3.1.6	SG Finance	AMC	AD	DWL to be kept informed
	3.1.7	Joint NHS/UoG Op. Group	DWL	AD/PF/PM	
3.2	**Publicity / Comms / FOI's**				
	3.2.1	Key link for Board Comms	DWL	AD/SF	
	3.2.2	Community Engagement	DWL/MMA	AD/SF	
	3.2.3	FOI Enquiries	DWL	AD	
3.3	**Project Governance Structure**				
	3.3.1	Project Team	AD	PF	
	3.3.2	Project Management Group	AD	PF	Project size may dictate that some of these meetings can be merged. AD to review. DWL to be kept informed
	3.3.3	Commercial Group	AD	PF/LA	DWL to be kept informed
	3.3.4	Early Warning Meeting	AD	PF	DWL to be kept informed

	3.3.5	Construction Management	AD	PF	DWL to be kept informed
	3.3.6	Site Logistics Group	AD/HMcD	GT	Interface from Main Build Group
	3.3.7	IT/Equipment Groups	AD	EMC/MG/FC	See separate sections below.
	3.3.8	Gateway Review			Not required as confirmed by MML
	Activity	Sub-group	Leader	Support	Key Tasks and Timescale
3.4	**NEC 3 Project Management**				
	3.4.1	Monthly Assessments	PM/AD	PF/LA	DWL to be kept informed
	3.4.2	EWN / PMI / CE	AD/PM	PF/LA	DWL to be kept informed
	3.4.3	Programme review	AD	PF/GT	DWL to be kept informed
	3.4.4	Management of ASITE	SF	AD/PF	DWL to be kept informed
	3.4.5	CHEOP's audit	AD	LA	DWL to be kept informed
	3.4.6	Change control	AS/PM	AD	DWL to be kept informed
	3.4.7	Risk management	AD/PM	PF	DWL to be kept informed
3.5	**Town Planning /Masterplan/Transportation Interface**				
	3.5.1	Planning process	AD/PM	PF	DWL to be kept informed
	3.5.2	Purification conditions	AD/BAM	PF	DWL to be kept informed
	3.5.3	Transportation	AD	PF	Keep NMG in picture
	3.5.4	Section 75	DWL / NMG/MMA	PM	Any interface dealt with by Main Build team

	3.5.5	Section 56 & RCC	DWL/PM	DH	Any interface dealt with by Main Build team
3.6	**Design Management**				
	3.6.1	Envelope v cost plan	AD/PM	PF/LA	
	3.6.2	Post CIG approval commence Stage D design	AD	PF	
	3.6.3	Set design approval process and RDD/samples	AD	PF	
	3.6.4	Room data sheets/ADB	AD	PF	
3.7	**General Actions**				
	3.7.1	Scottish Enterprise	DWL	AD	
	3.7.2	Conclude PSC contracts	PM	AD	
	3.7.3	Conclude designer warranties	PM	AD	
	3.7.4	Submit OBC to joint Boards	DWL/MML	PF	
	3.7.5	Submit OBC to CIG	DWL/MML	PF	
	3.7.6	Agree governance for enabling demo works	DWL/AD	PF	e.g before FBC and Stage 4 approval
	3.7.7	Bridge link with BMCL	AD/PM	PF	
	3.7.8	Interface with BMCL re crane removal	AD/PM	PF	
	3.7.9	Submit FBC to joint Boards	AD	PF	Submission via DWL
	3.7.10	Submit FBC to CIG	DWL		

3.8	**Quality Management**				
	3.8.1	Appoint Supervisor	PM	AD/PF	Put in place for start of Stage 4.
3.9	**Equipment**				
	3.9.1	Develop equipment list	RS	AD/PF/UoG	
	3.9.2				
	3.9.3				

	Activity	Sub-group	Leader	Support	Key Tasks and Timescale
3.10	**Facilities Management**				
	3.10.1	Catering solution	KC	AD	Confirm extent of server, who operates, hours and level of catering
	3.10.2	CCTV / security	KC	AD	Links to Main Build
	3.10.3	Fire safety review	KC/GD	AD	Review proposals with our FO.
	3.10.4	Lifts	KC	AD/IP	
	3.10.5	Room booking system, management rooms and main auditorium	KC/Uni. Rep	PF	Booking system for core use, will be offered site wide through central web app?? Operational policy to be developed.
	3.10.6	Transport/deliveries/stores	KC	AD	
	3.10.7	Porters / staffing	KC	AD	

3.11	**Estates Management**				
	3.11.1	BMS	AD/IP	PF	
	3.11.2	Asset control	AD/IP	PF	
	3.11.3	Workforce plan	IP		
	3.11.4	M&E systems	AD	PF/IP	
	3.11.5	Commissioning systems	Supervisor/AD	PF/Project Team	
3.12	**Legals & Operational Management**				
	3.12.1	Lease and charging agreement	AD/AMC	MA	
	3.12.2	Running costs	AD	KC/IP	Agree cross charge if appropriate.
	3.12.3	Payment for works	AD/AMC/TC	PF	Avoid cap charges
	Activity	Sub-group	Leader	Support	Key Tasks and Timescale
3.13	**IT**				
	3.13.1	LAN Network Infrastructure	FC/MG/UoG	EM	
	3.13.2	WLAN Network Infrastructure	FC/MG/UoG	EM	
	3.13.3	Joint Desktop Appraisal	FC/MG/UoG	EM	
	3.13.4	BMS/IP System Implementation	FC/MG/UoG	EM	
	3.13.5	Installation & Commissioning	FC/MG/UoG/EM		
	3.13.6	Migration	EM/UoG	FC/MG	
	3.13.7	AV/Video Conferencing Integration	FC/MG/UoG/Kathy McFall	EM	

4.0	**Office Accommodation (Lead: PM Support: HG/AD/PF**				
4.1	Feasibility Stage				
	4.1.1	Draft OBC	DWL/HG/AD		
	4.1.2	Scope Project Brief	HG/AD	BAM/C&B	
	4.1.3	Visit reference sites	HG/DWL/PM/AD		
					Anna to review and comment
4.2	**Reporting**				
	4.1.1	Quality & Performance	DWL	AD/SF	
	4.1.2	ASSB (Board / Sub group)	DWL	AD/SF	
	4.1.3	On the Move	DWL	AD/SF	
	4.1.4	Monthly Report	PM	AD/SF	
	4.1.5	SG Infrastructure Portal	AD / AMC	PM	
	4.1.6	SG Finance	DWL /AMC	AD	
	4.1.7	Joint NHS/UoG Op. Group	AD	PF/PM	
4.3	**Publicity / Comms / FOI's**				
	4.3.1	Key link for Board Comms	DWL	AD/SF	
	4.3.2	Community Engagement	DWL/MMA	AD/SF	
	4.3.3	FOI Enquiries	DWL	AD	
4.4	**Project Governance Structure**				
	4.4.1	Project Team	AD	PF	
	4.4.2	Project Management Group	AD	PF	Project size may dictate that some of these meetings can be merged. AD to review.
	4.4.3	Commercial Group	AD / DWL	PF/LA	
	4.4.4	Early Warning Meeting	AD /DWL	PF	
	4.4.5	Construction Management	AD	PF	
	4.4.6	Site Logistics Group	AD/HMcD	GT	Interface from Main Build Group
	4.4.7	IT/Equipment Groups	AD	EMC/MG/FC	See separate sections below.
	4.4.8	Gateway Review			Not required as confirmed by MML

	Activity	Sub-group	Leader	Support	Key Tasks and Timescale
4.5	**NEC 3 Project Management**				
	4.5.1	Monthly Assessments	PM/AD	PF/LA	DWL to be kept informed
	4.5.2	EWN / PMI / CE	AD/PM	PF/LA	DWL to be kept informed
	4.5.3	Programme review	AD	PF/GT	DWL to be kept informed
	4.5.4	Management of ASITE	SF	AD/PF	
	4.5.5	CHEOP's audit	AD	LA	DWL to be kept informed
	4.5.6	Change control	DWL/PM	AD	
	4.5.7	Risk management	AD/PM	PF	DWL to be kept informed
4.6	**Town Planning /Masterplan/Transportation Interface**				
	4.6.1	Planning process	AD/PM	PF	DWL to be kept informed
	4.6.2	Purification conditions	AD/BAM	PF	DWL to be kept informed
	4.6.3	Transportation	AD	PF	Keep NMG in picture
	4.6.4	Section 75	DWL / NMG/MMA	PM	Any interface dealt with by Main Build team
	4.6.5	Section 56 & RCC	DWL/PM	DH	Any interface dealt with by Main Build team
4.7	**Design Management**				
	4.7.1	Envelope v cost plan	DWL/AD/PM	PF/LA	Confirm mesh affordable….options??
	4.7.2	Post CIG approval commence Stage D design	AD	PF	Confirm programme.
	4.7.3	Set design approval process and RDD/samples	AD	PF	
	4.7.4	Room data sheets/ADB	AD	PF	
	4.7.5				
	4.7.6				
	4.7.7				

	Activity	Sub-group	Leader	Support	Key Tasks and Timescale
4.8	**General Actions**				
	4.8.1	Scottish Enterprise	DWL	AD	
	4.8.2	Conclude PSC contracts	PM	AD	
	4.8.3	Conclude designer warranties	PM	AD	
	4.8.4	Submit OBC to joint Boards	DWL/MML	PF	
	4.8.5	Submit OBC to CIG	DWL/MML	PF	
	4.8.6	Agree governance for enabling demo works	DWL/AD	PF	e.g before FBC and Stage 4 approval
	4.8.7	Bridge link with BMCL	AD/PM	PF	
	4.8.8	Interface with BMCL re crane removal	AD/PM	PF	
	4.8.9	Submit FBC to joint Boards	AD	PF	Done via DWL
	4.8.10	Submit FBC to CIG	DWL	PF	
4.9	**Quality Management**				
	4.9.1	Appoint Supervisor	PM	AD/PF	Put in place for start of Stage 4.
4.10	**Equipment**				
	4.10.1	Develop equipment list	RS	AD/PF/UoG	

	Activity	Sub-group	Leader	Support	Key Tasks and Timescale
4.11	**Facilities Management**				
	4.11.1	Catering solution	KC	AD	Confirm extent of server, who operates, hours and level of catering
	4.11.2	CCTV / security	KC	AD	Links to Main Build
	4.11.3	Fire safety review	KC/GD	AD	Review proposals with our FO.
	4.11.4	Lifts	AD	KC/IP	
	4.11.5	Room booking system, management rooms and main auditorium	KC/Uni. Rep	PF	Booking system for core use, will be offered site wide through central web app?? Operational policy to be developed.
	4.11.6	Transport/deliveries/stores	KC	AD	
	4.11.7	Porters / staffing	KC	AD	
4.12	**Estates Management**				
	4.12.1	BMS	AD/IP	PF	
	4.12.2	Asset control	AD/IP	PF	
	4.12.3	Workforce plan	IP		
	4.12.4	M&E systems	AD	PF/IP	
	4.12.5	Commissioning systems	Supervisor/AD	PF/Project Team	
4.12	**Legals & Operational Management**				
	4.12.1	Lease and charging agreement	AD/AMC	MA	
	4.12.2	Running costs	AD	KC/IP	Agree cross charge if appropriate.
	4.12.3	Payment for works	AD/AMC/TC	PF	Avoid cap charges
4.13	**IT**				

	4.13.1	LAN Network Infrastructure	FC/MG	EM	
	4.13.2	WLAN Network Infrastructure	FC/MG	EM	
	4.13.3	BMS/IP System Implementation	FC/MG/UoG	EM	
	4.13.4	Installation & Commissioning	FC/MG/UoG/EM		
	4.13.5	Migration	EM/UoG	FC/MG	
	4.13.6	AV/Video Conferencing Integration	FC/MG/UoG/Kathy McFall	EM	

	Activity	Sub-group	Leader	Support	Key Tasks and Timescale
5.0	**CAR PARKS 2 & 3 (Lead: PM)**				
5.1	**Feasibility Stage**				
	5.1.1	Commence Planning Process for Car Park 2	PM	DH	Note – CP2 omitted from contract
	5.1.2	Commence Planning Process for Car Park 3	PM	DH	

	Activity	Sub-group	Leader	Support	Key Tasks and Timescale
6.0	**STAGE 3A, SITE MASTERPLAN ENABLING WORKS AND SUNDRY DEMOLITIONS (Lead: PM Support: HMD)**				
6.1	**Feasibility Stage – Masterplan**				
	6.1.1	Stage 3A with BMCL	PM		DWL to be kept informed
	6.1.2	Refurb CMB/AMB	PM		
6.2	**Demolitions**				
	6.2.1	Chest/GI Building	HMD/KC	PM/AGS/GT	
	6.2.2	OPD/A&E/Therapies	HMD/KC	PM/ AGS/GT	
	6.2.3	Mortuary	HMD/KC	PM/ AGS/GT	
	6.2.4	Estates cabins	HMD/KC	PM/ AGS/GT	
	6.2.5	Mental Health	HMD/KC	PM/ AGS/GT	Part of T&L Project
	6.2.6	Pharmacy	HMD/KC	PM/ AGS/GT	Part of T&L Project
	6.2.7	Clinical Physics cabin	HMD/KC	PM/ AGS/GT	
6.3	**Ronald Macdonald House**				

	6.3.1	Interface	PM		DWL to be kept informed
6.4	**Peel Holdings**				
	6.4.1	Interface for Energy Plant	IP	DWL	

NHS Greater Glasgow and Clyde — *Project Risk*

Risk is the chance of something happening which will cause harm or detriment to the organisation, staff or patients.

Risk is assessed in terms of likelihood of an event occurring and the severity of its impact upon the organisation, staff or patients.

NHS Greater Glasgow and Clyde has adopted, as standard, a “1 - 5” scoring system which enables the risks to be prioritised. This is illustrated in the following table.

Likelihood (L)		Consequence (C)		Risk (LxC) = Priority			
Almost certain	5	Extreme	5	20 - 25	=	Priority 1	= VERY HIGH
Likely	4	Major	4	12 - 19	=	Priority 2	= HIGH
Possible	3	Moderate	3	6 - 11	=	Priority 3	= MEDIUM
Unlikely	2	Minor	2	1 - 5	=	Priority 4	= LOW
Rare	1	Negligible	1				

NHS Greater Glasgow and Clyde

Project Risk Register

Completed by New South Glasgow Hospitals Project Team

Date Reviewed by Joint Project Team 2nd October 2013

Date to be reviewed by the On The Move Programme Board 14th November2013

Date to be reviewed by ASSB 11th November 2013

Date to be reviewed by Project Team 1st November 2013

LEGEND (RISK OWNERSHIP)
DWL - David Loudon
HG - Heather Griffin
HMcD - Hugh McDerment
MM - Mairi Macleod
MMc - Mark McAllister
PM - Peter Moir
KC-Karen Connelly

Risk = the chance of something happening which will cause harm
Levels of risk = assessed in terms of likelihood and consequence (LxC)

Likelihood (L)	Consequence (C)		Risk Ranking Priority
5	Extreme	5	20 - 25 = Priority 1 - **VERY HIGH**
4	Major	4	12 - 19 = Priority 2 - **HIGH**
3	Moderate	3	6 - 11 = Priority 3 - **MEDIUM**
2	Minor	2	1 - 5 = Priority 4 - **LOW**
1	Negligible	1	

Ref	THE RISK - what can happen and how it can impact	CONTROLS IN PLACE	RISK EXPOSURE Likelihood (L)	RISK EXPOSURE Consequence (C)	RISK RATING (LxC)	RISK RANKING PRIORITY	FURTHER ACTION REQUIRED	OWNER
1	Appropriate Design Quality not being Achieved. (Building and Services)	Detailed Employer's requirements set out Quality Standards. A&DS supporting project with enabler input. Evaluation criteria has quality as a key element and priority. Design Action considered in specifications BREEAM Consultant Input to Planning process Project Supervisor contracted from 1st June 2010 (Capita) Project Supervisors quality checking construction and engineering	1	5	**5**	**4**	Design checks on appendix K agreed for FBC approval Supervisors on site from June 2010 - Monthly reporting Ongoing monitoring RDD process will continue to be maintained. 2 Stage review process - 1st stage review undertaken in July 2010. 1:200 review concluded minimum scope change 1:50 process finalised - minimum scope change Project Team involved in product workshops to input services/finshes selection 1:50 "sweep-up" exercise concluded	PM
2	HOSPITALS - Capital costs outwith affordable level	Formal change control process in place to control scope change Review contingency at ASSB Review at Commercial Group meeting	1	5	**5**	**4**	Ongoing monitoring. Regular reporting to the Exec Group Final stage of 1:50 process in place. 98% of contract let Hospitals outturn cost forecasted within budget. Continually review and report on contingency Ongoing assessment of risks through Early Warning meeting with Brookfield	DWL
3	Lack of adequate resources and skills for next stage of the project (Stages 2&3) are in place and for commissioning	Realign project team and technical team to meet new project challenge. Review and change technical advisor input. Identified requirement to commission quality regime for construction phases of the project (supervisors) Restructured Project team and allocated responsibilities	2	2	**4**	**4**	Obtained support from Procurement and Medical Physics, IT and Pharmacy Continuous Review Assign each team member with special responsibilities. Out sourcing specialist staff for testing and commissioning	DWL

Ref	THE RISK - what can happen and how it can impact	CONTROLS IN PLACE	RISK EXPOSURE Likelihood (L)	RISK EXPOSURE Consequence (C)	RISK RATING (LxC)	RISK RANKING PRIORITY	FURTHER ACTION REQUIRED	OWNER
4	Major Hospitals works starting on site from March 2011 and potential risk to current site operation	Construction Interface Group established to manage, control and monitor all activities and liaise with Contractor, SGH Facilities and SGH Estates Depts. Group undertakes a weekly "look-ahead" of programme to identify any potential disruption. Site and/or specific department notified in advance of any potential disruption. Other site projects also members of this group Complaints Register instigated to log any complaints and actions taken Ongoing liaison with local residents during link bridge install and VIE construction	3	3	**9**	**3**	Continuous monitoring and evaluation of processes and outcomes by Project Team and PMG Ground scanned for services check Users involved where there is potential for the works to impact on their services Ground scan for services check repeated (March 2012). Prior to any works continuing to liaise with Directorate Lead Current focus is on the link bridge installations and associated works	DWL
5	Appropriate communications not being provided to all stakeholders	Since Ministerial announcement with role out communication plan to all stakeholders Communications Plan in force	1	2	**2**	**4**	Project team continue to review communications Boards website updated monthly with webcam images A project web-portal has been set-up Project Community Engagment Manager working closely with BCL to take forward joint communications Community Engagement events for local residents commenced formally 19th July 2010. Presentation to South Glasgow Area committees x 6 ASR Comminucations Group established Neighbourhood Liaison Group established	MM/Project Team
6	Detrimental environmental impacts i.e. Noise disruption and pollution	All works to be assessed for noise disruption and/or pollution consequences Ecology report undertaken Contractors environmental policy implemented WRAP initiative implemented . Brookfield monitor vibration and noise automatically. Disruption to local residents during VIE construction, removal of tower cranes. Continue local liaison with residents	4	3	**12**	**2**	Ongoing review by PMG Regular meetings with local residents to discuss a series of environmental issues pre construction of the hospitals BCL WRAP on site Dust monitors installed around BMCL site to gather information - weekly report provided to NHS Team Dust screens erected in specific locations Acoustic barriers erected to minimise potential noise disruption Project Director reinforced that Brookfield must comply with GCC conditions.	PM
7	Inadequate IT costs allowed for in Project (Hardware/Software)	LAN IT infrastructure, including active switches is part of works, cost allocated. Allocated £1M for end user devices	1	4	**4**	**4**	Contractor appointed to install LAN and switches. IT active equipment install programmed to commence October 2013. NHS liaising closely with BMCL. Implementation plan has been developed in line with BMCL commissioning plan.	DL/MS
8	Failure to meet requirements of fire guidance documents - programme impact (design process)	Fire strategy developed in conjunction with NHS personnel including Fire Officer Progress monitored at Project Management Group and Project Team Regular specific fire meetings scheduled with Project Team and Users. All information sent to building control. Only cause and effect matrix to be concluded	1	3	**3**	**4**	Building Warrant application submitted to GCC Building Control Dept Workshops arranged to discuss fire strategy with Architects, Project Team, Technical Advisers, Contractor and Strathclyde Fire & Rescue Ongoing discussions TA Fire Advisers prepared report for submission to Building Control - indicating BCL design fully compliant with Fire Regulations Recent guidance released setting out new complaince standards for the prevention of fire in the atria of healthcare buildings. NHS Project Team and designers determining whether any changes to the design is required. Ongoing liaison with GCC Building warrant for Stage 8 (Fire Strategy) now received by BMCL Project Team met with HFS who are satisfied the atrium design meets new re	DH

Ref	THE RISK - what can happen and how it can impact	CONTROLS IN PLACE	RISK EXPOSURE Likelihood (L)	RISK EXPOSURE Consequence (C)	RISK RATING (LxC)	RISK RANKING PRIORITY	FURTHER ACTION REQUIRED	OWNER
9	Data share with Contractor not adequate	Process in place (Aconex) to ensure contractor correspondence widely circulated and requests actioned	2	2	**4**	**4**	Standing agenda item for weekly project team Further aconex training provided to project team members Request For Information (RFI) tracker developed and being actively managed to ensure responses provided to contractor within appropriate timescales. RFI tracker is standing agenda item on site progress and design groups.	DWL
10	A&C - Group 2,3,4 & 5 Equipment Non-compliance of group 5 equipment with BMCL Construction programme	Project Team have agreed a methodology to respond to BMCL plan/construction programme. Resource to assist maintaining the programme being provided to the project Team from Medical Physics (Secondment) Cost estimate prepared and reviewed for each equipment category. Tenders issues and returned. Tender assessment process is underway	3	4	**12**	**2**	Project Team receives regular progress updates from Equipment Group lead to ensure no impact on programme. Work underway to identify 'new' versus 'transfer' equipment Full detailed equipment installation process being developed Regular meetings between BMCL and NHS to discuss and agree way forward re group 5 equipment install in those areas to be completed first. Deliveries of Group 2 (Board supply) equipment to BMCL ongoing and methodology for the delivery and storage of Group 2 equipment to/by BMCL concluded. Group 3 & 4 - Project team meeting users to start process of determining old versus new Group 5 - detail plan agreed to procure and install equipment - still to agree purchase/transfer	MM
11	Specialist Departments Failure to identify early those reps who need to be involved in the final sign-off of specialist departments i.e. external validators, external testers, etc	Project Team have identified a list of departments that will require specialist input to the design/sign-off process.	2	5	**10**	**3**	Project Team to liaise with the leads of the specialist departments to seek details of validators/testers that will be required for final sign-off of a room/area/dept. BMCL are organising to present their proposals to commission the hospitals to the NHS Team. Final system commissioning programme required from BMCL to allow planning of the test and commissioning of systems. Information required by April/May 2014 to progress within timelines	PM
12	Construction Quality requirement not being achieved	Capita Symonds appointed independent testers. Additional NHS support/resource provided on project (July 2012)	2	3	**6**	**3**	Provide regular reports on all aspects of construction activities. Provide weekly quality report to Project Team Both reports discussed at monthly meetings and information shared with contractor. Daily site visits undertaken by NHS Reps to monitor works on the site. NHS Reps linking with Capita to raise any concerns in order that formal communications are provided to BMCL. Exemplar areas have been signed off which sets the precedent going forward for the rest of the building.	PM
13	The detrimental effect of any of the demolitions works - post 2015- on the hepa filtered wards in both the adult and children's hospitals	Distance from air intake point. Environmental control covered within contract	3	3	**9**	**3**	Discussions to be instigated with BMCL Dustscan in place to monitor dust levels. Dust suppression system used onsite Understanding dust filter implications	PM

Ref	THE RISK - what can happen and how it can impact	CONTROLS IN PLACE	RISK EXPOSURE Likelihood (L)	RISK EXPOSURE Consequence (C)	RISK RATING (LxC)	RISK RANKING PRIORITY	FURTHER ACTION REQUIRED	OWNER
14	PPC Permits - Change to legislation Requirement to obtain permit to operate large scale combustion plant for purposes of commissioning. Not obtaining permit will delay BMCL commissioning	Joint application to be made by NHS & BMCL Programme to submit application to be agreed. Full implications being established	3	5	**15**	**2**	Discussions to be instigated with SEPA.	PM
15	Inadequate Commissioning of Buildings	Commissioning Plan and Completion Criteria. NHS Resource Plan Focussed meetings with BMCL	2	4	**8**	**3**	Completion criteria to be circulated to the group	PM
16	Building Control - Delayed Statutory approval	Project programme Project meetings with BMCL	2	4	**8**	**3**	Completion criteria to be circulated to the group	PM
17	Non-compliance of completion criteria by BMCL	Meetings to be arranged. Criteria to be circulated	3	4	**12**	**2**	Completion criteria to be circulated to the group	PM
18	Helipad flight acceptance test not being granted Unable to recruit and train staff to manage the helipad for test flight after commissioning	Method statement from BMCL	2	2	**4**	**4**	Alternative landing and transport in place, Contact with relevant external - including SAS/GCC/Military/Private Sector suppliers to be involved	PM
19	Witness Testing - lack of availability of appropriate resources	Make arrangements with relevant specialist staff groups to prepare for work load	3	4	**12**	**2**	Commissioning programme required from BMCL to prepare and plan for this part of the process	DH
20	Non-completion by February 2015 - impact on migration, procurement	Monthly monitoring and weekly walkthrough to monitor situation	4	2	**8**	**3**	Continue regular monitoring	DH

Ref	THE RISK - what can happen and how it can impact	CONTROLS IN PLACE	RISK EXPOSURE Likelihood (L)	RISK EXPOSURE Consequence (C)	RISK RATING (LxC)	RISK RANKING PRIORITY	FURTHER ACTION REQUIRED	OWNER
21	Early completion - compress procurement programme, less time to plan and prepare Service planning will be incomplete therefore migration planning to able to progress Compressed commissioning programme. Time of year - adverse weather for deliveries and commissioning double running costs, staff and utilities. Seasonal increase in clinical workload reduces staff availability to attend familiarisation and testing sessions	Review programme for procurement and commissioning Confirmation from BMCL on completion to vie comfort to Board Take account of seasonal pressures and plan appropriately	2	4	**8**	**3**	Decisions by senior management on completion of service planning	DH/PM
22	Compression of commissioning programme	Existing commissioning programmes are in place for plant rooms and energy centre	2	4	**8**	**3**	Request issue of commissioning programme on a quarterly basis. October/Jan/April and July to keep under review	DH
23	External envelope not wind and watertight by end of 2013	Construction progress meetings, supervisors meetings and regular programme reviews	3	2	**6**	**3**	Continue to monitor programmes, input from Capita and progress meetings are maintained	PM
24	Imaging Floor slab being inappropriate	on-going communications with relevant parties. Sign off from supplying company and Board representative	4	4	**16**	**2**	Confirmation from the supplier that appropriate floor set up in place will not impact on planned 1 1/2 T being installed from transfer. Communication on-going with BMCL advisors	DH
25	Financial/Commercial - impact of failure to budget appropriately for remaining packages	Monitor on a regular basis procurement and financials of BMCL	2	2	**4**	**4**	Regular monitoring of the financial spending of the contractor	DR
26	Sub-contractor liquidated/cease to trade	Financial checks continue to be carried out - guarantee bonds in place and warranties in place via BMCL	1	3	**3**	**4**	Continue to check financials on a regular basis	DR
27	Non-completion of project - £1/4M per week costs to BMCL, impact on migration, procurement, commissioning and Board being unable to clear areas of the campus scheduled for demolition to complete stage 3 works	Continual monitoring of programmes, work on site and financial status of main contractor and their sub-contractors	2	5	**10**	**3**	Include this issues within programme risk and continue liaison with BMCL	DWL/PM/DH

Ref	THE RISK - what can happen and how it can impact	CONTROLS IN PLACE	RISK EXPOSURE Likelihood (L)	RISK EXPOSURE Consequence (C)	RISK RATING (LxC)	RISK RANKING PRIORITY	FURTHER ACTION REQUIRED	OWNER
29	Cashflow - possible issues for 2014/2015	Project Director working with Finance colleagues to ensure funds are allocated appropriately throughout the contract	2	5	**10**	**3**	Review of cashflow predictions with AMcCubbin	DWL
30	Staff - lack of familiarisation with new areas Lack of familiarisation with new technologies Inadequate plan with FM colleagues to take forward best ways of familiarising buildings and campus	Communications group to review ways of providing familiarisation with focus on relevant areas initially. Authorised persons for HV, Medical Gases etc to be incorporated in training Additional costs for additional training - contractually BMCL will provide commissioning training but clarity on what this incorporates and level of training provided. Board requires clear understanding in order to develop plans	2	5	**10**	**3**	Project Manager to liaise with colleagues in Communications and FM on the best way forward - target to complete discussion by end of 2013	MMcA/MM/HG/KC
31	Loss of Key Resources (NHS)	Sharing of knowledge, roles and responsibilities	2	3	**6**	**3**	Buddy up staff to lessen impact	DWL
32	Loss of Key Resources (BMCL) - key staff moving onto new contracts	BMCL to confirm	4	4	**16**	**2**	Check BMCL position in relation to staff retention until job is completed	DWL
33	Lack of early communication with external stakeholders	Split responsibility with project team and other NHS colleagues	3	4	**12**	**2**	Tours for staff, familiarisation, equipment training, video training? Supplier training built into procurement tenders	MMcA/MM/HG
34	On the Move Risks	Any further changes to national services will impact on migration planning. Colleagues informed of financial implication of any changes to programme at this stage	2	4	**8**	**3**	Continue liaison with stakeholders to ensure this message is understood	DWL
35	Access to new hospitals - transport/car parking, Section 75 not being fully implemented. GCC not completing Fastlink to ensure use for hospitals opening, costs being too high to make public transport attractive or timing being inappropriate for shifts and appointments. Under provision of car parking a concern, inappropriate signage and directions	Work with colleagues at GGC to ensure that planning of Fastlink is progressed within timeframe. Working with transport providers to ensure that transport is appropriate for requirements. Project team progressing and planning the car parking provision and understanding pinch points of the project	2	2	**4**	**4**	Community Engagement working with GCC, car parking policy being implemented and community engagement sub-group to take forward ideas for communication with users and staff. Noted reputation of Board at risk if not fully thought through	MMcA

From: Macleod, Mairi
To: Sansbury, Jackie
Subject: RE: commissioning job descriptions
Date: 23 October 2013 16:18:30
Attachments: commissioning structure.docx
JD - AFC 7 Network Lead New SGH Project.pdf
JD - AFC 8a IMT Service Manager Acute _SDM1.pdf
Appendix to AFC 8a NSGH HIIT Prog Mgr Role Description - September 2012.pdf
NCH Project manager.pdf
nursing advisor.pdf
Clinical Advisor NCH draft JD 150411.docx

Jackie

Please find attached the commissioning structure for the South Glasgow hospitals

I've also attached the job descriptions I have - most of these are pretty historic and were written on appointment to the design stage but they might be of some assistance

Hope this is helpful

Kind regards

Mairi

From: Sansbury, Jackie [redacted]
Sent: 21 October 2013 11:52
To: Macleod, Mairi; Macleod, Mairi
Subject: FW: commissioning job descriptions

oops

Jackie Sansbury
Head of Redesign and Commissioning
RHSC + DCN - Little France
NHS Lothian
56 Canaan Lane
Edinburgh
EH10 4SG
[redacted]

From: Sansbury, Jackie
Sent: 21 October 2013 11:51
To: 'mairi.macleod[redacted]
Subject: commissioning job descriptions

Dear Mairi, I am on the scrounge. We are currently looking at the detail of our commissioning process and the staff we will need to various times throughout the project. I am also looking at the roles and job descriptions. Do you have a commissioning structure you are able to share along with any job descriptions?
Jackie

Jackie Sansbury
Head of Redesign and Commissioning

RHSC + DCN - Little France
NHS Lothian
56 Canaan Lane
Edinburgh
EH10 4SG
[redacted]

****

The information contained in this message may be confidential or

legally privileged and is intended for the addressee only. If you

have received this message in error or there are any problems

please notify the originator immediately. The unauthorised use,

disclosure, copying or alteration of this message is

strictly forbidden.

****

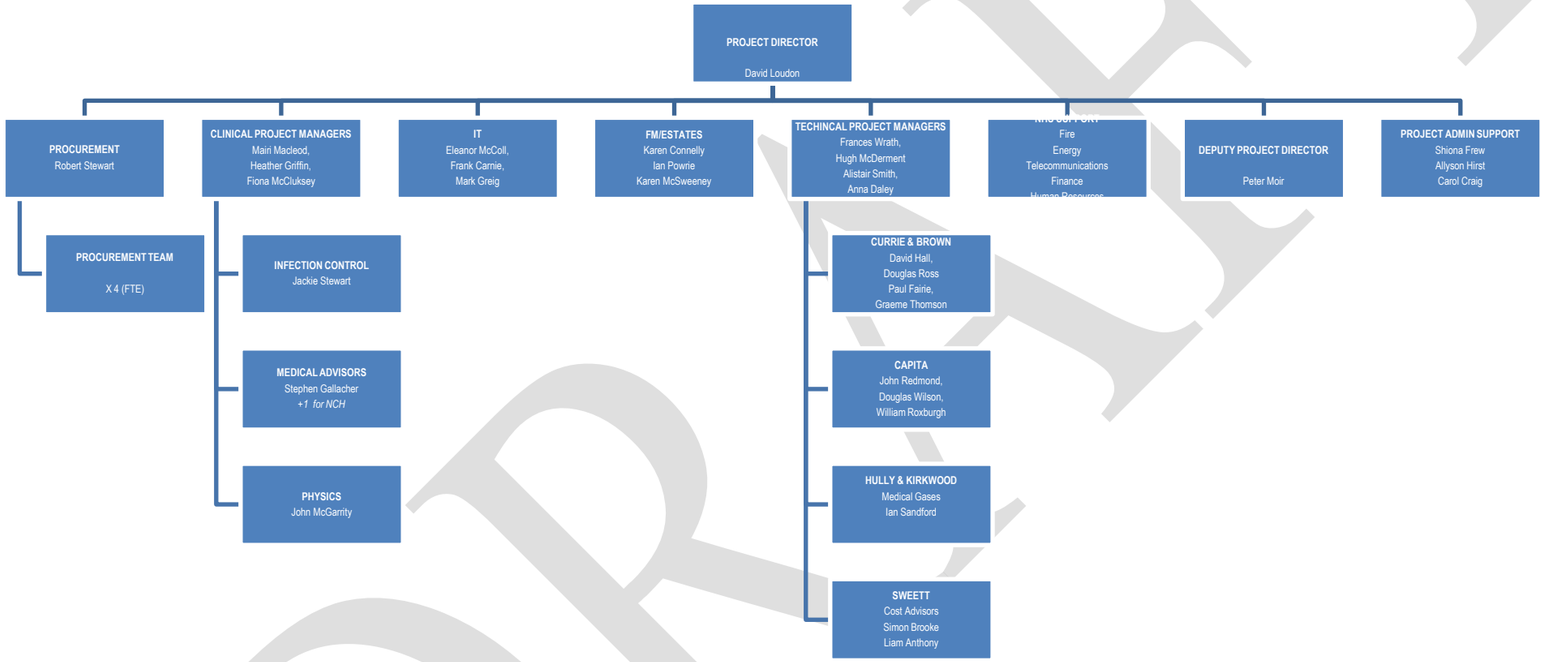
****

NHSGG&C Disclaimer

The information contained within this e-mail and in any attachment is confidential and may be privileged. If you are not the intended recipient, please destroy this message, delete any copies held on your systems and notify the sender immediately; you should not retain, copy or use this e-mail for any purpose, nor disclose all or any part of its content to any other person.

All messages passing through this gateway are checked for viruses, but we strongly recommend that you check for viruses using your own virus scanner as NHS Greater Glasgow & Clyde will not take responsibility for any damage caused as a result of virus infection.

****


PROJECT DIRECTOR
David Loudon
PROCUREMENT
Robert Stewart
CLINICAL PROJECT MANAGERS
Mairi Macleod,
Heather Griffin,
Fiona McCluksey
IT
Eleanor McColl,
Frank Carnie,
Mark Greig
FM/ESTATES
Karen Connelly
Ian Powrie
Karen McSweeney
TECHINCAL PROJECT MANAGERS
Frances Wrath,
Hugh McDerment
Alistair Smith,
Anna Daley
Fire
Energy
Telecommunications
Finance
DEPUTY PROJECT DIRECTOR
Peter Moir
PROJECT ADMIN SUPPORT
Shiona Frew
Allyson Hirst
Carol Craig
PROCUREMENT TEAM
X 4 (FTE)
INFECTION CONTROL
Jackie Stewart
MEDICAL ADVISORS
Stephen Gallacher
+1 for NCH
PHYSICS
John McGarrity
CURRIE & BROWN
David Hall,
Douglas Ross
Paul Fairie,
Graeme Thomson
CAPITA
John Redmond,
Douglas Wilson,
William Roxburgh
HULLY & KIRKWOOD
Medical Gases
Ian Sandford
SWEETT
Cost Advisors
Simon Brooke
Liam Anthony

Role Description

Network Lead New SGH Project

Job Title:	Network Lead New SGH Project
Directorate:	Health Information & Technology
Reports to:	HI&T Network Manager / NSGH Programme Manager
Location:	Southern General
Base job desc:	Network Team Lead & Technical Specialist
Grade:	AFC 7
Duration:	24 month secondment: Start date ASAP

Context

The lessons learned from the implementation of core network, voice and wireless solutions and network integration of facilities services such as BMS, CCTV and access-control for the new Labs Building on the SGH campus has highlighted the benefit of closer liaison between the builders, their sub-contractors and the HI&T Network Team.

Many of the requirements took a significant amount of detailed discussion, planning and technical liaison to ensure security, separation and availability of services whilst also providing all necessary functional requirements.

Whilst it is anticipated that the New SGH Adult & Children's Hospitals will leverage much of the learning from the Labs implementation and many of the same systems will be expected to be installed, there is a serious concern that the scale and additional complexity arising from the phased build proposals will require more resource than currently available in the HI&T Network Team.

In the Adult and Children's hospital build it is anticipated that the number of IP systems will be expanded further to include the AGV robotics system, a new staff communication system and nurse call solution all integrated within the data network. These systems are going to require a great deal of network input both in planning and implementation compared to the Labs and this list could continue to grow as the project progresses.

