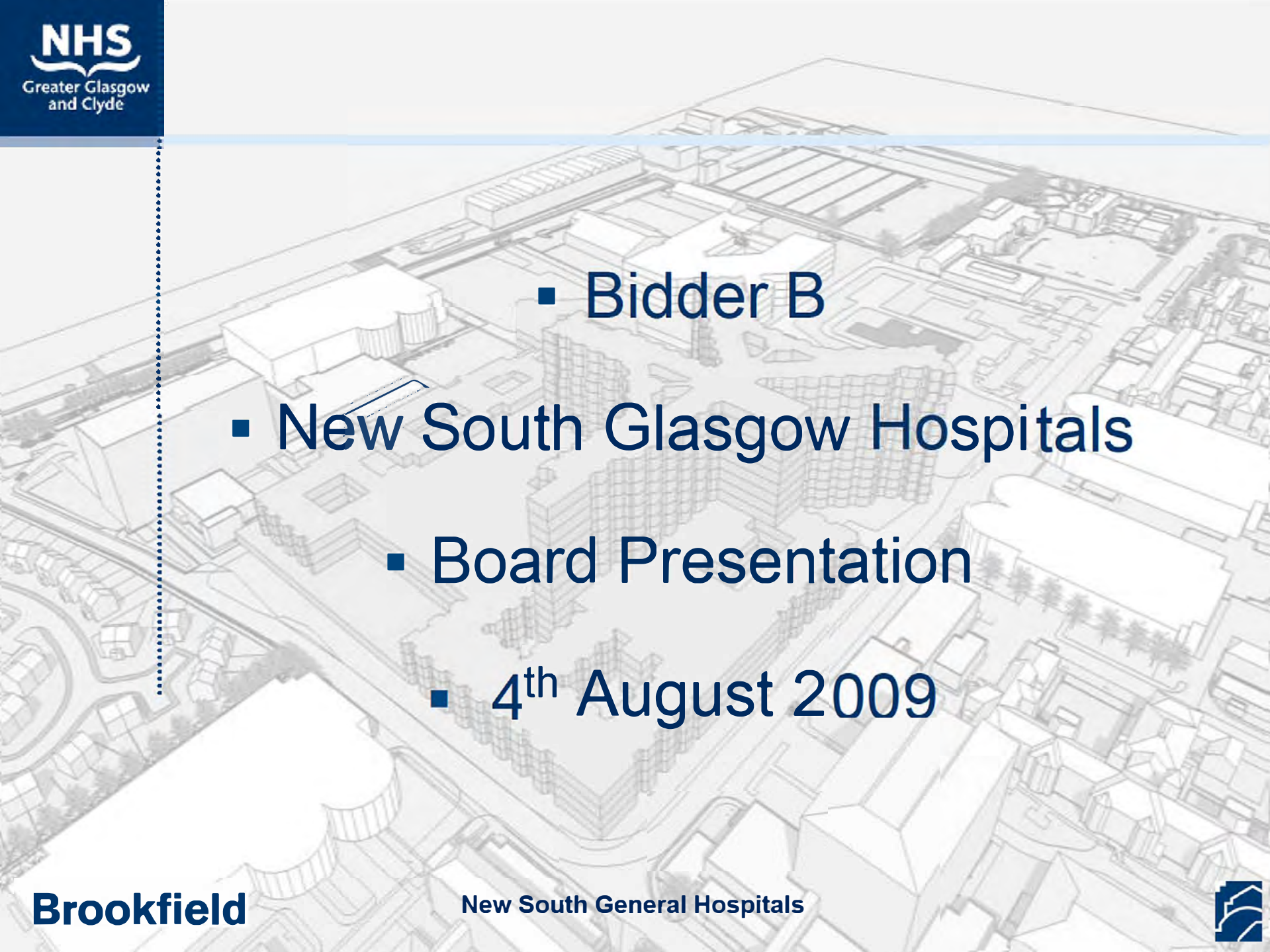


- Bidder B
- New South Glasgow Hospitals
- Board Presentation
- 4th August 2009

NHS Greater Glasgow and Clyde

DDM 1

Design Dialogue Meeting Agenda Proposals

Design Dialogue Meeting 1
BRIEFING STAGE

Present Proposals for Design Dialogue Meeting (DDM) Format

Proposal of 2xconcurrent separate Workstreams through each DDM

1.1 Design
1.2 Technical

DDM 2

Design Dialogue Meeting Agenda Proposals

Design Dialogue Meeting 2
INITIAL CONCEPT DESIGN STAGE

Design
Review Exemplar Design
Review Masterplan Options
Single Bed Ward Options
Tower & Podium Options
Initial 1:500 Concept Plans
Initial 3D Site Massing

Technical
As Agenda

DDM 3

Design Dialogue Meeting Agenda Proposals

Design Dialogue Meeting 3
DETAILED CONCEPT DESIGN STAGE

Design
Masterplan
1:500 Concept Plans
1:200 Ward Tower Module, Single Bedroom
3D Site Massing Development
Indicative elevational treatment concepts

Technical
M&E Design Strategy Review
Structural Design Stategy Review
Cladding Design Strategy Review
Fire Strategy Review
Acoustic Strategy Review
Equipment Strategy Review

DDM 4

Design Dialogue Meeting Agenda Proposals

Design Dialogue Meeting 4
DETAILED DESIGN STAGE

Design
Masterplan
Architectural Concept

Whole Hospital 1:500 Concept

1:200 Ward Plans

Single Bed Ensuites

Adult Hospital 1:200 Department Design
Accident & Emergency
Adult Theatres
Adult Assessment Ward
Adult Radiology
Adult Critical Care

Childrens Hospital 1:200 Department Design
Childrens Ward
Childrens Accident & Emergency
Childrens Radiology
Children's Observation Ward
Children's Theatres

DDM 5

Design Dialogue Meeting Agenda Proposals

Design Dialogue Meeting 5
DETAILED DESIGN STAGE

Design
Masterplan
Architectural Concept/ Scale/ Character

Whole Hospital 1:500 Concept

Adult Hospital 1:200 Department Design
-Adult Ward
-Adult A&E
-Adult Theatres
-Adult Radiology
-Adult Critical Care
Architectural Vision

Children's Hospital 1:200 Department Design
-Children's Ward
-Children's Ground Floor OPD/Atrium
-Children's Theatres
-Children's Radiology
Architectural Vision

Art
RFI's

Board Presentation

Design Dialogue Meeting 6
DETAILED DESIGN STAGE

Masterplanning
Masterplan Development
Massing and Identity
Logistics and the site
Pedestrian and Wehiculat movements (Externals area)
Community Engagement

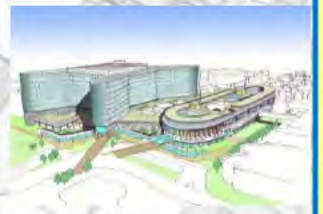
Stacking and Layouts
1:500 Stacking Diagrams
Patient, Visitor and Staff movements
FM Flows and systems

Materials and Finishes
Mechanical and electrical systems
Sustainability and low carbon
Incorporation of Arts

Summary








Brookfield

New South General Hospitals

NHS Greater Glasgow and Clyde

Agenda

- Masterplanning
- Massing and Identity
- Stacking, Layout and Flows
- Art Strategy
- Break
- M&E Systems
- Energy
- Logistics
- Community Engagement
- Summary

Masterplan Development

Introduction

Masterplan Context

Legibility & Wayfinding

The Masterplan

Landscape & Environment

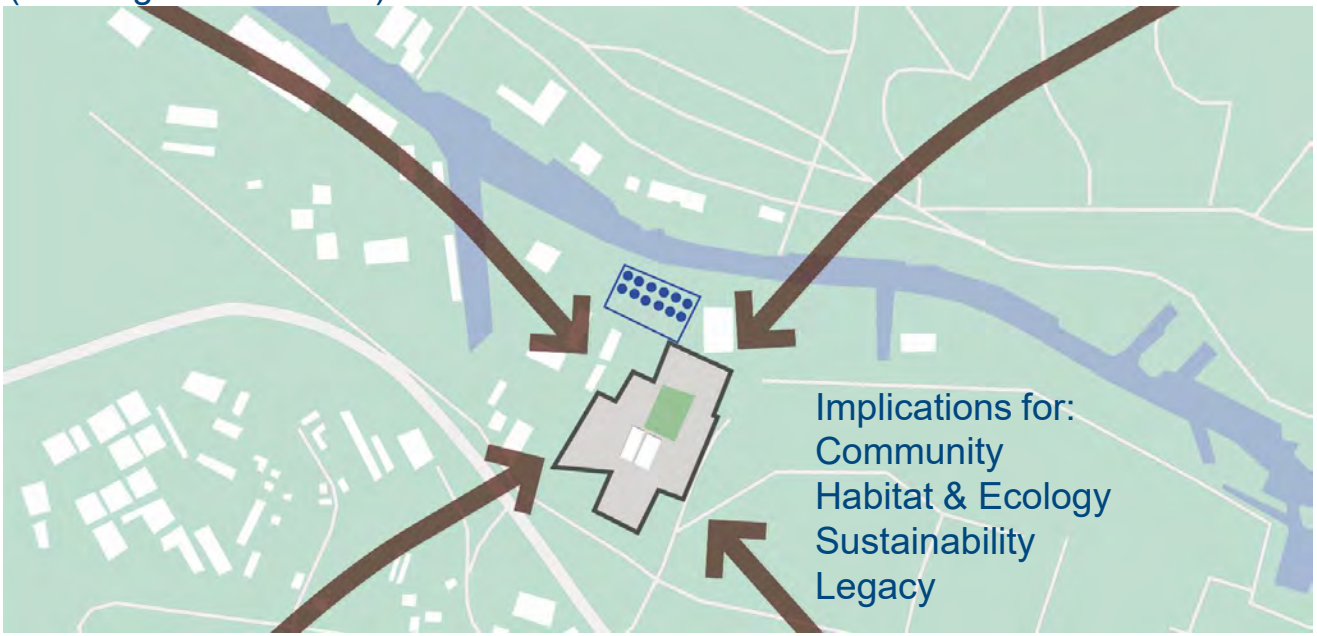
Project Context

Scale, Setting & Community

A heritage of big buildings and large projects - recent history

Project Context

Focus & Destination – regional facility
(Building for the future)