Primary purpose of this role

This individual will be primarily based with the Project Team at the SGH site and will have a dual reporting line to both the Programme Manager & the Network Manager and will also be expected to liaise closely with the Network Team based at Westward House in Paisley. The post will have no direct financial responsibility, but will have autonomy to make technical and functional project related decisions on behalf of the Network Manager.

Responsibilities

The post-holder would be expected to:

- Work with the HI&T NSGH Programme Manager to ensure that the technology aspects of the project are delivered as per the contracted Employer Requirements.
- Assist with wider Network Team and partners in key phases of developing technical design for HI&T network infrastructure to meet immediate needs of clinical, facilities & ancillary services.
- Develop requirements specification documentation and manage formal tender process for procurement of HI&T network and voice equipment in conjunction with Telecomms Team
- Liaise closely with building programme to ensure network service requirements for phased build are met and deliver in a functional way supportable long term by NHSGG&C Network Team.
- Liaise with Brookfield, Mercury, subcontractors and Project staff to ensure connectivity requirements are met for all proposed networked applications through build and to completion of construction phases and fit-out.
- Ensure the security and stability of the NHSGG&C network through segregation of services on the LAN and using security features available on the access layer and core switches.

- Monthly reporting to the Programme & Network Manager on process & progress and management of the budget.

Base job description

M:\Documents\HI&T Reorganisation\Job D

1. JOB IDENTIFICATION

Job Title: IM&T Service Manager (Acute)
(formerly known as Service Delivery Manager)

Responsible To : HI&T Account Manager

Department : HI&T

Directorate :Corporate

No of Job Holders: 3

Last Update:20/11/07

2. JOB PURPOSE

Responsible for the management of the IM&T service to multiple Acute Directorates ensuring the service performance is delivered to agreed service levels and KPIs.

Lead the development and delivery of the IM&T strategy for these Acute Directorates addressing applications, infrastructure and information reporting requirements.

Develop and manage the implementation of the IM&T policies required to support the delivery of projects and the IM&T service.

Specifically:

To directly manage 12+ members of staff comprising of system managers, technical specialists, application support analysts, business analysts, project managers and trainers.

To review and manage the requests for development and delivery of new and existing applications and database systems, support processes and service improvements, which support both the clinical and administrative functions of the Acute Directorates, ensuring requirements are prioritised in line with the strategic HI&T aims of NHSGGC.

Act as a Senior Programme Manager across the team's clinical and service projects primarily focused on HI&T support and authorised projects, growing delivery of NHSGGC services and technologies.

To manage the delivery of application support and service delivery within the NHSGGC Acute environment, including the organisations Patient Administration Systems, specialist clinical systems and clinical administration applications, through specialist teams.

To influence, through analysis and negotiation, the introduction of new applications and technologies within NHSGGC via focused Client Management to agreed Acute Directorates identifying requirements and developing applications and services in line with organisational strategies. To advise on the management and governance of information technology applications and end to end service delivery.

3. ROLE OF THE DEPARTMENT

NHS Greater Glasgow and Clyde (NHSGGC) is the largest healthcare system in Scotland and one of the largest in the UK.

NHSGGC works in close partnership with other NHS organisations, local authorities and other agencies to ensure that social work, education, housing, employment and environmental services unite effectively and efficiently with the NHS in tackling inequalities and underlying health problems in local communities.

There are a number of significant issues that fundamentally affect the way NHSGGC delivers its responsibilities in the near future:

- the dissolution of NHS Argyll and Clyde and merging of services provided to people living in East Renfrewshire, Renfrewshire, West Dunbartonshire and Inverclyde into an enlarged NHS Greater Glasgow and Clyde from 1 April 2006
- the establishment of Community Health (and Social Care) Partnerships - which will manage local healthcare services: in most of our areas CHCPs will also manage a range of local authority services - and links to secondary and tertiary healthcare
- a complete restructuring of all NHSGGC's services into a single, coordinated, inter-dependent healthcare system serving the entire population of the area
- £750 million programme to modernise and reconfigure acute hospitals so that they are purpose-designed to deliver the most advanced, integrated forms of care.

NHS Greater Glasgow and Clyde serves a population of around 1.2 million people. We employ around 44,000 staff. We cover a geographical area which includes eight Local Authorities..

We have a budget of around £2.5 billion to deliver local, regional and national services, included in which are a number of world-class specialist services. A significant portion of our income is from other NHS areas for providing services to non residents.

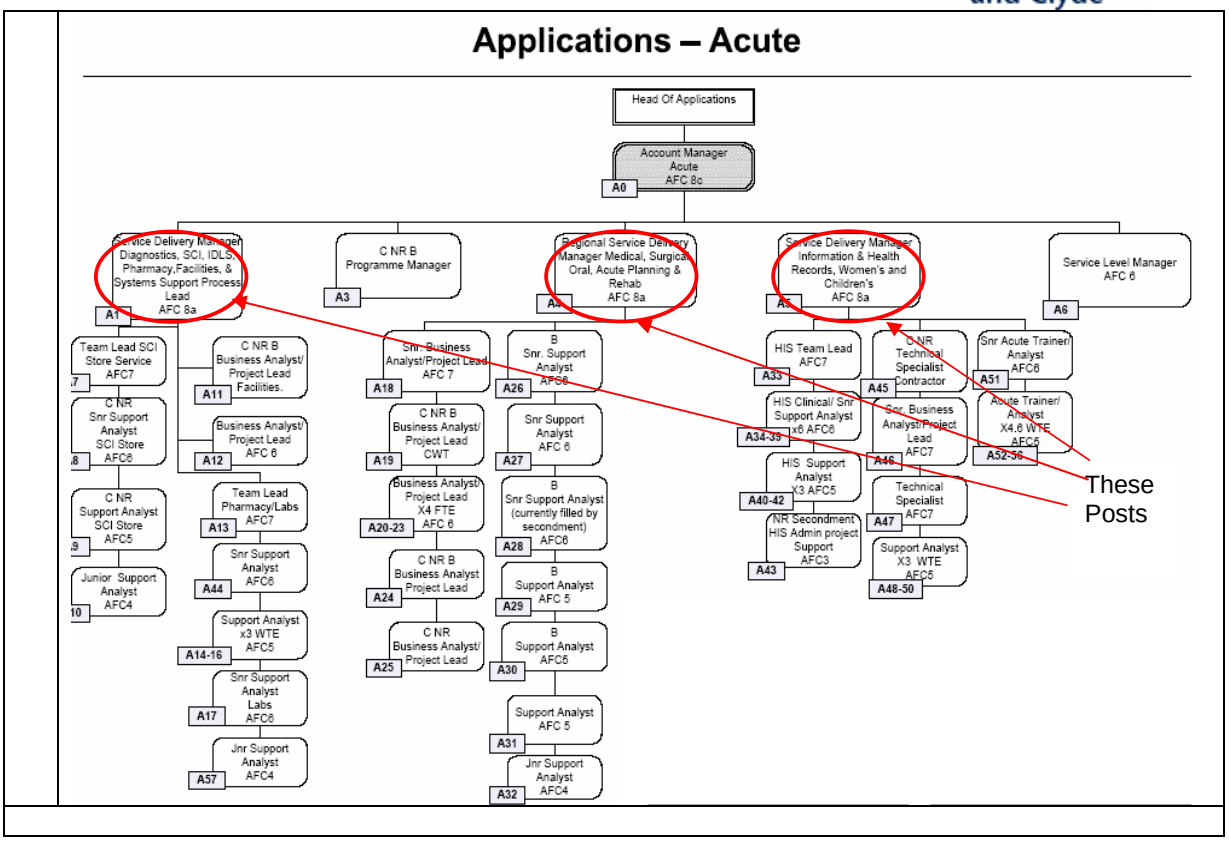
The healthcare challenge within NHSGGC is considerable: Many of the most deprived communities in Scotland (and in the UK as a whole) exist within the Board's boundaries. People in the area suffer higher than average rates of coronary heart disease, lung cancer, respiratory illnesses and premature deaths among males, although real headway is being made in tackling these. Ongoing lifestyle issues, such as the prevalence of smoking, poor diet and lack of exercise, are key factors, as is the steadily 'ageing' profile of the population.

NHSGGC has undergone a major reorganisation of clinical services and now operates on a single system basis with Directorates across the city combining in a single Acute Division (Clyde remains a separate Directorate for the foreseeable future), 11 CHCPs or CHPs managing local and community services and a Mental Health Partnership covering the whole area. Clinical services are supporting by non-clinical support services and a corporate/ headquarters service which includes Planning, Finance, HR, Public Health, Communications and Health Information and Technology.

The Health Information and Technology Directorate when restructuring is complete will have:

Staff:	approximately	1400
Annual Revenue Budget:	approximately	£32m
Annual Capital Budget:	approximately	£7m

4. Organisational Position



5. SCOPE AND RANGE

The post holder has direct managerial responsibility, including personal development, appraisal, discipline and work evaluation for 12+ members of staff from the Acute Applications Team, manages the development requirements and support service delivery to Acute Directorates, and works in conjunction in cross boundary requirements for CHCP's and local authorities (where information needs to be shared). This often requires very complex workflows.

Application and Service Developments require the job holder to understand complex working practices across a wide range of medical/clinical professions in acute services translate them into technical solutions to facilitate the flow of information to support the healthcare practitioner and the patient, and implement these through managed projects. These systems and services directly impact the care provided to patients.

Advises and influences business clients and customers at senior management level regarding the delivery, costs, availability and functionality of services and systems and develops effective relationships whilst at the same time acting as the Client Manager for the HI&T Application service delivery function. Proactively seeks and manages development requests and provides implementation services for new and existing third party applications which enhance the deliverables of the NHSGGC clinical practice which forms a key part of the GGC HI&T strategy.

Takes overall responsibility for the financial and staffing aspects of the team's operational management, service and project management as well as the full range of technical considerations involved. Possesses the confidence of the highest level of management in the ability to deliver an efficient and effective service within agreed time and cost constraints.

Manages Acute based Clinical, Patient Care and PAS systems, including support to many of which are

required to be available 24*7*365, including direct provision of technical support and services for the teams applications / systems, when required.

Contributes to policy making at a high level with respect to the full range of matters including strategic planning, application and software procurement. Leads contributions and direction to National System & Application Developments and Projects, responsible for the support and implementation within NHSGGC Acute Directorates and provides advice on National Data Sets.

Ensures that the delivery of systems and services are monitored and maintained to the high levels of quality, standards and operability as defined within negotiated and agreed service level agreements, parameters or contracts. Ensures that service level agreements, contracts and negotiations with both internal and external suppliers are always aimed at meeting the business needs of the organisation in terms of operability, standards, quality, efficiency, performance and cost effectiveness.

Ensures that the necessary arrangements are in place to maintain or recover the delivery of systems and services in the event of any physical, technical or environmental disaster or major outage providing continuity of service to the client organisation.

Manages IT applications to facilitate information retrieval and analysis services which support National reporting requirements, SMR, ISD(s) and waiting time schemes. Manages IT applications to facilitate information retrieval and analysis services which support Acute Directorate service planning, bed management, discharge, staff activity and service usage.

6. MAIN DUTIES/RESPONSIBILITIES

Programme Management and Implementation (40%)

Has lead responsibility for the design and development of major information systems to meet the specification of a wide range of clinical disciplines.

Responsible for the development and implementation of IM&T policies required to successfully deliver quality services and projects to Acute Directorates.

Ensure that the information, systems and processes which support the strategic HI&T objectives of NHSGGC are successfully scoped, developed and implemented. Requires understanding to re-assess priorities as business objectives change. To manage the successful delivery of developed or procured applications over multiple independent project work streams.

To develop comprehensive plans compliant with standard frameworks applied with NHSGGC. To develop and implement robust and appropriate communications plans for all stakeholders ensuring ownership and maximum take up of new clinical applications, thus ensuring maximum benefits achievement. Monitoring and reporting of programme progress, risk and expectations to the programme steering group. To deliver projects on time, in scope and on budget with the ability to address any implementation 'drift' and 'manage out' any associated risks.

To ensure that the database aspects of developments are in line with current industry and NHS Scotland standards and support Business requirements and needs.

To co-ordinate developments arising from the ACH Programme (including SCI Store & Clinical Portal) & Programme Steering Group (PSG) and provide leadership to working groups as required.

Business analysis, process mapping, re-engineering and re-design of existing and proposed operational environments for clinical and administrative settings. Definition of clinical and professional requirements,

identification and evaluation of technologies to meet service needs**.**

Management of project staff and external vendors and consultants as required, as well as defined budget management for assigned projects.

Definition and implementation of support requirements necessary to sustain the service during and post project go live.

Service Management (25%)

Manages the Acute Directorate's and HI&T Department priorities to support strategic and business objectives.

Manage and deliver the Acute Directorates key applications (PAS systems, clinical and administrative applications) ensuring focus on patient care, business processes and service requirements. Work closely with internal and 3rd Party suppliers, ensuring availability and continuity of applications, systems and services. Ensure active involvement in the contract management process of clinical systems/services to monitor and oversee performance of external supplier support Teams and ensure full integration with IT Applications Team.

To co-ordinate work with third party suppliers involving the implementation of product updates, upgrades and fixes.

Establish and maintain close working relationships with both supplier and Client representatives to ensure that Operational and Service Level Agreements in support of clinical systems/services are formulated, reviewed, reported on and enhanced on an ongoing basis. Responsible for ensuring that SLA's for the Departments key applications are met and managed.

Develop and implement key performance indicators for the measurement of accurate and prompt support of Service Delivery and Management of incidents and requests. Directs effective management of 1500+ support calls per annum assigned to IT Applications Teams, ensuring they are assigned & prioritised appropriately and are progressed to Operational and Service Level Agreements.

Manages delivery of the departments Application Administration & Support Standards, Training Standards and Business Analyst Standards for the NHSGGC Acute Applications Team.

Client Management 25%

Act as a senior point of contact for the escalation of any IT related issues within assigned Directorates. Provide a single point of senior client contact that will co-ordinate the IT Service provision for the nominated Directorate

Obtain working knowledge of processes and systems within Directorate Specialities and analyse and identify how IT can assist in the delivery of improved patient care.

Identify new or changes to IT related requirements arising from new business or clinical developments within Directorates.

Ensure that key Client contacts in Directorates are informed of progress within Board and National HI&T led projects or other developments that impact services.

Identify services levels and availability of support required by the Directorates or Specialities (e.g 24x7 cover) agree associated costs and identify funding or resources to obtain provision.

Maintain close working relationships with client/user representatives to ensure that SLA's (Service Level Agreements) in support of clinical systems/services are formulated, reviewed and enhanced on an ongoing basis and ensure that senior IT staff are updated on developments and continued progress.

Management of Staff (incl HR & Payroll Responsibilities) 10%

Schedule and direct the activities of the IT Applications Teams, directly or via Team Leads, taking account of individual's abilities and the requirements of the organisation.

Ensure all work is carried out and documented in accordance with required and agreed standards, methods and procedures (leading in specific areas of standard or processes as directed by Acute Account Manager).

Motivate staff through the provision of appropriate development opportunities, training and objective setting and maintain a Personal Development Plan for each team member.

Maintain records of attendance, sickness or other absence and leave for team members.

Communicate with HR and Occupational Health advisors to notify them of any staffing issues or to work with Recruitment on any vacancies

Responsible for the recruitment and selection of potential new staff within Teams

6a&b. SYSTEMS AND EQUIPMENT

The post holder would require knowledge of complex data structures with an emphasis on Oracle, Unix and SQL database structures. The post holder will also be required to carry out research into latest IT application innovations ensuring appropriate technology is utilised and will manage and support services and applications within wide range of technical platforms and software environments, including configuration, support and analysis with the following programming languages;

Unix
SQL (incl SQL DBA)
Microsoft.NET
JavaScript
ASP.NET
HTML
Visual Basic
XML
MS Access

The post-holder will also use support monitoring tools and applications for Performance, Availability and Capacity Management.

7. DECISIONS AND JUDGEMENTS

The post holder will establish how local and national eHealth and organisational policies should be applied to the IM&T services to the Acute Directorates and be accountable for their delivery.

This is a senior IT post and the post holder is expected to deputise for Acute Account Manager at meetings or in periods of absence as and when required. The majority of the post holder's activity will be self initiated and proactive in response to meeting objectives of the job with freedom to act/autonomy.

The post holder will work on their own initiative to deliver within agreed timescales the relevant projects. The post holder is expected to anticipate problems and to resolve them. The post holder will plan and supervise the workload and deliverables of all the staff within the teams. The post holder will have the

discretion to identify solutions to both application, service support and process issues.

The post holder requires skills in developing relationships and it is particularly important to work closely with other Senior H&IT Managers, IT Service Delivery Managers, other HI&T staff, clinicians, business managers and project managers.

Key areas of responsibility and agreed priorities and objectives will be agreed with the Acute Account Manager, in keeping with the National e-Health Strategy and NHSGGC's HI&T Strategy.

8. COMMUNICATIONS AND RELATIONSHIPS

The post holder requires highly developed communications and interpersonal skills as they will frequently be in situations where they will provide and receive complex, sensitive and contentious information and have to use these skills to gain agreement from multiple areas on a way forward. Such situations may be highly emotive with major barriers to getting agreement and good relationships will need to be maintained throughout the process. The post holder will be required to execute these key skills in a variety of settings including during presentations to large groups, during meetings and on a one to one basis.

The post holder is required to communicate with;

Other H&IT Department Professional ensuring models of service delivery are achieved, negotiating the release of resources to perform areas of work, allied to this the post holder.

When required, will negotiate with the 3rd Party suppliers ensuring their compliance with the service delivery needs of the HI&T Department and its Clients.

Senior clinical staff to discuss information and data requirements during scoping and development phases of project, and throughout to implementation and sign off.

Acute Directorates Directors, senior managers, Business and Project Managers, both advising and negotiating the use of new and emerging technologies.

Third party software Supplier Account Managers, negotiating changes to software and highlighting discrepancies within the product.

The NHSGGC ICT Programme Office and Programme Steering Group.

Local, regional and national groups such as but not limited to 'Managed Clinical Network' emphasis on Diabetes, Stroke and Heart Disease.

9. PHYSICAL MENTAL AND EMOTIONAL DEMANDS OF THE JOB

The post holder is expected to deliver in line with project plans, unforeseen events can have an adverse effect on how time/resource is managed. As with any non-scheduled support environment, user expectation is of quick fix, which means post holder will re-act to situation. The job requires the juggling of large numbers of complex projects large and small to ensure that priorities are met for the clinical and business services in NHSGGC.

Frequent, intensive concentration when working on highly complex business processes and management information issues. Lengthy periods of concentration are required whilst acknowledging frequent interruptions are an unavoidable element of the role and working environment.

The systems that are supported are key clinical systems and require quick fixes when problems occur this can be extremely pressurised.

The post holder is also required to undertake stressful tasks concerning poor staff performance and disciplinary issues and managing complex interactions with staff's personal circumstances.

Ability to deliver initiative, proactive approaches and subjectivity at times of high demand and pressure, such as major clinical or IT system outage affecting many users and/or many sites, or dealing with staff on emotional or personal issues.

Knowledge that major impact on clinical and medical services can be affected by initiative, decisiveness and promptness of reactions to loss of IT services can create high levels of stress, often requiring explosive effort.

Maintaining and increasing productivity within EU Working Directives and Contracted Hours.

Maintaining knowledge in areas of expertise including managerial, technical, legislative advancements, whilst continuing to carry out day to day activities.

Ability to deal with complexity of integrated Applications and Systems

Requirement to undertake additional out of hours (evening, weekends and holiday) work to minimise disruption to clinical services during IT upgrades, changes etc

Requirement to work in clinical areas where IT services are deployed, which on occasions may be in close proximity to sensitive patient/clinical situations

Regular exposure to confidential/sensitive data, much can be distressing

Inter-site and intra-site mobility, including travelling anywhere as required.

10. MOST CHALLENGING/DIFFICULT PARTS OF THE JOB

Understanding, analysing and interpreting complex problems or information across major clinical and IM&T services and then developing and evaluating options to recommend, agree and deliver a way forward.

Ensuring that the most appropriate solution to any given problem is offered. This is achieved through not only an understanding of the business need but also an understanding of the people who carry out the business, be they Clinicians, Managers or administration staff. The challenge is heightened by the introduction of new technologies.

Being aware of National IM & T developments within the NHS.

Providing service improvements necessary to meet the aspirations of users that have an ever-increasing dependence on continually evolving HI&T services, whilst managing limited available resources

Prioritisation of the IT Applications Team workload to balance effectively the resources required to support strategic projects against those for ongoing support requirement, whilst preserving team dynamics and motivation

Maintaining a working knowledge of the vast number of clinical IT applications

Influencing and directing users to ensure that well informed decisions are made in support of the service.

11. KNOWLEDGE, TRAINING AND EXPERIENCE REQUIRED TO DO THE JOB

Educated to masters degree with a relevant post-graduate standard or equivalent IT professional qualification e.g. British Computer Society or relevant experience

The post holder will have gained a minimum of 5 years practical experience in the analysis, specification, development and implementation of information systems, preferably within a public service environment (although not essential). Both highly developed theoretical and practical experience of database structures gained through achieving a relevant diploma or degree and/or previous practical workplace experience.

Both theoretical and practical experience of application or database structure gained through achieving a relevant diploma or degree and/or practical workplace experience.

Proficient in the role of IT Service Delivery Management with exceptional problem solving abilities. (Preferably qualified in ITIL Service Management - International standard for Best Practice in IT Service Management). ** If candidate does not have this qualification, they will be required to undertake this training in post as a necessary component of their personal development plan**

Experience in project management and knowledge of methodology such as ELMP, Six Sigma or Prince advantageous

Ability to understand the business aspects of information systems and supported applications.

Highly developed knowledge of technical aspects of systems; hardware, database, software and hardware integration environments and associated knowledge of legislation, best practices and procedures surrounding IT.

High level of communication and negotiating skills within complex environment and situations and the ability to diplomatically deal with all levels of users, senior management and clinical staff, allowing post holder to influence decision making.

Organised approach to administration, workloads and prioritisation. Ability to prioritise and meet deadlines in a time constrained environment. Ability to exercise initiative and work independently.

12. JOB DESCRIPTION AGREEMENT

A separate job description will need to be signed off by each jobholder to whom the job description applies.

Job Holder's Signature:	**Date:**
Head of Department Signature:	**Date:**

Role Description

HI&T Programme Manager - New South Glasgow Hospital

Job Title:	HI&T Programme Manager – New South Glasgow Hospital
Directorate:	Health Information & Technology
Reports to:	Head of Applications
Grade:	Secondment, as per current grade (Band 8a) – Based on HI&T Service Delivery Manager Job Description
Last update:	10/09/2012

Context

To support the leadership of the development and implementation of the Board's Acute Services Strategies, specifically the delivery of the New Adult Acute Hospital, New Children's Hospital and New Laboratory Facility (including associated enabling works) on the Southern General Hospital site, ensuring all business cases and capital developments are delivered on time and cost. To underpin this work ensure a focus on health inequalities and patient and public engagement in planning.

The Project Director reports directly to the Board Chief Executive. The Project Director has responsibility to deliver the major capital building programme of modernising Glasgow's Acute and Paediatric Hospitals.

Primary purpose of this role

Lead and deliver the IT Programme to support the New Adult and Children's Hospital, including:

a) Lead, for IT, the procurement, implementation, migration and transition of services to the New Adult and Children's Hospitals.
b) Identifying and delivering associated IT projects and dependencies

Summary of responsibilities

1. Responsible, on behalf of the Senior Responsible Owner (Director of HI&T), for successful implementation of the new IT capabilities to deliver a successful implementation of technology in the New Adult & Children's Hospital.
2. Translating the overarching HI&T strategy into a detailed delivery strategy for the New Adult & Children's Hospital..
3. Ensuring fit with overall HI&T strategy.
4. Leading the development of IT architecture and roadmaps around the programme, deliverables and technology.
5. Ensuring that the IT programme environment, including controls, is established to support each project within it.
6. Delivering at least the following IT projects or workstreams:
    a) Procurement
    b) Infrastructure
    c) 3rd Party Suppliers (Building Management Systems, CCTV)
    d) Clinical Systems Rationalisation
    e) Commissioning
    f) Decommissioning
    g) Health Records Planning
    h) New Technology
    i) Staffing Planning
    j) Telecoms
7. In all work ensuring the effective involvement of the core HI&T organisation in developing all services, and communication within that group
8. Appointing and managing appropriate IT project teams (project managers and resources).

9. Effectively coordinating all the IT projects and their inter-dependencies, and any risks and other issues that may arise.
10. Project managing and/or directing specific constituent projects and activities where required.
11. Representing IT on the overall On the Move Programme.
12. Managing the IT programme budget.
13. Ensuring effective IT relationships with the New South Glasgow Project Team and associated contractors.
14. Contributing to the overall business case
15. Ensuring best value in all work delivered by the IT Programme.

Appendix – General MSP role description for reference – "Programme Manager"

In this case for the IT Programme and all IT activities:

1. Day-to-day management of the specified programme.
2. Being the day-to-day agent on behalf of the SRO, for successful delivery of the new environment capability.
3. Planning and designing the programme and proactively monitoring its overall progress, resolving issues, and initiating corrective action as appropriate.
4. Defining, with the SRO, the programme's governance framework.
5. Effective coordination of the projects and their interdependencies.
6. Managing and resolving any risks and other issues that may arise.
7. Maintaining overall integrity and coherence of the programme, and developing and maintaining the programme environment to support each individual project within it.
8. Managing the programme's budget, monitoring the expenditures and costs against benefits that are realised as the programme progresses.
9. Facilitating the appointment of individuals to the project delivery teams.
10. Ensuring architectural coherence within the programme via design authority alignment (and possible creation).
11. Ensuring that the delivery of new products or services from the projects meets programme requirements and is to the appropriate quality, on time and within budget.
12. Ensuring maximum efficiency in the allocation of resources and skills within the projects dossier.
13. Managing third-party contributions to the programme.
14. Managing the communications with stakeholders.
15. Initiating extra activities and other management interventions wherever gaps in the programme are identified or issues arise.
16. Reporting progress of the programme at regular intervals to the SRO.

NHS GREATER GLASGOW & CLYDE

JOB DESCRIPTION (Ref No: 11702AH)

1. POST DETAILS

TITLE	**ASR Project Manager – New Children's Hospital Project**
GRADE	**Executive Level 8**
REPORTING TO	**Project Director – New South Glasgow Hospitals**

2. JOB PURPOSE

To contribute to the strategic direction of the NHS GG&C by providing project and planning management support; enabling the planning, development and organisation of a varied portfolio of complex activities associated with the development of the new Children's Hospital Project and the wider implementation of the Acute Services Review and the Board's clinical strategy.

3. DIMENSIONS

NHS Greater Glasgow –

Total Population---870,000

Total Budget ---- £1.4 billion

Total Staff (headcount) – 33,000

Annual capital spend -- £70m

ASR Implementation and the new Hospital Building Programme 700 million over a ten-year period

Total Budget for the Children' Hospital £120 million.

Total Staff 2,347 in WTE

New Childrens Hospital

One of the largest children's hospital new build projects within the UK, the project is Treasury funded and is currently estimated at £100 million in capital costs.

The scheme will provide modern purpose-built paediatric inpatient and ambulatory care facilities on a new site to be co-located with obstetric and adult services.

Glasgow currently provides a range of paediatric secondary care and specialist services, including regional and national services. The new Children's Hospital will continue to have a national role in teaching , education and research

NHS Greater Glasgow provides services to a population of 870,000 covering 6 local authority areas, i.e. the City of Glasgow, East Dunbartonshire, West Dunbartonshire, South Lanarkshire, East Renfrewshire and North Lanarkshire. As a provider of regional services to a the West of Scotland population of circa 2.5 million and as a provider of national paediatric services to a Scotland wide population of circa 5.million.

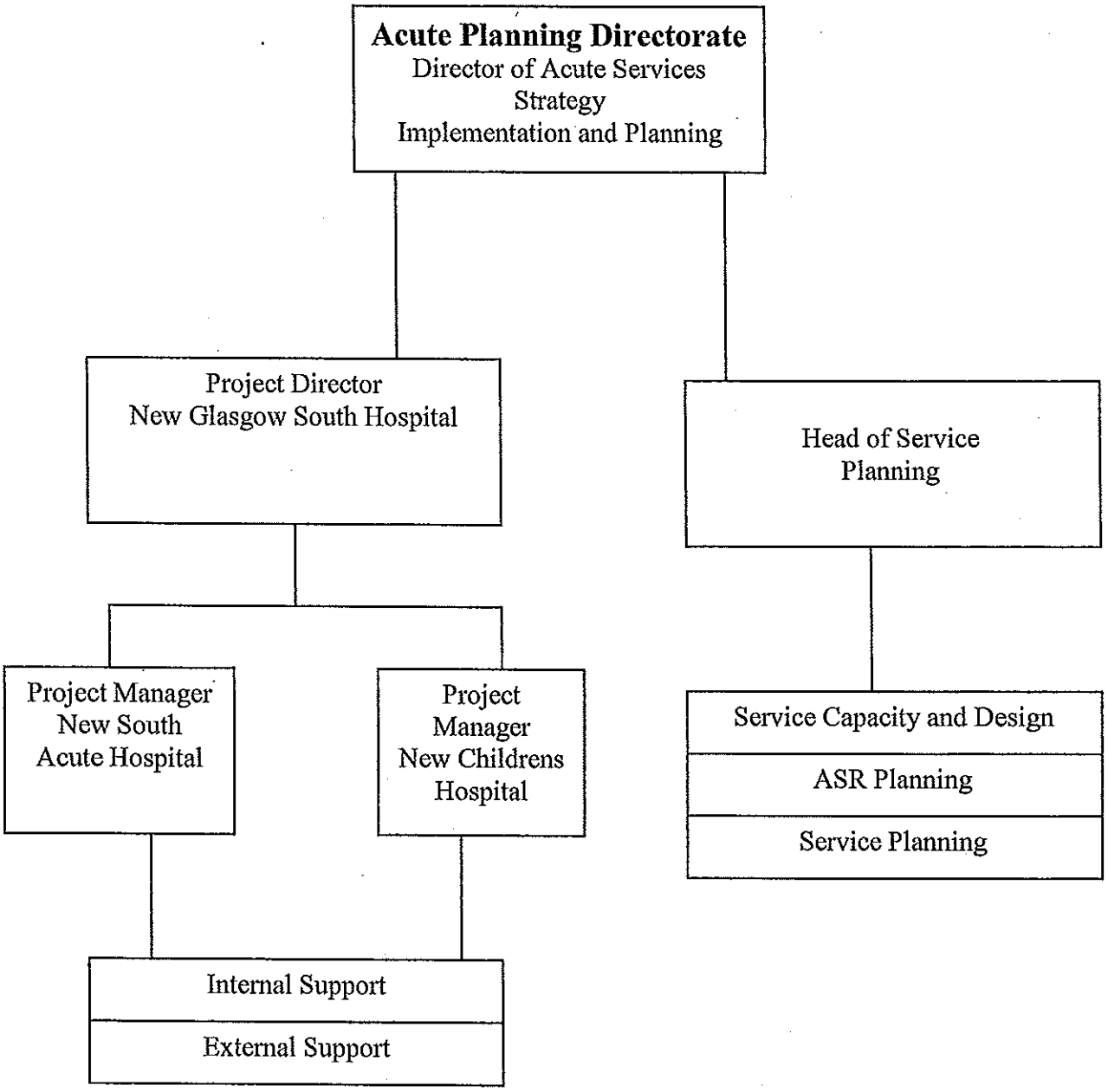
Glasgow has areas of great social need, deprivation and also an increasing diversity of ethnic minority groups. NHS Greater Glasgow & Clyde and its partners have seen improvements in these areas but there is still much work to be done to improve and development existing services and to provide high quality facilities.

There are 5 major teaching hospital sites providing teaching and research facilities for medical, nursing and the allied health professions. There are partnership arrangements with 3 Universities.

There is a major capital building programme of £700m over the next 10 years to modernise Glasgow's Acute Hospitals. This programme comprises four phases of developments. These are:

- Phase 1 includes the new West of Scotland Cancer Centre at Gartnavel, and Ambulatory Care Hospitals at Stobhill and the Victoria Infirmary sites
- Phase 2 the new South Glasgow Acute Hospital on the SGH site alongside the new Children's Hospital
- Phase 3 the new 450 bed ward block completing the redevelopment of Glasgow Royal Infirmary
- Phase 4 the Redevelopment of the Gartnavel General Hospital

4. ORGANISATION



5. ROLE OF THE DEPARTMENT

The department has three prime functions:

1. To provide robust planning and project management input to support the implementation of the Acute Services Review including the following major capital build projects:

    - The new South Glasgow Hospital
    - The new Children's Hospital
    - The Redevelopment of GRI
    - The Redevelopment of GGH

2. To provide an integrated acute service planning function covering the following services:

    - Emergency Care & Medical Specialties
    - Surgery & Anaesthetics
    - Regional Services including Cancer
    - Women, Children (Acute only) and Maternity Services
    - Diagnostics
    - MCNs (CHD, Cancer, Diabetes)
    - Chronic Disease)
    - GPAT

3. To ensure that all planning activities are connected and coherent. This will require joined up planning processes bringing together planning staff and activities from across GGNHS.

6. KEY RESULT AREAS

The Post holder will: -

a) Work within the New South Glasgow Hospitals Project Team to prepare a sustainable Outline Business Case for submission to the ASR Programme Board and Scottish Executive Health Department, which supports capital investment in the development of the New Children's Hospital.

b) Coordinate the input of capital and estates, finance and a range of other services, into the drafting of the OBC.

c) Lead and coordinate all activities required to fulfil all elements of procurement after the completion of the OBC.

d) Report progress to Acute Services Review Board and Project Executive Group on a regular basis.

e) Set up and maintain appropriate structures to lead, manage and coordinate a development and implementation programme to design, procure, construct and commission the New Childrens Hospital.

f) Manage agreed financial parameters relating to the project.

g) Provide adequate liaison with Glasgow City Planning Department to conclude all planning activities for the New Childrens Hospital.

h) Manage a small multi-disciplinary team to progress agreed project plans to develop, construct and commission the New Childrens Hospital.

i) Provide service planning support, to a range of ASR developments including the formulation of detailed plans related to accelerating elements of the final clinical configuration of services and specialties.

j) Work collaboratively with the Directorate for Women's and Children's Services, Senior Managers and other strategic partners to agree and coordinate the implementation of project plans.

k) Work with the Project's Medical Director and the Clinical Reference Group to develop a high level clinical vision for the new hospital and the detailed clinical models of care and the development of detailed transition plans to ensure they are delivered.

l) Deliver the detailed service planning work which reflects the whole hospital model, the main clinical pathways and the bed modelling and capacity planning work for each service and specialty.

m) Coordinate the formulation of the clinical output specifications including the whole hospital model, clinical adjacencies and aggregations, and departmental clinical operational policies.

n) Work with the Director of Facilities Management to develop the non-clinical output specifications for the new hospital.

o) Provide project management support to the Project Executive, the Clinical Reference Group and the various Working Groups, which form part of the project structure.

p) Liase with the Community Engagement Team to contribute to the development of effective communication consultation and user involvement strategies that ensure that at all stages of project planning and delivery, the patient and public views are taken into account.

q) Liaise with the ASR Capital Team on all aspects estates, physical and capital planning.

r) Work with the ASR Finance Team in the development of the South Glasgow Business Case and other associated business case / development proposals.

s) Ensure that comprehensive filing systems are established and maintained for all project documentation in line with the defined project methodology.

7. ASSIGNMENT AND REVIEW OF WORK

The post holder is accountable to the Project Director – New South Glasgow Hospitals, for leading/driving planning and project management processes and groups in identified areas of responsibility within the parameters of national and local priorities and will work with a high degree of autonomy within this framework.

Review of performance is undertaken through the agreement of performance objectives and individual performance appraisal by the Project Director – New South Glasgow Hospitals, reviewed by the Director of Acute Services Strategy Implementation & Planning.

Formal appraisal is annual but informal reviews will be ongoing and will take place between the post holder and the Head of Service Planning.

8. COMMUNICATIONS AND WORKING RELATIONSHIPS

The post holder will develop working relationships and communicate regularly with a wide range of individuals, clinical and non-clinical, internal and external to NHS Greater Glasgow & Clyde. These will include:

Internal: -

Members of the NHS Board Directors, Senior Managers and other relevant staff within the Acute Operating Division and CHPs
Senior Clinical and non-Clinical Staff
Staff Partners
Community Engagement Team

External: -

The PFI Unit within the SE and the DOH
Technical Advisers, Medical Planners, Legal Advisors
Local Authority Partners
Senior Staff in neighbouring NHS Boards
SEHD
Politicians at local and national level
Members of the public
Press/Media
National representatives of trade unions/professional organisations
Voluntary organisations

9. MOST CHALLENGING PART OF THE JOB

Establish robust project management working arrangements for the Children's Hospital Project and coordinate a wide range of inputs in the development and delivery of the work programme.

Working effectively with a wide range of key stakeholders.

Ensure that the planning and management of the project reflects and is sensitive to, the high degree of political and public interest in this development.

Maintain highly effective work relationships across NHSGG&C and Partner organisations.

Maintaining a high level knowledge of effective models of delivery in paediatric health care and persuading others of the benefits of changing existing clinical practice.

Ensuring the arrangements are put in place to ensure that clinical transition plans are put in place and taken forward as the project moves from planning, through procurement to construction and commissioning.

10. QUALIFICATIONS AND/OR EXPERIENCE SPECIFIED FOR THE POST BY THE EMPLOYING AUTHORITY

Educated to degree level or equivalent. Post-graduate or equivalent qualification desirable.

A minimum of 5 years general and project management experience within the public sector or private sector organisation and with a high level of interpersonal, strategic and technical skills.

NHS GREATER GLASGOW & CLYDE - ACUTE SERVICE DIVISION
SUMMARY OF CORE COMPETENCIES REQUIRED FOR THE POSTS APPLIED FOR

Core Competency	Example Performances Criteria/related behaviours
Strategic Focus	Sets longer term plans and develops contingencies Understands eternal environment and how to interpret the implications of findings Translates broad strategies into specific objectives and action plans: aligns processes and systems to support strategic priorities
Flexibility/Champions Change/Demonstrates Initiative/Creativity	A flexible and adaptable approach is demonstrated in the workplace Demonstrates a positive acceptance of, or adjustment to, change Proven ability to move to new roles, seeking new improved ways of working or continuous improvement Champions new initiatives and service redesigns: Stimulates others to develop innovative ideas and improvements: Prepares others to understand and accept change. Challenges the status quo Innovative approach seeking new or alternative methods for service delivery Demonstrates a creative approach to problem solving. Is proactive, utilising intelligence to support proposals An enabler
Understanding and operating in the political environment	Is aware of relevant National and Local initaitives, imperatives and factors influencing local health service provision Understands current power and political relationships and the way in which these may affect proposals Has a sound understanding of influencing and decision making protocols across all stakeholders and elected bodies
Influencing and Negotiating Collaborative/Partnership approach	Promote ideas and proposals persuasively: Provides compelling rationales Shapes stakeholder opinions: negotiates win/win solutions Builds a broad base of support among key decision makers and influencers Promote collaboration and team across organisation boundaries Overcomes any barriers and builds consensus Creates on open, team environment where differences can be discussed constructively: Cultivates an active network of relationships inside and outside the organisation.
Core Competency	Example Performances Criteria/related behaviours

Accountability/ achieving Results/Impartially	Key accountabilities, judgement and decisions are accepted and acted upon Sets and pursues appropriate goals Is committed to achieving results and demonstrates a strong commitment to organisational success A balanced view of conflicting perspectives is established A response to conflicting perspectives is developed which is consistent with agreed polices Important issues in a complex situation are identified
Resilience	Demonstrates resilience to continuous/concurrent change Manages set backs positively and is able to deliver difficult messages Makes hard decisions
Professional Growth	Areas of strength are identified through reflection and are applied to achieve organisational goals. Areas for development are identified through reflection and appropriate development strategies are pursued to improve performance. The reflective process is used to monitor self in relation to the application of ethical practices across all facets of work Constructive feedback is sought an acted upon to improve professional performance A high level of skill in analysis, conceptual thinking. integration of ideas, abstract thinking, and creativity is demonstrated by self and valued in others

ASB

NHS
Greater Glasgow and Clyde

NHS GREATER GLASGOW AND CLYDE

1. JOB IDENTIFICATION	
Job Title:	**Senior Nurse Adviser - Acute Services Hospital's (1WTE) 2 years secondment**
Responsible to: **Department(s):** **Directorate:** **Job Holders:**	**Project Director**
Job Reference number (coded):	

2. JOB PURPOSE

The Nurse Adviser provides expert professional advice in relation to all service redesign, planning and implementation aspects associated with the New South Glasgow Hospital and New Children's Hospital Project.

As a key member of the Project Team, they will:

- build key internal and external stakeholder networks to achieve key project objectives
- be responsible for ensuring there is user involvement in the Project
- challenge and lead the drive for modernisation of clinical services by encouraging innovation, identifying new ideas and practices and use of new technology
- Work with the Acute Nurse Director in providing expert Nursing advice and significantly contributing to the identification of a nursing workforce for the new hospitals
- identify changes in roles and skill mix and identify training requirements in taking forward the new ways of working

3. DIMENSIONS

NHS Greater Glasgow and Clyde Health Board has 44,000 staff serving a total population of 1.2 million people with a total budget of £2.6 billion.

Glasgow currently provides a range of acute inpatient care and specialist services, including regional and national services. The new South Glasgow Hospital will continue to have a national role in teaching, education and research. There are partnership arrangements with 4 Universities.

There is a major capital building programme of £1b over the next 8 years to modernise Glasgow's Acute Hospitals. This programme comprises four phases of developments. These are:

- Phase 1 - includes the new West of Scotland Cancer Centre at Gartnavel, and Ambulatory Care Hospitals at Stobhill and the Victoria Infirmary sites
- Phase 2 - the New South Glasgow Acute Hospital on the SGH site alongside the New Children's Hospital and New Labs build, on the Southern Campus
- Phase 3 - the redevelopment of Glasgow Royal Infirmary
- Phase 4 - the Redevelopment of the Gartnavel General Hospital

New South Glasgow Hospital (Adult)

The New South Glasgow Hospital will be one of the largest new hospital projects within the UK and will include 1,100 new inpatient beds, 20 theatres, clinical support facilities for medical and surgical specialties and a new Emergency Medical Complex with an Emergency Department capable of attending 110,000 patients per annum. The New South Glasgow Hospital will house inpatient services which are currently located at the Victoria Infirmary. This will allow the Victoria Infirmary to close, as the outpatient and day case activity will have already transferred to the New Victoria Hospital, opening in 2009. There will be a transfer of some smaller specialty services (Renal, ENT and Vascular Surgery) from the Glasgow Royal to the Southern site to allow centralisation. There will also be a number of services associated with the reduction in A&E departments transferring from the Western Infirmary to the Southern campus.

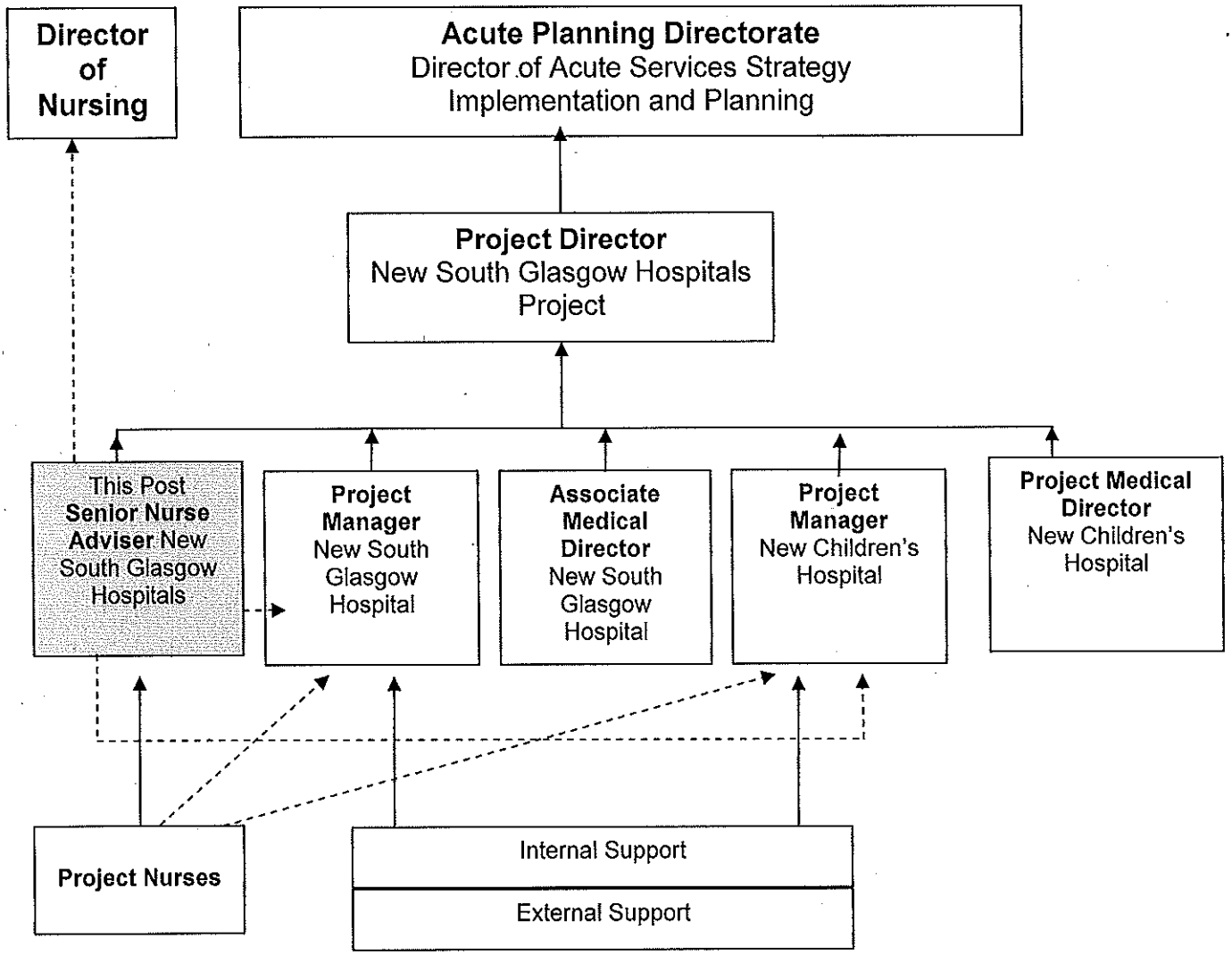
New Children's Hospital

In addition to the New South Glasgow hospital there will be a new 240 bedded Children's Hospital development located on the Southern General site. The proximity to the New South Glasgow Hospital will provide the triple co-location of paediatric, maternity and adult services. The Children's Hospital will provide a large number of specialist services to the West of Scotland and the wider population of Scotland in addition to the full range of secondary care services to people of Greater Glasgow and Clyde. Specialist services include: cardiology and cardiac surgery, renal and bone marrow transplantation. For a number of these specialised services, the Children's Hospital is recognised as the sole provider in Scotland.

New Laboratory Facility

There are plans for a new laboratory build on the Southern Campus which will physically link into the new adult and children's hospitals. The new facility will house haematology, biochemistry and mortuary services.

4. ORGANISATIONAL POSITION



5. ROLE OF DEPARTMENT

To lead the development and implementation of the Board's Acute Services Strategies and Capital Plan, ensuring all business cases and capital developments are delivered on time, and ensure the associated project management arrangements deliver to the agreed timetable. To underpin this work ensure a focus on health inequalities and patient and public engagement in planning.

The Project Director reports directly to the Director of Acute Services Strategy, Implementation & Planning. The Project Director has responsibility to deliver the major capital building programme of modernising Glasgow's Acute and Paediatric Hospitals the main components of which are:

- The New South Glasgow Hospital
- The New Children's Hospital
- The New Laboratories Development at South Glasgow Campus
- The Redevelopment of GRI

6. MAIN DUTIES/RESPONSIBILITIES

The post holder will:

- Provide expert clinical nursing input into the design and development of the New South Glasgow Hospital and New Children's Hospital drawing on their previous experience of redesigning clinical services and systems, and their specialist knowledge of new effective clinical service models, best practice and standards.

- Establish and oversee structures and processes that:-
  - ensure wide nursing engagement and support
  - ensure relevant technical nursing expertise and staff input into key planning decisions
  - Drive and support all necessary service redesign activities
  - maintain effective links with all clinical disciplines (Nursing, Medical, AHP)
  - ensure clinical advisory processes are aligned with the planning timelines

- Working with the Director of Nursing, responsible for planning the nursing provision for the new hospitals' Nursing Service, taking into account changes that may impact on this and amending the plan accordingly

- Work with Directorates, Planning Managers and Project Managers to drive forward the modernisation of clinical services for the New Adult and Children's Hospitals. This will involve working with numerous (over 60) clinical multi-disciplinary and other stakeholders encouraging new innovative clinical models of care across a wide range of specialties challenging the status quo and providing problem solving skills in driving forward change. It will also involve the post holder in organising and facilitating workshops, group sessions and seminars with users to develop the plans for the new Hospitals.
- In influencing and negotiating with clinical users in developing new innovative service models the post holder must be able to promote and advise on up-to-date best practice regarding clinical service delivery. It will therefore be important that the post holder continuously updates their knowledge into new, effective clinical practices around the UK and internationally.

- The post holder will devise and direct research projects to ensure the adoption of the most modern techniques and best practice in the future Acute Services, based on sound empirical evidence of

successful clinical outcomes. Research activities are a significant feature of the role as a number of research projects will be running concurrently throughout the project lifespan.

- With other members of the Project Team and in liaison with Clinical User Groups, Directors and Planning Managers input into the production of Clinical Output Specifications for each part of the clinical service for the New Hospitals. This will entail negotiating and agreeing with users issues in respect of how services will be provided, space utilisation, the impact of new treatment techniques and technologies, issue of access, circulation and adjacencies to other areas, services and departments.

- To develop policies and procedures required as part of the project or related service developments and implement these for the Nursing service

- Use negotiation, influencing and challenging skills to ensure that the agreed clinical requirements of the Units and Departments are reflected in the tender documentation and ultimate design of the New Hospitals while ensuring that the project remains within set affordability parameters. This will involve a significantly input into the design of the New Hospitals in terms of patient facilities and pathways and particularly where there is potential for an impact on nursing e.g. ward design and layout and use of technology. It will also involve reviewing the detailed designs of contractors identifying where there may be discrepancies between the layout and the clinical functionality/specification/requirements.

- The post holder will be responsible for the line management of nursing staff seconded to the project, including recruitment selection, discipline and grievance matters, attendance management, allocation of work and determining the workloads of the relevant project work streams.

- Responsible and accountable for authorising expenditure within an allocated budget.

- Act as a liaison point between the Project team /Technical Advisers (TA) and the users over queries and assist in helping the project team in understanding the needs of the users.

- Work with Project Manager to help the users to work with the bidders and interpret their (bidders) requirements.

- Provide clinical advice and support to other members of the project team and TA regarding how design, equipment and other issues may impact upon clinical practice and manpower.

- Work with staff to understand the implications of the new service models and give support and input for users to express these as operational policies.

- Work with users to drive through change, implement as much of the new service models as possible in the current physical environment in preparation for the transfer into the new hospitals.

- Work with the Director of Nursing in significantly contributing to the identification of a nursing workforce for the New Adult and Children's Hospitals that is agreed by the Acute Directors, reflects the models of care and is clinically acceptable whilst ensuring that the affordability parameters are managed within the defined corporate budget. The workforce planning for the New South Glasgow Hospital will include new services/departments such as Emergency Medical Complex and the Medical High Dependency Unit.

- Identify issues of changing clinical roles and skill-mix and training and development needs of the nursing staff to facilitate the implementation of the agreed models of care and liaise with training department / college / University to put into place training required

- Provide expert clinical nursing advice and input to the project planning team and all relevant planning processes/committees including the Health Board and Scottish Government and the various groups which form the Governance Structure for stage 2 of the project.

- Provide nursing support for community, public and voluntary sector engagement activities where necessary. This will include delivering presentations and participating in meetings which may be politically sensitive and contentious in nature.

- The post holder will be responsible for keeping a comprehensive audit trail of their work and participating in external and internal audits e.g. Gateway Review.

- The post will involve working closely with a range of people in delivering the New Hospitals, these include other members of the Project Team and the Associate Medical Director for the Project (Adult Hospital, new post), Project Medical Director (Children's Hospital), the Planning Team, Directorates and Users.

- The post holder, while accountable to the Project Director, will report to the respective Project Managers regarding all aspects of the New South Glasgow Hospital and New Children's Hospital respectively.

- The post holder will attend the regular Heads of Nursing meetings chaired by the Director of Nursing in order to formally update Heads of Nursing/Head of Midwifery

7. DECISIONS AND JUDGEMENTS

The post holder will:

- Have a high level of autonomy in a self directed way, but within agreed objectives set by the Project Director.

- Be responsible for driving forward the development of new systems and ways of working for all of the clinical services which will transfer to the New Hospitals, as stated this will involve leading, encouraging and motivating numerous separate user groups. In more detail the post holder will have the ability to stimulate change by energising and supporting users in developing new relationships and ways of working, sensitively handle resistance to change and new ideas, be able to challenge in an informed non-threatening way the traditional boundaries and ways of doing things. Find creative solutions to complex problems and initiate new ideas. It should be noted that one of the key skills of the post holder will be the ability to draw upon specialist technical clinical knowledge in assessing user needs and requirements and offering challenge.

- In driving forward the redesign the post holder will be required to utilise a range of analytical skills and draw on previous clinical management experience in analysing performance, and undertaking evidence based benchmarking. In some situations, there will be incomplete information sets as the project plan develops. In these circumstances, the Nurse Adviser must make decisions based on their assessment of the situation, taking all available factors into account, particularly on those occasions when information is not readily available or where conflicting views exist.

- The post holder must have a good knowledge of the project budget and timescale and be able to analyse the impact on cost and time of any change requested by the users. It should be noted that the impact of a change will vary depending upon the stage of the project.

- The post holder must be able to interpret the impact of national policies and standards e.g. must ensure current standards are incorporated into the developing service models and must also be able to advise upon the impact of any new national policies in terms of cost and delay to the project.

- Responsible for providing regular reports for a range of audiences is a significant feature of this role. The Nurse Adviser will be required to present complex information from these reports to a multi-disciplinary audience and be able to deal with any questions, issues and differing points of view within this context.

8. COMMUNICATIONS AND RELATIONSHIPS

The post holder will develop working relationships and communicate regularly with a wide range of individuals, clinical and non-clinical, internal and external to NHS Greater Glasgow and Clyde. These will include:

Internal
Director of Nursing and all levels of nurse management levels and service users. Members of Acute Directorates, Directors, Senior Managers and other relevant staff within Acute Operating Division and CHPs.
Staff Partners
Community Engagement Team
Head of Practice Development

External
External Advisers, technical, legal, financial
Other Health Boards
Other Organisations such as National Services Scotland, Quality Improvement Scotland, NES, NHS 24
Local Authority Partners
Universities and other higher education institutions
Voluntary Organisations
Scottish Government
Member of the Public
National Representatives of Trade Unions/Professional Organisations

- The post holder will facilitate effective interactions between planning team members and nursing community and will work with the rest of the project team to promote and publicise the New Hospitals project briefing and educating users on the New Hospitals process and timescales to enable a smooth seamless flow in the programme.

- The post holder will be expected to present information about the project to varying audiences at seminars, meetings and conferences involving, in some cases politically sensitive or contentious information with the need to respond to assertive styles of questioning from, for example, local active community groups. In other cases presentations may involve large groups of people e.g. international conferences with responses required to questions of a clinical nature requiring the post holder to draw upon their technical knowledge and experience.

9. PHYSICAL, MENTAL AND EMOTIONAL DEMANDS OF THE JOB

The post holder must be able to:

- concentrate for sustained periods to find creative solutions to complex problems and write detailed reports while dealing with frequent interruptions necessitating immediate response to questions or issues.
- prioritise competing tasks in an unpredictable workload.
- negotiate with clinical teams where necessary challenging assumptions and the norms to ensure that the procured solution meets clinical requirements within the project affordability.
- Managing user expectations and imparting unwelcome news where users' requests cannot be matched by actual need, value for money, project budget or where there are competing/conflicting requests between specialties. This will require exercising judgment and advising on actual need (verses request), priorities of need in the case of competing requests and negotiating with users to re-align expectations with achievable deliverables.
- The role requires frequent travel between various sites to attend meetings, presentations, project group activities

10. MOST CHALLENGING/DIFFICULT PARTS OF THE JOB

- Working effectively with a wide range of key stakeholders ensuring robust Stakeholder and User input into the New Hospitals Project and to achieve a consensus view from all parties.
- Openness to new ideas and being prepared to challenge and encourage users to be innovative in developing their plans for the new hospital.
- Maintaining a high level of knowledge of effective models of delivery in acute care. Build and maintain highly effective work relationships across NHSGG and Partner organisations.
- Capacity to interact effectively and productively with the wide clinical community.
- Objectivity and resilience in respect of competing and aspirational expectations.
- Working with deadlines and under pressure and to extend working day to accommodate users. The critical deadlines in this project are time and cost.
- Ability to co-operate effectively with a range of processes and colleagues involved in the managerial, planning and design elements of the project to develop outputs for design and operation of the New South Hospitals.
- Ensuring that the planning and management of the project reflects and is sensitive to, the high degree of political and public interest in this development this includes informing/responding to MSP's and Ministers, presenting to local interested groups/public and managing press and media enquiries.

11. KNOWLEDGE, TRAINING AND EXPERIENCE REQUIRED TO DO THE JOB

- First level registered nurse with post-registration qualification, and either degree/MBA or equivalent in-depth experience.
- Substantial professional nursing experience with a minimum of 7 years at senior management level (i.e. Head of Nursing / Assistant Director of Nursing level, or equivalent).
- Track record of achievement and high level of professional accountability.
- Evidence of developing new systems, policies and ways of working and change management.
- Ability to influence and liaise across a wide range of staff and specialties.
- Excellent interpersonal and problem solving skills.
- Evidence of experience in undertaking analysis and interpretation of complex problems, developing options and undertaking option appraisal identifying the optimum solution.
- Experience in risk management and quality planning (setting standards) working in a politically sensitive environment with multi-agency stakeholders.
- Experience in leading or involvement in continuous improvement programme and an understanding of the functioning of Quality Improvement Scotland.
- Well developed IT and key board skills is essential.
- Up–to-date knowledge of innovative practices and service models around the UK and beyond and sound understanding of local and national healthcare policies, standards and priorities and an understanding of how technology can assist in quality improvement.
- An effective communicator with experience in negotiating and influencing at a senior level with ability to work flexibly within a large multi-disciplinary team.

12. JOB DESCRIPTION AGREEMENT

A separate job description will need to be signed off by each jobholder to whom the job description applies.

Job Holder's Signature:	**Date:**
Head of Department Signature:	**Date:**

JOB DESCRIPTION APPENDIX – ADDITIONAL ROLES AND RESPONSIBILITIES

Please use this form to describe any additional roles or responsibilities currently fulfilled by a jobholder that are not an integral part of the person's substantive job (e.g. Radiation Protection Supervisor, "Link Practitioner" etc)

1. TITLE OF JOBHOLDER'S SUBSTANTIVE POST:	
2. DEPARTMENT:	
3. DESCRIPTION OF ADDITIONAL ROLE/RESPONSIBILITY:	
4. AGREEMENT OF ABOVE DESCRIPTION **Job Holder's Signature:** **Head of Department Signature:**	 **Date:** **Date:**

NHS GREATER GLASGOW & CLYDE

1. JOB IDENTIFICATION	
Job Title:	**Clinical Medical Advisor – New Children's Hospital New South Glasgow Hospitals Project (0.2 WTE)**
Responsible to:	**Project Director New South Glasgow Hospitals**
Department(s):	
Directorate:	**Acute Services Strategy Implementation & Planning**
Job Holders:	
Job Reference Number (coded):	

2. JOB PURPOSE

To provide the clinical leadership in taking forward the New South Glasgow Hospitals, act as a key member of the New South Hospital Project and the Women & Children's Directorate Teams, provide challenge and drive through the modernisation of the clinical services, encouraging innovation, new ideas and new practices and use of new technologies.

Through clinical leadership and personal initiative to engage with clinical teams across the range of services provided by the Royal Hospital for Sick children to ensure that the design for the New Children's Hospital supports best clinical practice for the future.

3. DIMENSIONS

There is a major capital building programme over the next 10 years to modernise Glasgow's Acute Hospitals. This programme comprises four phases of developments. These are:

- Phase 1 - includes the new West of Scotland Cancer Centre at Gartnavel, and Ambulatory Care Hospitals at Stobhill and the Victoria Infirmary sites
- Phase 2 - the New South Glasgow Hospital on the SGH site comprising the New Children's Hospital, the new Adult Hospital and New Labs build
- Phase 3 - the redevelopment of Glasgow Royal Infirmary
- Phase 4 - the Redevelopment of the Gartnavel General Hospital

As described the New Children's Hospital is part of the second phase of the ASR Strategy.

The RHSC currently provides a range of acute inpatient care and specialist services, including regional and national services. The new Children's Hospital will continue to have a national role in teaching, education and research.

New Children's Hospital

The new 256 bedded Children's Hospital development located on the Southern General site will be built alongside the new Acute adult hospital. The proximity to the New South Glasgow Hospital will provide the triple co-location of paediatric, maternity and adult services. The Children's Hospital will provide a large number of specialist services to the West of Scotland and the wider population of Scotland in addition to the full range of secondary care services to people of Greater Glasgow and Clyde. Specialist services include: cardiology and cardiac surgery, renal and bone marrow transplantation. For a number of these specialised services, the Children's Hospital is recognised as the sole provider in Scotland.

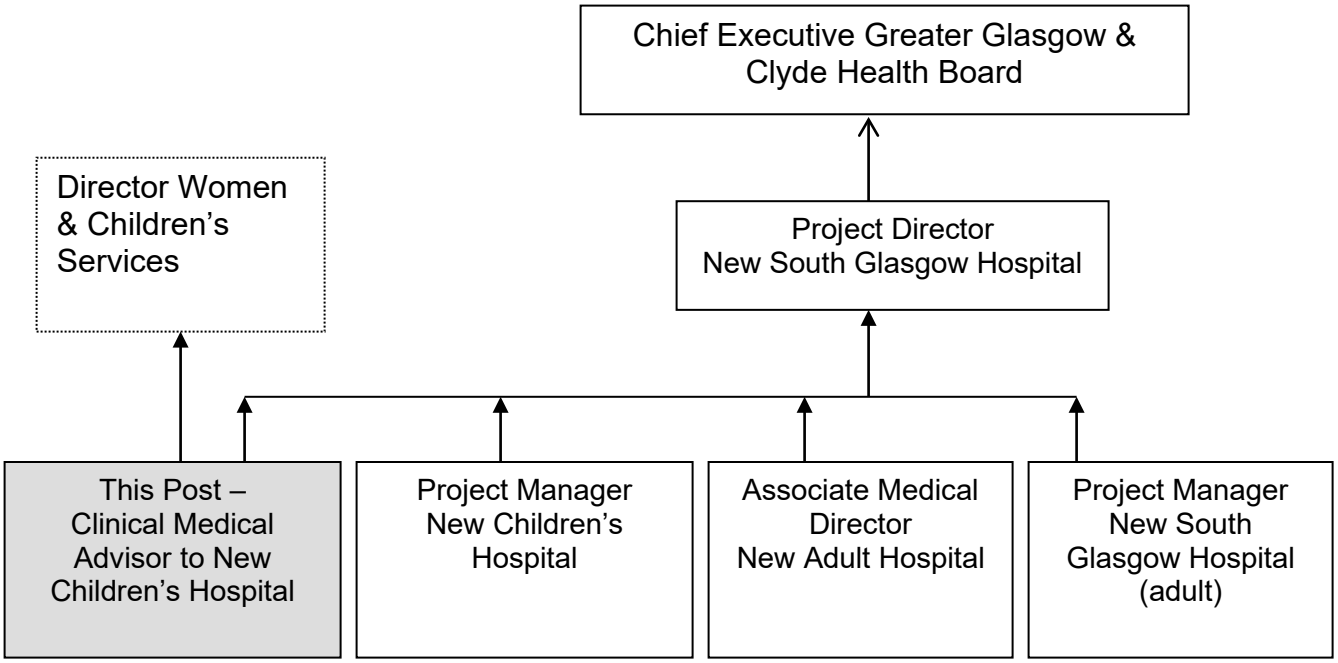
New South Glasgow Hospital (Adult)

The New South Glasgow Hospital will be one of the largest new hospital projects within the UK and will include 1,100 new inpatient beds, 20 theatres, clinical support facilities for medical and surgical specialties and a new Emergency Medical Complex with an Emergency Department capable of attending 110,000 patients per annum. The New South Glasgow Hospital will house inpatient services which are currently located at the Victoria Infirmary. This will allow the Victoria Infirmary to close, as the outpatient and day case activity has already transferred to the New Victoria Hospital. There will be a transfer of some smaller specialty services (Renal, ENT and Vascular Surgery) from the Glasgow Royal to the Southern site to allow centralisation. There will also be a number of services associated with the reduction in A&E departments transferring from the Western Infirmary to the Southern campus.

New Laboratory Facility

The new laboratory build on the Southern Campus, which is under construction, will physically link into the new adult and children's hospitals. The new facility will house haematology, biochemistry and mortuary services.

4. ORGANISATION POSITION



5. ROLE OF THE DEPARTMENT

The department has three prime functions:

1. To provide robust planning and project management input to support the implementation of the Acute Services Review including the following major capital build projects:

    - The new South Glasgow Hospital
    - The new Children's Hospital
    - The New Laboratory Build
    - The Redevelopment of GRI
    - The Redevelopment of GGH

2. To provide an integrated acute service planning function covering the following services:

    - Emergency Care & Medical Specialties
    - Surgery & Anaesthetics
    - Regional Services including Cancer
    - Women, Children (Acute only) and Maternity Services
    - Diagnostics
    - MCNs (CHD, Cancer, Diabetes)
    - Chronic Disease
    - GPAT

3. To ensure that all planning activities are connected and coherent. This will require joined up planning processes bringing together planning staff and activities from across GG&CNHS.

6. MAIN DUTIES/RESPONSIBILITIES

The post holder will: -

- Drive forward the modernisation of services, encourage innovation, new practices and use of technologies. Provide challenge, problem solving and change management advice and skills to clinical users in developing new clinical models. This will involve the post holder drawing on their specialist knowledge of new effective service models, best practice and standards.

- Establish and oversee structures and processes that

    - ensure wide clinical engagement and support
    - ensure relevant clinical input into all key planning decisions
    - prompt and support all necessary service redesign activities
    - maintain effective links with all clinical disciplines (Medical, Nursing, AHP)
    - ensure clinical advisory processes are aligned with the planning timelines

- Act as project "champion" within the clinical community.

- Facilitate effective interactions between Project Team / Technical Team, the Directorate Team and the clinical community resolving queries and helping the project team in understanding the needs of users.

- Provide clinical advice and input to the project planning team and all relevant planning processes/committees etc.

- Provide clinical advice to the various groups which form the Governance Structure for the project, the Health Board and Scottish Government.

- Ensure the project is informed by best practice guidance regarding clinical service delivery.

- Provide clinical support for community, public and voluntary sector engagement activities.
- Input into work led by the Medical Director (children's) around medical workforce planning for the New Children's Hospital ensuring that the manpower planning reflects the models of care, has clinical buy in whilst meeting the affordability parameters of the corporate budget. The work force planning for the South Glasgow Hospitasl will include identifying issues of changing clinical roles, skill mix and training and new services/departments.
- Collaborate with and support the work of the NCH Project Manager
- Lead or participate in specific committees or working groups relating to the design, redesign or development of services for the New Children's Hospital
- In collaboration with the NCH Project Manager ensure that the ongoing design of the New Children's Hospital and the development is appropriately informed by relevant examples of best practice in the design of children's hospitals elsewhere in the UK and beyond
- Assist in the communication of information about the Project and its progress to staff and support the work of the NHSGGC Communications Team in their activities in respect of the New Children's Hospital
- As required provide clinical advice to work undertaken in parallel with the Project to agree the provision of educational and academic facilities on the South Glasgow site.

7. MOST CHALLENGING/DIFFICULT PARTS OF THE JOB

Work effectively, with a wide range of key stakeholders, ensuring robust Stakeholder and User input into the New Children's Hospital Project.

Openness to new ideas and being prepared to challenge and encourage users to be innovative in developing their plans for the new hospital and maintaining a high level of knowledge of effective models of delivery in acute care.

To work to deadlines and under pressure.

Ensure that the planning and management of the project reflects and is sensitive to, the high degree of political and public interest in this development.

Maintain highly effective work relationships across NHSGG and Partner organisations.

The capacity to interact effectively, and productively, with the wide clinical community.

To be objective and resilient in respect of competing, and aspirational, clinical expectations.

Working with deadlines and under pressure.

Ability to co-operate effectively with a range of processes and colleagues involved in the managerial, planning and design elements of the project.

the

isal

by the Project Director. Formal appraisal is annual but informal reviews will take place at regular intervals.

HOSPITALS CONSTRUCTION PROGRESS MEETING: No 31

Notes from meeting held on 9th December 2013 at 3.30pm in the Boardroom, Top Floor

Action Note

Present:	Peter Moir (PM)	Alan Keeley (AK)	Alasdair Fernie (AFe)	Andrew Bebbington (AB)
David Hall (DH)	Douglas Wilson (DW)	Darren Pike (DP)	Frances Wrath (FW)	Gavin Burnett (GB)
Hugh McDerment (HMc)	Jim Murray (JMu)	John Redmond (JR)	Willie Roxburgh (WR)	Shiona Frew (SF)
Apologies:	Graeme Thomson (GT)	Grant Wallace (GW)	Derek McFarlane (DMF)	Darren Smith (DS)
Jeff Murdoch (JM)	John Ballantyne (JB)	John Wales (JW)		

Item No	Item	Discussion / Information	Action	Action by whom
1.	Action Note from Previous meeting	Accepted as an accurate record subject.	-	-
2.	Matters Arising			
	NCH Column Finishes	PM noted that the children's hospital samples had been approved. It was noted that BMCL will need to check when strip down the scaffolding that the double height columns are as straight as can be. A mark-up indicating the columns which BMCL propose to have an alternate column finish within the adult hospital will be provided to the NHS for sign-off in due course.	Item closed	-
	VIE Drawings	DH noted that the VIE drawings had been returned back to BMCL (mainly B status). The matter of concern for the NHS was the geometery i.e. access down to gas bottles and the cross over. JMu advised that NMcGarry (WSP) was progressing the geometry drawing and this would be provided to the NHS asap. AK acknowledged that the road crossing and permeable paving was still to be concluded.	Provide WSP drawing to NHS	JMu
	Zutec/Piling Drwgs upload	AFe reported that WSP would have all the piling drawings uploaded to Zutec by 20/12/2013.	Piling drawings to be uploaded to Zutec	AFe/WSP
	Arrival/Transport Hub	DH noted that the NHS had received the cost information from BMCL however had not received any BMCL design comments regarding the proposal. The NHS had fedback to SPT and a meeting was being arranged with SPT to finalise the proposals.	-	-
	Group 5 Equipment	FW advised that she had provided information to BMCL to allow them to progress rooms. AFe noted that it was disappointing not to have information for the holes for intensive radiology and this was holding BMCL from progressing works in this area. FW advised that she would resend the drawing as soon as her IT was back operational. AFe enquired if it would be possible to agree the position of the isolator as this would allow BMCL to install the backboard into the lead lined walls. FW advised that the locations of the isolators had been agreed during a walkround and the marked- up drawings were unchanged. FW would recheck the positioning as it was now known what equipment was being provided.	Provide drawing to BMCL re holes for intensive radiology.	FW
	NHS Equipment – Insurance Coverage	FW noted that BMCL would need to know the phasing for bringing on the group 5 equipment for the insurance coverage and this would be provided in due course.	Provide delivery dates for group 5 equipment	FW
Item No	**Item**	**Discussion / Information**	**Action**	**Action by whom**

2.	Matters Arising *IT Rooms – Cleaning Regimes*	DH suggested that the IT Hub rooms should be cleaned 3 times i.e. a) before handover to NHS contractor for fit-out, b) just after the ventilation is switched on in that area and c) before handover of the full building. A discussion re including the cleaning of the inside of the cabinets was required. DH noted that the main computer rooms needed a different regime because there is more equipment and movement in these rooms. DH suggested that he didn't think the main computer rooms would need to be cleaned any more frequently than fortnightly. AFe agreed to investigate how much dust is in these rooms and feedback.	Discuss cleaning inside node cabinets Investigate the amount of dust in the main computer rooms	DH/DP/AFe AFe
	Specialist Areas	FW advised that it would be possible for information to be provided to BMCL post Xmas. FW needed to prepare a programme later that week regarding NHS Cashflow and deliveries. RStewart had already liaised with the suppliers and obtained indicative supply dates.	-	-
3.	A&C Design Issues	• Adult Atrium – JMu noted that the proposed samples had been reviewed. The drawings and colours had been agreed. The barn door light effect had been considered and Mercury had been challenged to provide a lighting solution/samples. • Structal Panel Replacement - AFe reported that BMCL had identified a piece of equipment for the panel replacement works and road closures would not be necessary. AFe noted that the panel replacement process would be included on the O&M manual. DH suggested that it would be beneficial to have representation for FM present when the panel replacement works are being carried out so that they can observe the works. AFe agreed to identify potential dates for the panel replacement works and feedback to DH. • Link Bridge Connection – It was noted that the NHS Team needed to know the BMCL proposed connection tie-in dates so that the team can start liaison with the building users. AK noted that BMCL still proposed to carry out the link bridge connection works in January 2014 and BMCL were currently considering the best way to cut the concrete suggesting that they may use a grinder/stihl saw in order to minimise the duration of the works but BMCL will confirm the cutting technique to the NHS once internally agreed. • Aseptic Suite (Vinyl colour) – FW noted that confirmation regarding the vinyl colour was provided to Fergus Shaw on 04/12/2013 as it had been approved by Ellen Griffiths. • Building Warrants for Car Park – JMu advised that the warrant for Stage 1 had been received and the warrants for 2, 3, 4 and 5 were awaited and RNetherey had been asked to chase these up. A meeting with Building Control was scheduled to take place on 10/12/2013 and BMCL would request an update re the outstanding building warrants at this meeting. An email reminder would be issued to Building Control reps in advance of the meeting. • Equipment List – FW noted that the equipment list had been provided to AKerr and there had been circa 5 JTC items queried. FW advised that she would provide the information to BMCL as soon as her emails were back up and running (potentially 10/12/2013) • ABrennan visits – AFe suggested that the NHS were looking at organising these for end of January 2014. It was proposed to test 2 rooms which have full height lead partitions. The room information would be provided to FW in due course. AFe would discuss further with FW after the HCSP meeting.	- Provide indicative dates for NHS to observe panel replacement Confirm cutting technique to NHS Item closed Email Building Control requesting update re outstanding building warrants Provide response to equipment list queries Liaise with FW re ABrennan visits	- AFe AK - JMu FW FW/AFe
Item No	**Item**	**Discussion / Information**	**Action**	**Action by whom**

3.	A&C Design Issues (cont'd)	• Commissioning Programme – DP advised that the commissioning programme would be provided to the NHS after the next quarterly update has been carried out. DH noted that the next quarterly update was due in January 2014. PM requested that the programme be provided through Sypro and DP confirmed that the NEC Programme update and Quarterly programme of plant rooms would be provided through Sypro. BMCL had already forwarded all the programmes that were up to date. PM noted that the programmes informed the resource planning for both the NHS and Capita. DH advised that the programmes should be provided through Sypro in order to formalise the acceptance of the programmes. • Police Office – Blinds – AFe advised that he would deal with this matter. • Stage 8 warrant – GB noted that there had been a couple of amendments to the Stage 8 warrant (sprinkler exclusions, AGV door closers) and the documentation would be provided to Building Control in due course however Building Control had been made aware of the amendments in order that they can be discussed at the meeting scheduled to take place on 10/12/2013. • DQ for Aseptic had been issued to the NHS and response awaited. FW noted that she had advised RNetherey that the DQ would be returned later that week. • RFI schedule – GB is reviewing the RFI schedule and will catch-up with DH & SF in due course to agree the closure of items on aconex and close off any outstanding RFIs. • Stage 24 Warrant – JMu had received the final schedule of deliveries from Schindler and would provide these to Building Control on 10/12/2013. JMu noted that there were a lot of Building Warrants which were dependent on receiving the Stage 24 warrant so once received this would allow other warrants to be granted. • Stage 45 warrant – Neonatal link bridge – package of information prepared for submission to Building Control on 10/12/2013 WR enquired whether Building Control had commented on the Stage 4 Car Park warrant and JMu advised that he hadn't seen any comments and that this was covered under the SER noting that Building Control regularly visited that site therefore were aware of the works being undertaken. JMu advised that he would email JMunro/BTierney to request an update regarding the car park warrants. WR noted that there was a lot of drawings being issued post construction.	Provide commissioning programmes through Sypro Resolve blind opener on police office - Return DQ for Aseptic to BMCL Liaise with DH/SF re RFI schedule - - Email Building Control re warrants	DP AFe - FW GB - - JMu
4.	Contractor Report	The Contractor Report was circulated in advance of the meeting and the following key points were highlighted: **Health & Safety (AFe)** • There had been one reportable incident on the site within the reporting period. An operative had hurt his ribs on the handrail as he tripped going off site at the top of the ramp. BMCL had been unable to identify how this injury could have happened. • There had been 1 ill health incident on site whereby an operative had chest pains. The operative was admitted to hospital for investigation of the chest pains but had been released from hospital the same day. • The AFR had raised from 0.08 to 0.09 and across the 12 month rolling had increased from 0.05 to 0.07 • There had been 1 red card in the period (operative found with tools belonging to another operative) and there had been a couple of yellow cards issued for general infringements. The toolbox tools with the sub-contractors continue weekly and bi-weekly. The current health & safety initiative was focused on ensuring that operatives were wearing the correct hats underneath the safety hats. There had also been a diabetes campaign in the canteen area which had been well received.	- - - - -	- - - - -
Item No	**Item**	**Discussion / Information**	**Action**	**Action by whom**