NHS
Greater Glasgow and Clyde

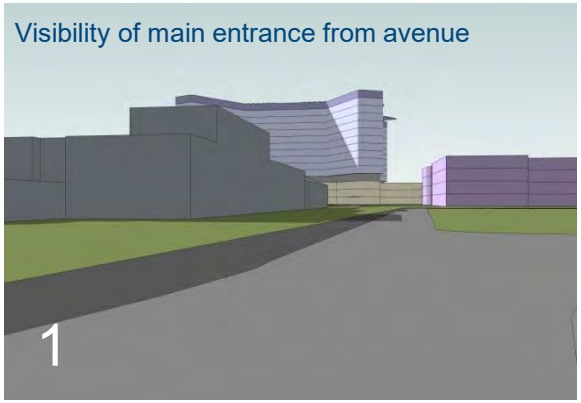
Masterplan DDM5

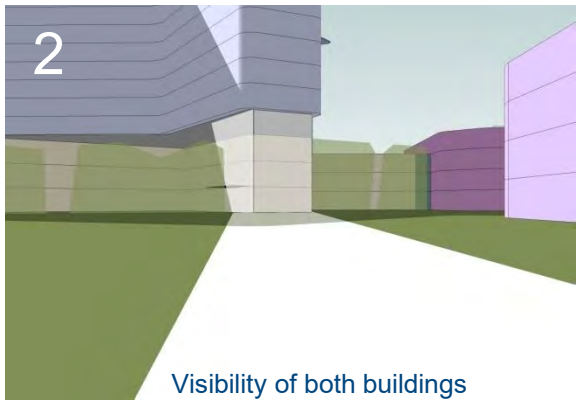
Brookfield

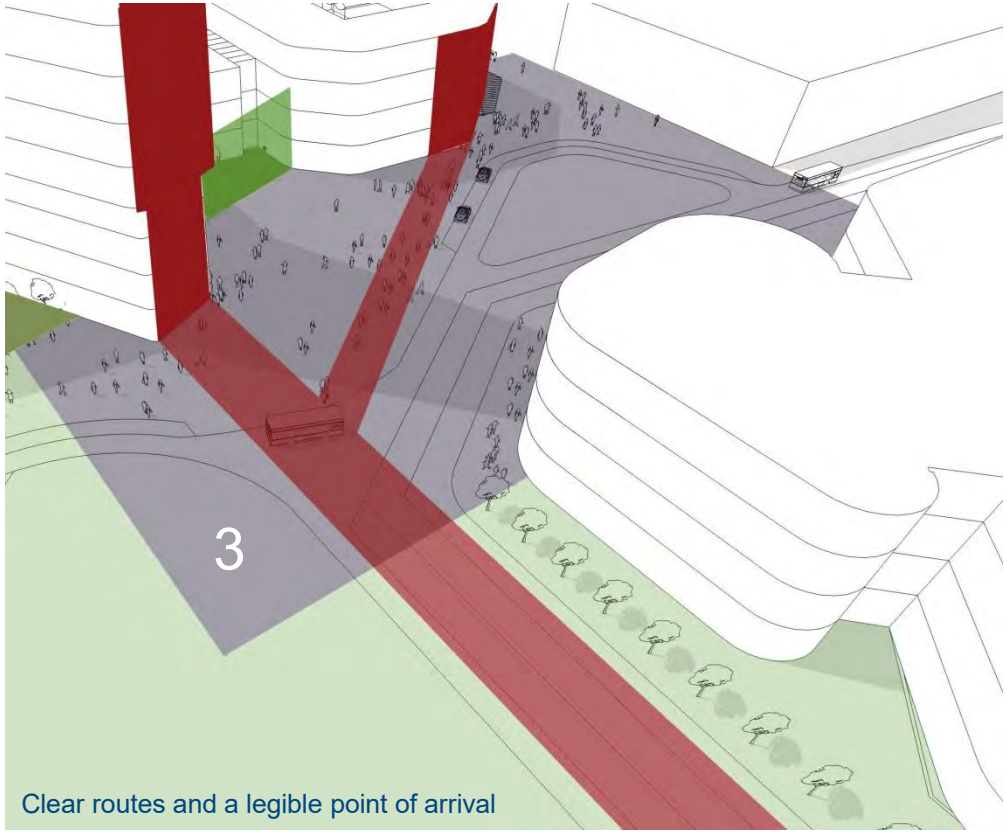
New South Glasgow Hospitals

Masterplan Structure Principles

Orientation and Wayfinding





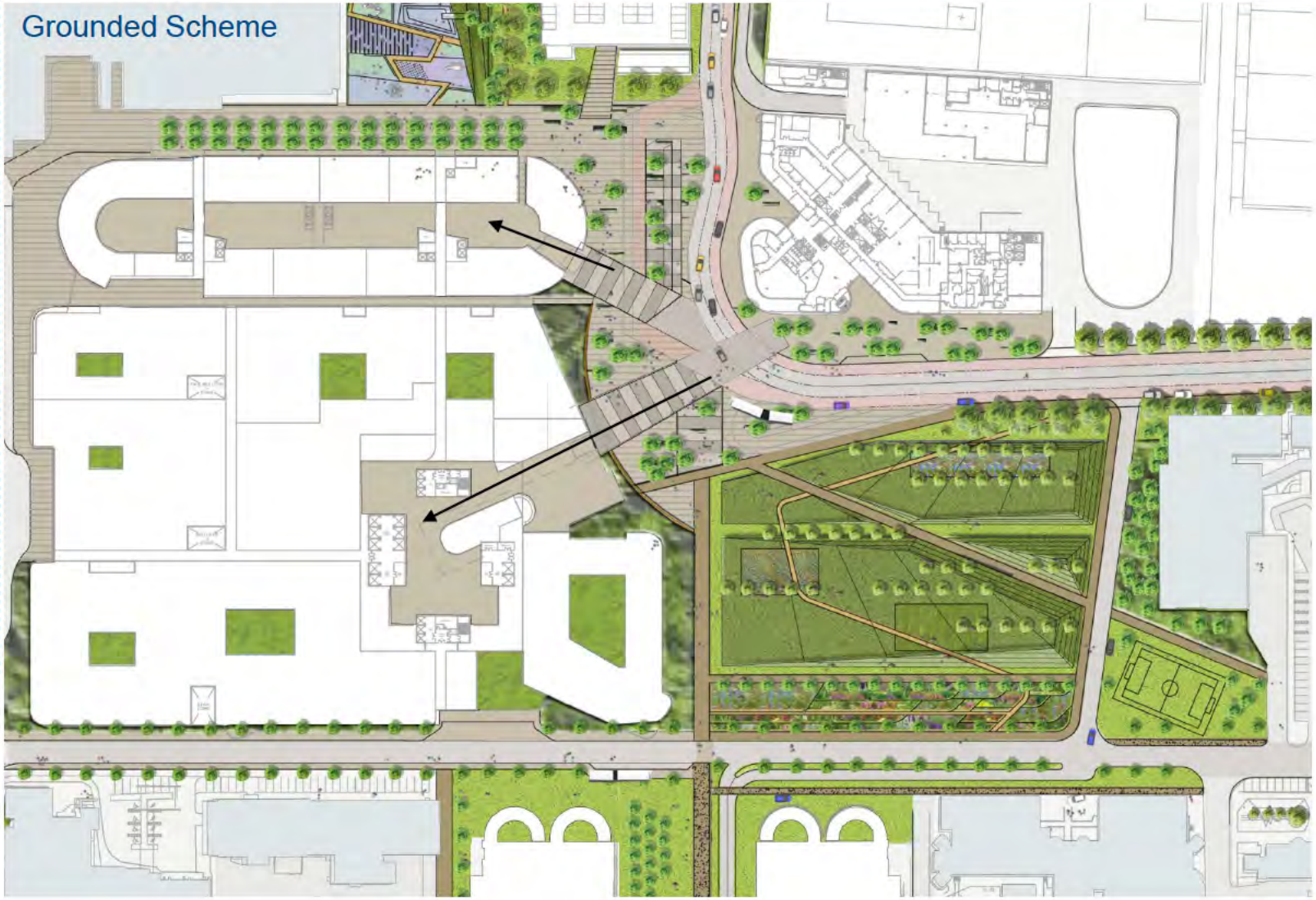


Movement & Function

Clear Wayfinding & Orientation – Main Entrance route from Govan Road

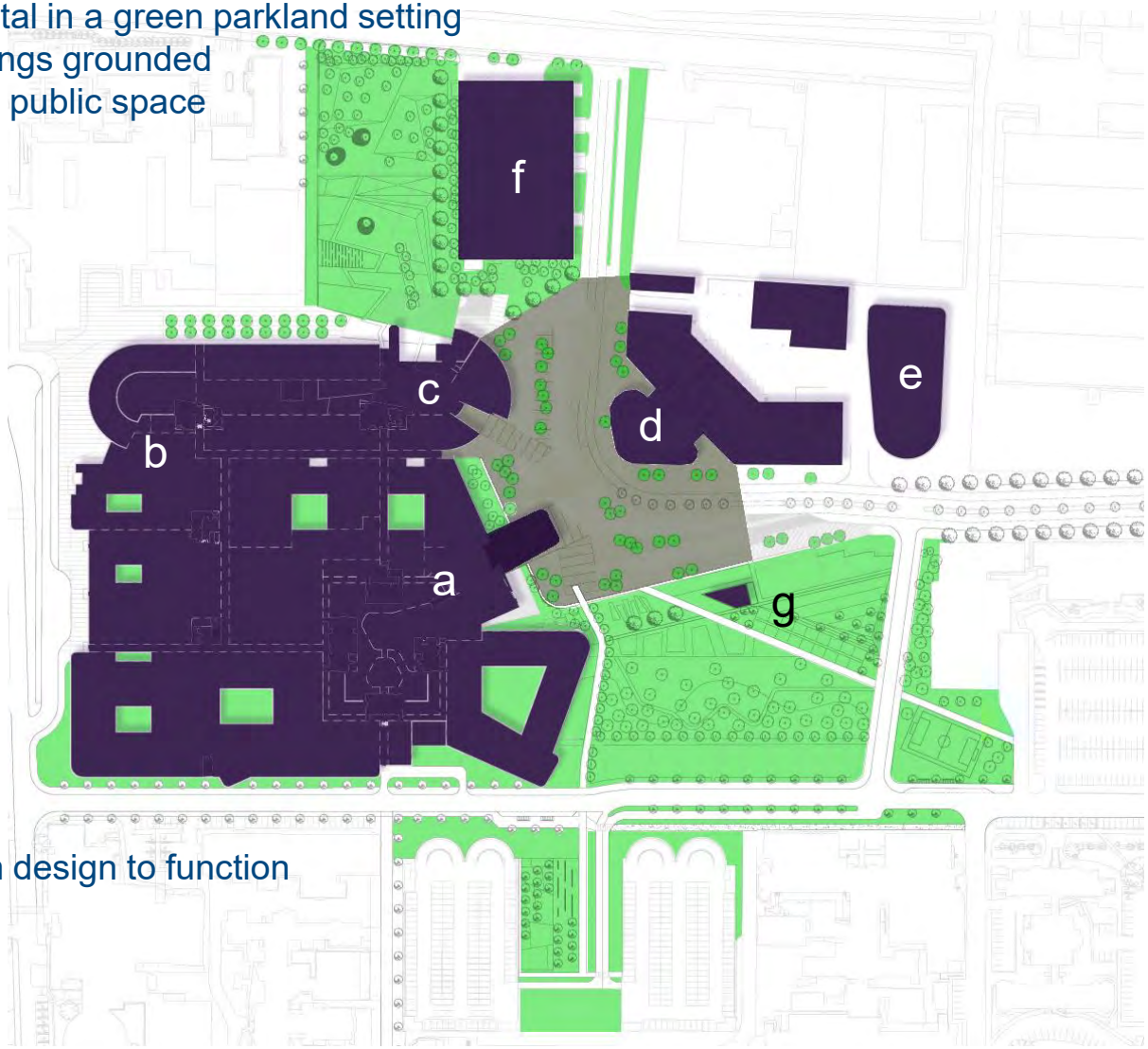
NHS Greater Glasgow and Clyde

Masterplan Evolution



Glasgow Hospitals Campus

Hospital in a green parkland setting
Buildings grounded
within public space



From design to function

Orientation & Wayfinding

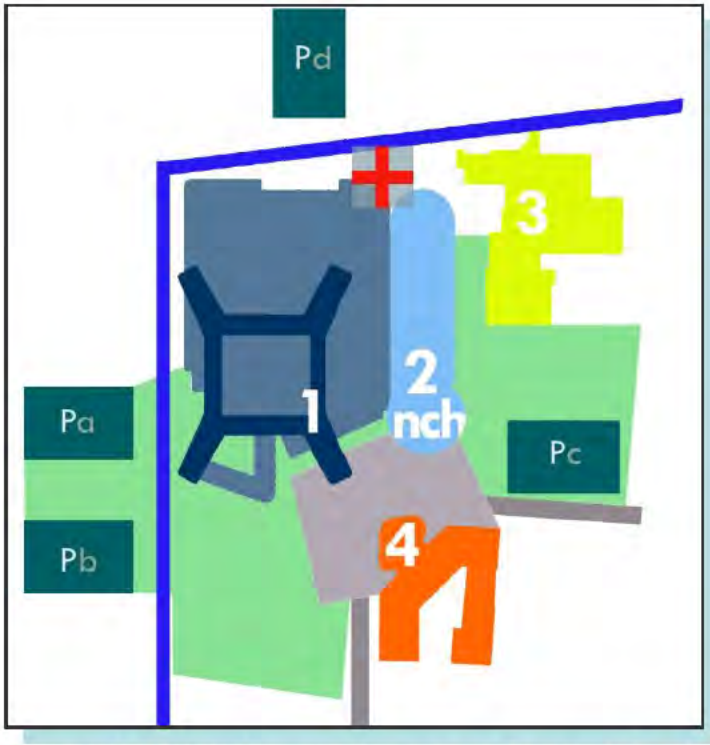
Clear communication to aid wayfinding

Defining the masterplan structure as a functional campus

Orientation of plan rotated to reflect principal entrance point from Govan Road

Legibility & Identity

Clear communication to aid wayfinding and promote identity
Development of masterplan objectives – clear entrances/landmark tower
Translated into graphic wayfinding through signage suite