4.	Contractor Report (cont'd)	**Health & Safety (AFe) (cont'd)** • Drug & Alcohol testing – (will be included in the next monthly report) - there had been 2 non-negative results and the operatives concerned were no longer on site. **Quality (AFe)** • Big driver was focusing on the small % of rooms which have been left behind. Some of the inspections had been re-sequenced due rooms being unable to be finished until further group 5 services information is known i.e. coring holes. • There was a slight gap between the snags being identified and the snags being closed out. The snagging was a standing discussion item with the sub-contractors in order to track the close out of snags. **Progress (AFe)** • Progress throughout the period had been good and an increased level of water-tightness was being achieved and inspections continuing to be carried out in line with the programme. There were no weather events for the month of November and no exceptions to report. • The adult hospital atrium roof works had progressed – there was 43 cushion installed to date of which 17 had been damaged during the period of high winds and there was 17 cushions still to be installed. The damaged cushions had been temporarily repaired and the material to replace the 17 damaged cushions had been ordered however the replacement fabric would not be available until the beginning of 2014 as there was a 10-15 day turnaround. DH raised concern that the supplier had initially advised that the turnaround time was 4-5 days. AFe noted that the increased turnaround time maybe due to the volume which needs to be replaced. AB noted that previously the company had provided a new cushion within 1 week. PM enquired if it was known what had caused the damage and AFe suggested that it was caused by debris which had been blown into due to the works in progress on site. The wind had peeled back the insulation which did not have any ballast on it. AFe advised that it had been identified that the damage could have been caused by the lid off a timber box which had screws protruding. AFe noted that there was also some Rookie panels which were wip that had come loose. AFe suggested that the NHS would never be in the same position as BMCL as there would be no works in progress. There had been cladding panels damaged (scraped/scratched) on the 12th floor and BMCL would prefer to replace rather than wait for good weather to repair. AFe noted that a couple of unitised panels had been smashed during the high winds. AFe advised that BMCL were preparing a list of the damages noting that the works on site had also been impacted on due to the high winds i.e. preparing for the high winds and also checking the cranes out after the high winds had subsided. DH enquired if BMCL would be instigating an insurance claim and AFe advised that the Commercial Reps were investigating making an insurance claim. AFe reported that the scaffolding at the helipad which was to be taken down had been left up and it hadn't moved during the high winds, the scaffolding had been designed to withstand 165kph winds and had been catching flying debris. AFe noted that the panel at the helipad which had become loose in the winds. DH enquired if the panel at the helipad hadn't been finally fixed and AFe confirmed that this had been work in progress. AK noted that the Neuro link bridge panels had also caused concern. AFe noted that the scaffolding was not being taken down. The Rostek access cradle would remain in place a bit longer than programmed.	- - - - - -	- - - - - -
Item No	**Item**	**Discussion / Information**	**Action**	**Action by whom**

4.	Contractor Report (cont'd)	DH enquired if the BMCL would be highlighting the delays to works due to the high winds in the next run of programmes and this was confirmed. AFe advised that the programming delays would mainly be observed in the level 12 plantroom and plantroom 32 had suffered the worst of the damage. AFe suggested that 150 linear metres of partitioning had been damaged on finger f.	-	-
		• Internally the adult atrium was progressing. Due to the damage to the roof BMCL were being cautious about the works being progressed in the adult atrium to minimise the risk of further damage i.e. partitions/plasterboard wards. BMCL were reviewing the ribbon windows and consideration was being given to adding in additional steel and may need to install a sill piece. WSP had applied an open atrium load should the roof burn off.	-	-
		• The atrium programme would be further reviewed and the works impacted upon identified/highlighted. The sanctuary slab works may be reprogrammed due to the area being used to get materials in and using forklifts for the concrete pours	-	-
		• Externals – the damages due to the wind had impacted on progress and BMCL would carry out an assessment of the works needed.	-	-
		• Air Handling – starting to arrive on site and the floor painting to progress on level 12. The floor painting would be carried out locally around the AHUs, install the AHUs and then go back at an appropriate time to complete the floor painting.		
		• Windows – it had been anticipated having the windows installed pre Xmas however there were 10 units which may not be fitted due to a manufacturing issue and these would be arriving on site post Xmas.	-	-
		• Render works – programme impacted by the weather		
		• Roofing – was progressing fairly well until impacted on by the weather (both Adult and NCH)		
		• Unitised cladding – completed excluding the mast climber infills.	-	-
		• Podium – progressing as programmed	-	-
		• Lights on – putting temporary measure in so can get working in areas with painting, etc. The painting does not sit on the critical path.	-	-
		• There were no big peaks in the sub-contractors labour. It was expected that the number of partitioning operatives would start to decrease onsite in the new year.	-	-
		• Screeding is going well however temperature impacting on the ames taping. Temporary heating had been put on and BMCL were trying to section down the building to minimise heat loss from areas to minimise delays to ames taping works	-	-
		• Internal corridors - installation of the ceiling tiles would commence in January 2014 in G1. DP noted that the service and system tiles would not be installed at this point.	-	-
		• Tower – works progressing well. There are 1 or 2 areas which may be slightly behind due to cool conditions impacting on the ames taping works. The tower works were on the critical path and BMCL were ensuring that the works were resourced appropriately in the tower to ensure no delays and no impact from the atrium works.	-	-
		• Commissioning programme – as soon as get the ceiling tiles going in the painting and decoration will follow on and the painting/decorating did not impact on the commissioning activities.	-	-
		• Scaffolding was staring to be taken down in the NCH.	-	-
		DH enquired if BMCL had the revised services kit for the NSGH 4th floor haemato-oncology. DP advised that the ducting was all installed at a high level	-	-
Item No	**Item**	**Discussion / Information**	**Action**	**Action by whom**

4.	Contractor Report (cont'd)	• Hoists 3 & 4 & 5 anticipated to be taken down by the end of January 2014, hoist 6 by end of March and tower crane to be taken down by end March/beginning April bearing in mind that crane time had been lost due to the high winds.	-	-
		Commissioning (DP)		
		• Plantroom 21 – well progressed on all systems	-	-
		• Plantroom 31 – underway	-	-
		• MTHW legs complete and able to be utilised throughout the building	-	-
		• SEPA provided confirmation of the conditions that BMCL must adhere to re using boilers.	-	-
		• Connection to the gas meter was still awaited and it was anticipated that the connection works which were not expected to take place before the new year	-	-
		• Power was onto 4 of the 6 sub-stations and every boiler had been preconditioned to 50%. BMCL have not conditioned the boilers to 100% to ensure no impact on the Labs building.	-	-
		• 37 of the 149 areas have power on	-	-
		• Lift installation – progressing well and currently ahead of programme in most instances. Met with DH and KC to discuss the deliverables for the AGV commissioning/simulations. DH enquired if the phone lines needed to be installed into the lifts for the commissioning and DP advised that they did not need to be installed.	-	-
		• 43 out of 222 systems completed, 37 areas with power on, 13 IT hubs live – which was a good position to be in.	-	-
		• Energy Centre – MTHW completed, Chilled water legs – nearing completion. The Energy Centre was ready to run once the connection has been made and the full PPC permit has been received.	-	-
		External Works (AK)		
		• South yard drainage and suds installation – being reviewed to improve the buildability	-	-
		• 3m deep drain – BMCL do not want to start due to the closeness to the Xmas break	-	-
		• Blockwork foundations to west elevation of NCH being excavated	-	-
		• Hard & Soft landscaping – Dunnes to complete their works. Post tender interview undertaken with the preferred contractor. BMCL will carry out a survey of the levels as preferred contractor will be undertaking the cut & fill works. The preferred contractor tender has some Value Engineering options and these had been discussed with WSP, Gillespies, Nightingales, etc. Confirmation of the potential cost savings was awaited. BMCL were identifying if proposals need to be issued to the NHS via RDD process or whether there is any planning issues. It was hoped to let the hard & soft landscaping tender on 20th December 2013.	-	-
		Car Park (AK)		
		• Frame progressing reasonably well and no time lost during the month	-	-
		• Steelwork progressing reasonably well	-	-
		• Pre-cast stairs and landings – to commence w/b 9th December 2013	-	-
		• Removal of back-props to level 1 has opened up the area to allow the barrier works to commence and the M&E high level containment fit out due to commence	-	-

Item No	Item	Discussion / Information	Action	Action by whom
4.	Contractor Report (cont'd)	**Car Park (AK) – cont'd** • Concrete pours not as had hoped • Generally in the new year there will be meaningful fit-out starting in the car park • Brackets for the external cladding have started to be installed. • BMCL were awaiting the SPEN cable to be dropped so that the construction of the car park entrance can be commenced and the reconfiguration of the public entrance can commence. DH noted that the NHS were currently in negotiation with SPEN as the original proposal would have required a way leave. AK reported that if the cable is diverted then this would cause a clash with the NHS cable. DH noted that the original date for the works was 17th January 2014 which could not be confirmed until negotiations are concluded. It had been agreed that FES could progress the internal cable works. AK advised that he would review the cut-off date for the SPEN works to be concluded so as not to impact on the BMCL works. • No further losses or gains had been made to the programme. BMCL were still keen to regain some time however there was less time available to try and pull back the programme. **VIE compound (AK)** • Piling successfully completed. Only 1 complaint received which was on the last day of the piling. • Foundation works in progress • Road crossing solution work in progress by BMCL, WSP, WW and the NHS • Structural steelwork – erection due to be commenced mid January 2014 **Link Bridges (AK)** • JDP carrying out the infills of soffits , flashes and cladding to connection • Cladding progressing and remedial works to be undertaken • Connection to adult hospital in progress • Anticipate early 2014 for the connection works to Neuro further to agreement with NHS • BMCL will provide a programme for the connection works • BMCL are investigating ways to improve the appearance of bridge further to comments received from NHS • BCMCL considering the cladding, elevations and windows of the neo-natal link bridge **Generally (AK)** • Progress is as desired. The focus will be concentrated on fit-out from January 2014. • Roof works may not be finished however Prater will be on site for some time yet • BM Floor Managers will be re-organised in order to push on works in areas • Level 12 cladding – focus on completing and undertaking the remedial • Externals programme and work content to be agreed with the preferred contractor. The preferred contractor was also pricing the section 56 works. • BMCL are identifying how much works can be progressed before the hoarding comes down	- - - - - - - - - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - - - - - - - - -

Item No	Item	Discussion / Information	Action	Action by whom
4.	Contractor Report (cont'd)	**Procurement (AFe)** • Easy read chart included in the report for information. Any queries to be directed to GW PM noted that the fabric ceiling for the main entrance had been signed off however had not been signed off for the sanctuary.	- -	- -
5.	Project Supervisor's Report	The Project Supervisors Report was circulated in advance of the meeting. JR highlighted the following items from the report: • Construction procedures - continue to be satisfactory and in accordance with the ERs • Standard & Quality – works continue to be to a generally good standard • 3 areas were inspected for quality compliance in the reporting period. BMCL had provided a QA pack for the inspections. Only minor defects were being illustrated on the IDMS. There are 2 historical defects to be resolved i.e. a) pull cords in the wrong position, b) smoke detectors in the wrong position. On level 2 an issue gaps between the base unit and the wall had been identified. AFe reported that BMCL have prepared a proposal and will provide a sample for inspection. • 4 x 85 point partition inspections undertaken in the reporting period – a couple on the partitions failed due to missing insulation – subsequently rectified. **Civil & Structural (WR)** • Quality continues to be good throughout • NCH Roof steelwork remedial works have still to be completed. AFe noted that the steelwork remedial works had been completed however the concrete remedial works were to be undertaken. WR suggested that some of the concrete remedial works were not very good however acknowledged that these were work in progress. WR noted that a lot of the wedges had now been removed. • Helipad – well attended to however some touch-up to paintwork is required. AFe reported that BMCL would be changing the water pipe as BMCL were not happy with the finish **M&E (DW)** • Quality being maintained • Various tests witnessed within the reporting period i.e. Fire Alarm testing (a couple of revisits are required), fire damper (a couple of revisits are required) however other tests witnessed were satisfactory • Plantroom 21 – furthest progressed however still alot of work to be done to it PM noted that there had been a discussion regarding witness testing noting that it would be beneficial to agree a minimum period of notification for witness testing. DP advised that BMCL are working on a 48 hour notification period and try to provide a 2 week lookahead. DH advised that the Project Team would be as flexible as possible however as the number of areas being completed ramp up then keeping to the 48 hour notification would assist resourcing. JR noted that there could be an issue for Capita if they do not get 48 hours notice i.e. when DW goes on leave the coverage is provided from another office. AFe noted that there was no reason why BMCL could not adhere to the 48 hour notification process.	- - - - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - - -

Item No	Item	Discussion / Information	Action	Action by whom
6.	EWN/PMI	It was noted that there were no EWNs or PMIs requiring discussion.	-	-
7.	RFIs	It was noted that there were no RFI issues which were not being discussed in other fora.	-	-
8.	Equipment Co-ordination	FW advised that most of the group 2 to group 3 amendments had been undertaken. The orders for the Group 5 Equipment had been by the NHS and it was anticipated that machine information could be provided to BMCL in early January 2014. FW noted that HFS were pulling together the tender package for the decontamination equipment and it may be necessary to form a short-life working group to progress this.	- -	- -
9.	AOCB	PM enquired about the site arrangements over the Xmas period. AK advised that Peter Beauchamp was pulling together a schedule of the BMCL Managers who will be on-site on the non-working days. A lot of the sub-contractors were taking the full 2 week Xmas break. The BMCL Managers would be onsite to check the buildings. The only days that BMCL Managers would not be on site was Christmas Day and New Year Day and these days would be covered by the on-site Security. AK advised that he had investigated the complaint email from an NHS Rep to HGriffin stating that the on-site security did not have emergency contacts for BMCL and Security have advised that they received no calls requesting BMCL Emergency contacts. AFe requested an updated list of the NHS Emergency contacts for the Xmas period. PM sought clarity about whether the NHS Project Team members would be able to access the site over the Xmas period as there was a number of zone completion checks to be carried out. AK confirmed that the NHS Project Team would be unable to access the site over the Xmas period.	Provide BMCL Emergency contacts list to NHS - Provide NHS emergency contacts list to BMCL -	AK - SF -
10.	Date and Time of Next Meeting	Monday 7th February 2014 @ 1pm		

New South Glasgow Hospitals and Laboratory Project

Acute Services Strategy Board

Meeting Held on Monday 10th March at 9am in Board Room, Project Offices

Robert Calderwood (RC) (Chair)	Chief Executive, NHS GG&C
Tony Cocozza (TC)	Capital Planning Accountant, NHS GG&C
Barry White (BW)	Chief Executive, Scottish Futures Trust (via telephone)
Jennifer Armstrong (JA)	Medical Director, NHS GG&C
Grant Archibald (GA)	Chief Operating Officer, Acute Division, NHS GG&C
David Stewart (DS)	Associate Medical Director, NHS GG&C
Mike Baxter (MB)	Deputy Director, Capital Planning and Asset Management, Scottish Government

In Attendance

David Loudon (DWL)	Project Director/Director of Facilities and Capital Planning, NHS GG&C
Douglas Ross (DR)	Commercial Director, Currie & Brown
Angus Brown (AB)	External Auditor, Audit Scotland

Apologies

Rosslyn Crockett (RCr)	Director Nursing, NHS GG&C
Carmel Sheriff (CS)	Depute Director Health Delivery, Scottish Government
Paul James (PJ)	Director of Finance, NHS GG&C

Minute Taken By

Allyson Hirst	PA, NHS GG&C

1. Apologies and Previous Minutes

Apologies as noted above. Minutes of the 20th January 2014 were approved as an accurate record.

2. Matters Arising

There were no matters arising not included within the agenda.

3. nSGH Project Update

Adults and Children's Hospitals

DWL reported on paper marked Enc 2 It is reported that the contract period for the adults and children's hospitals has 47 weeks to target completion on 26th January 2015. DWL reported that this is on programme. Works on the energy centre continue.

Following a programme review, Car Park 1 is now reported to complete in July 2014. However, as the Board has recently completed a review of car parking capacity pan campus and it is apparent that beneficial occupancy of CP1 in advance of the target completion date is not required. Therefore, DWL confirmed that he would advise Brookfield Multiplex of the Board's decision.

Design work within the hospital is now almost completed and internal works within the buildings is well underway. It is expected that the tower cranes will be removed from site over the coming weeks (weather permitting).

Quality control inspections continue with the NEC 3 Supervisor reporting that 35 completed areas have been checked to date.

Transfer equipment identification is being identified and workbooks are completing in time to allow procurement process to commence.

Teaching and Learning Centre

The project remains on programme for completion in May 2015. Meetings continue with users to complete internal designs and all planning conditions had been met and within timescales required.

Clinical Research Facility

Work is nearing completion for May 2015 and equipment procurement is underway.

New Office (Accommodation) Building

DWL reported that the FBC had received approval from CIG at their meeting in January.
Clinical Directors continue to engage with their staff on the new ways of works.
DWL noted that the project remains on programme for completion in April 2015.

Equipping Strategy

As previously requested by the members, DWL requested RStewart (RS) to attend the meeting in order to explain the current progress for this strategy. Included with the papers for the meeting was Enclosure 3 with additional two appendices. RS went on to explain the project plan (included as an appendix to Enclosure 3) which was highlighted as very high level only showing a few of the thousands of lines included within this. RS explained the management structure which is in place. In order to understand the complexities of the equipping process, RS explained that there are around 147,000 lines within the equipment list with over 2,000 unique items of equipment noting that the majority of the items are scheduled to be transferred. RS noted that as it stood the current equipment list allowance was s circa £60M.

It was noted that all public areas will receive new furniture to give a uniformed appearance to these areas and pre-equipping wards with the adult hospital to ease pressure during the migration process.

The procurement team continue to work with colleagues to ensure maximising the framework agreements, delivery options to keep within programme. RS noted that low volume and small items falls to the board to bring into the building with the assistance from staff to put in place to assist with the clinical migration. With regards to standardisation it was noted that NHSGG&C have been working to ensure that equipment being purchased over the last few years is similar to gain economies of scale for the Board.

Board Commissioning Programme – The migration process will take place over a short period

and it was noted that patient safety will be a priority. It was also noted that after contract completion, there would be circa one hundred days of Board related commissioning and then moving staff and services into the buildings.

4. On the Move Update

GA gave the group an update as per enc 7.
Both MEG and CEG are now well established with regular meetings taking place in order to progress decisions to a conclusion. The CEG has arranged a workshop for 25th March to explore the work to date on pathways and clinical service models and the implications for other workstreams to ensure seamless working within and across all Directorates. The work groups work to date is noted in the content of the paper including IT who are looking at the infrastructure and different ways of working to ensure this fits with expectations, staff and users of the building. The workforce advisory group task is to ensure that staff are ready for the moves into the new hospital, dealing with new ways of working and working with new team members. The members have asked for a reminder of the governance arrangements for the migration process and for the accountability of the process and this will be made available for the next meeting of the group.

5. Compensation Events

DR spoke to enc 4 – noting the changes – exceptional weather in December and DR reported that he was in discussions with BMCL in this regard and hoped to have a lesser figure to report for the next meeting of ASSB. DR reported that 96% of BMCL packages are now procured and thereby lessens the risk to BMCL and hopeful of delivering the project for £584M if able to sustain the progress. Car Park 1 will come in at target price of £11.4M.

6. Budget

TC reported on the budget paper on behalf of AMcC. TC advised that both Income and expenditure for the additional data, power and lighting to be funded by the YCF had increased by £15k. TC also advised that the New Office project budgets had been updated to reflect the FBC position and that there were no new compensation events impacting on the risk provision. MB asked how the phasing of 2014/15 and 2015/16 budgets were progressing and RC advised that he was currently working with AMcC on this.

Key Risks

No movement to report and the Project Team will continue to review risks.

7. Proposed Alterations to the INS Link and Neurosciences Entrance

The Board has consulted BMCL regarding remedial options for the neuro link bridge and it was noted that the Board have opted for Option B – this will provided additional glazed panels, better lighting and coloured banding incorporated to improve the aesthetics to the bridge. BMCL are currently developing proposals for the consideration of the Board at the end of March.

8. Proposed Works to Institute of Neurological Sciences Procurement Strategy

DWL presented the paper marked Enc 9. Due to proposed clinical migration to the SGH site on completion the of the nSGH, Wards 66A & 66B and 62 within the Neuro Surgical building require to be refurbished Due to the time constraints for completion by April 2015, the Board instructed Currie & Brown UK Ltd to prepared a procurement strategy to deliver the requirements and ensure value for money.

In developing a life sciences strategy with the University of Glasgow, an area to the rear of the Neuro Surgical building has been identified to develop a new Stratified Imaging Centre incorporating a 7T MRI scanner and related clinical support facilities. The university will be responsible for procuring consultants and the PSCP.

To enable the decant of existing NHS staff from the existing "Roundhouse" building on the proposed site for the Stratified Imaging Centre, the university will provide capital investment funding to refurbish the University Corridor on the ground floor of the Neurology Building. Discussions continue with the university regarding the construction procurement plan.

9. On the Move – Elective In-patients Workstream

GA had prepared a presentation for the group on the proposed elective inpatient flow workstream. GA noted that the purpose of this workstream was to minimise the amount of time that patients spend in hospital and to review the patient pathways to ensure that they work in reality. Therefore sub groups have been set up to look at pre-assessment, treatment and critical care pathways. To date, operational policies have been put in place and fully reviewed and checked via a series of workshops and reviews and these will be used as part of the staff briefings as these take place in the run up to the hospital opening. GA went on to note the progress made by each of the groups to date and details of this can be found in the copy of the presentation which will be forwarded with these notes. In order to ascertain an appropriate workforce, the Keith Hurst Nursing model is being utilised. As the moves to the hospital are planned and staff become more involved, it is imperative to build the teams that will be working together and to keep staff informed and enthusiastic about their future working environment.

10. AOCB

It was noted that BMCL have been appointed constructors for the New Edinburgh Children's Hospital. It is likely that the some of their management team would be transferred to the project. DWL noted that he was mindful of this and is in discussion with BMCL to ensure that key staff will remain until the nSGH project is completed. The Board's Project Risk Register has noted this potential risk.

Disposals and Decommissioning of other Hospitals – A progress review will be presented at the next meeting of the ASSB including strategy and timeframes.

PROJECT SUPERVISORS MEETING: 4th April 2014
ACTION NOTE

Present:	Peter Moir (PM) Allyson Hirst (AH) (Notes)	Hugh McDerment (HMc)	John Redmond (JR)	Willie Roxburgh (WR)
Apologies:	Graeme Thomson (GT)	Alastair Smith (AS)	David Hall (DH)	Douglas Wilson (DW)

Item No	Item	Discussion/Information	Action	Action by Whom
1.	Action note from the previous meeting	Accepted as an accurate record	-	-
2.	Matters Arising		-	-
	Acoustic Test Report	JR reported that these are produced and forwarded as the tests are carried out – so far 6 locations tested with 1 failure but this was remedied and will be retested	-	-
3.	Capita Report			
		JR noted reported No 35 – highlights as follows :- Quality and Compliance inspections are continuing through basement to level 4 – quality of the work was to a good industrial standard. It was to be noted that within areas smoke detectors are position such that there is insufficient space around these and therefore not compliant with BS 5839-1:2002. A derogation will be required within these areas where they cannot be moved. Supervisor's communication 191 – nurse call not being installed within some rooms – BMCL awaiting confirmation from Mercury on fitting programme. Supervisors communication 194 – congestion within room OPD1-004 with BMCL for resolution 85 point checks are continuing with only minor issues to report on but these were remedied. Above Ceiling Inspections are underway within level 0 zone D with only minor issues noted. These were recorded on a drawing and a sign off sheet completed. Final inspection will be carried out by Building Control. Witness Testing and Commissioning - a number of tests were carried out in March – the majority of these being satisfactory and are reported fully within Captia report. Noted unsatisfactory testing within level 0 zone H including inability to access hatches and hatches being too small – these have been noted and to be rectified. Non Conformance Reports – Capita reviewed BMCL NCR tracker and issues noted with package managers including block work and pointing on the south and east elevations – cleaning was undertaken but has not improved to a satisfactory standard. A solution is awaited from BMCL and their sub-contractors. Also noted an issue with water between glass panels and an n independent survey has been arranged. A further NCR was issued to Astins for lack of insulation and is being reviewed. Sructural – WR reported on the atrium bridges – final screeding on the floor of the 4th floor and will be used as a bench mark for the remaining floors Communication No 145). Roof Bolt Failure – the bolt failure within the ETFE roof space was under investigation and a different fixing system to be employed and the area checked by appropriately training personnel. Roadway issues at Renfrew Road remain outstanding and are under programme review with BMCL		

		Leg extensions – analytical assessment awaited on level 0. Pipework – protection to exposed pipework (supervisors communication No 122) previously noted and reported to BMCL – resolutions were offered and apparently agreed upon but not by NHS therefore clarity required on who and what has been agreed. Flood Damage – failure in crimped joints in level 1 and level 0 have caused water damaged to floors and it is necessary to lift, dry and replace the vinyl laid within the affected areas – this will delay inspection of these sections by around 3 weeks. Ventilation – flexible connections and supporting system in plant room PR31 and fire rating of these and fans was to be confirmed. Feedback on communication No 133 is awaited. Partitions – there are three specifications for the partitions between the Snoozlum room/Medicinema. A. Specification has been requested and Astins to supply in relation to Communication 192. Water ingress at the east side of atrium is damaged by water and will be replaced when resin floor works are completed. Wiring congestion – DB4A-5-1 exceeds the regulations for wiring installation – Capita will report back when addressed. GENW006 metaflex cables bound with PVC tape – this is not to industry standards – this is not confined to this area alone and is evident on other floors and reported via defects No 76. Supervisors communication 137 – AHU are not compliant to 2 meters per second and BMCL asked to provide degradation – PM will raise at the Hospital Construction Meeting.		
4.	Car Park	WR reported that steel work and concrete finishing to be completed and generally quality is good. Ground floor tarring is completed and work is well underway on the approach road.		
5.	Information Requirements	No requirements	-	-
6.	AOCB	There were no further discussions and the meeting was closed	-	-
7.	Date and Time of Next meeting Friday, 9th May 2014 at 2pm.		For noting	ALL

HOSPITALS CONSTRUCTION PROGRESS MEETING: No 39

Notes from meeting held on Monday 4th August 2014 at 3.30pm in the Boardroom, Top Floor

Action Note

Present:	Peter Moir (PM)	Alasdair Fernie (AFe)	Darren Pike (DP)	David Hall (DH)
Fergus Shaw (FS)	Grant Wallace (GW)	Jeff Murdoch (JM)	Hugh McDerment (HMc)	John Redmond (JR)
John Wales (JW)	Shiona Frew (SF) (Notes)			
Apologies:	Darren Smith (DS)	Jim Murray (JMu)	John Ballantyne (JB)	Graeme Thomson (GT)
Gavin Burnett (GB)	Andrew Bebbington (AB)	David Loudon (DL)	Douglas Wilson (DW)	Willie Roxburgh (WR)
Frances Wrath (FW)				

Item No	Item	Discussion / Information	Action	Action by whom
1.	Action Note from Previous meeting	Accepted as an accurate record.	-	-
2.	Matters Arising			
	Neuro cladding link bridge works	PM suggested that a meeting to discuss with the works between PM and AFe to understand the impacts however he understood that AFe had met with GForsyth (GF). AFe confirmed that a meeting with GForsyth had been held noting that AFe had been advised by GF that the Board reqired the link bridge to be complete by end March 2015. AFe advised that BMCL would need to tie in with BAM regarding works and that BMCL were programming the start date on the basis of the end March date however would want to do the break in as soon as possible. AFe noted that he would ask PMcG to liaise with HMc to discuss dates for the works. AFe noted that he understood that there is an issue retaining the fire escape. PM noted that he had looked at the retention of the fire escape and he had been unable to identify any real options. AFe suggested that a containerised fire escape could be a potential solution noting that the fire escape is into the new construction site. AFe concurred that a solution to the fire escape matter would need to be identified. AFe proposed to provide the NHS with the detail of the fire escape issue noting that the NHS would need to be shown how BMCL had priced the works. AFe noted that an end October start date was optimistic and dependent on concluding the planning matters then an early November start date may be more realistic. AFe stressed that November was not a good time of year to be commencing piling works. AFe stressed that he did not believe that completion of the neuro in time for the 'big visit' would be possible. PM advised that he would relay the information re March 2015 completion date as being unachievable. AFe nted that the works had identified a timeline of 56 weeks.	PMcG to liaise with HMc Provide info re fire escape issue to PM	AFe AFe
	Surveys	HMc advised that L&M had surveyed at the Neuro and also at the rear of the Maternity. The survey reports received had been provided to PMcG. HV suggested that there was an HV cable with the site location and HMc suggested that a diversion would be required. AFe noted that he though the NHS would be dealing with the HV diversion. HMc advised that he hadn't realised that BMCL had expected the NHS to do services/diversion works and that he would discuss this with PM. GW advised that BMCL would not normally carry out diversion works and that the costs had been based on receiving a clean site free of services. GW reported that BMCL could carry out the diversion	Review surveys and discuss way forward re diversion works	PM/HMc

		works but that this would impact the BMCL programme. HMc noted that the survey had also identified something else in this area and suggested that BMCL may want to do a hand dig in the area to investigate. PM advised that he had provided a PMI to BMCL to do hand digs and suggested that it may be the foundations of the old duck pond. AFe advised that he would have a look at the survey and identify what hand dig investigations would need to be carried out. PM advised that he would review the survey information and confirm to BMCL the way forward re the HV diversion works.	Confirm way forward with BMCL	HMc
	Group 5 Equipment	DP advised that he had met with FW and DH to discuss Group 5 equipment programme. The programme were generally in line with previous discussions. There are a couple of rooms that need to be considered and a meeting to be reconvened i.e. DR rooms which have a reasonable amount of work to be done in them. DP had sent back a programme which had been marked up to advise when the environmental proving for each room will be completed. BMCL would require method statements for each of the suppliers to be provided in the next week or so. DH advised that the NHS had met with MIS earlier that morning to discuss scoping, floor cutting, etc. MIS are familiar with working on live sites and have experience of using wet and dry vacuums to minimize dust. MIS Had been asked to provide their exact proposals for the trunking so this can be checked with WSP as MIS will be cutting into the floor. AFe enquired about the cutting that was required and DH advised that it was expected to be 50-60mm into the screed not the slab. Drawing from MIS were expected to be received by close of business on 6th August 2014. MIS had been asked to highlight any works that they are unable to do i.e. there are a couple of locations where this is a sprinkler head or wireless access point which may need to be moved to the next along ceiling tile. The contractor will then return for a site visit so that they can double check details, etc and thereafter (circa 1 week) will provide their method statements and risk assessments.	Provide method statements and risk assessments to BMCL when received from suppliers	FW/DH
	Neuro-entrance works	PM noted that there had been a joint NHS/BMCL meeting to discuss the plans, etc. There were a couple of minor changes to be made to the plans however it had been decided that the planning application should be lodged so that it is registered and that any matters which arise could be dealt with as conditions to the application. A VE meeting had taken place and the focus of the meeting had been on the access doors at the main screen. PM was happy to consider any further VE options. AFe advised that the piling design had been amended and that the number of piles required had been reduced. The design was not the stage where BMCL would want at this time. There was potential to save some time on the piling due to the reduction in piles. AFe suggested that the design was circa 8 weeks behind where BMCL would want the design to be in order to commence works. BMCL were pushing on the design works so that the works can be started asap. AFe advised that if any time could be made back then it would be.	-	-
	Snagging items – long lead items/lead in times	AFe advised that BMCL had carried out a recheck on certain items i.e. lead glass. BMCL have a fortnightly meeting with their sub-contractors whereby the snags are reviewed and the subcontractor asked to advise how they propose to close off the snags. AFe acknowledged that more snags are being identified as works are progressed however items on the snagging list are being closed off.	-	-

Item No	Item	Discussion / Information	Action	Action by whom
2.	Matters Arising (cont'd)			
	Zutec	JW advised that he had put the pie chart into the report however had a handout of the full Zutec uploads. It was agreed that JW should provide an update on this item under the agenda.	-	-
	AGV Delivery dates	DP confirmed that 22 AGVs were due to be delivered to site on 8th August 2014.	-	-
	Equipment List CE	PM advised that he had received the appropriate schedules and would issue a nil cost CE event later that week.	-	-
	Atrium point load	AFe advised that the point load was 5knewtons per m^2.	-	-
	Fire extinguisher drawing references	DP advised that he would liaise with FW to ensure that she had the drawing series numbers.	Liaise with FW re drawing series for fire extinguishers	DP
	Bus Shelters	PM advised that he had issued an updated PMI and revised drawings to BMCL in order that BMCL can provide cost information. The NHS are meeting with SPT and will confirm the way forward regarding the shelters asap thereafter however it was known that the shelter size will be reduced.	Coonfirm way forward re bus shelters	PM
	Stage 3a	PM advised that a joint NHS/BMCL meeting had taken place to discuss the stage 3a works and it was understood that BMCL may have some further review to be carried out.	-	
		PM noted that he would liaise with DLoudon regarding retaining one of the buildings for joint use and re-phasing the demolitions.	Liaise with DL	PM
	Site car parking	PM note that the MSCP would be brought into use at the beginning of September for site car parking.	-	-
3.	A&C Hospital Design Issues	It was noted that there was no BMCL design rep present at the meeting to provide an update on design issues.	-	-
4.	Contractors Progress Report	The contractors report was circulated in advance of the meeting and the following information highlighted:	-	-
	Health and Safety (AFe)	• There had been no reportable incidents within the reporting period.	-	-
		• Back to basics campaign being pushed and being well received by the operatives as good feedback being received	-	-
		• BMCL will be installing some water fountains in the building due to the heat levels being experienced in the building by the operatives. A chill out zone had also been set-up. BMCL proposed to put more fans into the building	-	-
		• 2 red cards had been issued in the period (1 due to operative being aggressive/abusive to H&S Manager and 1due to operative working in an unsafe manner).	-	-
		• Focus on permit to work and checking that Mercury permits are being issued appropriately as had an electrocution on site – operative was ok. Making sure that people do not work in a live zone .	-	-

		BMCL did not understand why the operative had not carried out initial checks. • Other H&S Matters being addressed through the back to basics campaign on site include: o Operatives surfing on a pallet truck o Operatives climbing out of MEWPs o Removal of edge protection (Prater) • Drug & Alcohol screening – no screening had been carried out in the reporting period • Audits - as listed in the report. PMooney is putting a lot of work into the audits and feedback indicates that voices are being heard. Have won a HWL RoSPA award. The H&S team have done well. • Principles meeting – Contractor directors presented their commitment to the Back to Basics Campaign and have responsibility for feeding back to their company.	-	-
	High Risk Activities	• External- maintaining segregation between works and the public. Making sure that barriers are being set-up appropriately and securely. • Bridge installation at Maternity – works progressing well. BMCL had an issue re the overclad so will delay so can do the planting in that area. • Underfloor heating inch - ongoing • Canopies at South elevation – have taken these down as BMCL do not consider that they were manufactured correctly • Big push on the amount of mobile traffic on site at the North elevation and monitoring of the interface with the landscaping works ongoing AFe noted that some of the landscaping dates will be out of programme.	-	-
	Non conformances	• 704 NCRs raised to date with 605 NCRs closed out. Continuing to meet with Capita to progress closeout of items. • 6 week lookahead – as detailed in the report • Audits – continuing with desktop audits (Aconex) • QA packs continue to be provided to Capita • Communications- 210 communications raised overall(including 3 in July). 197 communications have been closed and 9 are ongoing to achieve close out. • Defects – 80 defects raised and 78 defects have been closed. Initial responses to the 2 defects have been issued. • Inspections – as detailed in the Capita report • Snagging – over 25,000snags identified and 13,000 snags are currently outstanding • Zone Inspections – a further 14 areas were inspected within the month – 116 areas in total. This accounts for 4402 rooms with 558 room exclusions i.e. 4960 in total. Of the 558 room exclusions 215 excluded rooms have now been inspected therefore 4600 rooms inspected to date. • Above ceiling inspections continues • Further atrium inspections were carried out in the period • Inspections of courtyards and elevations have begun by the sub-contractors. • Zutec – the print out of the Zutec uploads was tabled. The print out provides an indication of progress to date. The information uploads appear to be positive for the main build project and	-	-

		uploads in relation to the car park are underway. DH noted that the Zutec schedule only covered fabric. JW acknowledged that only fabric was contained in the tabled schedule. DP advised that the M&E Zutec uploads were positive. The subcontractors had been issued with a quarterly deliverables schedule and the schedule is being maintained. JW advised that a copy of the M&E schedule will be provided to the NHS on 5th August 2014. PM requested that the schedule information/update is provided to the NHS on a monthly basis as the NHS Have a focus on the completion criteria. JW noted that a meeting with IP and Zutec was scheduled to take place on 13th August 2014.	Provide M&E schedule to NHS	DP/JW
		• A meeting is scheduled for later next week with JMurdoch to discuss the H&S file.	-	-
		• Design consultants – joint meetings being held. A lot of work is taking place in the background to pull together the as built drawings.	-	-
		• Completion criteria – a further meeting had been held to discuss the completion criteria. It was anticipated that the information flow will commence soon.	-	-
	Construction Progress Update	***Construction Update (AFE)*** AFe provided a presentation advising of the progress on each floor of the hospitals. The podium areas are work in progress. Focus is currently on the main atrium and getting the mast climbers down, sanctuaries completed and commencing the tiling. BMCL are repricing the cleaning works and as previously advised have directly employed the cleaners. PM enquired about the pigeon issue and BMCL advised this would be sorted. AFe advised that there had been a fox captured within the building however the fox had caused a lot of damage to rooms in the stroke ward which would need to be remediated.	-	-
		AFe noted that on the podium levels there were no matters causing concern. PM enquired about the area at the dental rooms noting that he was due to inspect this areas and it did not appear to be in a condition suitable for inspection. FS advised that the final decoration to area 515 was due to be completed and the final decoration was due to commence to area 513. DP advised that progress in both areas had suffered slightly as was unable to get the lights on in this area as early as would have wanted.	-	-
		AFe reported that he would review the Capita inspection dates for the tower. There had been some issues re TDSL doors which was now improving however he did not want inspections of areas taking place if there was door missing. BMCL were ensuring that the ceiling tiles and grilles are installed so that the M&E commissioning can take place.	-	-
		AFe advised that the majority of the plantrooms in the adult hospital are nearing completion . The installation of the glazed units had been halted and would commence later and that there was circa 40 panels left to be installed.	-	-
		AFe noted that the underfloor heating to the NCH is in the drying out process and that the tiling was due to commence that day.	-	-
		In relation to the externals, AFe advised that the Prater works are getting closer to completing. Works are focused on the front door area. The main entrance door installation will commence after the wall climbers are removed however there are no programming issues regarding the front doors.	-	-

Item No	Item	Discussion / Information	Action	Action by whom
4.	Contractors Progress Report (cont'd)	***M&E Update (DP)*** DP advised that M&E commissioning activities are progressing well. • Plantroom 31 – commissioning progressing well. • Plantrooms 32 & 33 – pushing through the water and vent systems. • Plantrooms 41 & 42 – LTHW systems being flushed and cleaned. Panel power on – 127 live out of 143 areas • Lifts installation – no matters and on track. Focus is on getting the services up and running and phone lines in so can commission • AGV Survey – survey recommencing later that day. 22 AGVs to be delivered 8th August 2014 • Air systems – 120 completed out is 356 • IT hubs – all live • Fire alarm panels – 30 out of 69 have been commissioned In general, commissioning activities are hitting the programme dates. DH enquired about level 12 zone H as the programme shows a12 week slippage. DP suggested that this was a glitch. AFe noted that zone H is ready for a walkthrough and that anything which moves by 2 weeks is red flagged by AB. DP advised that Plantroom 41 had been moved forward as was tied into the theatres. • Witness testing – going well. A couple of niggles have been identified but are being resolved i.e. lighting at static bedheads not switching properly DW noted that there had been 5 cancellations and these needed to be picked up. DP advised that a lot of testing had been left behind as had been tied into doors interfaces. DW suggested that there was a lot of activity which would be coming together and asked BMCL to provide a programme identifying when activities will be taking place. AFe advised that Capita should have a programme. DH advised that the programme shows blocks not specific dates and then sometimes there ends up being a couple of tests on the same day. DW advised that he was conscious that there is a lot of witness testing to be done and as Capita are also involved in quality inspections it would be helpful to have a programme which identified dates so that workload can be planned. • Energy Centre – finishing off the CHP on the gas side. Getting electrical panels ready for testing mid August 2014. In general, Energy Centre commissioning progress is in a good position. Final commissioning to be to be carried out to generators before the CHPs are commissioned. DH enquired about the BMCL proposals re ensuring no corrosion to the pipework/no infection control issues. DP advised that the domestic hot water is stainless steel pipework so there should be no corrosion issues. In relation to infection control concerns BMCL will ensure that a major sterilization process is undertaken to clean out the pipework. The sterilization process will commence September and go through to January 2015. BMCL had taken the view to fill the systems and do major sterilization programme as could not wait to fill the systems.	- - - - - - - - Review level 12 programme - Consideration to be given to ensuring no witness testing and compliance inspection clashes - -	- - - - - - - - DP/AFe - AFe/DP/JW - -

Item No	Item	Discussion / Information	Action	Action by whom
4.	Contractors Progress Report (cont'd)	***Externals (AFe)*** AFe noted that the externals are not going as quick as would have liked however there is no major impact on the programme. BMCL will push on the works .	-	-
		Site Car Parking (AFe) AFe that information would be provided in due course regarding parking in the MSCP and parking permits. AFe reported that AHirst had requested additional car parking spaces and this had been refused. DH advised that there is more NHS staff that car park spaces and enquired whether these staff would still be able to park and AFe advised that the existing arrangements for the Ogilvie site would be transferred to the MSCP.	-	-
		VIE Compound DH suggested that there was a discussion to be concluded with Ian Powrie re gas. DP advised that he would ensure that DW progresses the discussion on IPs return from leave.	Discussions to be progressed between DW and IP	DP
		Procurement • GW advised that the tenders had been received for the demolition works and GW would meet with AKerr later that week to go through the tenders. 3 demolition tenders had been received in total – Demaster had not submitted a tender.	-	-
		• The car park price was awaited from Land Eng.	-	-
		• There are only small bits and pieces of procurement remaining and these would be dealt with through existing supply chain.	-	-
		PM suggested that a meeting to go over the overclad proposals was to be set-up so that the NHS can sense check the proposals i.e. how will BMCL replace windows.	Meeting to discuss overclad proposals to be arranged	AFe
		Generally AFe noted that the last 3 months had been a particularly busy period and a lot of rooms had been inspected. AFe noted that he would be reviewing the tower programme.	-	-

Item No	Item	Discussion / Information	Action	Action by whom
5.	Project Supervisors Report (Capita) (cont'd)	JR provided the following highlights from the Project Supervisor's report:	-	-
		• Works continue to be in accordance with the ERs	-	-
		• Testing and inspections – quality generally good throughout	-	-
		• Capita continue to receive Q&A packs for their inspections.	-	-
		• Inspections being carried out to areas on levels 1- 8 – identifying doors and windows missing. Minor snags being identified i.e. tertiary glazing not installed, doors not installed, damage to doors, etc.	-	-
		• Back checks to rooms on the ground floor had been carried out – only minor issues identified	-	-
		• Inspections to courtyards 1 and 5 – quality good	-	-
		• Inspection carried out to 4th floor atrium link – vinyl satisfactory	-	-
		Neo-natal link bridge connections to existing building – response awaited from BMCL to close out communication. AFe advised that he was progressing the responses.	Provide responses re neonatal link bridge	AFe
		• MSCP – generally to a good standard with only minor snags identified. AFe advised that BMCL will be changing the signage.	-	-
		BMCL have addressed the issue in relation to the northwest stairwell plate. BMCL have yet to address the issue re the NCH Level 4 door to plantroom	Resolve outstanding issue re NCH level 4 door	AFe
		• Landscaping – progressing well		
		M&E (DW)		
		• Installation continues to be to a good industrial standard	-	-
		• Generally satisfied that installation is in compliance with the exception of those items highlighted to BMCL	-	-
		• Installation of specific specialist areas is ongoing – installation generally good	-	-
		• Commissioning and Testing – levels 0 to 3 most advanced	-	-
		• 2nd fix installation – continuing on all levels	-	-
		• Levels 4-11 – installations work in progress	-	-
		• Plantroom 21 – installations nearing completion	-	-
		• Testing and commissioning ongoing to other plantrooms	-	-
		• Level 12 plantroom equipment installation in progress	-	-
		• Lighting controls – wip	-	-
		• Witness testing carried out in the period included: lighting controls within the basement, sprinkler system pressure testing to the ground and third floor, nurse call on 1st and 4th floors, fire alarm system on ground floor, IT activity tests to ground floor computer room and hub on level 5, electrical circuitry tests in NCH, etc.	-	-
		DW was keen to try and avoid a rush of dates as Capita are carrying out both compliance inspections and witness testing.	-	-

		General (JR) • 3 communications were issued during July. It was expected that the number of communications being raised would drop to 0 very shortly. • Capita continue to be assisted by the BMCL Project Team PM noted that in relation to the pictures of the Car Park stairwell he understood this was an outstanding communication. GW advised that PMcGuinness is progressing the Car Park issues.	- - Conclude car park issues/communications	- - PMcG/AFe
7.	Early Warnings	It was noted that there were no early warnings requiring discussion which were not already being dealt with in other fora	-	-
8.	RFI's	It was noted that there were no RFIs requiring discussion/outstanding.	-	-
9.	Equipment Co-ordination	DH noted that the endoscopy washer dryer procurement process was nearing completion. 3 suppliers have been shortlisted for the supply of the washers and they would be on site on 2nd August to see the room. GW enquired about the steel plinth and DH reported that the suppliers have advised that the plinth is not required as their washers come with detachable legs. DH noted that the infill is to be done by the suppliers and they will be informed of this via a clarification.	-	-
10.	AOCB			
	PPC	DH suggested that the wall within the SUDS had been designed and the drawing for this needed to be circulated.		
	Lift controls	DH enquired about progress re the lift controls positions etc and DP advised that he would push this on and that he would confirm the bed lift controls in the same communication.	-	-
11.	Date and Time of Next Meeting	Monday, 8th September 2014 at 3.30pm in the Boardroom, Top floor, Construction Site offices.	To Note	All

From:	Brough, Katharine
To:	Kane, Mary Anne
Cc:	Gardner, Andrew; Hunter, William; Connelly, Karen; Young, Scott
Subject:	FM Migration Planning Group Meeting notes
Date:	19 August 2014 11:21:10
Attachments:	Action Plan 150814 updated.doc FM Migration- Minutes 150814.doc Agenda 190914.doc Risk RegisterAugust.xls FM Migration Planning Group.msg

---

Mary Anne,

Please find attached notes from Friday's meeting for your review and approval. I also attach the updated action plan, risk register and revised agenda for the next meeting on 19th September.

I am not back in the office until 1st September and attach the group distribution list for ease in case you wish Andrew to issue meeting papers in my absence.

Katharine Brough
NHS Greater Glasgow and Clyde | Facilities Directorate| Southern General Hospital, 1345 Govan Road, Glasgow G51 4TF
[redacted] www.nhsggc.org.uk

Meeting held Friday 15 August 2014, 12noon Hillington				
Agenda Item	**Action Item**	**Timescale**	**Owner**	**Update 19 Sept meeting**
6	Workforce planning. Staffside meeting scheduled to review supernumerary posts, numbers of displaced staff and timeline. Site FM to identify vacancies at respective sites.	20/8/14	MAK/BH /SW	
7	By end August all rotas/ rosters / financial plan to be signed off. Catering rota outstanding.	15/8/14	SW/ RA	
4	KC to update commissioning period paper. This would be circulated with minute with revised names against FM activities.	August 2014	KC	

Meeting held Friday 18th July 2014, 1pm Hillington				
Agenda Item	**Action Item**	**Timescale**	**Owner**	**Update 15 August meeting**
5.4	GK to meet with BH/JM to clarify delivery arrangements. Project plan with timescales required for September.	By next meeting 19/9/14	GK	Work progressing with delivery issues, meeting scheduled for 25th August. Plans to contact all suppliers by letter to advise as deliveries would commence in January 2015. BH noted logistics plan for AGV was developed.
6	KC/KM to set timescales for security/helipad recruitment process.	By next meeting	KC/JM	MAK/BH progressing. Awareness days scheduled w/c 25/8, to enable staff to note interest
7	MAK/BH/RA/SW to meet to review proposed rotas in preparation for manager final sign off. Catering o/s	15/8/14	MAK/ BH/RA/ SW	All rotas/ rosters / financial plan to be signed off by end August.

Meeting held Friday 4th April 2014, 9am, Hillington				
Agenda Item	**Action Item**	**Timescale**	**Owner**	**Update 15 August**
4a	Workbooks to be sense checked to assess equipment. Three equipment categories identified: 1. Transferring 2. Surplus for disposal 3. Equipment for storage continued use elsewhere	By next meeting	KC/RS	Info available end August. BH to progress with KC. Options appraisal to be completed end July to retain Yorkhill for storage.
4g.1	Proposed WPM timings to be refined for NSG deliveries.	ongoing	GK/ BH	GK awaiting pharmacy figures. GK progressing for end August detailing frequency of timings. BH to follow up with Pharmacy [Marie Brady].

Meeting held Friday 16th May 2014, 9am, Hillington				
Agenda Item	**Action Item**	**Timescale**	**Owner**	**Update 15th August**
4a	MAK and BH to review STO workbooks to sensecheck quality with Lorna Murray.	Carry forward	MAK/BH/LM	Update at next meeting. BH noted possibility KC to progress.
5c	SOPs to be reviewed. ALL SOPs to be completed end August.	Update at next meeting	BH/MAK KB AMcC KM GK BH KMcS	o/s SGH retail Patient catering to be added to SharePoint. KMurray to pass comments to BBH. o/s Domestic services [MAK/AMcC to complete] o/s Linen provision [K Murray to write up incorporate bed linen policy. o/s WPM policy. GK working with NDC. Draft to be available end August. Hard FM SOPs – IP draft lifts SOP in progress, BH to get Estates SOP written up, noting response times etc. Helpdesk service provision – SOP to be reviewed/ updated. Telecoms SOP to be drafted on completion of Telecoms procurement process.

Actions closed down – 15/8/14

Agenda Item	Action Item	Timescale	Owner	Update 15 August meeting
5.5 18/7/14	MM to confirm Fire Risk Assessment liability should contractors progress with the assessment work.	Complete	MM	Clarification provided to Project Team FRA work progressing.
10 18/7/14	Workforce change communication sessions to be mapped by HR.	Complete	SW	
5.6 20/6/14	All workstream leads to review SOPs and identify any IT related aspects to PMcG/SD.	COMPLETE	ALL	Workstream leads to advise IT
10 20/6/14	Clinical services OTM session had been scheduled for 20th August with invitation to be extended to members of FM Migration group	CANCELLED	KB	Circulated to group.
4b 16/5/14	Patient Movement:	Complete	DMacd	SLWG convened to review patient equipment with clinical and facilities staff at demitting sites. All detail collated from sites for 18/7/14 including specification and ownership. I RFID not viable.
5b 16/5/14	A multidisciplinary ALS session held 9th July, to inform Domestic & Portering Managers on agile working, hot desking and use of mobile devices.	Complete	MC	A McCafferty has summary and further dates for sessions to be agreed via MAK. MM requested Fire officers attend session.
5d.1 16/5/14	Hard FM draft service support contract to be submitted.	Complete.	IP	The draft programme for the development and issue of hard FM service support contract tenders has been uploaded on to SharePoint, with weekly meetings programmed with the Estates procurement team from 28 July 2014. Additional Support required to inform technical content for these contracts, to be identified through first group of Estates staff moving in August. KB PUT ON SHAREPOINT

5d.2 16/5/14	Additional costs for test equipment to be collated and submitted along with costs for fitting out workshops.	Complete	IP	Capital bids prepared and submitted & approved for nsgh schemes: Additional Support required to develop technical specification for these contracts – NOTE PICKUP OUTWITH FM GROUP IP/MAK
8a 16/5/14	Estates profile: IP to firm up rotas and identify gaps firstly for Supervisors and Estates Managers.	COMPLETE	IP	
8b 16/5/14	All to review and submit bids where appropriate entitled New South Enabling compromising NSG campus.	COMPLETE	ALL	CLOSED – Estates Capitals bid submitted
8c	Telecoms update on major incident plans	REMOVE	KMcS	KMcS raised with ECMS. NSGH arrangements under review. Not currently part of project team discussion. To be picked up by A&E when room identifiers are in place.
8d	KC to confirm proposals for Cardiac arrest team at NSG	REMOVE	KC	KMcS in ongoing discussion with resus committee. 2 clinical teams under consideration for NSGH plus team for demitting site. Similar process to be followed for Fire, Violence Alert and Security teams. Represents change how telecoms respond for a & b teams. Need to work through logistics for id available teams.
10b 16/5/14	SW to pass FAQ for staff information sessions	COMPLETE	SW	Information to be circulated to Group 21/7/14
4a.2 4/4/14	JM to identify storage areas for redundant equipment/ equipment for disposal.	Complete	JM	Options identified. JM looking at Yorkhill, possible opportunity also at Dykebar.

FACILITIES DIRECTORATE
NSGH FM MIGRATION PLANNING GROUP
Friday 15th August 2014 2014, 12 noon, Hillington, Contact centre

---

Present

Mary Anne Kane	Group Lead / Interim Director of Facilities
William Hunter	Group Deputy Lead/ General Manager Facilities- South/Clyde
Ian Powrie	Workstream Lead – Hard FM
Rob Anderson	Head of Finance
Stephen Wallace	HR
Margaret Coleman	OD
Jim Magee	Lead – Portering/Security, Helipad, Waste, AGV
Gary Kean	Workstream Lead - Supplies
Annette McCafferty	Workstream Lead - Domestic
Kate Murray	Workstream Lead - Catering
Pat McGorry	Workstream Lead - IT
Steven Drummond	IT
Mandy Machell	Workstream Lead - Fire Safety
Scott Young	Workstream Lead – Travel, Laundry, Helpdesk, Cashiers
Karen Connelly	Workstream Lead- FM Commissioning

In Attendance
Katharine Brough Admin [*minutes*]

	ITEM	ACTION
1.	**Apologies** were received from Robert Stewart, Lorna Murray	
2.	**Matters Arising** All matters arising were covered by the agenda and action plan.	
3.	**Notes of the last Meeting** The Minutes of the last meeting held on the 18th July 2014 were reviewed and accepted as an accurate record. *Mandy Machell joined meeting.*	
3.i	**Action Plan 180714** Action plan was reviewed and updated.	
6	Due to KC running late due to previous meeting obligation, HR and Finance Updates were brought forward in the meeting agenda. **HR Update**: SW confirmed available next week for staff side colleagues. HR had mostly concluded estates matching posts. RA to link in with finance 94 appointed to rotary shift. 17 provisionally displaced staff. 14 vacancies lined up for displaced staff. Letters out to Estates Managers to outline preference, with responses due next week w/c 18/8/14.	

	Advert had been composed for Estates Duty Manager – to allow supervisory post to be completed by end of this month. SW noted number of vacancies within technician posts, and advised this was under review for recruitment. A Staffside meeting was scheduled for Wed 20/8/14 at which point Facilities would have details of supernumerary posts, numbers of displaced staff and timeline. Site FM have been contacted to identify vacancies at respective sites. MAK noted Facilities were moving apace. A process for each discipline was now in place. Area of most concern is Domestic Services. MAK, AMcC and staff side to meet ahead of job matching to demonstrate flexibility of matching process. MAK noted a number of displaced Domestic supervisors; Band 3 and 4 posts were traditionally harder to place. MAK stressed FM need to quantify displacement to enable staff to apply for vacant posts. This process was on schedule for end of October. Staff Transfer dates would be at point when demitting hospital transfers to NSGH. FM to proactively manage vacancies. Each dept. to have OTM noticeboard for staff vacancies across sites using postcard/ job centre format. *K Connelly / K McSweeny joined meeting* Trawl of temporary contracts underway. SW identified approx 70 people. MAK raised issue of staff on fixed term contracts and inclusion of such staff in the process.	
7	**Finance Update** R Anderson noted no further update from last month. SW/ RA to review catering rota 15/8/14. By end August all rotas/ rosters / financial plan signed off. MAK observed the financial envelope does not factor in protection. These were additional costs which staff are entitled to. A piece of refining work would be required to consider implications of protection. It was clarified that double running and decommissioning costs were different funding streams.	
4	**Project Update** KC noted 18th August 23 weeks to go. Schedule of works on programme. KC updated group on plans for contractor to use the new multi storey car park and give up Hardgate Road for period up to 26th January 2015. Initial meeting for Helipad operational group had been held and dialogue with Brookfield Helipad lead had resulted in guidance that there was no requirement for breathing apparatus for response team. KC to advise Occupational Health and H&S accordingly. It was noted that Leeds Helipad use the apparatus, however use is not advocated Health Building note. The apparatus is designed for people such as Scotland Fire & Rescue after dealing with an incident. Standard PPE helmet is sufficient. Induction and orientation signed off by workforce advisory group 15/8/14. 11,000 people. Two stage approach. Induction element majority by DVD, including fore training. L&E staff to lead the sessions and booking sessions and session	

	introductions. STO responsible to ensure staff are booked. Resources required to support induction including ID badges at each session. Orientation. Project Team orientate STO into building. Then STO take responsibility for cascading orientation training to staff. Session starts week after handover 26/1/15 Commissioning team/ STO / contractors Aiming 70 attending each session, two sessions per day. KC updated commissioning period paper. This would be circulated with minute and had revised names against FM activities to reflect FM personnel changes. 12 week migration group in place, comprising of AMcC, J Magee, G Kean. D Louden keen to see detail from group discussions. MAK noted Professional leads should be part of group for familiarisation.	
5	**Workstream Group Leads: Project plan / issues log update**	
5.1	**Laundry:** K Murray updated group on work progressing with Mailbox on laundry trolley. Trial trolley had been lost in Ireland. A replacement was expected in 2 weeks for trial. KC noted it would be useful to have model for the mock up ward. KC to pass details to ward group for initial meeting.	
5.2	**Migration**: DMacdonald provided update. No RFID will be available to track Patient transfer equipment. Update for CSS OTM- no business case, no money, there will be no RFID. Not an immediate priority for FM. Estates asset tracking not seen as viable option, going from active to passive / mobile to static. DMacd attended clinical migration group. Debate on schedule on moves, SGH Plus renal at WIG in excess of 400 seen as too ambitious. Still considering schedule, breakdown of 300 patients. This still requires commitment from Scottish Ambulance on their input. DMacd reported on realisation that such significant numbers were heavily dependent on Scottish Ambulance. Engagement ongoing and follow up work had been delayed due to Commonwealth Games. Hopeful next meeting 19/9/14 will clarify extent of SA commitment.	
5.3	**Catering**: KM to have catering update for next meeting.	**NOTE**
5.4	**Portering/Security –** no exceptions reported**.** Update: Working with IT/Comms to identify receipt delivery device. S Drummond progressing hybrid system prices. Portertrac goes live Monday at SGH, 1st Sept at Neuro. Client live into control desk then out via radios. PDAs trial was cost prohibitive. PMcG to look at app potential for smartphone Z10, Q5 or a galaxy mini [as per Estates]. JM noted need to identify mailroom in sub basement at NSGH. Reviewing incoming mail procedures. Waste and waste yard. JM had met with waste equipment contractors, reviewed spec. KC to ensure compatibility with AGVs. J Magee and Supervisor doing initial commissioning for AGVs and training for AGVs to take place thereafter.	

	IP noted need to look at spill kits [battery acid] and operational arrangements.	
5.4	**Procurement/ Supplies** Generic ward storage group. Additional theatre issues identified such as moving highly valuable consignment stock. Suppliers to be met with discuss procedures. L McMullin, S&A, was part of discussions. GK noted T&LC discussions ongoing re PECOS.	
5.5	**Domestic** No exceptions Storage for Vermop identified.	
5.6	**Fire**: No exceptions. MM to review BH/MAK SW to review resource requirement for 12 month fixed term Fire advisor and provide figures for salary/ payment. MAK stressed importance to clearly identify resource requirements and take care to avoid any potential double running costs. Chair noted Lorna Murray would takeover from MM when she went on maternity leave [end Sept.]. MM raised suggestion of Fire emergency incident desktop exercise by civil contingencies S Johnson aims for January. It was agreed timing was too early and not suitable for FM.	
5.7	**IT**: SD updated group noting no exceptions to report. Decontamination scoring for Washer / Dryers will be complete 21 August. Altrax meeting for Scantrak taken place in readiness for implementation once the washer/dryers are in place. Adult Patient Entertainment scoring complete - awaiting confirmation. Additional capability and additional funding implications written up as business case with Heather Griffin. System is compatible for additional functions. This was noted as important with regard to menu ordering. Asckey have been on-site this week and working with Zutec to import estates asset, PPM and task data to FM first. This would serve as template for New Labs. Brookfield had made significant progress, and alignment would be required between systems. Dynamic risk register and synbiotix domestic reports exceptions ongoing.	L
5.8	**Estates:** IP updated group. Lift service contract framework and impact on AGV. Procurement group had identified best way forward to award contract and 6 month warranty revise with incoming contractor, otherwise reverts back to\Schneider. PPC permit had been granted. IP noted significant work was required to meet conditions with additional assistance required. IP/MAK to meet separately to discuss, Hard FM checking of transfer equipment schedule workbooks was ongoing. A generic action was for KC/ RS to review STO workbooks and extrapolate	

	equipment for each FM service. Gap for FM is being worked up. DMacd has reviewed. IP Estates workbooks progressing. IP hope to have Hard FM reviewed by end August. Pseudomonas guidance outcome HPS/HFS agreed NSGH campus will be treated as retrospective not new build. Caveat to this being campus was subject to risk assessment and control. Assessment underway by S McNamee, J Green, and IP. Copy to be sent to MAK for approval. *Scott Young joined meeting*	
5.9	**Telecoms** – No exceptions to report. KMcS had scheduled January 2015 for training on wireless handsets. Venue tba. PMcG queried spec of mobile devices. KMcS advised they would be Blackberry Z10, mixed bag of models. BT liaison with telecoms progresssing for configuration of virtual numbers for mobile devices. Purchase aimed for December.	
5.10	**Travel / Transport** SY updated group on travel / transport. No exceptions to report with all actions progressing. Ogilvie land not to be used at end of this month to be used by contractors. Notification to site necessary that staff know they cannot use the car park. Managed by Brookfield. BH requested update on transport for communication sessions on 25th August. MAK reflected on number of car parking spaces that would be available. More car sharing permits to be issued, using budi sites. The NSG would result in less staff moving less frequently with fewer permits to be issued. SY was currently participating and facilitating communication sessions. Work on public transport ongoing. However no clarification on public transport service provision was expected until October. JMP consultancy work underway to determine vulnerabilities and shortfalls in public transport infrastructure to identify sustainable routes. Subsequent tendering process for additional public transport services would commence with service in operation in May. Group agreed that scare stories circulating on lack of parking provision was unhelpful and very unlikely. M Coleman remarked that J Best, Director Regional Services had requested SY Travel presentation. MAK noted number of positive messages to be communicated to staff such as the link in with SPT, Traveline site and NHS £ 2 ¼ million injection. SY looking at promotion of local information for staff, based on manpower data of staff start times. Encouraging staff to car share was an important message. Car parking policy review was ongoing. BH queried on timeframe for comments. MAK noted no fundamental changes, and need for inclusion of	

	GRI into policy and need for leased car users to get a permit. ANPR checks would robustly test validity of permits on site. Pool cars to be introduced. It was accepted that RA needs to identify savings on rationalisation to inform any proposal. MAK advised group that pool cars would negate need for many permit holders. A significant number of On call consultants had approved permits and greater permit control was required.	
9	**Risk Register** Register was reviewed and updated.	
10	**Communication:** It was agreed this item would be removed from agenda.	
11	**Migration Executive Group** MAK to cascade minutes from last meeting.	
	AOCB T&LC/ Office Block to be added to agenda. MAK noted importance for **All** Operational Leads to attend meetings. MAK to view T&LC operations and was lead for office block. There was a need to treat all buildings as a totality of campus. Portering/ Domestic input and supplies to be considered and rosters to be reviewed. Front Desk management. This issue had been raised at OTM Board meeting by J Best out-patients group. NSGH Adults front desk has no-one to man desk. It was agreed this was not a facilities task, unless funding is available. Need to consider voluntary services as per other sites, Vic ACH, GGH. FM had responded accordingly to J Best. Out-patients/Ambulatory Care Steering Group requested FM rep. BH to attend and share attendance / feedback amongst FM Migration Group. KC to circulate full list of sub groups for information and secretariat information. Double running and Migration to be added to agenda. No further business reported.	**NOTE** **KB**
	Date of Next Meeting: 19th September 2014 at 1.00pm, within Boardroom, Contact Centre, Hillington	

NSGH FM MIGRATION PLANNING GROUP

Meeting of the Facilities Management Planning Group to be held:
Friday 19th September, 1pm
Boardroom, Contact Centre, Hillington

Agenda

1. Apologies
2. Matters Arising
3. Notes of the last Meeting
   - Action Plan 15th August 2014
4. Project Update [K. Connelly]
5. 12 week commissioning period [K. Connelly]
6. Teaching & Learning Centre/ Office Block
7. Workstream Group Leads: Project plan / issues log exceptions [ALL]
8. HR Update [S. Wallace]
9. Finance Update [R. Anderson]
10. Decommissioning Update [W. Hunter]
11. Risk Register
12. Migration Update
13. Double Running Update
14. Migration Executive Group
15. AOCB

Date of Next Meeting: Friday 17th October 1.00pm, 1pm, Hillington Board Room

From: Powrie, Ian [redacted] on behalf of Powrie, Ian
To: Moir, Peter; Connelly, Karen; David Hall; Fergus Shaw; David Wilson
Cc: Loudon, David
Subject: RE: CLEANING AND WEEKLY CATCH UP WITH BROOKFIELD
Date: 17 February 2015 18:27:32

Guys,

I have arranged with Fergus for the weekly catch-up meeting on Friday of this week at 10 ? 11am in the Rehab Class room.

The issues to be covered are:

1. Pre handover Snagging status update.
2. Post hand over incident report update (Defects).
3. Radiant panel flexible hose replacement programme.
4. Potable water commissioning results and sign off.
5. Status of Sentinel points marked up plans and schedules? Required ongoing monitoring water quality.
6. Fire alarm snagging and commissioning status.
7. Cleaning update.
8. AOCB

From: Moir, Peter
Sent: 13 February 2015 13:02
To: Loudon, David
Cc: Connelly, Karen; Powrie, Ian; 'David Hall'
Subject: CLEANING AND WEEKLY CATCH UP WITH BROOKFIELD

David

I have had a word with Alasdair as follows;

Ultimate Clean ? this does not mean they will go back in and fully clean all areas, will focus on where they have been working, they currently have 22 BMCE cleaning staff on site. Alasdair suggests Karen raise any areas of concern with Fergus and he will organise and co-ordinate. If there are areas that Karen does not require further cleaning then these should be advised to Fergus.

Weekly Catch-up with BMCE ? Karen currently meets with Fergus on a Friday morning and I propose that we maybe add a few bodies to the meeting and cover a wider agenda bringing in M&E items. Is this ok with you Karen or would you prefer to keep your meeting on a Friday morning operationally focused, let me know.

Hugh will call you and update on progress with tender report, they have met Dunne and C&B are completing their report, I understand the tender from SCC has been badged as non compliant, but have not seen updated report.

Regards

Peter Moir
ARIAS

Deputy Project Director

New South Glasgow Hospitals
NHS Greater Glasgow & Clyde
Project Office - Top Floor Site Office
Southern General Hospital Construction Site
Hardgate Road
Glasgow G51 4SX

[redacted]

From: Sinead M. Rogan [redacted] on behalf of Sinead M. Rogan
To: David Wilson
Subject: RE: NSGH A&C - Ward 4b HEPA Chellenge Test Ports
Date: 23 July 2015 11:37:57
Attachments: image001.jpg

David

The intention was to use an existing access hatch

Sinead

From: David [redacted]
Sent: 23 July 2015 08:24
To: Sinead M. Rogan
Subject: NSGH A&C - Ward 4b HEPA Chellenge Test Ports

Sinead,

See attached a sample test port that can be used for the HEPA DOP testing in Ward 4b. I?m not sure if you or H&V have another one in mind. Bearing in mind we will probably need to get some type of port quite quickly as it would be better part installed prior to the ceiling going up.

David

David Wilson
Commissioning Manager - Construction

brookfield_multiplex_logo

Brookfield Multiplex Europe
New South Glasgow Hospitals Project
Hardgate Road
Glasgow, G51 4SX, United Kingdom
[redacted]
W www.brookfieldmultiplex.com

From: Grant Wallace [redacted] on behalf of Grant Wallace
To: Moir, Peter [redacted]
Cc: Gavin Burnett; David Wilson; Alasdair Fernie
Subject: Level 04 - Haemato Oncology Department
Date: 29 September 2015 14:03:18
Attachments: image003.jpg
SHTM 60 building component series - ceilings.pdf
NA-SZ-04-RD-400-HOW_Z1.pdf
NA-SZ-04-RD-400-HOW_B.pdf
B0308A - Single Bed Room_Isolation.pdf
B0305A - Single Bed Room.pdf
SHTM 60 building component series - ceilings categories.pdf
NSGH_Haematology & Oncology_Room Data_ZBP Comments 070812.xlsx
NA-xx-04-PL-332-150_02.pdf
image001.png
image002.png

Peter

Following on from the Early Warning Meeting on Wednesday 16th September, I have collated documentation detailing why BM believe that the changes to Level 4 should result in a compensation event.

Basically, pre-FBC/Appendix K the 'briefing' ADB room data sheets were produced by Tribal. These contained only a standard single bedroom, and an isolation single bedroom (one each for Adults, and for Children's).
[B0305A - Single Bed Room and B0308A - Single Bed Room Isolation extracted from the Tribal RDS pack and attached]

The design team then developed the project specific Room Types in Codebook, importing the Tribal ADB database, and the 800 odd 1:50 room type drawings and RDS. What was produced was reviewed with the design team, BM and Board and signed-off for FBC/Appendix K. During this process, the environmental data was exported and issued to ZBP for review; this was then imported back into the database and incorporated in the RDS. ZBP, BM and yourselves also had separate M&E review meetings to agree this data.
[NSGH_Haematology & Oncology_Room Data_ZBP Comments 070812 attached is the excel file received from ZBP containing the M&E data]

Ceiling Strategy drawings proposing the height and type of the proposed ceilings, along with a specification, were also produced for Appendix K. These were checked against the SHTM, reviewed and approved in design dialogue meetings with the NHS and BM. The SHTM does not specify this department in the Schedule of Activity Space Requirements in the Appendix. We had assumed these bedrooms were to be designed as a generic inpatient bedroom (Single Bedrooms are SHTM Category 5; Isolation Bedrooms are Category 3). Please note that the suite of interior strategy drawings were agreed to take precedent over the ADB room character page and these were omitted from the IBI issued RDS.
[NA-xx-04-PL-332-150_02 Ceiling Strategy drawing attached]

During the fully loaded 1:50 process, post Appendix K, RDS were developed for each unique room. As far as I can tell, the environmental data for Haem-Onc bedrooms has not changed from the extract below and on the attached RDS;

Description: cid:image004.png@01D0DF6D.7F889070

We (BM and their Design Team) have interpreted the 'brief' as the above extracted RDS from the NHS clinical output spec below;

Description: cid:image007.png@01D0DF6D.7F889070

You will also see from the attached ceiling SHTM that as a category 3 type, an isolation bedroom (a higher spec) does not have to be plasterboard to be 'compliant'.

Additional to the above, BM were issued with PMI 21 on 23rd June 2010, accepted in CEN 14, confirming alterations to Board requirements for M & E services. This CEN removed the Hepa filter air supply to 8 bedrooms in the original Haemato-oncology ward. Therefore the ventilation requirement as stated above would and could not have been met if the intention of the original design was to meet your current needs.

BM were then issued PMI 228 on 2nd July 13 requesting change to Level 4 Hepa filtration. This was confirmed in CEN 51 dated 2nd October 13, accepting the design and adaptations to this area are to be taken forward and incorporated into the finished building.

We have proceeded based on the signed off design by the Board in response to the briefing document together with the 2 no PMI's noted above. There are no chilled beams, there is positive pressure, there are no side rooms included in the design as agreed with the Board and at all stages the design as installed has been agreed and signed off by the Board through the RDD process.

I trust this helps with understanding both the architectural and 'briefing' history together with the changes that have occurred post Appendix K / FBC. However if you would like to discuss further we are happy to meet you to discuss.

Regards

Grant

Grant Wallace
Project Commercial Director - Construction

brookfield_multiplex_logo

Brookfield Multiplex Construction Europe Ltd
Fairfield – Suite 12
1048 Govan Road
Glasgow, G51 4XS, United Kingdom
[redacted]
W www.brookfieldmultiplex.com

From: David Wilson [redacted] on behalf of David Wilson
To: steve.russell@[redacted]
Cc: Gillon Armstrong; Alasdair Fernie; david.loudon[redacted]
Subject: Re: QEUH- Ward 4b
Date: 10 May 2016 17:32:09
Attachments: image002.jpg
image001.jpg

Steve,

We will forward on the costs we have tomorrow morning.

David

David Wilson
Commissioning Manager - Construction

Brookfield Multiplex Construction Europe Ltd
Fairfield - Suite 12
1048 Govan Road
Glasgow, G51 4XS, United Kingdom
[redacted]
W www.brookfieldmultiplex.com

P Please consider the environment before printing this email.

Please note we have now moved office!

From: Russell, Steve [redacted]
Sent: Tuesday, May 10, 2016 05:16 PM
To: David Wilson
Cc: Gillon Armstrong; Alasdair Fernie; Loudon, David [redacted]
Subject: RE: QEUH- Ward 4b

David,

Further to our meeting yesterday, we are now under significant pressure to secure the costs for the above alteration proposals due to the operational impact on the service having to decant elsewhere until the upgrading works are complete.

I've noted your comments on the difficulties in obtaining figures from your ventilation supplier, however, would it be possible to release those you have with estimated budget costs for the remaining? That way we can assess how the Board wishes to take this forward.

Regards

Steve Russell
Senior Project Manager

[redacted]

From: David Wilson [redacted]
Sent: 05 May 2016 16:57
To: Russell, Steve
Cc: Gillon Armstrong; Alasdair Fernie; Loudon, David
Subject: RE: QEUH- Ward 4b

Steve,

Our office is on Govan road next to the BAE shipyard (address below) about a 5 minute drive from the QEUH.

David

David Wilson
Commissioning Manager - Construction

BM logo for e-sig v4

Brookfield Multiplex Construction Europe Ltd
Fairfield - Suite 12
1048 Govan Road
Glasgow, G51 4XS, United Kingdom

[redacted]
W www.brookfieldmultiplex.com

From: Russell, Steve [redacted]
Sent: 05 May 2016 16:27
To: David Wilson
Cc: Gillon Armstrong; Alasdair Fernie; Loudon, David
Subject: RE: QEUH- Ward 4b

David,

I could come over to you at the QEUH for 11am. Where are you located at present?