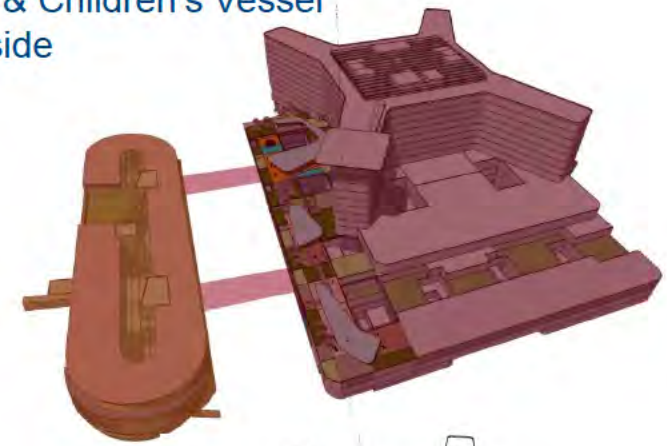


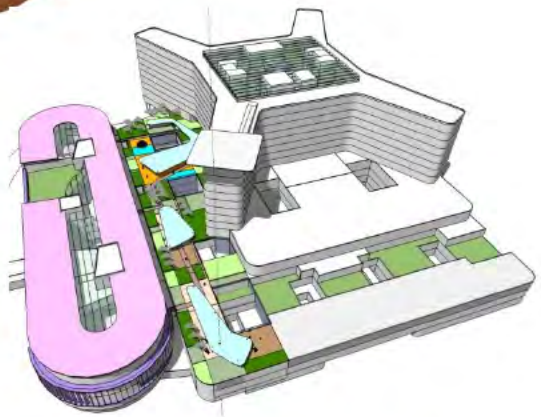
Translation into a sequence of consistent signage & wayfinding components (internal & external)

Legibility & Identity

Two hospitals within a new healthcare campus setting
Distinctive 'brand' identity
Clarity of communication

Relationship between Beacon Tower & Children's Vessel alongside



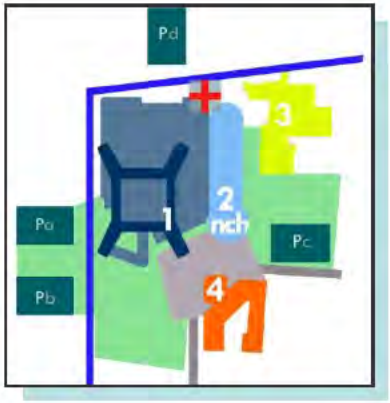


Legibility & Function

A very clear functional imperative for the external environment
- emergency routes
- managing the scale of the site
- ease of access
- efficient servicing routes
- environment as user-friendly as possible

- creation of a clear identity
- management of signage over time

Translation into a sequence of consistent signage & wayfinding components (internal & external)



Signage & Wayfinding

Logical colour & numerical references

Main entrance route & vehicular signage

Clear & Efficient Communication

Application of consistent & coherent elements throughout signage suite

Creation of Identity

Identifiable places defined within the Masterplan
A sense of place

SAMPLES ONLY!

Design development with hospital team & user groups
Clear opportunity for creative interventions within place-making

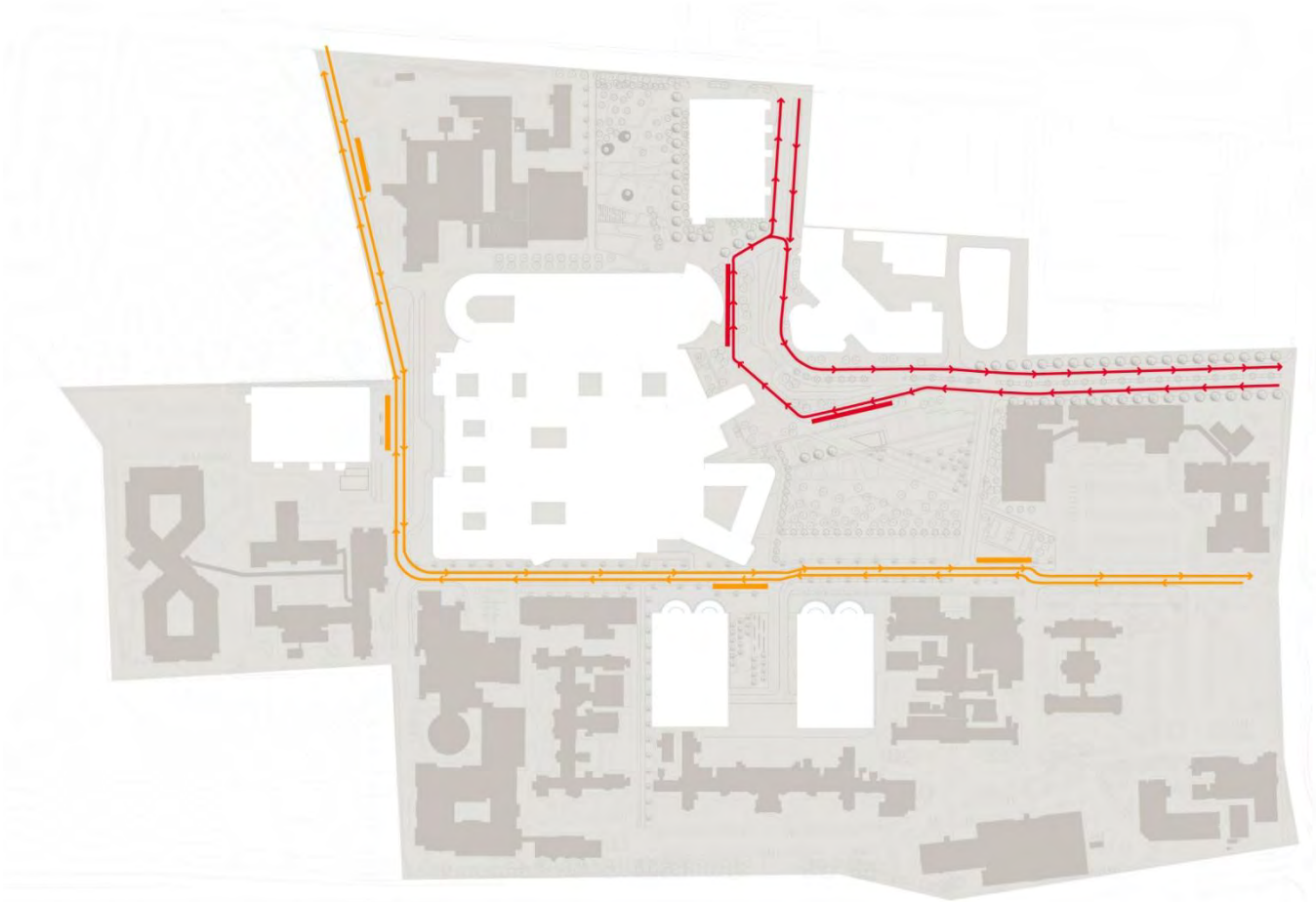
NHS Greater Glasgow and Clyde

Movement & Function

Car/Taxi routes
Blue Light movements & A&E access

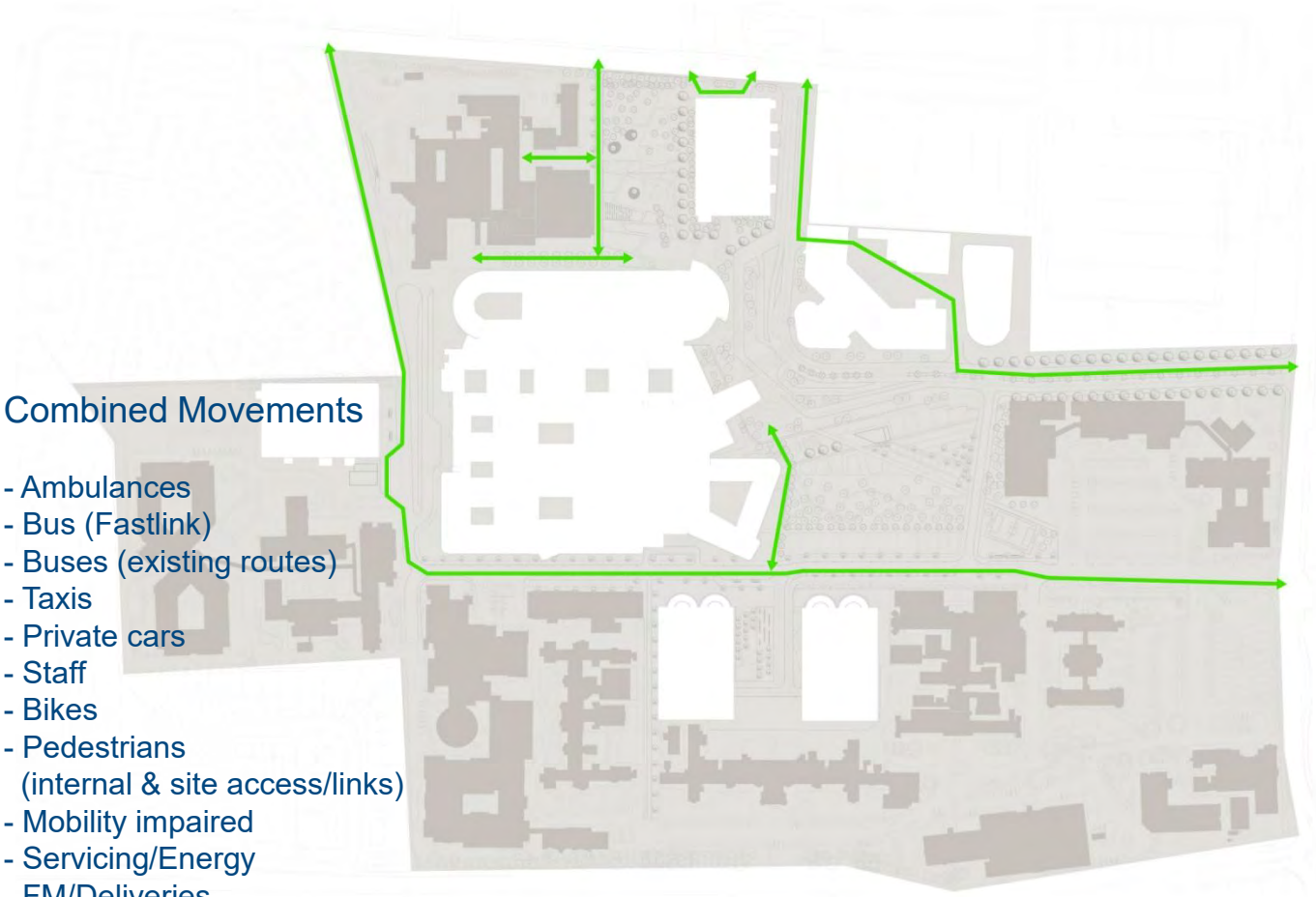
Movement & Function

Fast Link and Existing buses



Movement & Function

FM/Labs servicing
Service/Fire routes

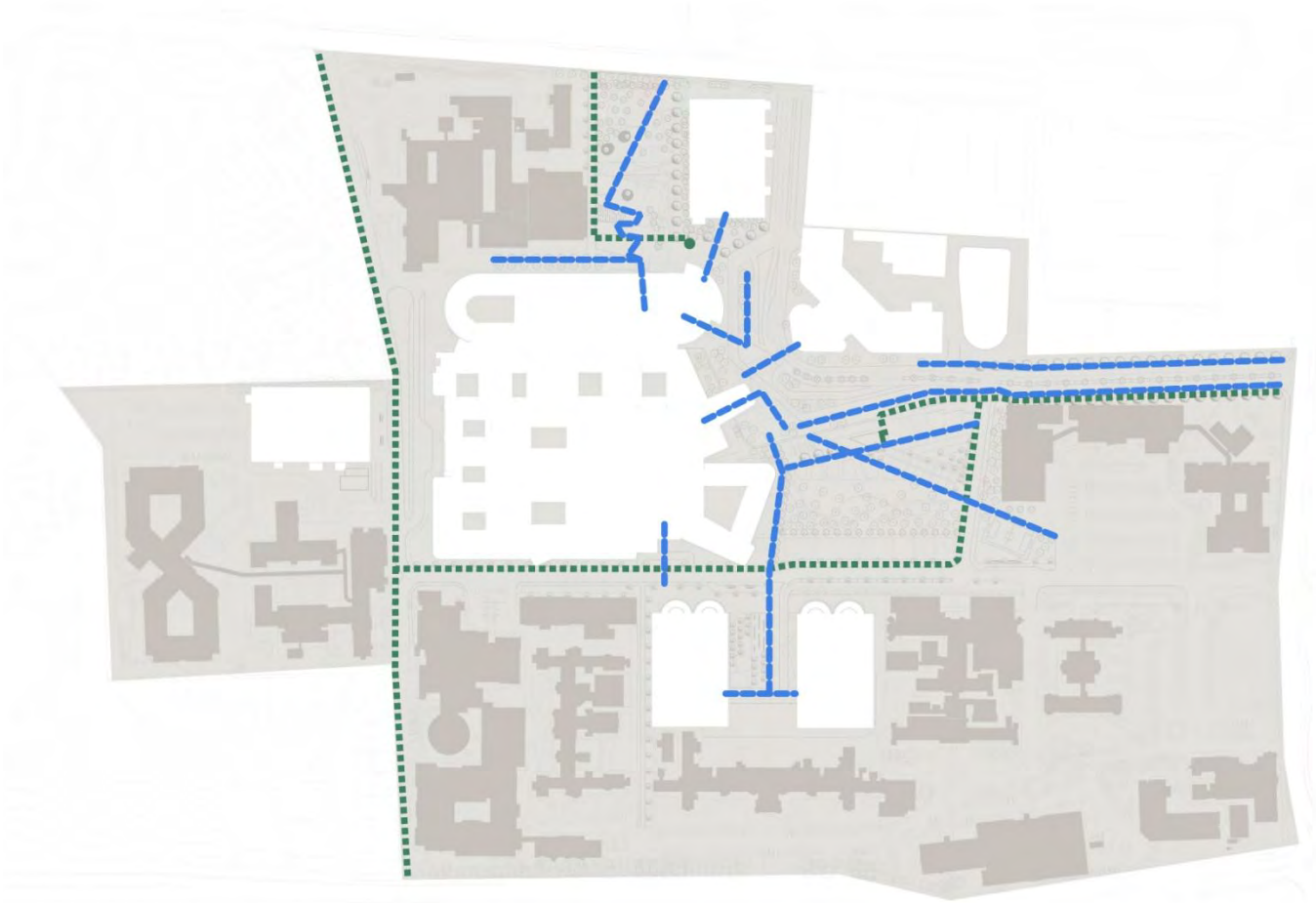


Combined Movements

- Ambulances
- Bus (Fastlink)
- Buses (existing routes)
- Taxis
- Private cars
- Staff
- Bikes
- Pedestrians
  (internal & site access/links)
- Mobility impaired
- Servicing/Energy
- FM/Deliveries