Regards

Steve Russell
Senior Project Manager

[redacted]

From: David Wilson [redacted]
Sent: 05 May 2016 15:57
To: Russell, Steve
Cc: Gillon Armstrong; Alasdair Fernie; Loudon, David
Subject: RE: QEUH- Ward 4b

Steve,

We are waiting on one final cost elements for the AHU upgrades from Barkell which Mercury are chasing.

I can met you on Monday and at the moment can be flexible on time. Let me know the best time to suit and where you would like to meet (our office, hospital etc.)

Regards
David

David Wilson
Commissioning Manager - Construction

BM logo for e-sig v4

Brookfield Multiplex Construction Europe Ltd
Fairfield - Suite 12
1048 Govan Road
Glasgow, G51 4XS, United Kingdom

[redacted]
W www.brookfieldmultiplex.com

From: Russell, Steve [redacted]
Sent: 05 May 2016 15:46
To: David Wilson
Cc: Gillon Armstrong; Alasdair Fernie; Loudon, David
Subject: RE: QEUH- Ward 4b

David,

Are we any further forward with the Feasibility initial cost projections? I would also like to clarify some points in the report with you, could you be available on any of the following next week:

Monday 11th May 11am or 3pm
Wednesday 11th May 10am or 2pm onwards

Regards

Steve Russell
Senior Project Manager

[redacted]

From: David Wilson [redacted]
Sent: 22 April 2016 12:21
To: Loudon, David
Cc: Russell, Steve; Gillon Armstrong; Alasdair Fernie
Subject: QEUH- Ward 4b

David,

Please find attached the Feasibility report for the award 4b upgrade work. We are still waiting on some costs coming back from our supply chain which we should have early next week, but I thought it would be worthwhile getting the majority of the report over to you to review.

If you need to discuss at this stage then give me a call.

Regards
David

we strongly recommend that you check for viruses using your own virus scanner as NHS Greater Glasgow & Clyde will not take responsibility for any damage caused as a result of virus infection.

****

****

****

No virus found in this message.
Checked by AVG - www.avg.com
Version: 2016.0.7596 / Virus Database: 4565/12167 - Release Date: 05/05/16

****

NHSGG&C Disclaimer

The information contained within this e-mail and in any attachment is confidential and may be privileged. If you are not the intended recipient, please destroy this message, delete any copies held on your systems and notify the sender immediately; you should not retain, copy or use this e-mail for any purpose, nor disclose all or any part of its content to any other person.

All messages passing through this gateway are checked for viruses, but we strongly recommend that you check for viruses using your own virus scanner as NHS Greater Glasgow & Clyde will not take responsibility for any damage caused as a result of virus infection.

****

From: David Wilson [redacted] on behalf of David Wilson
To: hk.sfm@[redacted]
Subject: RE: RE: QEUH & RHC - Isolation Rooms
Date: 14 June 2016 17:03:00
Attachments: image005.jpg
image004.jpg
image003.jpg
image002.jpg
image001.jpg

John,

The HBN was used.

We/ Mercury will deal with any defect issues that arise from the verification problem

David

David Wilson
Commissioning Manager - Construction

BM logo for e-sig v4

Brookfield Multiplex Construction Europe Ltd
Fairfield - Suite 12
1048 Govan Road
Glasgow, G51 4XS, United Kingdom

[redacted]
W www.brookfieldmultiplex.com

From: John.McEwan@[redacted]
Sent: 14 June 2016 09:06
To: David Wilson
Subject: Re: RE: QEUH & RHC - Isolation Rooms

Project: NSGH MEP Support
Our Ref: 70470/GLA/OEML/0012

David,

For clarity are we using the SHPN or HBN for the overall isolation suite?

With regards to validation the suite in its entirety has to be considered which includes the ductwork and associated ventilation plant (Supply & Extract). However if the verification in this instance gets done then any issues arising could be dealt with then providing it is carried out within the defects period.

Regards

John

From: David Wilson [redacted]
Received: Tuesday 14/06/2016 08:27
To: "hk.sfm@[redacted]
Subject: RE: QEUH & RHC - Isolation Rooms

John,

The ERs referenced the HBN rather than the SHPN hence when the discussions around the alarms were being had we set the lower limit at 8Pa. The pressure set point however is 10Pa.

Regarding the validation documents, as there was no set format detailed within the SHPN, we plumped for the spreadsheet with the overview information in one place. I have forwarded the annual verification report from Southmead to H&V to follow when they are doing the verification.

David

David Wilson
Commissioning Manager - Construction

BM logo for e-sig v4

Brookfield Multiplex Construction Europe Ltd
Fairfield - Suite 12
1048 Govan Road
Glasgow, G51 4XS, United Kingdom

[redacted]
W www.brookfieldmultiplex.com

From: John.McEwan@[redacted]
Sent: 12 June 2016 16:06
To: David Wilson
Subject: Re: QEUH & RHC - Isolation Rooms

Project: NSGH MEP Support
Our Ref: 70470/GLA/OEML/0010

Thanks David,

1. Agree 10-12 pa pressure should be utilised as this is what the guidance states. Estates should have no authority to change this, indeed the designer would identify it as a non-compliance. Would suggest this is adjusted to provide 12pa control allowing control at lower limit. 2min delay

2. Agree consideration for Hepa pressure is required to ensure continued compliance up to the stage the Hepa requires replaced.

3. Await final commissioning reports. Note documentation uses HBN04- Supplement 1. Was this the contract requirements

4. Confirmation from designer regarding compliance using room extract arrangement required and this will require discussed further.

5. The permeability letter states tests carried out to HBN-04 Supplement 1. Was this the contract requirements?

I have attached what would be expected as a validation document for an isolation room. *(See attached file: isolation room southmead.pdf)*. The H&V document does not meet the minimum validation requirements as currently issued, indeed no reference to the AHU Validation is contained within any information issued to date..

Regards

John

From: David Wilson [redacted]
Received: Thursday 09/06/2016 11:27
To: "JOHN McEWAN ([redacted]
Subject: QEUH & RHC - Isolation Rooms

Morning John,

Attached is the following information relating to the isolation rooms.

- Final validation schedule – the final validation checks were carried out by Julie Miller (BM), Gary Palmerii (Schneider) and Ian McKenzie (H&V). As the final validation check were carried after remedial works were completed in one session, this information was contained on one spreadsheet for ease of collation. The room references are based on the Isolation room number and in the case of BED 50 is noted as CCW165 on the report. It should be noted that the lobby pressure alarms were set up as HBN 04 Supplement 1(8-12pa) which differs from SHPN 04 Supplement 1 (10-12Pa), this was agreed with estates at time of setting, however this can be changed to 10Pa relatively easily if required.
- Air permeability report – all rooms
- As built ventilation drawing for CCW-165

I have asked H&V to update their final commissioning report as particularly the extract version for the critical care appear to be from the initial volume check exercise.

Also I am going to instruct Schneider to alter the control strategy for Supply AHUs for Isolation rooms where the HEPAs were instructed to be installed in the Supply grilles as I have noticed that the current control strategy of AHU static pressure needs altered. The current strategy is if the AHU filters get dirty the fan will ramp up to maintain the static pressure, but when the HEPA filter gets dirty the fan will not react accordingly. My suggestion is to change the strategy on these particular AHUs to control on room pressure to maintain the 10Pa with a delay and a maximum setting to account for when the door has been opened (or left open).

I'm on holiday this afternoon and tomorrow, but if you need to discuss I'm back on Monday.

Thanks
David

David Wilson
Commissioning Manager - Construction

BM logo for e-sig v4

Brookfield Multiplex Construction Europe Ltd
Fairfield - Suite 12
1048 Govan Road
Glasgow, G51 4XS, United Kingdom

[redacted]

W www.brookfieldmultiplex.com

New Southern General Hospitals

Compensation Event #24760

Status: Closed

Notification

Notified By

GGC01.NSGLP.sfrew on 31 Jan 2017

Notified To

BCL01

Proposed Compensation Event?

No

Under Dispute?

No

Type

60.1(1)-Change to the Works Information

Title

CE 194 - Asset Labels

Description

The Board confirm that BMCL should proceed with PMI 493 Asset Labels i.e. change of specification from laminated labels to Veneered Ultra- Destructible asset labels. Quantity as per contract remains at 20,000.

Linked to PMI

6755 - PMI 493 - Asset Labels

Reply By

21 Feb 2017

Decision

Request to submit quotation

Quotation Request Assumptions

£1112.11 inclusive of OH&P but ex VAT

Quotation #1

Proposed Cost

N/A

Accepted Programme affected?

No

Delay to the Completion Date?

No

Delay to a Key Date?

No

Alteration to Accepted Programme?

No

Quote Response Assumption

N/A

Quotation Submitted By

on

Reply By

Outcome

PM to make their own assessment

Outcome Comments

£1112.11 inclusive of OH&P but ex VAT

Assessment / Implementation

Proposed Changes to Price

£0.00

Proposed Changes to Completion Date

N/A

PM Agreed Changes to Price

[redacted]

PM Agreed Changes to Completion Date

Assessment Made By

GGC01.NSGLP.sfrew on 27 Apr 2017

From:	Armstrong, Jennifer
To:	McIntyre, Hazel
Cc:	Devine, Sandra
Subject:	FW: QEUH Ward 4B - HAI SCRIBE - Updated Thursday 24th August 2017
Date:	12 May 2022 16:51:48
Attachments:	Dialysis Dranage point behind IP panels.xls QEUH AC Ward 4B alts Rev D phases 1-3.pdf WARD 4b Ensuite HAI SCRIBE rev 2.doc
Importance:	High

For 4B PI

From: Armstrong, Jennifer
Sent: 02 May 2022 11:16
To: Armstrong, Jennifer [redacted]
Subject: FW: QEUH Ward 4B - HAI SCRIBE - Updated Thursday 24th August 2017
Importance: High

From: Loudon, David
Sent: 24 August 2017 15:41
To: Armstrong, Jennifer [redacted]
Subject: FW: QEUH Ward 4B - HAI SCRIBE - Updated Thursday 24th August 2017
Importance: High

FYI.

David

David W Loudon
Director of Property, Procurement & Facilities Management
NHS Greater Glasgow & Clyde
Corporate Headquarters
Gartnavel Royal Hospital
Glasgow
G12 OXH
Phone: [redacted]

From: Hunter, William
Sent: 24 August 2017 15:40
To: Peters, Christine; [redacted] (NHSmail); Pritchard, Lynn; Walsh, Tom; McNamee, Sandra; McColgan, Melanie; Gallacher, Alan; Brattey, David; Jones, Brian
Cc: McNeil, Elaine; Powrie, Ian
Subject: FW: QEUH Ward 4B - HAI SCRIBE - Updated Thursday 24th August 2017
Importance: High

Dear colleagues,

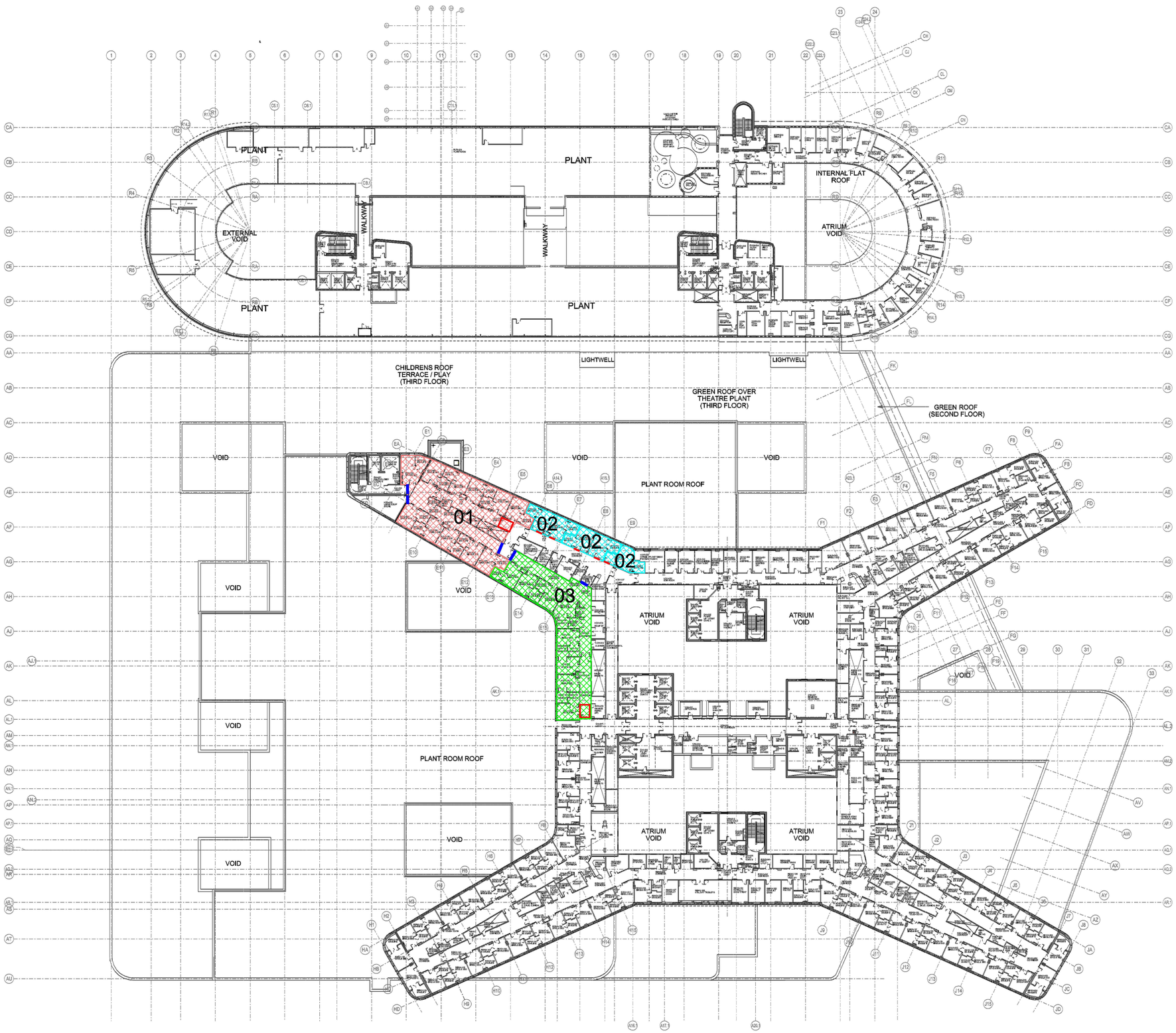
Further to our meeting which took place on Wednesday 23rd August 2017 at 12 noon within OPD Seminar room, can I please provide the following update in connection with HAI SCRIBE and other related points:

1. The HAI SCRIBE document is in the process of being completed and will look at two options. The first option is a phased approach where 3 distinct zones within Ward 4b are upgraded and the second option being a 'single zone approach' where the whole of ward 4b is vacated to be upgraded and handed over to estates. This document, when completed, will be shared with Infection Control and ICD colleagues for approval.
2. I would request colleagues to consider the feasibility and opportunity of handing the complete ward over to allow the full and free access which would see the programme of works reduce from 10 weeks to 6 weeks. If this was a possibility, there would be no requirement to build in negative air pressure arrangements (this was informally discussed between myself and Dr Peters) and would minimise any risk to the Board

around possible infection risk generated from this works.

3. The issue with full access to the ward means that 10 patient beds would not be available throughout the term of the proposed works. This is a decision that needs to be considered by clinical colleagues responsible for those beds (Medical beds).
4. A previous survey of QEUH was undertaken where rooms were fitted with Dialysis points. This survey was undertaken on the back of issues associated with leakage and mould growth. For clarity and assurance Ward 4B was included within that survey and there was no evidence of leakage or mould growth found within the cavity space. For information I have included the report.
5. Water quality should not be an issue within this area as a robust planned maintenance schedule is in place supporting the water assets in compliance with SHTM04-01.
6. Within the Prep Room, it was found that there was no Hepa Filter in place. This issue point was raised by Dr Peters. Action will be taken during the above works package to install and fit a Hepa Filter within this area, subject to the HAI SCRIBE being authorised.
7. With reference to the Estates element of ward commissioning arrangements, I can confirm that a full validation and verification exercise around air changes and, where required, pressures within Ward 4B will be undertaken in accordance with SHTM03-01. This action will be managed in accordance with the agreed and final plan of work and copies of the Validation reports will be made available to the ICD.
8. I have not included any narrative in connection with patient activity (if the ward remains operational). This point requires further clarity.

Regards
Billy



Legend

- Phase 1
- Phase 2
- Phase 2
- Phase 2
- Phase 3
- Environmental Containment Control Barrier: With Transfer area
- Environmental Containment Control Barrier
- Restricted or Emergency access

Notes:
- This drawing is copyright.
- Do not scale dimensions from this drawing.
- All discrepancies on this drawing are to be reported to the architect.
- Do not modify any element of this drawing.
- Use drawing only for purpose(s) issued.

Designer Identification of Hazard/Risk

X TYPE YOUR NOTES HERE

- Indicates a Residual Risk requiring a Compulsory Action
- Indicates a Residual Risk for Information
- Indicates a Residual Risk requiring a Prohibitive Action
- Indicates a Residual Risk as a Warning

Rev	Date	Drw	Revision Notes	Chk	App
Z1	21/01/15	ML	ISSUED FOR AS BUILT	ML	EW
07	31/07/13	CP	Issued for Information.	EW	EW
06	28/03/12	CQ	Issued for Information.	EW	EW
05	09/01/12	CQ	Issued for Information.	EW	EW
04	06/06/11	CQ	Issued to Building Control for Information only.	EW	EW
03	18/03/11	CQ	Issued for Information.	JW	JW
02	28/10/10	CQ	Issued for Information. Grid ommitted	AB	AB
01	28/08/10	CQ	Issued for Information.	AB	AB

Client: NHS Greater Glasgow and Clyde

Contractor: Brookfield Multiplex / BM

NIGHTINGALE associates architects
87-91 Newman Street
London
W1T 3EY
Tel: 0207 079 9900
Fax: 0207 079 9901
www.nightingaleassociates.com

Project: NEW SOUTH GLASGOW HOSPITALS (NSGH) PROJECT

Drawing Title: FOURTH FLOOR PLAN

Job No	Drawn	Checked	Approved
09080	---	EW	EW
Status: AS BUILT		1st Drawn Date: 28/09/10	Scale@A0: 1:200

Drawing No: NA XX 04 PL 252 150 — Rev: Z1

Ward 4b

Phased alterations to en-suite rooms Rev C

NHS National Services Scotland

SHFN 30:
HAI-SCRIBE

Questionsets and checklists

QEUH – Ward 4b
Ceiling & Ventilation Works

Health Facilities Scotland
Engineering and Environment

January 2015

Introduction

Scottish Health Facilities Note (SHFN) 30 in its 2014 published form comprises two parts:

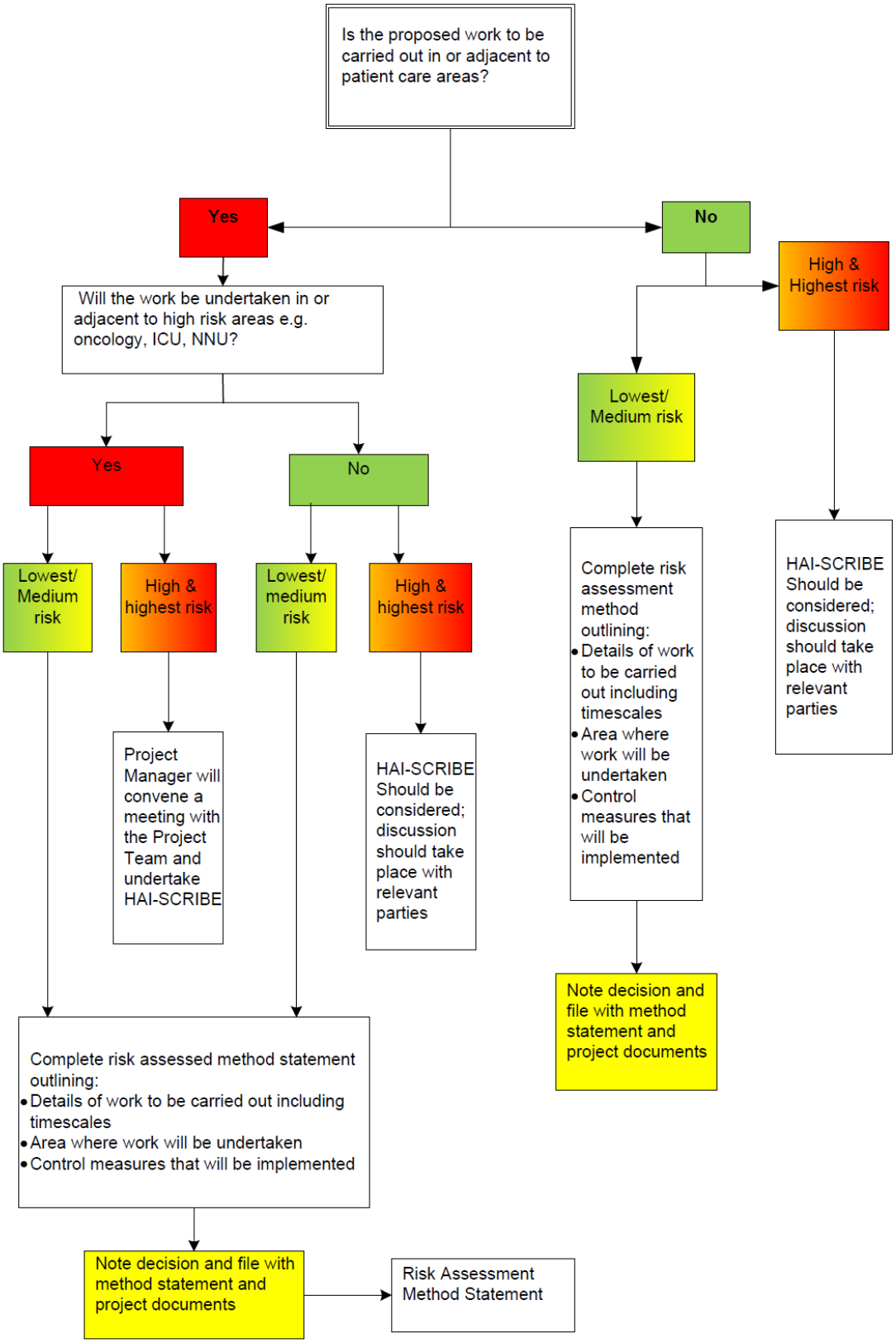
- **Part A**: Manual: Information for Design Teams, Construction Teams, Estates & Facilities and Infection Prevention & Control Teams.
- **Part B**: HAI-SCRIBE Implementation Strategy and Assessment Process.

Both have been published in book form.

It is appreciated that, as familiarity with the use of the procedures grows there will be progressively less need to rely on printed text, eventually leading to situations where Questionsets and checklists will themselves be sufficient. Photocopying from published books is a ponderous and time-consuming process with a tendency to produce distorted images and/or damage binding. To facilitate the process, therefore, Questionsets and checklists for each of the four project development stages have been produced in the form of an information pack ready for photocopying and distributing to project teams to assist in the HAI-SCRIBE review procedures as each new Project requires assessment. This pack is only available electronically.

The various proforma's, comprising Questionsets, checklists and certifications are provided for the following:

- **Development Stage 1:** Initial briefing and proposed site for development:
- **Development Stage 2:** Design and planning:
- **Development Stage 3:** Construction and refurbishment work:
- **Development Stage 4:** Pre-handover check, ongoing maintenance and feed-back.


Is the proposed work to be carried out in or adjacent to patient care areas?
Yes
No
Will the work be undertaken in or adjacent to high risk areas e.g. oncology, ICU, NNU?
High & Highest risk
Lowest/ Medium risk
Yes
No
HAI-SCRIBE Should be considered; discussion should take place with relevant parties
Lowest/ Medium risk
High & highest risk
Lowest/ medium risk
High & highest risk
Complete risk assessment method outlining:
• Details of work to be carried out including timescales
• Area where work will be undertaken
• Control measures that will be implemented
Project Manager will convene a meeting with the Project Team and undertake HAI-SCRIBE
HAI-SCRIBE Should be considered; discussion should take place with relevant parties
Note decision and file with method statement and project documents
Complete risk assessed method statement outlining:
• Details of work to be carried out including timescales
• Area where work will be undertaken
• Control measures that will be implemented
Note decision and file with method statement and project documents
Risk Assessment Method Statement

Type	Construction/Refurbishment Activity
Type 1	**Inspection and non-invasive activities.** Includes, but is not limited to, removal of ceiling tiles or access hatches for visual inspection, painting which does not include sanding, wall covering, electrical trim work, minor plumbing and activities which do not generate dust or require cutting of walls or access to ceilings other than for visual inspection.
Type 2	**Small scale, short duration activities which create minimal dust.** Includes, but is not limited to, installation of telephone and computer cabling, access to chase spaces, cutting of walls or ceiling where dust migration can be controlled.
Type 3	**Any work which generates a moderate to high level of dust, aerosols and other contaminants or requires demolition or removal of any fixed building components or assemblies.** Includes, but is not limited to, sanding of walls for painting or wall covering, removal of floor coverings, ceiling tiles and casework, new wall construction, minor duct work or electrical work above ceilings, major cabling activities, and any activity which cannot be completed within a single work shift.
Type 4	**Major demolition and construction projects.** Includes, but it not limited to, activities which require consecutive work shifts, requires heavy demolition or removal of a complete cabling system, and new construction.

Table 1: Redevelopment and construction activity

Type 3

Risk to patients of infection from construction work in healthcare premises, by clinical areas	
Risk rating	**Area**
Group 1 Lowest risk	1. Office areas; 2. Unoccupied wards; 3. Public areas/Reception; 4. Custodial facilities; 5. Mental Health facilities.
Group 2 Medium risk	1. All other patient care areas (unless included in Group 3 or Group 4); 2. Outpatient clinics (unless in Group 3 or Group 4); 3. Admission or discharge units; 4. Community/GP facilities; 5. Social Care or Elderly facilities.
Group 3 High risk	1. A & E (Accident and Emergency); 2. Medical wards; 3. Surgical wards (including Day Surgery) and Surgical outpatients; 4. Obstetric wards and neonatal nurseries; 5. Paediatrics; 6. Acute and long-stay care of the elderly; 7. Patient investigation areas, including; • Cardiac catheterisation; • Invasive radiology; • Nuclear medicine; • Endoscopy. Also (indirect risk) 8. Pharmacy preparation areas; 9. Ultra clean room standard laboratories (risk of pseudo-outbreaks and unnecessary treatment); 10. Pharmacy Aseptic suites.
Group 4 Highest Risk	1. Any area caring for immuno-compromised patients*, including: • Transplant units and outpatient clinics for patients who have received bone marrow or solid organ transplants; • Oncology Units and outpatient clinics for patients with cancer; • Haematology units • Burns Units. 2. All Intensive Care Units; 3. All operating theatres; Also (indirect risk) 4. CSSUs (Central Sterile Supply Units).

Table 2: Different areas of health care facility and the risk associated with each area.

Group 4

	Construction Project Type			
Patient Risk Group	**TYPE 1**	**TYPE 2**	**TYPE 3**	**TYPE 4**
Lowest Risk	Class I	Class II	Class II	Class III/IV
Medium Risk	Class I	Class II	Class III	Class IV
High Risk	Class I	Class II	Class III/IV	Class IV
Highest Risk	Class II	Class III/IV	**Class III/IV**	Class IV

Table 3: Estimates the overall risk of infection arising and will indicate the class of precaution that should be implemented

Type 3 – Highest Risk

Control measures			
	During Construction Work	**After Construction Work**	**By**
Class I	• Execute work by methods to minimise raising dust from construction operations;. • Immediately replace any ceiling tiles displaced during inspection.	• Clean areas by damp dusting with neutral detergent in warm water;. • Vacuum floor and damp mop.	Request via domestic supervisor. Request via domestic supervisor.
Class II	• Provide active means to prevent airborne dust from dispersing into atmosphere; • Water mist work surfaces to control dust while cutting; • Seal unused doors with duct tape; • Block off and seal air vents; • Place dust mat at entrance and exit of work area; • Remove or isolate HVAC system in areas where work is being performed.	• Dampwork surfaces and ledges with neutral detergent solution; • Contain construction waste before transport in tightly covered containers; • Damp mop and/or vacuum with HEPA filtered vacuum before leaving work area; • Remove isolation of HVAC system in areas where work is being performed.	Request via domestic supervisor. Estates staff. Request via domestic supervisor. Estates staff.
Class III	• **Remove or Isolate HVAC system in area where work is being done to prevent contamination of duct system;** • **Complete all critical barriers eg plasterboard, plywood, plastic, to seal area from non work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins;** • **Maintain negative air pressure within work site utilizing HEPA equipped air filtration units;** • **Contain construction waste before transport in tightly covered containers;** • **Cover transport receptacles or carts. Tape covering unless solid lid.**	• **Do not remove barriers from work area until completed project is inspected by the Board's Health & Safety representative and Infection Control Department and thoroughly cleaned by the Board's domestic services staff;.** • **Remove barrier materials carefully to minimise spreading of dirt and debris associated with construction;** • **Vacuum work area with HEPA filtered vacuums;** • **Damp mop area with neutral detergent and warm water;** • **Remove isolation of HVAC system in areas where work is being performed.**	**Request by Estates Dept.** **Contractor/Estates Staff.** **Request via domestic supervisor.** **Request via domestic supervisor.** **Contractor/Estates Staff.**

Table 4: Describes the required infection control precautions depending on class of risk

	During Construction Work	After Construction Work	By
Class IV	• Isolate HVAC system in area where work is being done to prevent contamination of duct system; • Complete all critical barriers eg plasterboard, plywood, plastic to seal area from non work area (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins; • Maintain negative air pressure within work site; • Seal holes, pipes, conduits, and punctures appropriately; • Construct anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving work site or they can wear cloth or paper coveralls that are removed each time they leave the work site; • All personnel entering work site are required to wear shoe covers. Shoe covers must be changed each time the worker exits the work area; Tack mats have to be used within containment area and at the entrance to the lift on the ground floor. A shoe dispenser should also be situated at the lift on the ground floor. • Do not remove barriers from work area until completed project is inspected. • Leave extractor running as a control measure to maintain negative pressure within work space and to maintain pressure from the lobby to the corridor.	• Remove barrier material carefully to minimise spreading of dirt and debris associated with construction; Builders Industrial clean also to be included in capital cost. • Contain construction waste before transport in tightly covered containers;. • Cover transport receptacles or carts. Tape covering unless solid lid; • Vacuum work area with HEPA filtered vacuums; • Damp dust area with neutral detergent and warm water; • Scrub floor area with neutral detergent in warm water; • Remove isolation of HVAC system in areas where work is being performed.	Contractor. Contractor. Contractor. Deep Clean by Contractor first then Request via domestic supervisor. Request via domestic supervisor. Contractor/Estates Staff.

Table 4 continued: Describes the required infection control precautions depending on class of risk

Construction and refurbishment Stage

Project particulars and checklists for Development Stage 3

Development stage 3: Construction and refurbishment work: Checklist to ensure all aspects have been addressed		
HAI-SCRIBE Name of Project	Ward 4B En-suite ceiling replacement (24 rooms)	
Name of Establishment	Queen Elizabeth University Hospital, Ward 4b	
National allocated number		
HAI-SCRIBE Review Team	As per attendance list	
HAI-SCRIBE Sign Off - As per attendance list		
Completed By (Project Manager) (Print Name) **Ian Powrie/Alan Gallacher**		Date: 24/8/2017
Signature		Date
Stage 3		

Additional Notes

Works will be carried out in 5 stages in 3 zones:

Stage 1: Screen off & seal with zipped air locks both sides, 2 separate locations, of the corridor to rear of ward 4b (isolating 10 rooms) including sealing off:

- Fire escape route, core "H" (break out in emergency escape requirements only).
- The equipment store
- Disabled WC

Stage 2: Screen off & seal with zipped air locks 2 individual single rooms Doors (How-015 & How-017) Facing nurses station (maintaining N\Station & support room access)

Stage 3: Screen off & seal with zipped air locks 2 individual single rooms Doors (How-011 & How-012) Facing nurses station (maintaining N\Station & support room access)

Stage 4: Screen off & seal with zipped air locks 1 individual single rooms Door (How-009) Facing nurses station (maintaining N\Station & support room access)

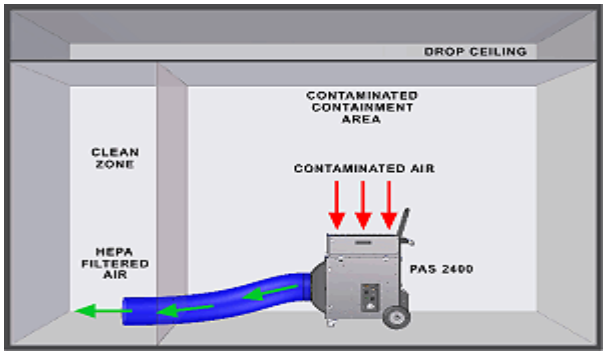
Stage 5: Screen off & seal with zipped air locks ~~3~~both sides of the corridor to rear of ward 4b (isolating 10 rooms) including sealing off:

Stage 6: Replace all Terminal HEPA Filters (24 off) on completion of construction works.

Notes:

- **See attached zone plan detailing staged works and environmental control containment locations**.
- **Isolation room door to corridor to be closed and sealed during works in each room.**
- **Deep clean within each zone before sealed Environmental Control Barriers are removed**.

Development stage 3: HAI-SCRIBE applied to Construction and refurbishment work Prior to the commencement of work		
3.1.1	Brief description of the work being carried out.	QEUH Ward 4b, BMT: Remove existing suspended ceiling grid and replace with a Solid Gyproc construction sealed system. This work will be carried out in 3 distinct zones as highlighted on attached layout drawing.
3.1.2	Using the matrix above establish the type and extent of construction and refurbishment /repair work, patients at risk and level of control measures.	
	Type of work - Type 3	
	Patient risk group - Group 4	
	Risk class - Class 3-4	
3.1.3	Identify any potential hazards associated with this work.	Dust Exposure
3.1.4	Identify any risk associated with the hazards identified above.	Fungal Infection
3.1.5	Outline the control measures that require to be implemented to eliminate or mitigate the identified risks. Ensure these are entered on the project risk register.	
	Control measures: All control measures detailed under risk class 3 are to be fully adopted with the exception of Isolation of the ventilation system which is covered in point 1, 2 & 3 of the additional control measures detailed below: <u>Zone 1 – Red Hatched Area. Work will be carried out in en-suite rooms numbered HOW-057,060,061,065,066,030,028,027,023,022&019.</u> General - Ventilation is common system to all ward isolation rooms therefore cannot be isolated, however the supplies are protected by Terminal HEPA filters which will protect the supply ductwork from dust; 1. Extract ducts will be sealed off to protect from dust contamination. 2. Mobile HEPA recirculation filtration units will be deployed in each room for the duration of the works in that space and over night on completion of the works. 3. A further HEPA recirculation filtration unit will be installed at North of ward (near room HOW-031) which will extract filtered air into the lobby CA4-030. The principle of which is shown below;	



4. Sealed work space:
    a. Zip Lock Environmental containment will be applied to zone.
    b. Internal door faces to be tape sealed during all works.
    c. See attached zone plan detailing staged works and environmental control containment locations.
5. Timber ceiling frames will be prefabricated off site.
6. Monitored work space
7. Good housekeeping
8. Protective Clothing
9. Tack mats at work space entry & exit.
10. A domestic water flushing programme will also be implemented during period of works in zone.
11. Increased domestic cleaning programme access route to ward and ward corridor. (2 times per day).
12. An industrial clean of the area will be carried out, followed by an internal domestic clean.
13. All HEPA filters located in the ductwork for this area will be replaced.
14. Validation of the ventilation system will be carried out to suit the requirements of SHTM03-01.

<u>PHASE 2 – Blue Hatched Area. Work will be carried out in en-suite rooms numbered HOW-018,014,012,010&008</u>

General - Ventilation is common system to all ward isolation rooms therefore cannot be isolated, however the supplies are protected by Terminal HEPA filters which will protect the supply ductwork from dust;

1. Extract ducts will be sealed off to protect from dust contamination.
2. Mobile HEPA recirculation filtration units will be deployed in each room for the duration of the works in that space and over night on completion of the works.
3. A void area will be created extending half the width of the corridor the full length of the Zone. A HEPA recirculation filtration unit will be installed in each room during the works which will extract filtered air into the nearest extract grill. The principle of which is shown above.
4. Sealed work space:
    a. Zip Lock Environmental containment will be applied to zone.
    b. Internal door faces to be tape sealed during all works.
    c. See attached zone plan detailing staged works and environmental control containment locations.
5. Timber ceiling frames will be prefabricated off site.
6. Monitored work space
7. Good housekeeping

	8. Protective Clothing 9. Tack mats at work space entry & exit. 10. A domestic water flushing programme will also be implemented during period of works in zone. 11. Increased domestic cleaning programme access route to ward and ward corridor. (2 times per day). 12. An industrial clean of the area will be carried out, followed by an internal domestic clean. 13. All HEPA filters located in the ductwork for this area will be replaced. 14. Validation of the ventilation system will be carried out to suit the requirements of SHTM03-01. <u>PHASE 3 – Green Hatched Area. Work will be carried out in en-suite rooms HOW-056,052,051,199,197,196,192&191.</u> General - Ventilation is common system to all ward isolation rooms therefore cannot be isolated, however the supplies are protected by Terminal HEPA filters which will protect the supply ductwork from dust; 1. Extract ducts will be sealed off to protect from dust contamination. 2. Mobile HEPA recirculation filtration units will be deployed in each room for the duration of the works in that space and over night on completion of the works. 3. A further HEPA recirculation filtration unit will be installed at North of this zone in corridor HOW-069_1 (near room HOW-055) which will extract filtered air into the lobby. If preferred this could go to the nearest extract.The principle of which is shown above. 4. The Clean Utility Room (HOW-039) will have a HEPA filter installed during this particular phase of works. 5. Sealed work space: a. Zip Lock Environmental containment will be applied to zone. b. Internal door faces to be tape sealed during all works. c. See attached zone plan detailing staged works and environmental control containment locations. 6. Timber ceiling frames will be prefabricated off site. 7. Monitored work space 8. Good housekeeping 9. Protective Clothing 10. Tack mats at work space entry & exit. 11. A domestic water flushing programme will also be implemented during period of works in zone. 12. Increased domestic cleaning programme access route to ward and ward corridor. (2 times per day). 13. An industrial clean of the area will be carried out, followed by an internal domestic clean. 14. All HEPA filters located in the ductwork for this area will be replaced. 15. Validation of the ventilation system will be carried out to suit the requirements of SHTM03-01.	
3.1.6	It has been recognised that control measures identified to address the project risk may have unintended consequences e.g. closure of windows can lead to increased temperatures in some areas. Such issues should be considered at this point, they should be noted and action to address these taken.	