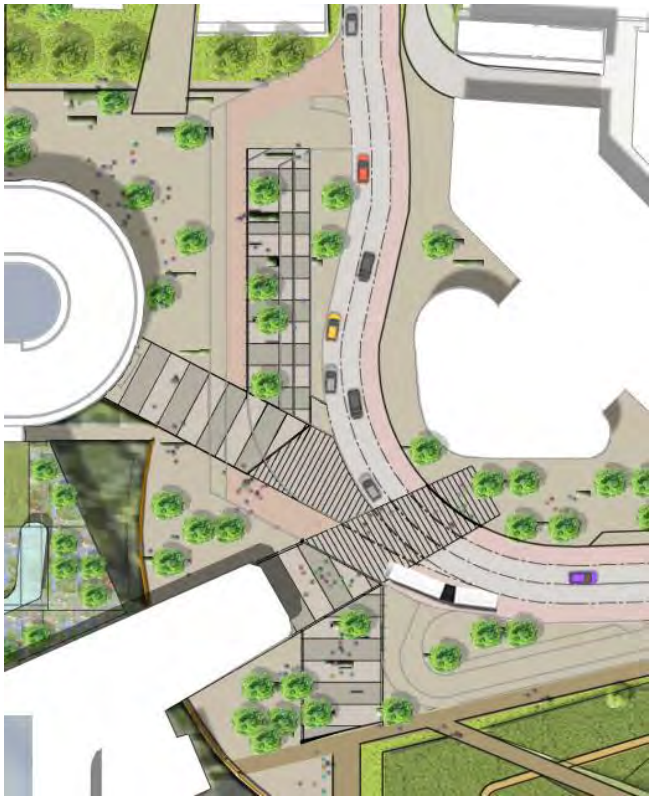
Movement & Function

Pedestrian and cycle routes



Masterplan Development

Arrival Space
design development to improve movements

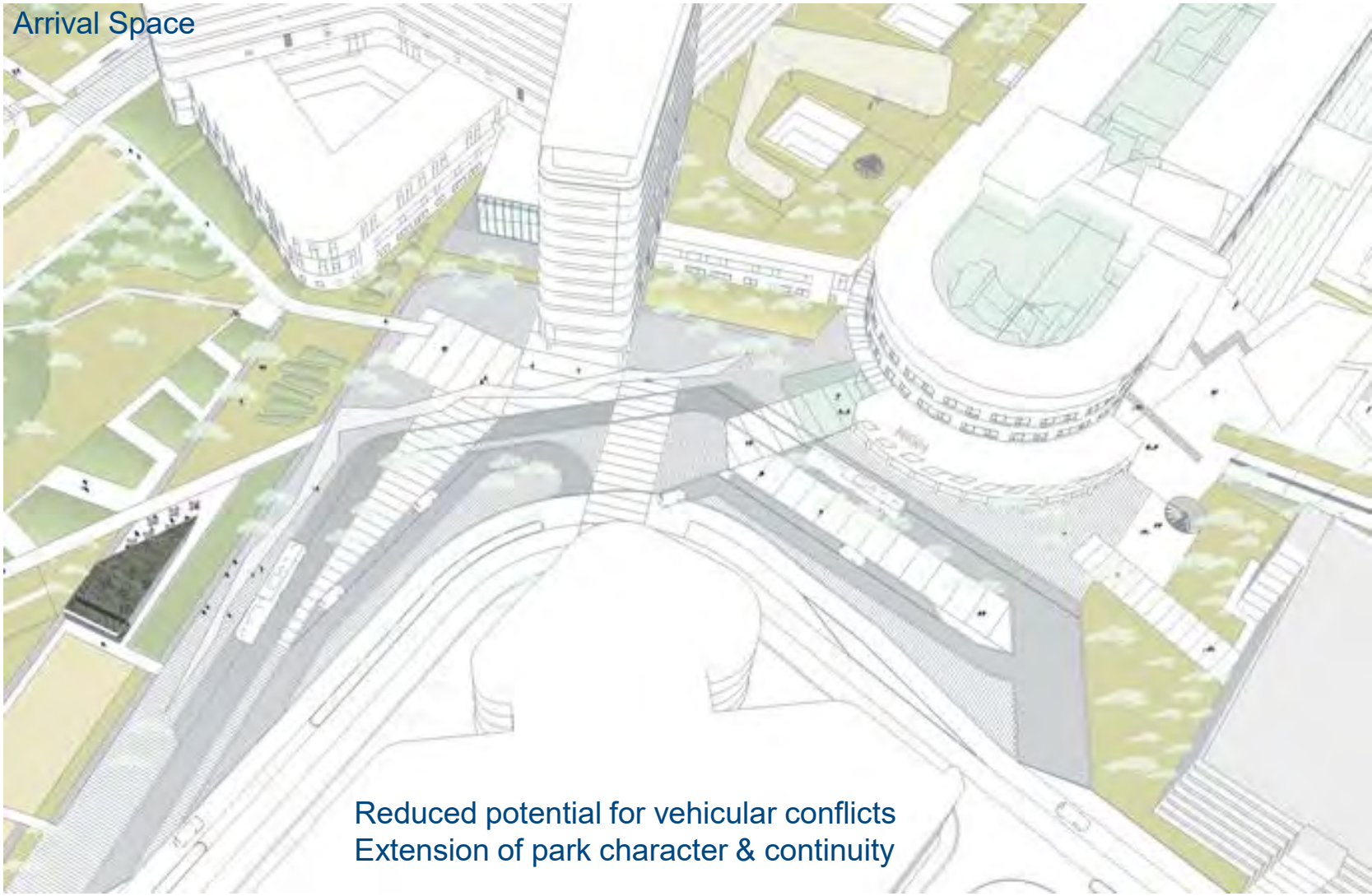


Previous version – DDM5

Enhanced version

Masterplan Development

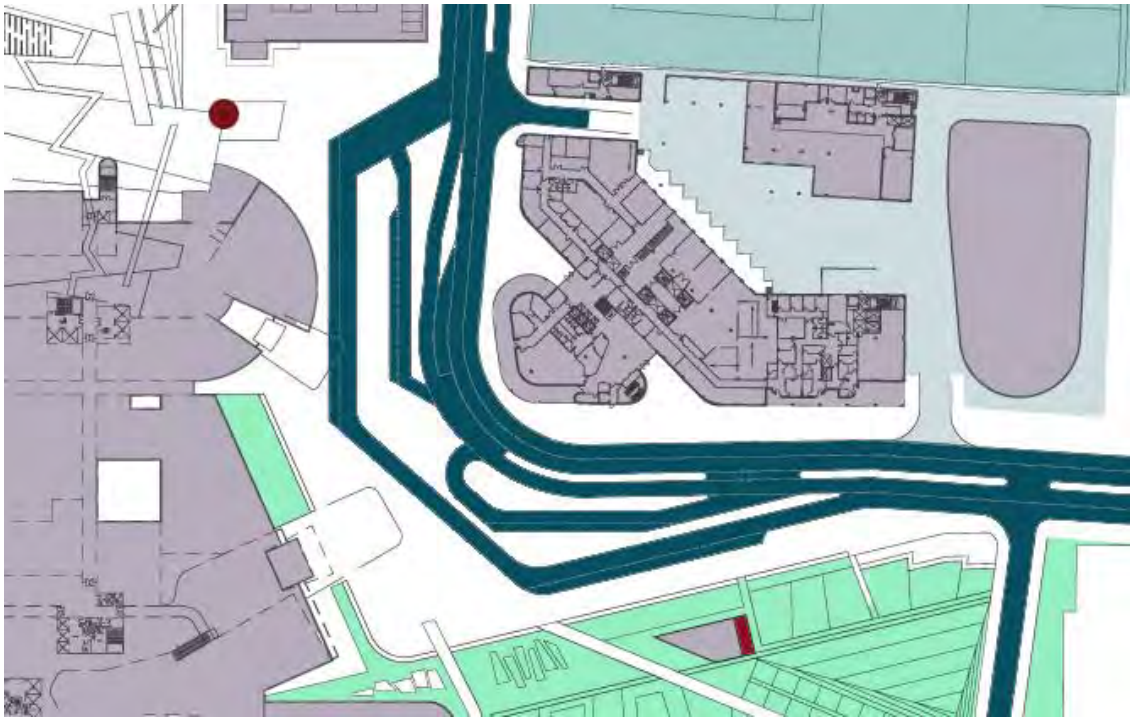
Arrival Space



Reduced potential for vehicular conflicts
Extension of park character & continuity

Masterplan Development

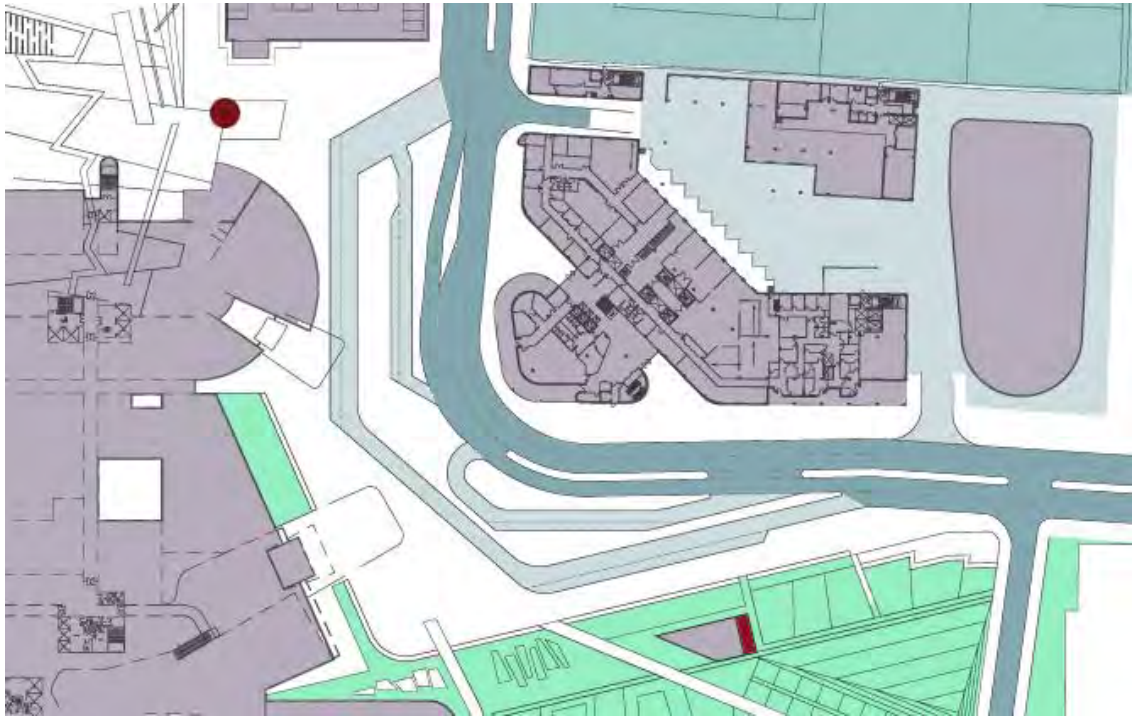
Arrival Space & Traffic Flows
Enhanced Arrangement



Relationship between traffic movement areas & pedestrian space

Masterplan Development

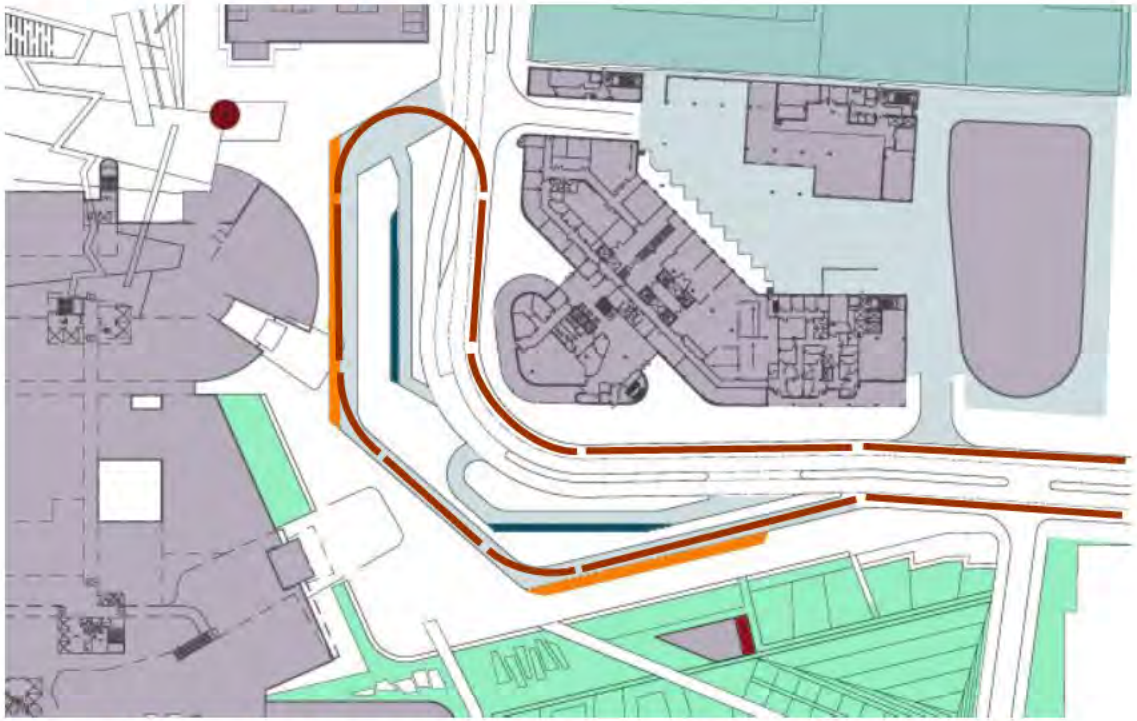
Arrival Space & Traffic Flows
Enhanced Arrangement



Relationship between road space and drop off routes

Masterplan Development

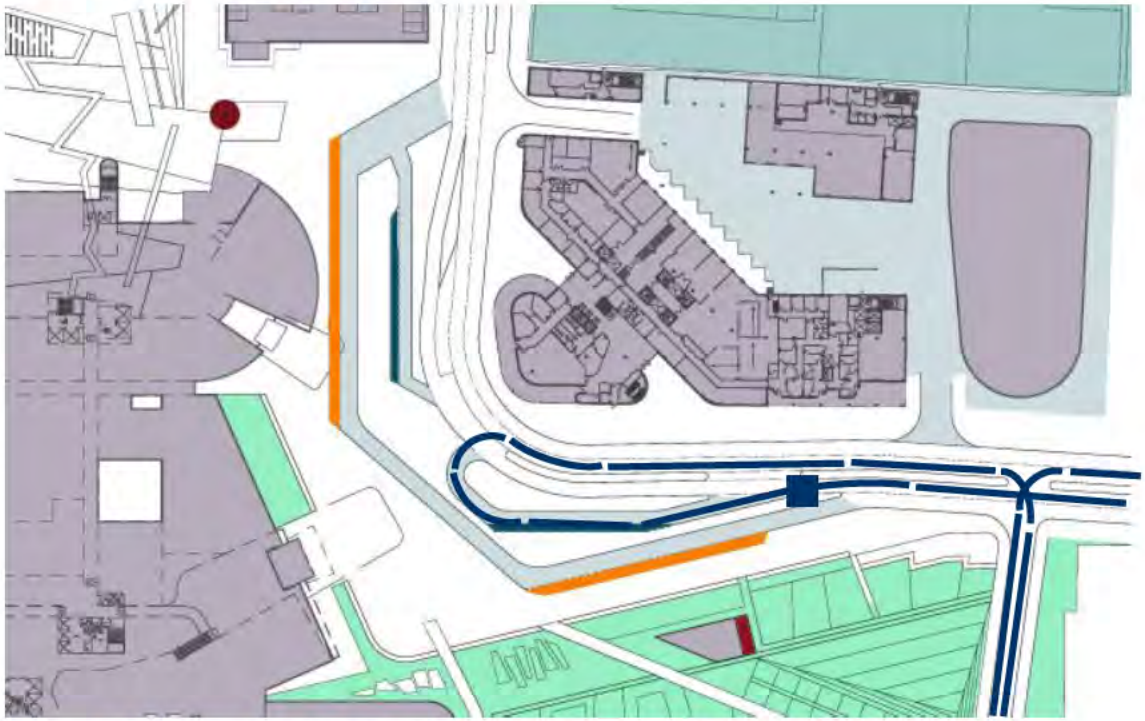
Arrival Space & Traffic Flows
Enhanced Arrangement



Drop off areas for buses & taxis (orange) & cars (dark grey)
Fastlink Bus Movements

Masterplan Development

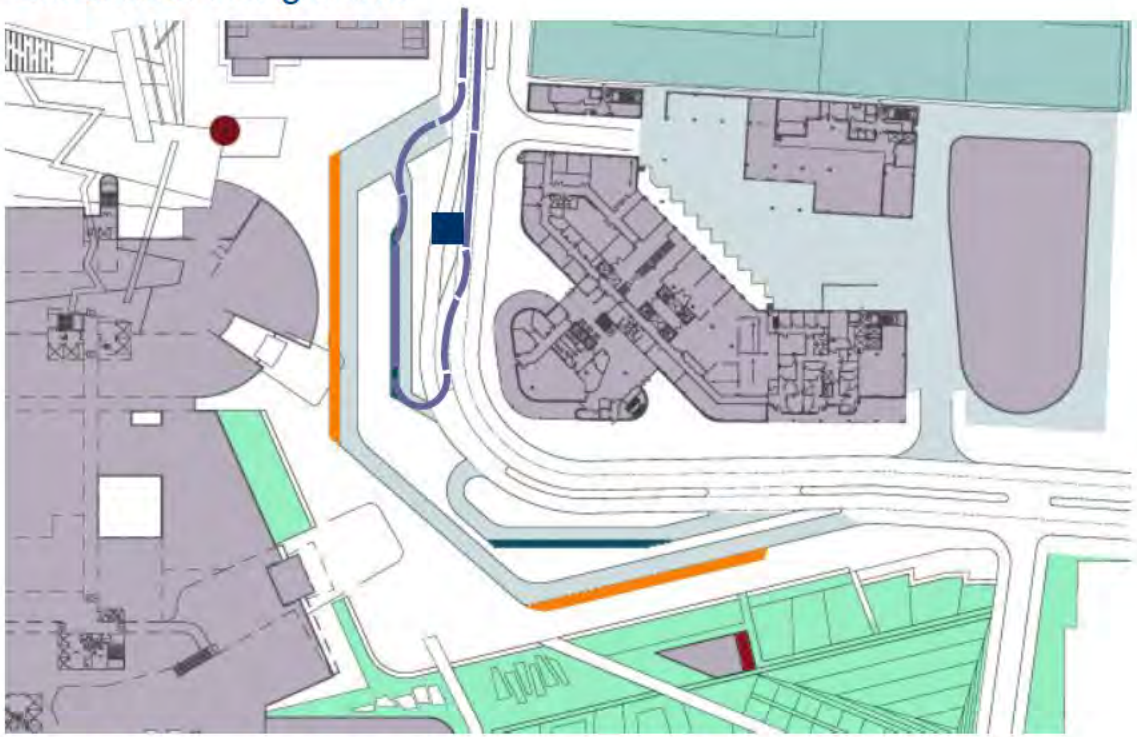
Arrival Space & Traffic Flows
Enhanced Arrangement



Drop off areas for buses & taxis (orange) & cars (dark grey)
Public Car & Taxi Movements (Govan Rd Entrance)

Masterplan Development

Arrival Space & Traffic Flows
Enhanced Arrangement



Drop off areas for buses & taxis (orange) & cars (dark grey)
Public Car & Taxi Movements (Hardgate Rd Entrance)