	Potential problems • Failure of general ventilation in ward • Breach in work space containment
	Control measures: • Stop work immediately & escalate as per SOP. • Monitoring & escalation arrangements - SOP to be developed
3.1.7	**Actions to be addressed** **Action 1:** Preparation of Monitoring and escalation SOP (3.2.1, 2 ,4 & 3.3.3) **Action 2:** Definition and confirmation of access egress routes (3.2.3) **Action 3:** Terminal HEPA filters to be replaced on completion of works.(3.2.5) **Action 4:** Management programme for daily flushing regime to be put in place and recorded (3.2.6) **Action 5:** Routine ward cleans will be increased to 2 x daily for duration of works.(3.3.2)

By: **Action 1**:- Ian Powrie\ Lynn Prichard **Action 2**:- Ian Powrie\David Brattey\Lynn Prichard **Action 3:-**David Brattey **Action 4**:- David Brattey **Action 5:** Pat Coyne.	**Deadline:** **Action 1:**- Complete **Action 2:**- Complete **Action 3**:- **Date to be agreed after start date agreed.** **Action 4**:- **Date to be agreed after start date agreed.** **Action 5:- Date to be agreed after start date agreed.**

Development stage 3: In terms of infection risk confirmation that the following been addressed		
3.2.1	The population groups most susceptible to infection. Items to be considered: • Adjacent rooms, wards and departments • Relocation of susceptible patients Have these issues and actions to be taken been noted in actions to be addressed section?	Yes ✓ No ☐ N/A ☐ Yes ✓ No ☐ N/A ☐
Comments		
3.2.2	The hours of operation of the construction work and the impact of this on the clinical area. Have these issues and actions to be taken been noted in actions to be addressed section?	Yes ✓ No ☐ N/A ☐ Yes ✓ No ☐ N/A ☐
Comments 8am-6pm 7 days per week. There is also the possibility to expedite this works by working at evenings.		
3.2.3	Separation of construction and healthcare activities including delivery and supply routes, removal of waste and patient transfers. Have these issues and actions to be taken been noted in actions to be addressed section?	Yes ✓ No ☐ N/A ☐ Yes ✓ No ☐ N/A ☐
Comments Set of drawings to be produced for tender as per drawing 70520(57)01		
3.2.4	The construction of temporary barriers and/or sealing of doors and windows to minimise contamination of the environment by dust and potentially infectious particles created during the construction works. Have these issues and actions to be taken been noted in actions to be addressed section?	Yes ✓ No ☐ N/A ☐ Yes ✓ No ☐ N/A ☐
Comments		

Development stage 3: In terms of infection risk confirmation that the following been addressed (continued)		
3.2.5	Airflow patterns including:	
	Internal and external ventilation systems	Yes ☑ No ☐ N/A ☐
	Exhaust ventilation	Yes ☑ No ☐ N/A ☐
	Sealing of doors and windows	Yes ☑ No ☐ N/A ☐
	Oxygen and Suction points	Yes ☑ No ☐ N/A ☐
	Air handlers, coils, fans and grilles	Yes ☑ No ☐ N/A ☐
	Have these issues and actions to be taken been noted in actions to be addressed section?	Yes ☑ No ☐ N/A ☐
Comments Fully Re-validation and air permeability tests in compliance with SHTM 03-01 requirements		
3.2.6	Work with sinks or plumbing which could give rise to aerosol water droplets in high risk areas.	Yes ☐ No ☐ N/A ☑
	Have these issues and actions to be taken been noted in actions to be addressed section?	Yes ☑ No ☐ N/A ☐
Comments Management programme for daily flushing regime to be put in place and recorded		
3.2.7	Impact on stock storage areas including:	
	Sterile and non-sterile items	Yes ☑ No ☐ N/A ☐
	Patient care equipment	Yes ☑ No ☐ N/A ☐
	Medications	Yes ☐ No ☐ N/A ☑
	Medical records and documentation	Yes ☐ No ☐ N/A ☑
	Linen and waste facilities including sharps	Yes ☐ No ☐ N/A ☑
	Have these issues and actions to be taken been noted in actions to be addressed section?	Yes ☑ No ☐ N/A ☐
Comments Ward partially occupied, Environmental Containment control issues reviewed and agreed...		

Development stage 3: During the construction phase have the following been addressed?		
3.3.1	Where external work is being carried out: Prevention of insect and rodent entry and prevention of weather/water entry to internal areas during the construction phase. Have these issues and actions to be taken been noted in actions to be addressed section?	Yes ☐ No ☐ N/A ☑ Yes ☐ No ☐ N/A ☑
Comments: **N\A**		
3.3.2	Cleaning of site and adjacent areas both during the construction phase and prior to handover. Have these issues and actions to be taken been noted in actions to be addressed section?	Yes ☑ No ☐ N/A ☐ Yes ☑ No ☐ N/A ☐
Comments Industrial deep clean to be completed by contractor at end of works. Routine ward corridor cleans will be increased to 2 x daily for duration of works.		
3.3.3	Enforcement of control and reporting system to ensure compliance with above issues. Have these issues and actions to be taken been noted in actions to be addressed section?	Yes ☑ No ☐ N/A ☐ Yes ☑ No ☐ N/A ☐
Comments Develop SOP and communication plan		
Additional notes - Stage 3		

Development stage 3: HAI-SCRIBE applied to the construction / redevelopment phase			
Certification that the following documents have been accessed and the contents discussed and addressed at the Infection Control and Patient Protection Meeting held on			
Venue	Laboratory Medicine, FRM Suite, Meeting room 5.	Date	24/8/2017
'Healthcare Associated Infection System for Controlling Risk in the Built Environment' *('HAI-SCRIBE) Implementation Strategy Scottish Health Facilities Note (SHFN) 30: Part B).*			
Declaration: We hereby certify that we have co-operated in the application of and where applicable to the aforesaid documentation.			

Present

Print name	Signature	Company	Telephone Numbers	Email address
Teresa Inkster		Lead ICD	[redacted]	[redacted]
McColgan, Melanie		GM Regional Services	[redacted]	[redacted]
Lynn Pritchard		Lead IPCN	[redacted]	[redacted]
David Brattey		Senior Estates Manager	[redacted]	[redacted]

Request For Information dated 6 February 2025 (RFI 45) – 24/02/25

The response below must be read in conjunction with the documents previously provided to the inquiry which, together with the documents identified below, form the full response.

Reference is made to NHS Greater Glasgow & Clyde's response to PPP 13 dated 2 December 2024 and specifically:

(a) In relation to PRF 1 of PPP 13 which states:

"The decision by GGC and Brookfield to enter into a Building Contract under which it was apparently agreed (in a document called the "M&E Clarification Log") that Brookfield would design and deliver a ventilation system for the hospital which, at this stage of the Inquiry's investigations, appears to have been known to, and accepted by, both parties as being (a) not compliant with SHTM 03-01; and/or (b) a derogation from the Employer's Requirements (the "Agreed Ventilation Derogation")."

NHS Greater Glasgow & Clyde has responded that:

"Multiplex clarified in October 2009 that the bid was 2.5 air changes. The Logs capture items in the bid documents which are different from the Employers Requirements. The M&E Log notes that "A typical ward in the tower has the following air change rates to either meet the ADB requirements or achieve the environment conditions: Bedrooms 2.5 ACH (related to ensuite extract rate and air volume for chilled beam unit loadings)....."

"On simple reading of the Clarification Log, the 2.5ACH refers to the "tower". It does not apply to the full QEUH/RHC. The Tower is level 4 and above of the QEUH."

Kindly explain what NHS Greater Glasgow & Clyde considered was the ventilation standard required for (a) the tower and (b) the rest of the QEUH/RHC outside of the tower. Please also provide details of when the issue of non-compliance with that/those standard(s) was raised with Multiplex.

NHS GG&C Response

The previous response provided was an observation that the M&E Clarification log when describing a *"a typical ward in the tower*" is identifying typical wards in level 4 and above in the QEUH Adult hospital. The "Podium" and "Tower" as descriptors of the mass of the building below and above level 4 were regularly used in documentation. The descriptor for the ward tower is contained within the following 2 documents as examples:

a) Volume 3, Section 3.1, page 9-11 of the Multiplex Bid document. Level 3 is plant areas and office accommodation for Medical Records staff therefore ward areas in the tower are level 4 and above (RFI dated 10 January 2025, Question 2m (42))

b) New South Glasgow Hospitals Full Business Case dated October 2010 section 6A.3.4 Adult Inpatient Block – The Beacon (RFI 1, Item 3.3)

NHSGGC have no interpretation of the standard required other than what is described in the contract documents. As noted in our original response to PPP13, NHSGGC consider that the questions asked cannot be answered without hearing evidence.

(b) In relation to Question 1.6.1(e) of PPP 13 which states:

> (e) Are CPs aware of any other features of the Building Contract which should be considered by the Inquiry as being relevant to the water or ventilation systems?"
>
> NHS Greater Glasgow & Clyde has responded that:
>
> *"All of the logs that were agreed as part of the 2010 ITP are relevant and ought to be considered.*
>
> *In particular the "Clarification Log final agreed for contract_.pdf" is relevant and must be read in conjunction with the "M&E Clarification Log".*
>
> We note, in particular, the comment that "All of the logs that were agreed as part of the 2010 ITP are relevant and ought to be considered" however it is not immediately apparent why that is the case. **Please clarify the point that is being made here in order that it may be properly considered by the Inquiry.**

Please refer to the contract documentation previously provided. In particular filenames "047 - NSGH 2010 Instruction To Proceed Bible – Index.doc" and " Stage 3_3a Signed Contract.pdf".

Please refer to the narrative provided in response to RFI (42) dated 10 January 2025, Question 4.3.

The contract for Stages 3 and 3a between Multiplex and NHS GGC (Design and Construct New Hospitals Building) was signed in December 2010 and provides, at item 3v, a list of the supplemental information that Contract Data Part One and Two is amended and supplemented by. The list includes the logs that were agreed as part of the 2010 ITP which formed part of the contract.

Scottish Hospitals Inquiry

[Uploaded via Objective Connect]

Our Ref: RIL.10513091
Your Ref:
Date: 24 February 2025
Please Ask For: Ruth Lawrence / Rachel Blair
Email: rlawrence[redacted]/ rblair@[redacted]
Direct Dial: [redacted]

Dear Sirs

Our Client: Currie & Brown UK Limited ("Currie & Brown")
Notice in terms of Section 21 of the Inquiries Act 2005 – Request for Documents dated 6 February 2025

We write further to the Inquiry's Section 21 Notice dated 6 February 2025 which requests various documents from Currie & Brown. We set out details of Currie & Brown's response to each of the four Requests below.

Request 1: **All documents, correspondence, reports and emails held by Currie & Brown in which it is proposed or asserted that the ventilation derogation as set out in the M&E log does not apply to any part of the hospital outside the QEUH tower and/or which sets out the number of air changes per hour that NHS GGC expected to be provided in (a) each Ward in the RHC, (b) each Ward in the QEUH below level 4 and in the QEUH tower on level 4 and above.**

The Clarification Log which was agreed at the time of execution of the Contract (and incorporated into the Contract) sets out the requirements for a typical ward in the QEUH (referred to in some documents at the time as "*the tower*"). A copy of that document, which is entitled 'Clarification Log_final', was provided to the Inquiry by Currie & Brown on 15 June 2021.

This was supported by the separate M&E Clarification Log which was agreed at the time of execution of the Contract (and, again, incorporated into the Contract). This refers to the final agreed position for rooms where 6 ACH was originally envisaged. A copy of that document, entitled 'ME Clarification log_final', was also provided to the Inquiry by Currie & Brown on 15 June 2021.

The Employer's Requirements (Inquiry Bundle 16, Document No. 13, page 1357) provided that the design was required to comply with SHTMs. The only permitted derogations from this requirement were those set out in the Clarification Logs incorporated into the Contract. The generic Room Data Sheets (titled 'NSGACL-Generic ADB Room Data Sheets_iss2_rev1'), which were incorporated into the Contract (and included in the agreed contract pack signed on 18 December 2009), set out the requirements for other specific rooms.

We understand that the Inquiry does not wish to receive duplicate documents and therefore Currie & Brown does not provide further copies of the 'Clarification Log_final' and the 'ME Clarification log_final'. Currie & Brown provides with this response a copy of 'NSGACL-Generic ADB Room Data Sheets_iss2_rev1'.

Request 2: All documents, correspondence, emails and reports held by [Currie & Brown] from between contract close and 26 May 2016 in which reference is made to the air change rate in any part of the hospital outside Ward 2A (RHC) and Ward 4B (QEUH) not being compliant with the standard set in SHTM 03-01 or having an air change rate of less than 3 air changes per hour.

Excluding communications relating to Ward 2A and Ward 4B, the only documents that Currie & Brown hold which refer to air changes being less than 3 air changes per hour are as follows:

- Email from David Loudon of NHS GGC to Currie & Brown and others regarding an SBAR and room air changes dated 21 June 2016 (Inquiry Bundle 12, Document 105, Page 815);

- Email from Currie & Brown to David Loudon of NHS GGC regarding room air changes dated 22 June 2016 (also contained in Inquiry Bundle 12, Document 105, Page 815); and

- Email in response to the above from Alan Seabourne of NHS GGC to Currie & Brown and others regarding the SBAR and room air changes dated 23 June 2016 (Inquiry Bundle 12, Document 104, Page 813).

Currie & Brown previously provided copies of the above email communications to the Inquiry on 15 June 2021. As noted above, these documents are already included in Inquiry Bundle 12.

Request 3: All documents, correspondence, emails and reports held by Currie & Brown which would support the conclusion, provided at Currie & Brown response to:

PRF 3(d) of PPP 13: "The extent to which the Agreed Ventilation Derogation was driven by any of the following factors:… (d) a contractual agreement that £250,000 would be paid to Brookfield if energy targets/BREEAM ratings were achieved by the design."

that:

"GGC's agreement to pay £250k to Multiplex was not a payment for achieving an energy target, it was an adjustment to the Building Contract sum (ie the target price) for potential works required to meet the Agreed Ventilation Derogation. Any works required to achieve that would have been paid under the conditions of the Building Contract as a defined cost."

Currie & Brown provides with this response a copy of a document entitled 'Brookfield Accepted Tender Revised 17.12.09'. This is Multiplex's tender reconciliation for the final agreed Target Cost that was accepted by NHS GGC in the Contract. It shows the £250,000 being added to the target as an additional risk item.

<u>Request 4</u>: All documents, correspondence, emails and reports held by Currie & Brown which would support the conclusion, provided at Currie & Brown response to:

PRF 4 of PPP 13: "The ambiguous scope of the Agreed Ventilation Derogation, in particular whether it covered all wards in the QEUH/RHC, including specialist wards and specialist ventilation and isolation rooms then intended to be included in the hospital, and any specialist facilities to be later added to the hospital before it opened"

that:

"The scope of the Agreed Ventilation Derogation as agreed between GGC and Multiplex was restricted to standard single bedrooms in general wards only. It did not apply to any specialist areas such as isolation rooms or neutropenic wards.

(a) This is clear from the wording of the comments and proposals recorded in the M&E Clarification Log which expressly described this as a derogation from the recommendation in the SHTM 03-01 guidance for "6AC/HR". The reasonably informed reader of the M&E Clarification Log would have known that the recommendation for 6ACH applied only to the air change rate in general wards. Had there been any proposal or agreement to derogate from the recommendation in SHTM 03-01 for isolation rooms or for neutropenic wards the M&E Clarification Log would have referred to a derogation from 10ACH. Accordingly, it is disputed that the scope of the Agreed Ventilation Derogation is "ambiguous" as stated in PRF 4. Currie & Brown also disagrees with the suggestion in paragraph 2.1.1 of PPP13 that "on a plain reading" the Agreed Ventilation Derogation "appears to apply to the whole hospital". The limited scope was, or ought to have been, clear to those required to consider the M&E Clarification Log and take account of the Agreed Ventilation Derogation.

(b) In the absence of any relevant derogation, the ERs applied unchanged to the specialist ventilation and isolation rooms, ie the default position was that those areas were required to be designed in accordance with SHTM 03-01 as per ERs. Further, as set out in para 3.20.1 of PPP 13, the tender clarification headed 'Update on the Isolation Rooms for the New South Glasgow (Adult) Hospital clarified that the isolation rooms should be designed "in accordance with SHPN4 and SHTM 03-01".

As noted above, the Clarification Log agreed and incorporated into the Contract (the document entitled 'Clarification Log_final') set out the requirements for a typical ward in the QEUH. As also noted above, this was supported by the M&E Clarification Log agreed and incorporated into the Contract (the document entitled 'ME Clarification log_final'). As above, the Employers' Requirements provided that the design was required to comply with SHTMs and the only permitted derogations were those agreed in the Clarification Logs incorporated into the Contract.

Currie & Brown understands that TUV SUD (then known as Wallace Whittle) carried out a review of the developing environmental matrix across 720 sample rooms in November 2010, prior to completion of Contract Stage 2 and the instruction to proceed with construction. A copy of Wallace

Whittle's report of this review (entitled '2900- NSGH-Environmental matrix_comments-011210 Final') was provided to the Inquiry by Currie & Brown on 4 July 2022 and is contained in Inquiry Bundle 16, Document 26, Page 677. Wallace Whittle's report comments on ventilation requirements and it would appear that it does not highlight any significant concern about non-compliance with SHTMs or the Employer's Requirements.

In conclusion, Currie & Brown enclose copies of the following additional documents in response to the Section 21 Notice:

1. NSGACL-Generic ADB Room Data Sheets_iss2_rev1
2. Brookfield Accepted Tender Revised 17.12.09

If any further information or clarification is required by the Inquiry, Currie & Brown would be happy to provide this.

Yours faithfully

[redacted]

Keoghs LLP

5.0	M&E Services	Please confirm that duty / stand-by plate heat exchangers will be provided for Domestic hot water.	Packaged plate heat exchangers/buffer vessels will be arranged to provide run/standby as described in Volume 4 Specification 4.28 and Volume 5 Schedule 5.2.			
6.0	M&E Services	Please provide details of proposed thermostatic mixing valves for DHW.	Taps with integral TMV3 will be used wherever suitable (refer to attached data sheet). In situations where these are not appropriate separate TMV3 thermostatic mixing valves will be used such as Oventrop Brawa-Mix 97 (or equivalent).			
7.0	M&E Services	Please provide details of trench make up for main services.	Trench depths, spacings and backfill will be as NHS Model Engineering Specifications C01 for pipe services and C41 for electrical services. Buried pre-insulated heating and chilled water mains will be in accordance with the system manufacturer's recommendations but will be similar to above.			
8.0	M&E Services	Please confirm that twin regulating valves have been included for gas supplies.	Yes confirmed			
9.0	M&E Services	Please confirm that NRV will be fitted at each fire isolation valve as ER's.	Yes confirmed			
10.0	M&E Services	Please confirm mechanical air change rate for the ward tower.	A typical ward in the tower has the following air change rates to either meet the ADB requirements or achieve the environment conditions: • Bedrooms 2.5 ACH (related to ensuite extract rate and air volume for chilled beam unit loadings) • Ensuites 10 ACH • Clean Utility 6ACH • Disposal Hold 10 ACH • Pantry 6 ACH • Dirty Utility 10 ACH • Equipment store • Cleaner 5 ACH • Nurse base Up to 12 ACH to balance extract from utility spaces, etc • Office/meeting 4 ACH			Refer to the M&E Clarification Log in Contract Data Part 2 for typical single bed ward.
11.0	M&E Services	Please confirm type of fire Extinguishants gas proposed for the main Comms rooms.	The main comms rooms will be protected by a gaseous fire suppression system, the two gases for consideration at detailed design stage are NOVEC1230 and FM200. Both gases have attributes and issues; NOVEC1230 has a Global Warming Potential(GWP) of 1, while FM200 has a GWP of 2900. Certainly NOVEC1230 is kinder to the environment, but it is less kind to the IT assets it is protecting due to the much greater temperature drop when released, over FM200. The rapid rate of change of temperature has been shown to result in failure of the electronic components. The hope is that the suppression gas is never released and that the systems operate on a double knock strategy of operation			Subject to detailed review Stage 2
12.0	M&E Services	Please indicate the plant resilience for hot and cold water services, e.g. full duplicate or is one extra unit proposed per plant area?	HWS calorifiers are provided in groups to serve zones of the building. Each group includes a standby calorifier. Refer to Volume 5 Schedule 5.2 Calorifier.			
13.0	M&E Services	Further to your responses to TC#2, the items listed in the attached Appendix B require further clarification/responses.	As noted on Appendix B			
Renewables/Sustainability/BREEAM						
-	-	No items in this TC.	-			
Laboratories						
-	-	No items in this TC.	-			

Formatted: Centered

NSGH PQQ Evaluation Model | Draft 5 | FINAL | BIDDER | Brookfield

PQQ Question Number	Weighting %	Question Type		
Section A - Bidder Details		**Capability**	**Capacity**	**Financial**
1	Information - Not Scored			
2	Information - Not Scored			
3	Information - Not Scored			
4	7 4	28		
5	4 6		24	
6	3 5	15		
7	2 9	18		
S&W 8	Pass/Fail			
9	Not scored separately, but should be considered as part of other scored questions			
	Section Totals	61	24	0

PQQ Question Number	Weighting %	Question Type		
Section B - Financial Standing		**Capability**	**Capacity**	**Financial**
EY & Amc 1	10			
EY & Amc 2	4			
EY & Amc 3	8			
EY & Amc 4	4			
	Section Totals	n/a	n/a	0

PQQ Question	Weighting %	Question Type		
Section C - Technical Ability		**Capability**	**Capacity**	**Financial**
1	Information - Not Scored			
2	Information - Not Scored			
3	1			
4	7 6	42		
5	4 7	28		
6	4 6	24		
7	6 7	42		
8	4 8	32		
S&W 9	2			
S&W 10	1			
11	2 8	16		
12	1 6	6		
13	1 8	8		
14	Information - Not Scored			
15	1 6	6		
16	1 5	5		
17	1 5	5		
Susan Logan 18	1			
Susan Logan 19	1			
Susan Logan 20	2			
Mark McAlli 21	1			
Mark McAlli 22	2			
23	1 5		5	
24	1 5		5	
25	1 5		5	
	Section Totals	214	15	0

PQQ Question	Weighting %	Question Type		
Section D - Information on Advisers		**Capability**	**Capacity**	**Financial**
1	Information - Not Scored			
2	Information - Not Scored			
3	7 9	63		
4	4 7	28		
5	1 8	8		
	Section Totals	99	0	0

PQQ Question	Weighting %	Question Type		
Section E - Declaration		**Capability**	**Capacity**	**Financial**
	Not Scored			

PQQ Section	Capability (wtg)	Capacity (wtg)	Financial (wtg)	Total (%)
Section A - Bidder Details	61	24	0	85
Section B - Financial Standing	0	0	0	0
Section C - Technical Ability	214	15	0	229
Section D - Information on Advisers	99	0	0	99
Sub-totals	**374**	**39**	**0**	**413**
Weighted to 90%	336.6	35.1	0	371.7
General Evaluation	-	-	-	
Grand Total				**371.7**

413 check

Assessment	Score
Very Poor - completely **fails** to demonstrate required capacity and capability	**0**
Poor - **limited** evidence of required capacity and capabilty	**1 - 4**
Satisfactory - provides **sufficient** evidence of required capability and capacity to undertake the project.	**5 - 6**
Good - shows **good** evidence of capacity and capability that meet the project requirements, and in some areas shows innovation in excess of the project requirements.	**7 - 8**
Very Good - shows **considerable** evidence of capacity and capability in all areas, shows and exhibits innovation in excess of the project requirements in most areas.	**9 - 10**

Assessment

A52825963

New Children's Hospital Project
User Group Membership & Leads

Director	Group	Lead	Members		
Rosslyn Crocket	**Emergency** incl ED Obs ward Transport base	**Scott Hendry**	Melanie Hutton Fiona Russell Will Christian Jack Beattie	Judy Taylor Andrew Watt (Diagnostics) Martyn Flett	**Transport Base** Charlie Skeoch Andrew McIntyre
Rosslyn Crocket	**In patient wards** **inc renal** **ARU** staff areas HaN	**Jim Beattie**	**wards & ARU** Isabel Swinbank Judy Taylor Kay Maley Jack Beattie Iain Horrocks Neil Gibson Stuart O'Toole Morag Liddell Helen Anderson	**Renal** David Hughes James Wallace Isabel Heather Maxwell Ursula Monaghan	**HaN** Lesley McKee Carol Dryden
Mark Feinmann	**Child Protection**	**Jean Herbison**	Lynne Robertson Sarah Hill	Amgaad Faltous Graham Stewart	Marie Valente
Rosslyn Crocket	**Cardiology** incl ward testing lung function	**Trevor Richens**	**ward** Kay Maley Lynne Robertson Kenny Macarthur John Sinclair	**testing** Eamon Murtagh Karen McLeod	**lung function** Caroline King Neil Gibson Anne Devenney
Rosslyn Crocket	**PICU**	**Andrew McIntyre** **Jennifer Scarth**	John Sinclair Maureen Taylor Chuck MacLean Mark Davidson Andy Clements	Atul Sabharwal Kenny Macarthur James Wallace (Pharmacy) Haytham Kubba	
Rosslyn Crocket	**Haemato-onc** incl ward Day Care TCT Teenage CT	**Brenda Gibson** **Dermot Murphy**	Elizabeth Chalmers Milinde Ronge Judy Taylor J Sastray James Wallace (Pharmacy)	Jean Kirkwood Angela Howart	

Rosslyn Crocket ***Aileen MacLennan*** ***Kevin Hill***	**Theatres** incl theatres 23 hour ward Imaging dental	**Pamela Cupples** **Gregor Walker**	**Theatres & Ward** Rod Duncan Judityh Gallagher Lynne Robertson Jane Peutrell Elaine Johnston Haytham Kubba	Kay Maley Paraic McGrogan Megan Orr James Wallace (Pharmacy) Graham Haddock **Cardiac** - Trevor Richens & Ida Torrance	**Imaging etc** G MacNeil (Cath lab mgr) Andrew Watt Andy Brennan Michael Bradnam Barrie Condon Andrew Morley Neil Gibson
Rosslyn Crocket	**Day Invest Unit**	**Maureen Lilley**	Rosie Hague Joyce Davidson Lynne Robertson Paula Beattie	Nurse specialists endocrine Nurse specialists rheumat	
Aileen MacLennan	**Imaging**	**Andrew Watt**	Michael Bradnam Kirsten Forbes	Barrie Condon Andy Brennan	Stuart O'Toole
Rosslyn Crocket ***Mark Feinmann*** ***Mark Feinmann*** ***Mark Feinmann*** ***Glasgow City***	**Rehab & Therapies** incl Physio SLT OT OPD psychiatry & psych orthotics Dietetics& milk kitchen education (schools)	**Lesley Smith** **(Mairi Macleod)**	Mike Morton Liam Dorris Sara Russell Gillian McDaid Dougie Fraser Rober Greig Anne Maclean Maureen Hendry	Paul Galea	
Rosslyn Crocket ***Kevin Hill***	**OPD** incl dental Ophthalmology Orthoptics	**Jamie Redfern** **Karen Prince**	Paula Beattie Lesley Crosbie Conor Docherty Heather Reid Lynne Robertson James Wallace (Pharmacy) Andrew Watt (Imaging) Sharon Ramsay Salvo Cascio Phil Davies	**Dental** Alyson Wray Maurag Buchanan Catherine Brown **Opthal & Orthot** Tim Lavy Jane MacKinnon Ruth Hamilton Roseanna Fraser	**Diabetes** Ken Robertson Anne Maclean Isabel Swinbank **Psychiatry & Psychology** Elain Lockhart Sue Robinson
Rosslyn Crocket	**Audiology**	**Jim Harrigan**	Juan Mora Simon Morrissey		

Rosslyn Crocket ***Anne Harkness***	**Public Areas & Admin** incl Family support siblings creche bereavement centre chaplaincy radio lollipop medical records discharge lounge Medicinema	**Elaine Love**	Marjorie Gillies Frances McGuiness Diane McCloskey Irene Court Alister Bull & Blair Robertson Andy Gray Lesley Crosbie Kay Maley Sheila Pacifico	Frank McGuire Lynda Lawson Martyn Flett Irene Buchanan	
Mark Feinmann	**Psychiatry/DCFP**	**Alex Fleming**	Sarah Hukin Lesley Dunabie Jacqui Begbie		
Kate McKean	**Pharmacy** incl Dispensary Aseptic wards etc	**Ellen Griffin**	**Aspetic** Scott Nicol Steven Leadbetter Lynn Morrison	**dispensary** Joanne Barton Heather Gallagher	**children's rep** James Wallace **Adult wards** Maureen White Alison Anderson
Aileen MacLennan	**Nuclear Medicine**	**Alice Nicol** **Michael Bradnam**			
Aileen MacLennan	**Medical Physics**	**Dave Sutton**	Michael Bradnam Dave Wyper	Elaine Dick Ursula Monachan	Maureen Taylor

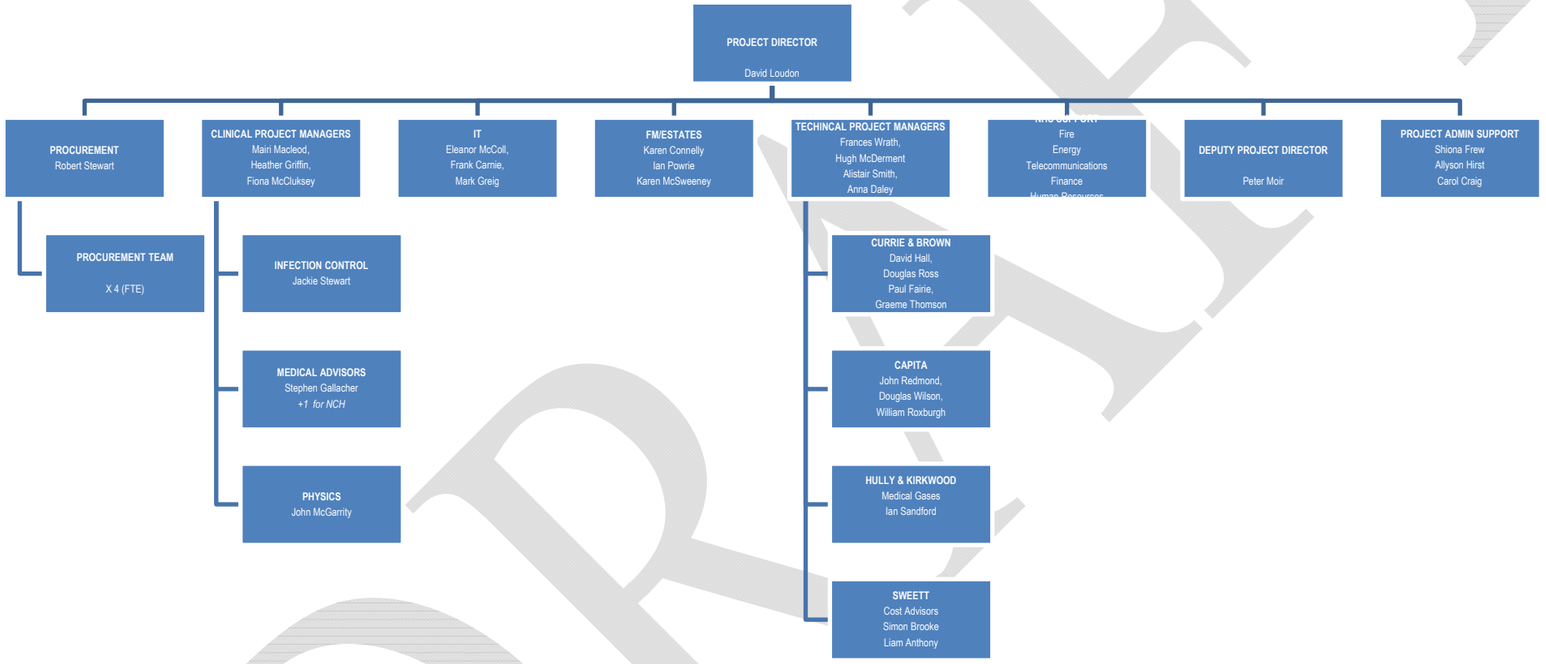
Alan Seabourne
Project Director - New Hospitals

Helen Byrne
Director of Acute Services Strategy, Implementation and Planning

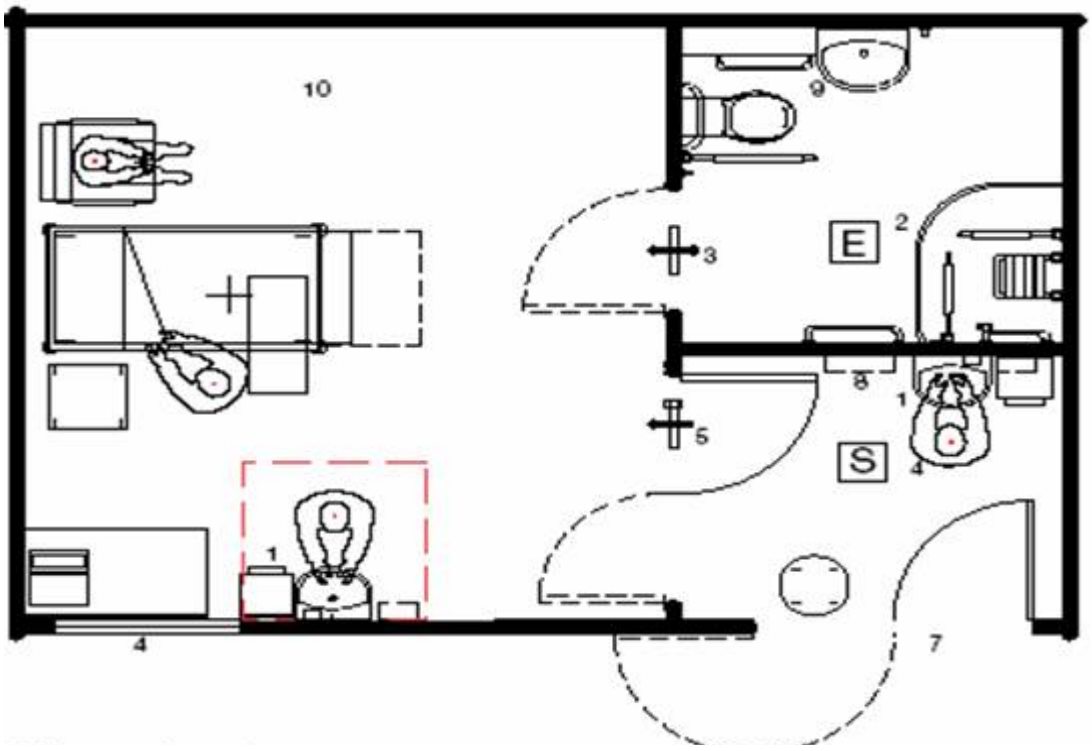
SUPERVISOR'S NOTIFICATION OF DEFECT (Cl 42.2)	**Stage 3 A&C**	CAPITA SYMONDS
Short Description		Date
Defect will prevent the Employer making use of the work	Yes: ; No: ✓	Instruction No.
To: Contractor: Brookfield Multiplex construction Europe		
Project Office Address: Project Office, Hardgate Road, Govan, Glasgow Scotland United Kingdom G51 4SX		
1. Dear Sir NOTIFICATION OF DEFECT The following Defect has been found :- Air Handling Units exposed.		Location of Defect: Level 2, Plantroom, Gridlines M-L1 & 1-1.1
Notification Signed [redacted] Supervisor		Date:
On inspection the correction to the above Defect is: • Accepted • not accepted because: Detail of further Defect		
Correction of Defect Signed Supervisor		Date:
Distribution: Alan Keeley, Peter Moir, Alasdair Fernie, Anthony Fogarty, David Hall.		

Contractors Response

New South Glasgow Hospitals Development – Commissioning Phase Core Project Team Organisation Structure



Sheet 2: New build single room with en-suite facilities and bed-access lobby (isolation suite)



Minimum requirements:

1. Clinical hand-wash-basin with non-touch, fixed temperature mixer tap.
2. Provide suitable extract fan.
3. Install transfer grille to en-suite door.
4. Supply air.
5. Pressure stabiliser.
6. Observation window in corridor wall with integral privacy blinds to allow for staff observation and patient views out.
7. Double door for personnel and bed access.
8 Disposable apron dispenser.
9. En-suite WC to be non-touch flush and hand-wash basin to have single tap with flow and temperature control.
10. Ceiling to be sealed solid construction, external window to be sealed.

DESIGN ACCEPTANCE PROCEDURE FORM

Haemato-Oncology User Group Meeting – 25th March 2010

ACTION POINTS

1. Assisted Bathroom is not required – to be renamed Socialisation Room.

2. Treatment Room to be renamed Intrathecal Chemotherapy Room.

3. Interview Room to be relocated within the Haemato-Oncology Department close to the ward entrance next to Pentamidine Treatment Room.

4. Wheelchair Bay to be adjusted to open onto Haemato-Oncology side.

5. Small Equipment Store is not on schedule of accommodation for Haemato-Oncology and should therefore not open onto the Staff Base – likely to be reallocated as a Disposal Hold for the adjacent department.

6. Central Support Space can't be shared with the adjacent department due to clinical requirements – Pantry and Dirty Utility can be split to provide 2 of each.

7. Link corridor between Clean and Dirty Utility to be omitted.

8. Resus to be relocated within department.

9. Architect to redesign department to allow access to adjacent department without passing through Haemato-Oncology. Admin Support to move towards Visitor Lift with clinical area moving towards ward end.