Masterplan Development – Pedestrian Routes

Arrival Space & Traffic Flows
Enhanced Arrangement

Primary pedestrian flows to entrances

Masterplan Development – Pedestrian Routes

Masterplan Development – Pedestrian Routes

An environment to promote health & well-being

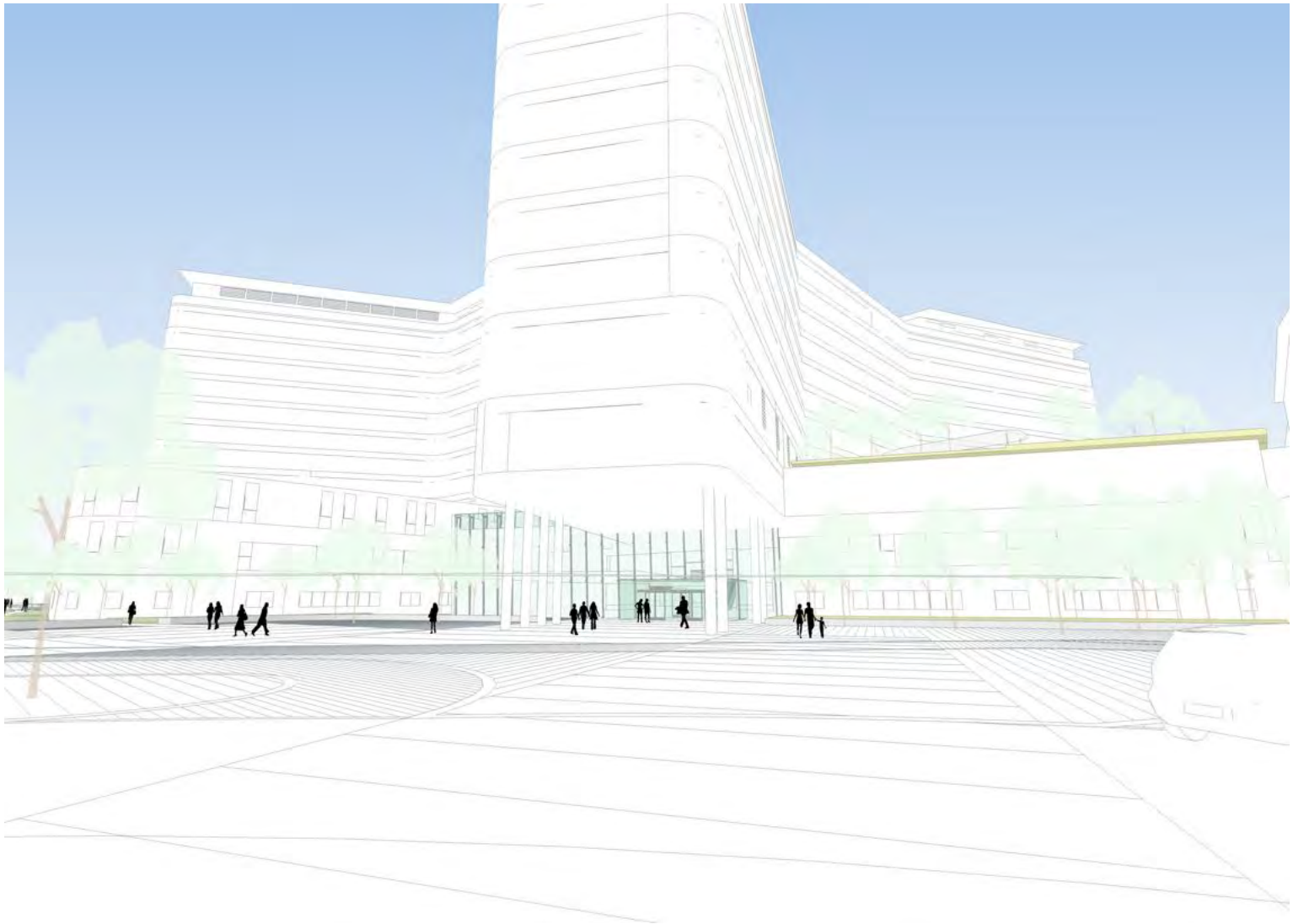
NHS Greater Glasgow and Clyde

Design Components - Opportunity

Masterplan Development – Pedestrian Routes

Design Components - Opportunity

Masterplan Development



Masterplan Development

NHS Greater Glasgow and Clyde

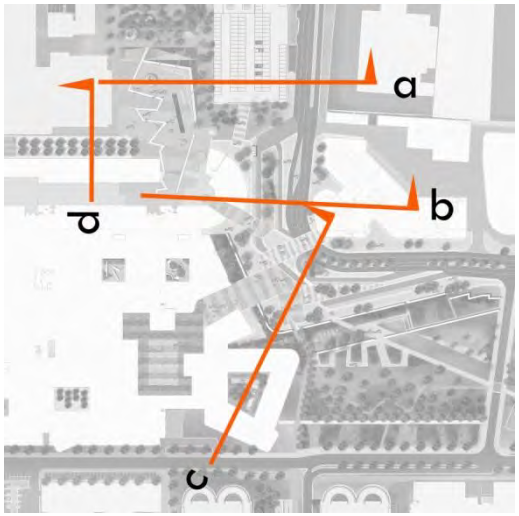
Masterplan Development

Brookfield

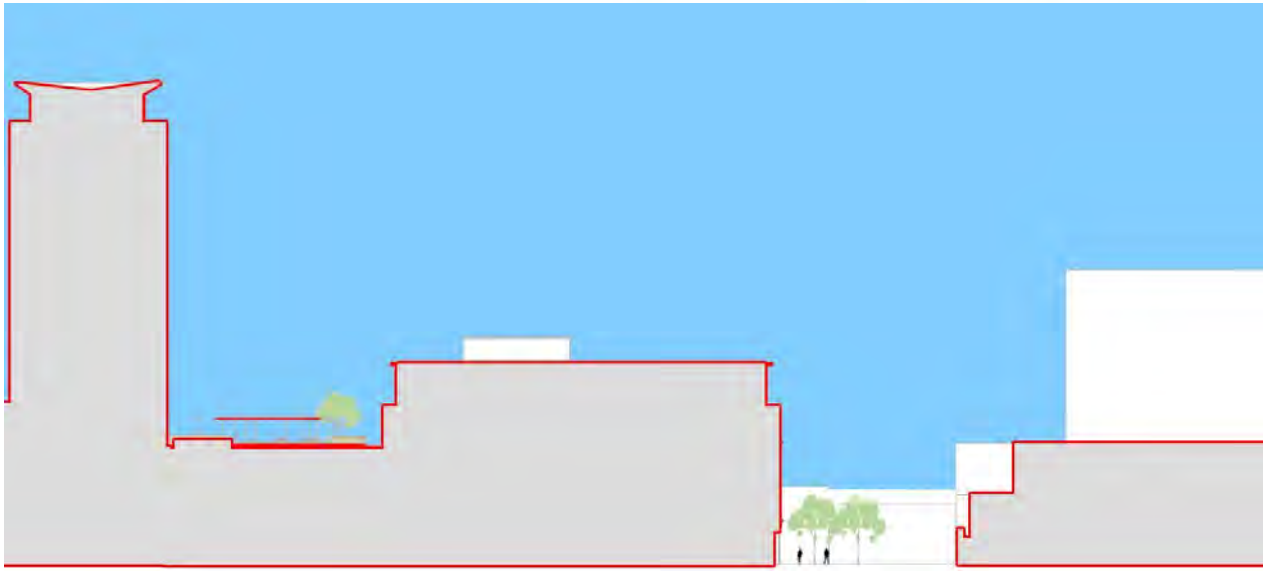
New South Glasgow Hospitals

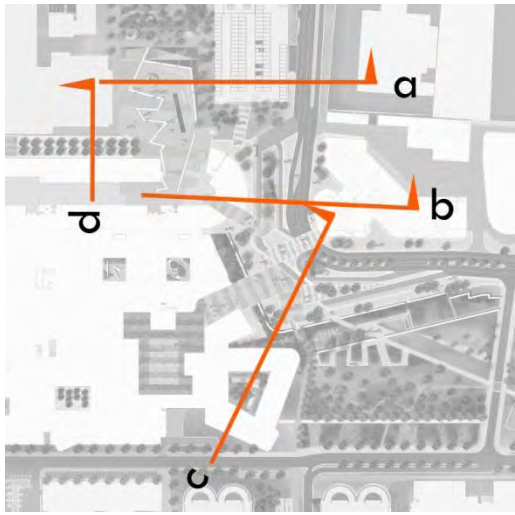
Masterplan Development

Children"s Hospital – park, lane & setting

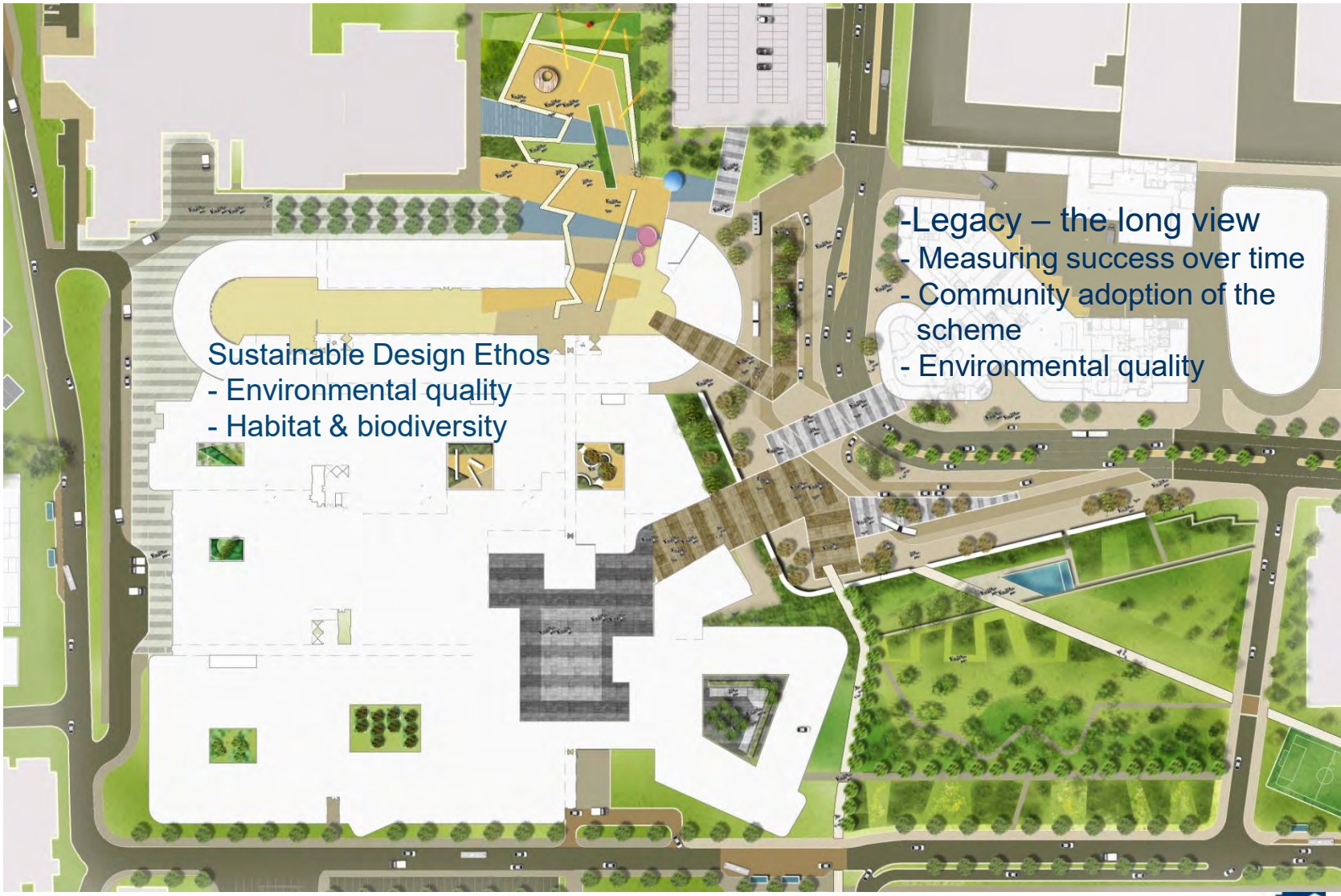


Masterplan Development





Landscape & Environment



Courtyards & Roof Terraces

- Intensive vs low maintenance
- Play space & therapeutic functions
- Seating areas & active spaces

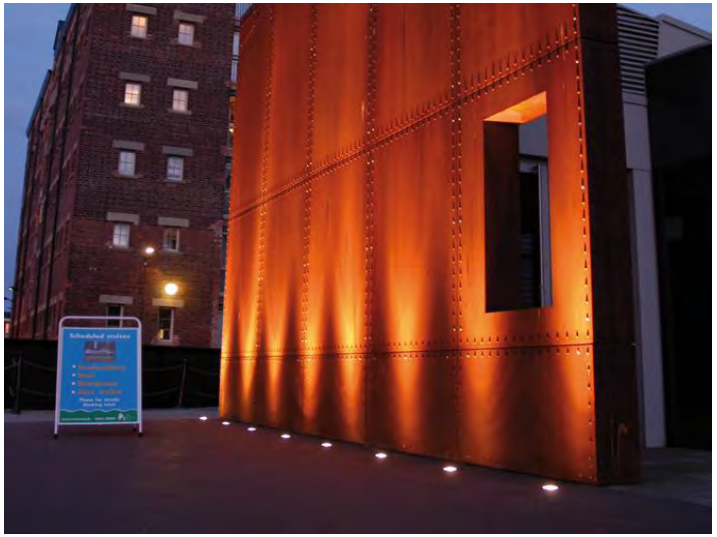
Landscape & Environment

Central Park

Design Character & Intent

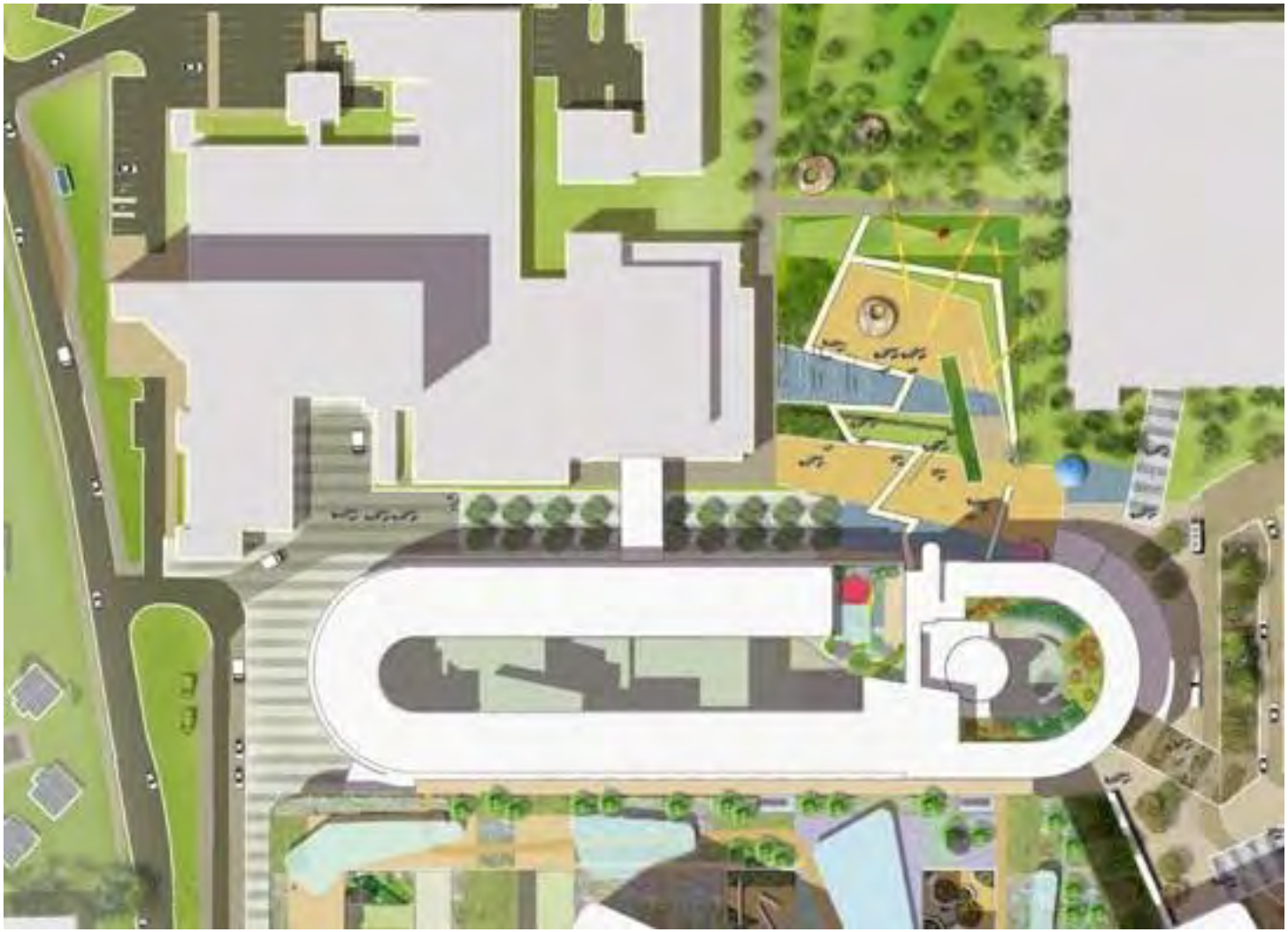
Children's Park

- Interesting elements
- Variety
- Covered play areas
- Space for flexible uses
- Colour
- Interactivity



External Environment

Children"s Hospital – park, lane & setting



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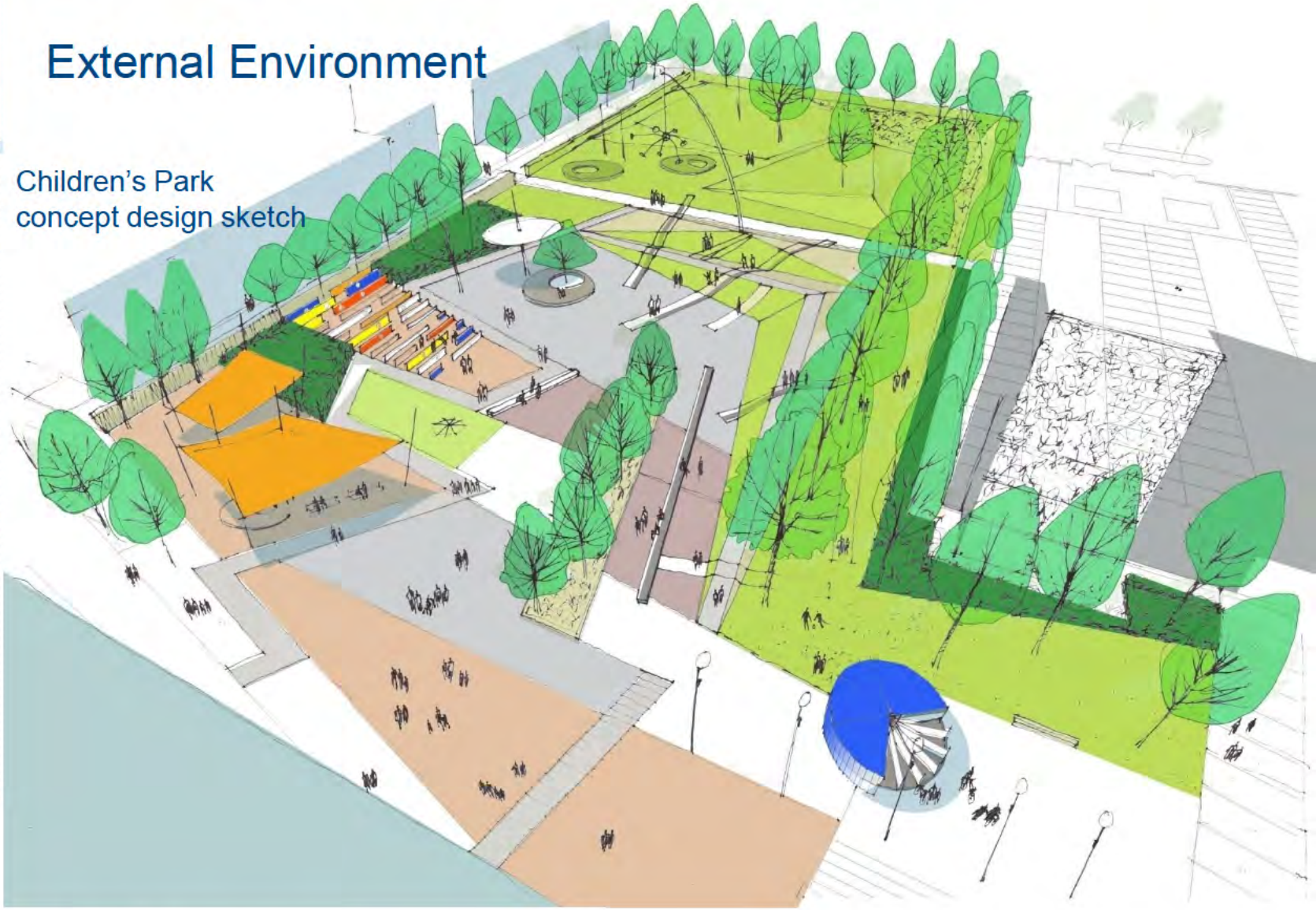
External Environment