User Attendees: *Myra Campbell*
Rosemary Twohig
Marjorie Johns

User Apologies: *Gary Jenkins*
Anne Parker
David Dunlop
Sandy Sharp
Fiona MacLean

EMMA WHITE NIGHTINGALE ASSOCIATES	ADB Room Data Sheets GENERAL CORRESPONDEN…	01/06/2010 NA-GC-000179
EMMA WHITE NIGHTINGALE ASSOCIATES	Fwd: ADB Room Data Sheets GENERAL CORRESPONDEN…	01/06/2010 NA-GC-000180

NHS Greater Glasgow and Clyde

NIGHTINGALE associates

MAIL TYPE	MAIL NUMBER	REFERENCE NUMBER
General Correspondence	NA-GC-000179	NA-GC-000179

ADB Room Data Sheets

From	Ms EMMA WHITE - NIGHTINGALE ASSOCIATES
To (18)	Mr Manny Ajuwon - Brookfield Construction (UK) Ltd
	Mr David Bower - Brookfield Construction (UK) Ltd
	Glasgow DocControl - Brookfield Construction (UK) Ltd
	Mr Darren Smith - Brookfield Construction (UK) Ltd
	Ms Gill Kirkness - Doig+Smith LLP
	Mr Bill McGaugie - Doig+Smith LLP
	Ms Emma Corry - Gillespies Landscape Architect
	Mr Alastair Leighton - Gillespies Landscape Architect
	Mr James Miller - Ironside Farrar
	Ms Rebecca Jones - Mercury Engineering (Ireland)
	Mr Ed McIntyre - Mercury Engineering (Ireland)
	Mr Paul Britton - Tribal
	Mr Craig Dixon - Tribal
	Mr Scott McCallum - Tribal
	Mr Billy Adams - WSP Buildings
	Mr Pete Dunbar - WSP Buildings
	Mr John Young - WSP Buildings
	Mr Zisman NSGH - Zisman Bowyer and Partners
Cc (7)	Mr Matthew Palavidis - Acoustic Logic
	Mr Grant Wallace - Brookfield Construction (UK) Ltd
	Mr Tom Allan - Doig+Smith LLP
	Mr David McLeish - Doig+Smith LLP
	Ms Nyree Bennett - Mercury Engineering (Ireland)
	Mr Neil Murphy - NIGHTINGALE ASSOCIATES [redacted]

A52825963

Mr George Iliopoulos - Tribal

Sent Tuesday, 1 June 2010 6:39:58 PM BST (GMT +01:00)

Status N/A

FILE ATTACHMENTS (1)

File Name
01-06-10 NSGH Tribal ADB RDS_all rooms.pdf

ATTRIBUTES

Attribute 1 Stage 2 - Adult New Hospitals Full Business Case (FBC), Stage 2 - Children's New Hospital Full Business case (FBC)

Attribute 2 031. Healthcare Planning, 095. 1:50 Design NSGH User Group Review, 500. Room Data Sheets (RDS)

MESSAGE

All,

Please find attached a copy of the full set of ADB Room Data Sheets produced by Tribal - this represents a 'merged' set of the RDS produced and issued by Tribal in their previously advised batch production. These have been reviewed by ourselves and ZBP prior to issue to the Board for agreement on 'technical readiness'. As previously reported in the DTM's, the Board were not willing to sign-off any RDS prior to the 1:50 Room Type Loading. What they have done is to review the ADB Briefing Codes, in combination with our Project Standardisation and Equipment Union Schedules, and agreed that they represent the equipment briefing they expect, i.e. that they are 'technically ready' and therefore have released the RDS in order to allow us to produce the 1:50 drawings in the agreed programme. During the 1:50 UGM we may discover that some of these Room Types are not required, that the users require a variant of our proposed Room Types or that our proposed Room Type is incorrect. The aim is to achieve a sign-off of all Room Type RDS and 1:50 Drawings, along with agreement of our attribution of Room Types throughout the Project Database at FBC. This will then provide us with a manageable benchmark for equipment when we move to the next stage of the project.

All other aspects of the RDS, in particular the M&E and Acoustic requirements, will be subject to separate Technical Review Meetings which have yet to be arranged with the Board. George has provided a sample excel spreadsheet from the ADB database which contains all the current M&E detailed information. It is proposed that this spreadsheet will be reviewed and agreed with the Board during the time period we are involved in the 1:50 UGMs, so that the approved environmental data can be re-imported back into the database and included for formal RDS sign-off at FBC. Templates will then be created in Codebook and the data will be copied to the assumed locations for each Room Type in the building to allow us to fully load the equipment and to produce RDS for each room, including all corridors, lobbies and the like not currently included.

Please note that the Aseptic Suite RDS still require further detail to be added by the DT (these are the rooms which appear at the front of the document and contain a number of blank pages).

regards,

Emma

From: Julie Miller [redacted] on behalf of Julie Miller
To: Alasdair Fernie
Cc: Moir, Peter; Loudon, David
Subject: Ventilation Pressure Checks - Schiehallion Ward
Date: 12 August 2015 17:18:30
Attachments: image001.jpg

Dear all,

Just to confirm Peter Moirs' and my earlier visit today to review the pressure levels and the direction of air flow in relation to the design criteria for the Isolation rooms.
Two rooms were checked in the Schiehallion Ward – SCH-068 (Bed 18) and SCH-071 (Bed 19).

Whilst they were checked with an uncalibrated meter (note: which could be slightly inaccurate), we still measured 10 pascals from the lobby / corridor. The magnehelic gauges were reading 10 and 11 pascals (these have been checked previously against a calibrated meter by H&V Commissioning).

There was a one pascal differential between the bedroom pressures from the lobby to the bedroom itself. This follows the air path in line with the design - extract air in the bedroom drawing air through and out of the room and also through the en-suite). The volume of extract from the bedroom is greater than that in the en-suite which is in line with the design intent. Both en-suites were in negative pressure.

Best regards
Julie

Julie Miller
M & E Manager

Brookfield Multiplex Europe
New South Glasgow Hospitals Project
Hardgate Road
Glasgow, G51 4SX, United Kingdom
[redacted]
W www.brookfieldmultiplex.com

From: Russell, Steve [redacted] on behalf of Russell, Steve
To: Alasdair Fernie
Cc: Loudon, David; Grant Wallace; David Wilson; Gillon Armstrong; Inkster, Teresa (NHSmail; McColgan, Melanie
Subject: RE: Adults Hospital - Ward 4B
Date: 15 April 2016 13:58:58

Alasdair,

Further to your queries and from my recollection of the meeting on 23rd March it was agreed that the airlock lobby with interlocking doors would be required. As I recall Brookfield had identified one room off the large corridor that maybe suitable, however, they were to check that this could accommodate a bed and two staff in the interconnecting lobby space and if not suitable offer alternative solutions.

The 6 air changes per hour air change rate in the corridor was confirmed as being acceptable. Discussion ensued around the practicalities of supplying additional HEPA filtered supply air into the corridors, however, it was accepted that was likely to be prohibitive due to the limited space available within the ceiling void to take the required additional ductwork, not to mention the increase in plant size. Since the air flow patterns at present are such that the air cascades from the rooms through the departmental corridors to the surrounding environment, it could be we already have the 6 air changes of HEPA filtered air through the corridors at present? Brookfield were to their designers to run some calcs in order to check this.

What was apparent and unacceptable is several positively pressured rooms that are not bedrooms and which have positively suppled air that is not HEPA filtered, this situation leads to the contamination of the corridors. Brookfield were to check if this could be addressed by making these rooms negative to the corridor with the exception of the prep room whose air supply is required to be no less a standard than that of the bedrooms, (positive to corridor, HEPA filtered and 6 air changes at 2.5 - 8pa differential).

Lastly, there was to be assessment made on the possibility of providing an additional standby ventilation unit to maintain some if not all the required air during periods of plant maintenance/failure etc.

Can you confirm please this information clarifies your queries?

Regards

Steve Russell
Senior Project Manager

[redacted]

From: Alasdair Fernie [redacted]
Sent: 12 April 2016 17:14
To: Loudon, David
Cc: Grant Wallace; David Wilson; Gillon Armstrong
Subject: Re: Adults Hospital - Ward 4B

David

I've asked Gillon for an update on this as follows:-

With regards the costs and programme details for the works to ward 4B cannot be finalized until the full requirements / options that the NHS require have been confirmed. At the BMT upgrade meeting held 2 weeks ago the majority of queries were addressed sufficiently to allow the feasibility study to progress.

There are 2 decisions that the NHS are still required to make following a review of the study to allow the costs and programme to be finalized. These are as follows;

1. Confirmation of the location of the interlock lobby – this item will have relatively minor impact on cost and programme.

2. Confirmation if current air change rate in corridors is sufficient (the NHS requested that the corridors be supplied with 6 air changes per hour via HEPA filters. At the moment there is no supply air direct into the corridor as the current design is for the HEPA filtered air to cascade from the bedrooms into the corridor and then into the rest of the hospital.) If it is deemed that the current air change rate is not sufficient then the works associated with providing this additional ventilation will be considerable, if indeed possible at all. Also the knock on effect that this would have on the differential pressure between the corridor and the bedrooms would need to be reviewed as providing that level of ventilation into the corridor may require all the bedroom ductwork to be upgraded also.

Regards

Alasdair Fernie BSc (Hons) MRICS FCIOB
Project Director

On 12 Apr 2016, at 15:38, Loudon, David [redacted] wrote:

Alasdair

Thanks for the update. Can I safely assume that the feasibility study due back at the end of next week will include costs and programme?

Regards

David W. Loudon, MCIOB, CBIFM, MBA
Director of Facilities and Capital Planning
NHS Greater Glasgow & Clyde
Corporate Headquarters
JB Russell House
Gartnavel Royal Hospital
Glasgow
G12 0XH

[redacted]

From: Alasdair Fernie [redacted]
Sent: 12 April 2016 15:33
To: Loudon, David
Cc: Grant Wallace; David Wilson; Gillon Armstrong
Subject: Re: Adults Hospital - Ward 4B

David

Current position on the above is as follows:-

- Architectural layouts are due back from Nightingales by the end of tomorrow showing options for the interlocking lobby.
- We met with WW on Friday following their review of the plantrooms and service route logistics. They are now compiling a brief detailing the options that the NHS have requested. This will be finalized on receipt of NA details later this week.
- Mercury are working in the background pricing the items of plant that will be required regardless of which options the NHS choose.

We have another meeting scheduled for Tuesday next week once David Wilson is back from holiday we will pull all the information together. We should be in a position to issue the feasibility study by the end of next week.

I hope that is enough information at the moment.

If you need anything else in the interim let me know.

Regards

Alasdair Fernie BSc (Hons) MRICS FCIOB
Project Director

On 11 Apr 2016, at 13:40, Loudon, David <[redacted] wrote:

Alasdair

In David's absence, are you able to provide an update?

David W. Loudon, MCIOB, CBIFM, MBA
Director of Facilities and Capital Planning
NHS Greater Glasgow & Clyde
Corporate Headquarters
JB Russell House
Gartnavel Royal Hospital
Glasgow
G12 0XH

[redacted]

From: David Wilson [redacted]
Sent: 11 April 2016 13:19
To: Loudon, David
Subject: Automatic reply: Adults Hospital - Ward 4B

I am on annual leave from Monday 11th April and return to work on Monday 18th April. If you require assistance prior to my return then please contactthe Glasgow office on 0141 445 7580

****

****
NHSGG&C Disclaimer

The information contained within this e-mail and in any attachment is confidential and may be privileged. If you are not the intended recipient, please destroy this message, delete any copies held on your systems and notify the sender immediately; you should not retain, copy or use this e-mail for any purpose, nor disclose all or any part of its content to any other person.

All messages passing through this gateway are checked for viruses, but we strongly recommend that you check for viruses using your own virus scanner as NHS Greater Glasgow & Clyde will not take responsibility for any damage caused as a result of virus infection.

****

No virus found in this message.
Checked by AVG - www.avg.com
Version: 2016.0.7497 / Virus Database: 4545/12015 - Release Date: 04/12/16

****
NHSGG&C Disclaimer

The information contained within this e-mail and in any attachment is confidential and may be privileged. If you are not the intended recipient, please destroy this message, delete any copies held on your systems and notify the sender immediately; you should not retain, copy or use this e-mail for any purpose, nor disclose all or any part of its content to any other person.

All messages passing through this gateway are checked for viruses, but we strongly recommend that you check for viruses using your own virus scanner as NHS Greater Glasgow & Clyde will not take responsibility for any damage caused as a result of virus infection.

****

Amy Pairman (Brodies Solicitors)

Subject: QEUH Ventilation Queries

From: David Wilson
Sent: 12 November 2018 13:16
To: Darren Pike; Ken Hall; McKechnie, Stewart; Brendan Rooney
[redacted]
Cc: "Ciaran J. Kellegher" ([redacted]; John Ballantyne; Fergus Shaw
Subject: QEUH Ventilation Queries

All,

Ciaran Kellegher and myself met with Ian Powrie today to review some ventilation queries the board have particularly on the level 2 childrens hospital ward 2a. They are carrying out some extensive changes in the ward in relation to the water systems and now the ventilation. The main ventilation queries revolves around why the dirty extract from the en-suite toilets is part of the AHU extract where a thermal wheel is present. The example would be 41-AHU20A. This is as design and as installed but did we go through any process for board sign of on this?

There stand at the moment is that the air extracted from the toilets should be discharged directly to external without passing through a thermal wheel where there is the potential for contaminating the supply air?

I'm sure many further vent queries are going to come at us but any help with this one would be appreciated.

Thanks
David

David Wilson
Commissioning Manager
<image001.jpg>
Multiplex Construction Europe Ltd
[redacted]
W www.multiplex.global

<image002.png>

<image003.png> <image004.png> <image005.png>

Please consider the environment before printing this e-mail.

From: David Wilson [redacted] on behalf of David Wilson
To: McKechnie, Stewart
Cc: Glasgow Filing; Glasgow Filing
Subject: RE: QEUH - Ward 4b
Date: 17 May 2016 16:07:00
Attachments: image002.jpg
image003.jpg
image010.png
image011.jpg
image012.jpg
image013.png
image014.jpg
image015.jpg
image016.jpg

Yes Barkell have not provided any cost for this yet so we have noted TBC in the Ward 4b cost plan

David Wilson
Commissioning Manager - Construction

BM logo for e-sig v4

Brookfield Multiplex Construction Europe Ltd
Fairfield - Suite 12
1048 Govan Road
Glasgow, G51 4XS, United Kingdom

[redacted]
W www.brookfieldmultiplex.com

From: McKechnie, Stewart [redacted]
Sent: 17 May 2016 12:26
To: David Wilson
Cc: Glasgow Filing; Glasgow Filing
Subject: RE: QEUH - Ward 4b

I think you may find that Barkell ain't too keen on doing anything for Mercury
I suspect new regs they are referring to is new unit total Pressure drop which is a new EU legislation .
I suspect that way forward here will be to ditch and totally replace existing hope your costs are strong enough !
Cheers

Stewart McKechnie
Director
IEng ACIBSE MIHEEM

TUV SUD Limited
The Venlaw Building
349 Bath Street

Glasgow
G2 4AA
United Kingdom

[redacted]
www.tuv-sud.co.uk/wallacewhittle

Follow us on social media

linkedin.com/company/tuv-sud twitter.com/tuvsud

From: David Wilson [redacted]
Sent: 17 May 2016 12:13
To: Andrew Moore
Cc: Leigh Jamieson; McKechnie, Stewart
Subject: {Disarmed} RE: QEUH - Ward 4b

Andy,

We need to understand what is non-compliant about the proposed AHU design and if they have an alternative solution?

David

David Wilson
Commissioning Manager - Construction

Brookfield Multiplex Construction Europe Ltd
Fairfield - Suite 12
1048 Govan Road
Glasgow, G51 4XS, United Kingdom

[redacted]
E MailScanner has detected a URL mismatch from "webmail.gb.brookfield.com" claiming to be [redacted]
W MailScanner has detected a URL mismatch from "webmail.gb.brookfield.com" claiming to be www.brookfieldmultiplex.com

From: Andrew Moore [redacted]
Sent: 17 May 2016 11:10
To: David Wilson
Cc: Leigh Jamieson
Subject: RE: QEUH - Ward 4b

Dave,

I have part of it, however they have advised the following with regard to the proposed standby units

"that the unit design would be non-ERP compliant, so we as a manufacture would not be allowed to manufacture, our Estimating department is waiting feedback on a revised design"

In addition to this they have issued some further information regarding legislation that came in 2016, which is fluent Russian to me, however the summary is they are not providing a quotation for the standby.

I will close all this out in an email later today with the elements they have priced.

Thanks,

Andy

From: David Wilson [redacted]
Sent: 17 May 2016 10:39
To: Andrew Moore
Cc: Leigh Jamieson
Subject: RE: QEUH - Ward 4b

Andy,

Did you manage to get the Barkell cost?

David

David Wilson
Commissioning Manager - Construction

BM logo for e-sig v4

Brookfield Multiplex Construction Europe Ltd
Fairfield - Suite 12
1048 Govan Road
Glasgow, G51 4XS, United Kingdom

[redacted]
E MailScanner has detected a URL mismatch from "urldefense.proofpoint.com" claiming to be [redacted]
W MailScanner has detected a URL mismatch from "urldefense.proofpoint.com" claiming to be www.brookfieldmultiplex.com

Please consider the environment before printing this email.

From: Andrew Moore [redacted]
Sent: 13 May 2016 11:39
To: David Wilson
Subject: RE: QEUH - Ward 4b

Dave,

Just off the phone to them they have confirmed I will have the quotation this afternoon.

Unfortunately I am back over in Ireland early next week but will issue something to you if not today, then at some point over the weekend.

They wouldn't give me an indicative cost so would prefer to wait on them rather than second guess and make an arse of myself, I am more than capable of doing that on my own!

Thanks,

Andy

From: David Wilson [redacted]
Sent: 13 May 2016 11:32
To: Andrew Moore
Subject: RE: QEUH - Ward 4b

Cheers Andy,

Whats your gut feel for Barkell?

David

David Wilson
Commissioning Manager - Construction

BM logo for e-sig v4

Brookfield Multiplex Construction Europe Ltd
Fairfield - Suite 12
1048 Govan Road
Glasgow, G51 4XS, United Kingdom

[redacted]
E MailScanner has detected a URL mismatch from "urldefense.proofpoint.com" claiming to be [redacted]
W MailScanner has detected a URL mismatch from "urldefense.proofpoint.com" claiming to be www.brookfieldmultiplex.com

Please consider the environment before printing this email.

From: Andrew Moore [redacted]
Sent: 13 May 2016 11:02
To: David Wilson
Subject: RE: QEUH - Ward 4b

David,

Please find attached revised cost taking cognisance of all information etc. with the exception of Barkell.

I now have a contact and chasing on a daily basis, will issue over as soon as I have it.

Thanks,

Andy

From: David Wilson [redacted]
Sent: 12 May 2016 15:03
To: Andrew Moore
Subject: Re: QEUH - Ward 4b

Andy,

Can you issue the rest of the prices with the HEPA and Schneider revised cost - barkell?

David
David Wilson
Commissioning Manager - Construction

Brookfield Multiplex Construction Europe Ltd
Fairfield - Suite 12
1048 Govan Road
Glasgow, G51 4XS, United Kingdom
[redacted]
W www.brookfieldmultiplex.com

P Please consider the environment before printing this email.

Please note we have now moved office!

From: Andrew Moore [redacted]
Sent: Thursday, May 12, 2016 02:46 PM
To: David Wilson
Subject: RE: QEUH - Ward 4b

David,

Indicative costs for items below;

- [redacted]
- [redacted]
- [redacted]
- [redacted]

I trust this meets your requirements.

Thanks,

Andy

From: David Wilson [redacted]
Sent: 09 May 2016 13:43
To: Andrew Moore
Cc: Michael Haveron; Johnathan Dunnett; Sean Flynn; Ciaran J. Kellegher; Leigh Jamieson; McKechnie, Stewart [redacted]
Subject: QEUH - Ward 4b

Andy,

As briefly discussed this afternoon, the NHS has asked us to cost some further items as part of the ward 4b PMI.

1. Entrance lobby to have powered doors – MER to cost for two unswitched fused connections above ceiling within HOW 203 from new circuit at local DB. Allow for interface between access control and door operation.
2. Entrance buzzer system between new entrance and nurse station.
3. Core G access Control to be disabled with B/G unit added on ward side - all other controls to be removed
4. HEPA filter grille housing and filter to be added to Store room HOW 032 (design air volume 39l/s) include for testing

Give me a call if you need to discuss.

Thanks
David

David Wilson
Commissioning Manager - Construction

BM logo for e-sig v4

Brookfield Multiplex Construction Europe Ltd
Fairfield - Suite 12
1048 Govan Road
Glasgow, G51 4XS, United Kingdom

[redacted]
E MailScanner has detected a URL mismatch from "urldefense.proofpoint.com" claiming to be [redacted]
W MailScanner has detected a URL mismatch from "urldefense.proofpoint.com" claiming to be www.brookfieldmultiplex.com

Please consider the environment before printing this email.

http://www.au.brookfield.com for more information about use, disclosure and access). Brookfield's liability in connection with transmitting, unauthorised access to, or viruses in this message and its attachments, is limited to re-supplying this message and its attachments

From: David Wilson [redacted] on behalf of David Wilson
To: Sinead M. Rogan ([redacted]
Cc: Ciaran J. Kellegher" ([redacted] McKechnie, Stewart ([redacted]
Subject: NSGH A&C - Ward 4b
Date: 10 July 2015 16:46:42
Attachments: image001.jpg
20150710163014157.pdf

Sinead,

This afternoon we measured the room pressure on the "sealed room" and with the current design (80l/s supply) managed to achieve 8Pa. I have met with Stewart (WW) and talked through the figures achieved and even though we are now achieving a greater differential pressure we feel that we will still need to increase the supply fan firstly so that we have some additional scope for when the filters get dirty and secondly we will need to increase the supply volume to the three larger rooms to achieve the 6ac/h.

Can you speak with Barkell to find out if we can increase the supply unit a further 0.6m3/s. I have attached the marked up fan sheet with volume and pressures. Can you also find out what the lead in time for any additional part (fan / motors etc.)

Thanks
David

David Wilson
Commissioning Manager - Construction

brookfield_multiplex_logo

Brookfield Multiplex Europe
New South Glasgow Hospitals Project
Hardgate Road
Glasgow, G51 4SX, United Kingdom
[redacted]
W www.brookfieldmultiplex.com

H & V
H & V
H & V

Commissioning Services Ltd
EST: 1975

Kilknowe Office,
16 Barrmill Road,
Galston,
Ayrshire, KA48HH.
TEL Nº. 01563 821991
[redacted]

CONTRACT: NSGH, ADULT & CHILDRENS HOSPITAL – PLANTROOM 31

AHU TEST SHEET

SYSTEM: 31 – AHU 63 SUPPLY (4TH FLOOR HAEMATOLOGY)

AHU								
AHU Manufacturer		Barkell		Fan Size		355		
Fan Manufacturer		Comefri		AHU Serial No		OP1B3043173		
Fan Type		Centrifugal		AHU Model Nº.		NTHZ 355 R		
		Design		**Test** 2·176 m³/s			**% Design**	
Air Volume	(L/S)	1940		363 ~~2050~~			~~106~~ 112	
External Static Pressure	(Pa)	430		Inlet ~~240~~	Outlet 182 ~~332~~		Total ~~572~~ 845	
Fan Rotational Speed	(R.P.M)	2570		2050				
Filter Test Data	Pre Filter (Pa)	Inlet	*	Outlet	*	ΔP	~~40~~ 55	
	Sec Filter (Pa)	Inlet	*	Outlet	*	ΔP	~~55~~ 70	

MOTOR				
Manufacturer	TEC	Output kW	5.5	
Serial Nº	1204-06812693	Motor Full Load Current	10.4	Amps
Voltage	400	Motor Running Current	~~8·9 7.19~~	Amps
	Design	**Test**		
Rotational Speed.	2920	2628		

DRIVE DETAILS						
Motor Pulley/Shaft Size (mmØ)	132 X 1	38	Motor Pulley Taper Lock Size	1610		
Fan Pulley/Shaft Size (mmØ)	150 X 2	40	Fan Pulley Taper Lock Size	2012		
Belt Type/Size	XPZ	975	Nº. Of Belts	2		
Shaft Centres mm	270		Adjustment	- 30	+ 20	mm
Variable Speed Drive	Yes		Set Point	~~45 Hz~~ 52·6		

STANDBY PLANT							
Test Air Volume	2050	Inlet Pressure	240	Motor Rotational Speed	2628	Motor Running Current	
% Design	106	Outlet Pressure	332	Fan Rotational Speed	2313	~~8·9 7.19~~	Amps
Variable Speed Drive		Yes		Set Point	~~45 Hz~~ 52·6		

Comments.

Motor 2 Serial No. 1204-06812862

Motor & Fan Pulley = SPZ 482

Control static pressure set point = ~~332~~ Pa

* Filter pressures taken from magnehelic gauges.

~~Main Volume = TH1 - 1111 l/s + TH2 – 939 l/s = 2050 l/s~~

Instrument Used (Ref Nº.) HV12/1, HV12/4, HV12/5

Date: 23/8/14	Engineer: Stephen Murdoch & Gregor Fulton	Sheet 3 of 10

From: Loudon, David
To: "Alasdair Fernie"; "Darren Pike"
Cc: David.Hal[redacted] Moir, Peter; Barnes, Andrew
Subject: FW: Renal Commissioning report
Date: 17 November 2014 14:32:00
Attachments: Commissioning of new water treatment plant..docx

Alasdair

Andy has prepared the attached report which highlights some of the challenges we have faced when commissioning renal water systems.

Can I suggest that Darren and Andy have a short meeting to go through the report. As you know, the commissioning of renal systems sits high our risk register especially as we are transferring existing renal installations to the NSGH and I recommend that we need to meet to pull together a detailed method statement for this critical piece of work. At present, we don't have a plan B if the event that we have significant challenges with the commissioning.

David

David W. Loudon, MCIOB, CBIFM, MBA
Project Director - South Glasgow Hospitals Development / Director of Facilities and Capital Planning - Designate
NHS Greater Glasgow & Clyde
New South Glasgow Hospital Site Offices
Top Floor, NHS Offices
Hardgate Road
Glasgow
G51 4SX

[redacted]

From: Barnes, Andrew
Sent: 13 November 2014 09:14
To: Loudon, David
Subject: Renal Commissioning report

Hi David,

Please find attached a copy of the commissioning / lessons learned report for renal. As discussed yesterday, once I have the cost's form the labs I will email you the final copy.

Let me know if any further information is required.

Regards
Andy

Andrew Barnes

[redacted]

Project Team, NSGH
Southern General Hospital Construction Site
2nd Floor, Modular Building
Off Hardgate Road
G51 46X

Contents:

1. Background

The water treatment facilities for the South Glasgow University Hospital and Royal hospital for Sick Children will be the largest within Greater Glasgow and Clyde. The two water treatment facilities will provide dialysis water to around 154 points of use with max of 81 simultaneous treatments within the following areas:

- Adult renal dialysis outpatients, ready for use and Technicians workshop.
- Adult renal dialysis In-patient area.
- Intensive Care Unit
- Children's Inpatients & Outpatients Dialysis area.

The two water treatment facilities will include the following:

Plant room 32 will hold the following:

- 1 x Holding Tank
- 2 x Booster pumps
- 2 x Softeners
- 1 x Salt Tank
- 2 x Carbon Column
- 2 x Double pass Reverse Osmosis units, 1x Heat Disinfect/ Nephrosafe filter feeding 1 x supply loop to adult in patient ward area (88 points of use).
- 1 x Double pass Reverse Osmosis units, 1x Heat Disinfect/ Nephrosafe filter feeding 1 x supply loop to adult Out-patients area (23 points of use).
- 1 x Double pass Reverse Osmosis units, 1x Heat Disinfect/ Nephrosafe filter feeding 1 x supply loop to adult Out-patients area (23 points of use).

Plant Room PLT2-001 will hold the following:

- 1 x Holding Tank
- 2 x Booster pumps
- 2 x Softeners
- 1 x Salt Tank
- 2 x Carbon Column
- 1 x Double pass Reverse Osmosis units , 1x Heat Disinfect/ Nephrosafe filter feeding 1 x supply loop to Children's Inpatient / Out-patients area(8 points of use).
- 1 x Double pass Reverse Osmosis units , 1x Heat Disinfect/ Nephrosafe filter feeding 1 x supply loop to Children's Inpatient / Out-patients area and Adult ICU (12 points of use).

There is also a central concentrate system with storage tanks within the basement plant room and a holding tank on level 2 to supply the Adult renal dialysis out-patient area.

In order to complete the validation of the treatment facilities prior to migration of renal dialysis patients we should look at past experiences to plan ahead.

2. Previous Commissioned Facilities

In recent years several of Greater Glasgow and Clyde's Renal Dialysis water treatment facilities have been installed, commissioned and validated. These include the facilities at the following Hospitals:

- Western Infirmary
- Stobhill ACH
- Victoria Infirmary ACH
- Inverclyde Royal Hospital

At each of these sites the validation period has ran over causing delays in the use of the new facilities, postponing moving into new ACH or decommissioning of old equipment . In some cases there were several reasons that contributed to the delay however one of the consistent ones is failing to meet the water quality.

The most recent installation of a water treatment facility with heat sanitisation capabilities was at Inverclyde Royal Hospital, renal dialysis unit with 22 points of use with max of 22 simultaneous treatments. This was to replace the obsolete water treatment facility whilst still continuing dialysis treatment in the unit.

The validation process was started at the end of April 2013 and after six false starts the process was not complete until November 2013.

Some of the contributing factors to the failed Validations are:

- Reverse Osmosis units automatically shut down during generator run.
- Aquatic Valves failed on Carbon column resulting in water failures, Reverse osmosis units shutting down.
- Heat sanitisation failures.
- Loss of feed water, Problem with Hospital supply.
- Leaks in flowmeters.
- Failure to meet TVC limits of <0.1CFU /ml.
- TVC samples take 7 days to cultivate resulting in a delay to act upon and failed samples.

Clinicians then delayed the changeover until January 2014 due to staff training, familiarisation with the new heat sanitisation system. During that delay there were failures with equipment resulting in reverse osmosis unit's being shut down. This then lead to several months failing to consistently produce dialysis water to ultrapure quality.

3. Validation

The guidelines used within Greater Glasgow and Clyde, suggests several recommendation when installing, commissioning and validating a new Water treatment facility for renal. This can be found in the UK Renal Association and Association of Renal Technologists: Guideline on water treatment facilities, dialysis water and dialysis fluid quality for haemodialysis and related therapies dated 20/01/2012. .

Within the document it suggests that the suppliers/contractors should agree on a validation plan with renal services, see section: 3.1.2 below:

"*The validation process should provide documentary evidence that the system will consistently produce water, dialysis fluid, or substitution fluid meeting the quality requirements of ISO 13959 or ISO 11663. The contractor or supplier of the water treatment system should draw up the validation plan, which must be submitted to and approved by a member of the renal services with responsibility for clinical care of the patient".*

The validation plan is made up of three sections Initial qualification, Operational Qualification and Performance Qualification. See below for requirements:

1. **Initial Qualification**: (Section 3.1.3 & 3.1.4 of guideline)
   Completion of installation of water treatment facility
   The water treatment facility when completed should be confirmed to have met all aspects of the design specification. This needs to be agreed and signed off by the manufacturer/installer, commissioning team and by the person within the renal service with responsibility for clinical governance of the water treatment facility (Guidelines 1.2 and 1.3)

   Initial qualification
   On completion of installation, full system documentation should be available including system flow diagrams, layout, log books and operator's manuals. Following completion of the installation, an installation qualification is performed. The purpose of this is to define and provide documented proof that the system has been installed in accordance with the approved plans and the manufacturer's technical requirements and specifications.
   Problems have arisen from a lag between completion of the installation process and the commencement of the validation process. To avoid such problems, it is imperative that the water treatment plant and distribution system are not left for any period during which there is fluid present in the system but there is no flow through the system.
   Furthermore, it is highly desirable that the entire system is run for short periods on a daily basis. If this is not possible then suitable alternate approaches will need to be established and discussed with a designated technical expert. If the designated technical expert is not part of the renal team, this should be clearly indicated on the documentation together with signed approval from a member of the renal team.

2. **Operational Qualification**(Section 3.1.5 of Guideline)
   The initial qualification of the water treatment system is followed by an operational qualification, the purpose of which is to verify the proper operation of the system, including operating range, set point, interlock and functional testing. On completion the following information should be available:
   - test records;
   - set up record;
   - calibration schedule;
   - sampling procedures;
   - maintenance plans (e.g. disinfection, filter changes, etc.) and monitoring plans (e.g. conductivity, microbiological analysis);
   - record of operator(s) training.

3. **Performance Qualification (**Section 3.1.6 of guideline)
   Performance qualification
   Performance qualification generally follows a successful completion of the validation plan. The purpose of the performance qualification is:
   - a demonstration that the plant has been installed in accordance with the design plans and follows the manufacturer's procedures for installation (i.e. Installation Qualification);
   - a demonstration that the system performs all the required actions and can be operated in accordance to relevant technical manuals (i.e. Operational Qualification).

   The Performance Qualification includes periodic assessment of a set of physical, chemical and microbiological parameters to demonstrate that a consistent performance pattern can be achieved for the specific system design and performance requirements. The sampling and testing pattern can be relaxed during the monitoring phase (normal operation) provided it can be demonstrated that the system consistently yields high quality results over an extended period and that continuously monitored parameters provide full surveillance of the system performance. Under these assumptions, the following scheme may be adopted:
   The first phase requires a full chemical and microbiological analysis of the dialysis water, followed by weekly microbiological analyses during the first month, to demonstrate consistent quality in the interval between disinfections. During this period all the information about the system behaviour should be collected and fine-tuning of the action levels performed. In this phase the testing frequency of the microbiological parameters is kept at a higher level to create a 'trend analysis' and to identify any deviations to ensure patient safety.
   The achievement of at least three consecutive results, consistently below the action level allows the start of the second phase where the final testing of microbiological parameters and the disinfection plan are implemented. Attainment of results within the action level for two consecutive months allows the successful completion of the Performance Qualification and the start of routine monitoring operations.

NOTE: If at any time a water sample fail's the performance qualification the 4week process will need to restart again.

To complete the performance qualification of the water treatment facility, weekly water test's would need to be performed the estimated number of tests / cost's are:

Weekly Water Samples				
Test's	Analysis Centre	Cost Each	Qty	Total Cost
Microbiology (TVC)	SNBTS	£19.80	13	£257.40
Endotoxins	SNBTS	£26.75	13	£347.75
*Chlorine	Renal Technologists or External Test centre	***	12	***
**Chemical analysis	External Test Centre	***	12	***
	Total Weekly (Ex VAT)			

These are based on the draft sampling regime, See Appendix 1; this will need to be confirmed by GG&C Regional Service / Renal Technologists.

*Due to the number and frequency of these tests for validating the treatment facility i would suggest they are sent to an external accredited analysis centre.

**Since SGUH & RHSC is a new facility we need to establish the level of contaminates in the incoming water. This can be achieved by obtaining water results from Scottish water for water provided to the site and performing a full chemical analysis on the incoming and dialysis water. Once it has been demonstrated chemical contaminates in section 5.2, table 2 &3 of guidelines are consistently low these can be omitted. Returning to monitoring Mandatory chemical contaminants in section 5.2, table 1.

*** Cost's to be finalised.

4. Conclusion

The water treatment facilities for the South Glasgow University Hospital and Royal hospital for Sick Children will be the largest within Greater Glasgow and Clyde. In order to plan ahead to have the system validated and ready for the migration, we should adhere to the guidelines set out in the ”Guideline on water treatment facilities, dialysis water and dialysis fluid quality for haemodialysis and related therapies”. We should also use the experiences we have gained with previous validations and plan for these outcomes. Some suggestions from the Inverclyde royal hospital exsperiance are:

- Agree with the supplier product testing centres for all samples, sample point and techniques. This prevents any waiting time evaluating sampling techniques if validation fails.
- Agree with the supplier additional test to be carried out before validation starts. E.g. run RO’s during a generator run to confirm there’s no effects, Note the time taken to cancel a heat sanitisation >85 deg C, Sanitisation etc. This will prevent validation failure due to a preventable action.
- Agree with supplier on work instruction for the actions to be taken when:
    - parts are replaced
    - Failure or continual failure of validation attempts.
    - Action level’s for Chemical sanitisation of the system.
    - Failures causing water to become stagnated.
    - Cleaning procedure including Chemical to be used e.g. use the most effective process for cleaning system, efficient chemical or chemical heat mixture etc.

    Planning and agreeing on procedures to follow for failures, no discussion will need to take place as everyone is aware of the procedures to follow.

- Heat sanitisation system to be set up as in normal operational use during validation process. If the system is set up to perform every night it is not giving a true reflection on the quality of water produced during normal use.
- Either check the treatment facilities daily or have an automated system in place to highlight any failure or if the facility if not operating as specified. Prevents water becoming stagnant resulting in biofilm growth in the system.
- Check water treatment facilities daily to note normal operational pressures, temperatures, noise level etc. Familiarisation with the equipment can help identify early warnings of potential problems.
- Draw off dialysis water from the treatment facility simulating normal use, putting everything under demand to highlight any problems. Running the system this way will help maintain water quality and highlight any teething problems prior to migration.
- Agree with supplier fault reporting system e.g. numbers to contact and guaranteed parts / response time during the validation.
- Have materials available to replace pipe work sections in the event leaks on flow meters etc to prevent loops being shut down. This will keep the system running while waiting on spare parts.

Appendix 1

Plant Room 32, Test's required

Holding Tank: (This is a reference to know the quality of incoming water)

- TVC
- Endotoxin
- Chemical Contaminants
- Chlorine

Output at each Water softener to be sampled for:

- Chemical Contaminants

Output at each carbon Column to be sampled for:

- Chlorine

Reverse Osmosis (RO's) units & Loops

In-patients

- Output at each RO to be sampled for: TVC & Endotoxins.
- Output at each RO to be sampled for: Chemical Contaminants.
- Output at each RO to be sampled for: Chlorine.
- TVC & Endotoxins from return & Mid Point of supply Loop's.

Out-Patients

- Output at each RO to be sampled for: TVC & Endotoxins.
- Output at each RO to be sampled for: Chemical Contaminants.
- Output at each RO to be sampled for: Chlorine.
- Return at each RO to be sampled for: TVC & Endotoxins.

Plant Room PLT2-001

Holding Tank:

- TVC
- Endotoxin
- Chemical Contaminants
- Chlorine

Output at each Water softener to be sampled for:

Chemical Contaminants

Output at each carbon Column to be sampled for:

Chlorine

Reverse Osmosis (RO's) units & Loops

- Output at each RO to be sampled for: TVC & Endotoxins.
- Output at each RO to be sampled for: Chemical Contaminants.
- Output at each RO to be sampled for: Chlorine.
- Return at each RO to be sampled for: TVC & Endotoxins.

Bundle of documents for Oral hearings commencing from 13 May 2025 in relation to the Queen Elizabeth University Hospital and the Royal Hospital for Children, Glasgow

Bundle 43 – Volume 6
Procurement, Contract, Design and Construction, Miscellaneous Documents

A52825963