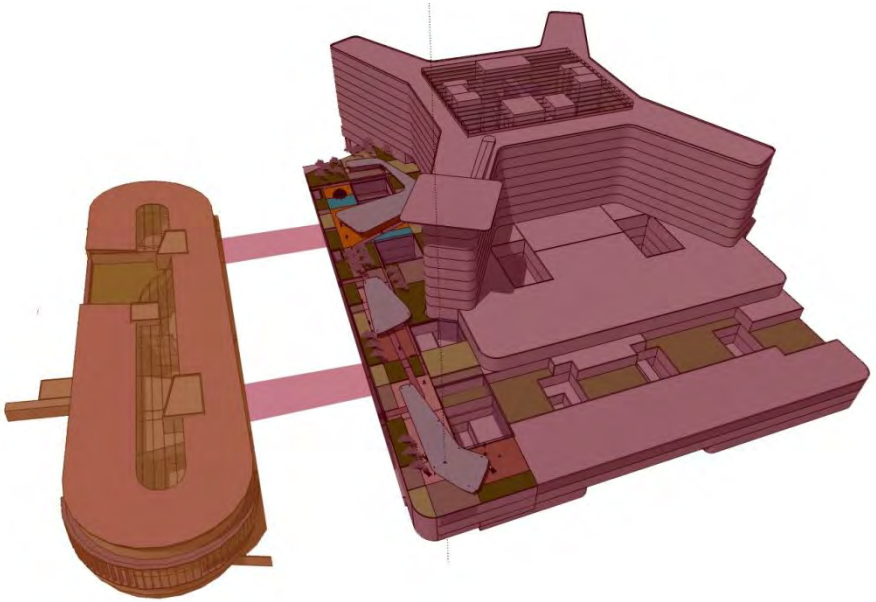
Children's Park
concept design sketch

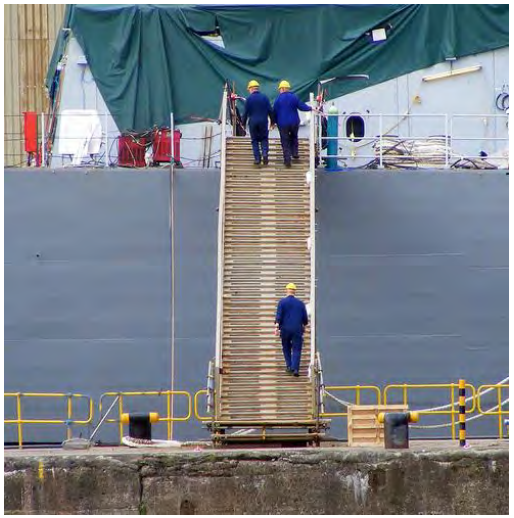


new south glasgow hospitals | lollipop lane | nch

Design Concept

Gangplanks and Walkways





The principle of coming alongside

Support

Security

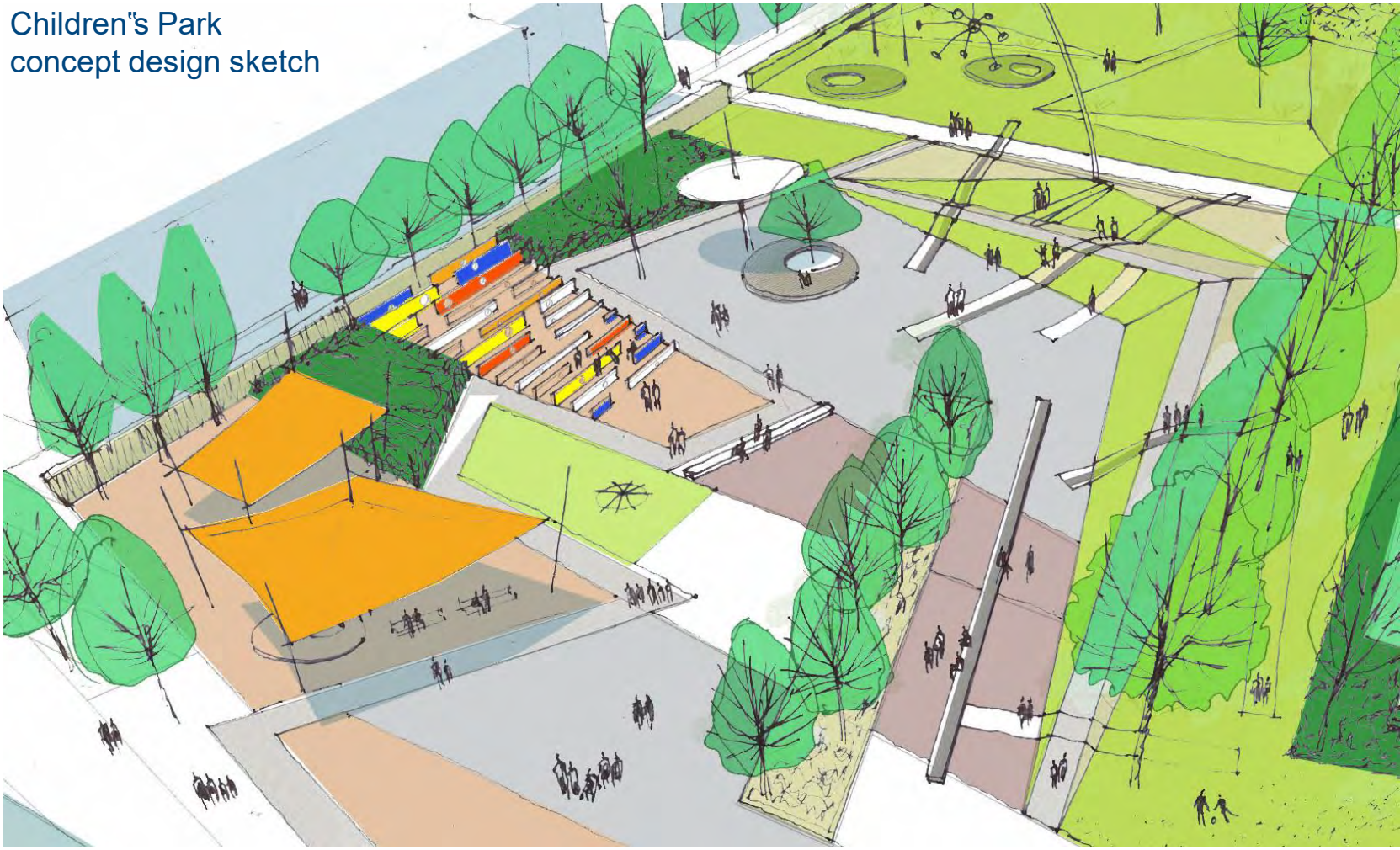
Approachable

Welcoming

Creation of a lasting public environment

External Environment

Children's Park
concept design sketch



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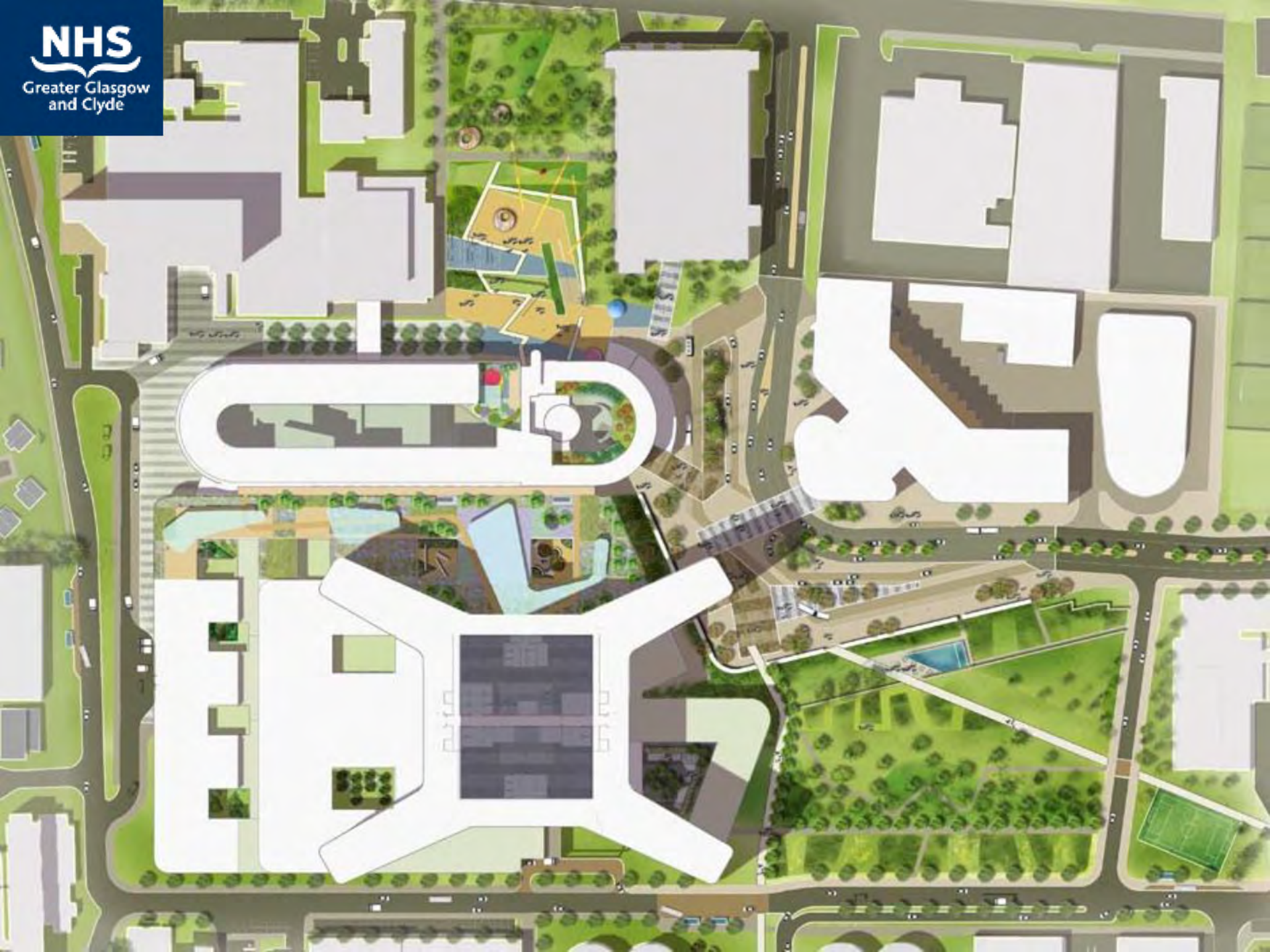
Masterplan Development

Brookfield

New South Glasgow Hospitals


NHS
Greater Glasgow
and Clyde

What We are going to do

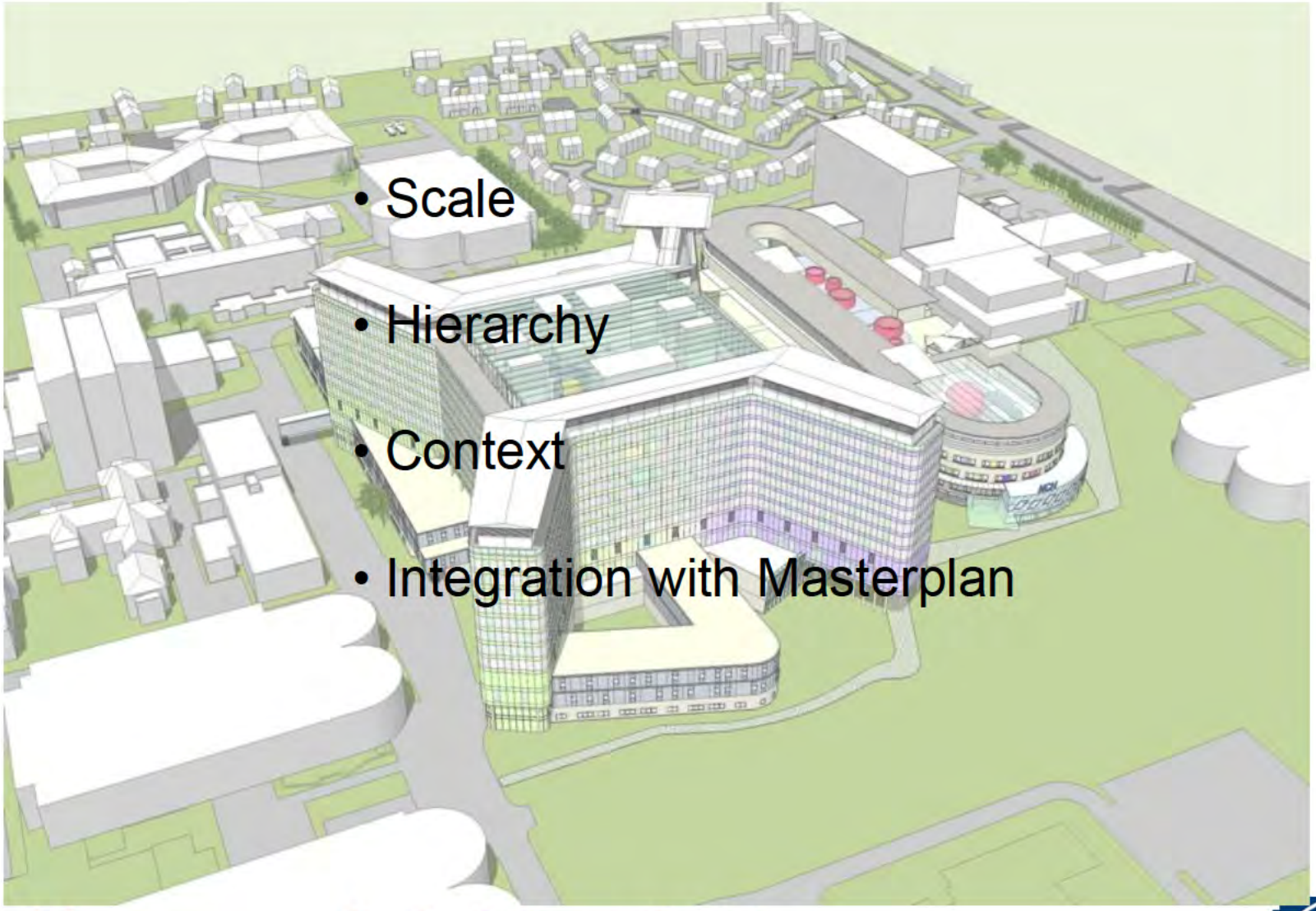
Massing and Identity

Materials and Composition

Scheme Developments

NHS Greater Glasgow and Clyde

Massing

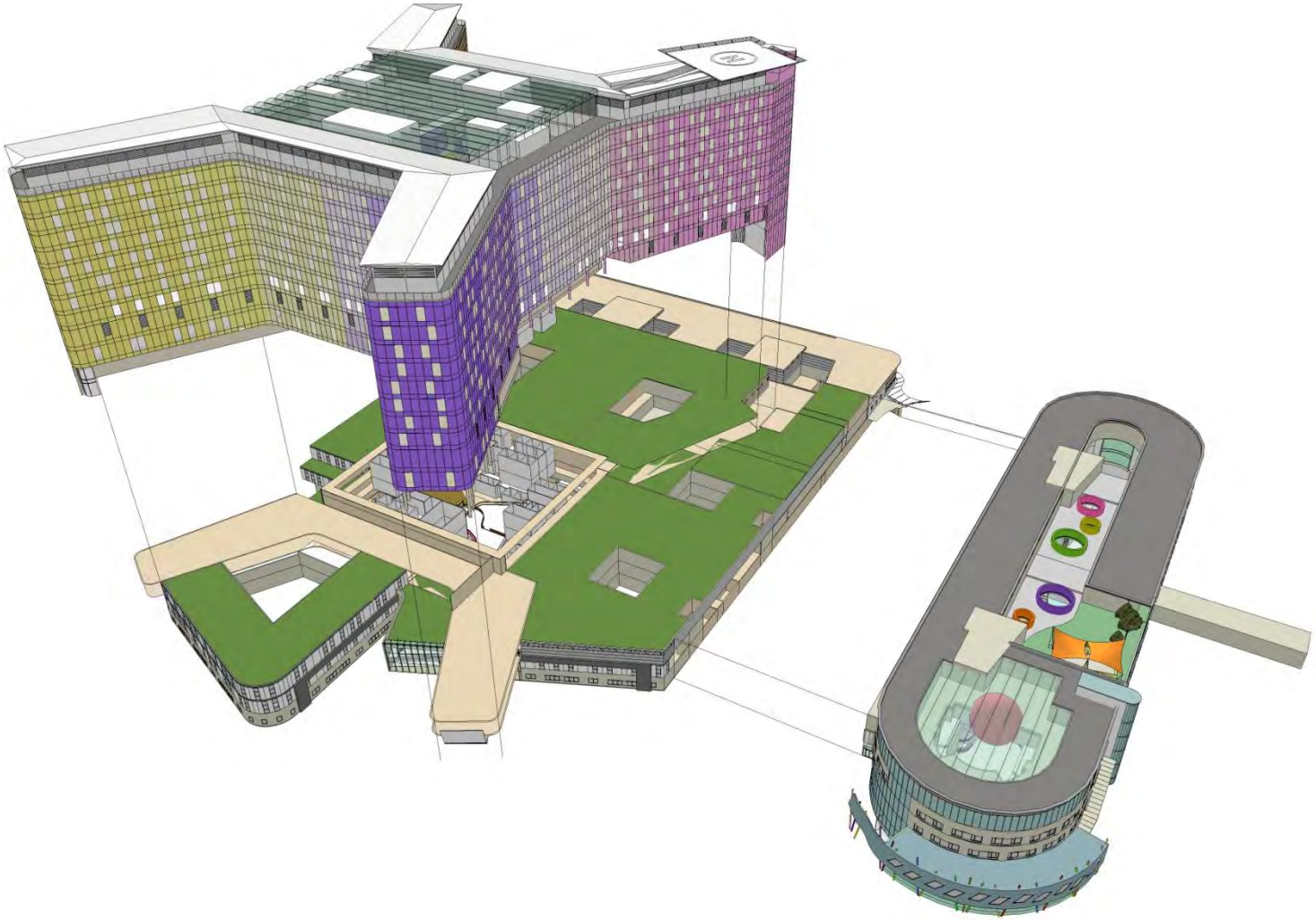


Scale

Acceptance of large scale structures in the locality & comparison with similar sized structure

Hierarchy

Three distinct elements – tower, podium, children's hospital

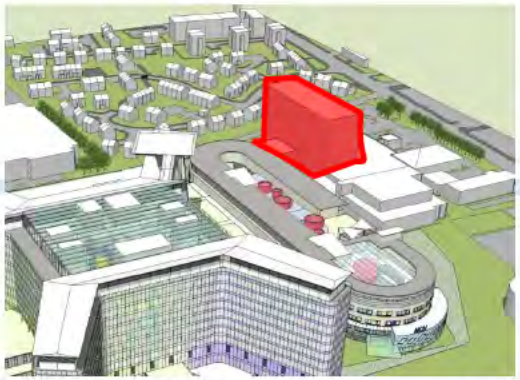


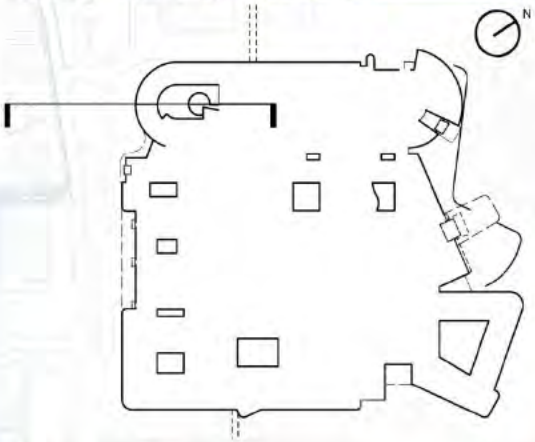
Hierarchy

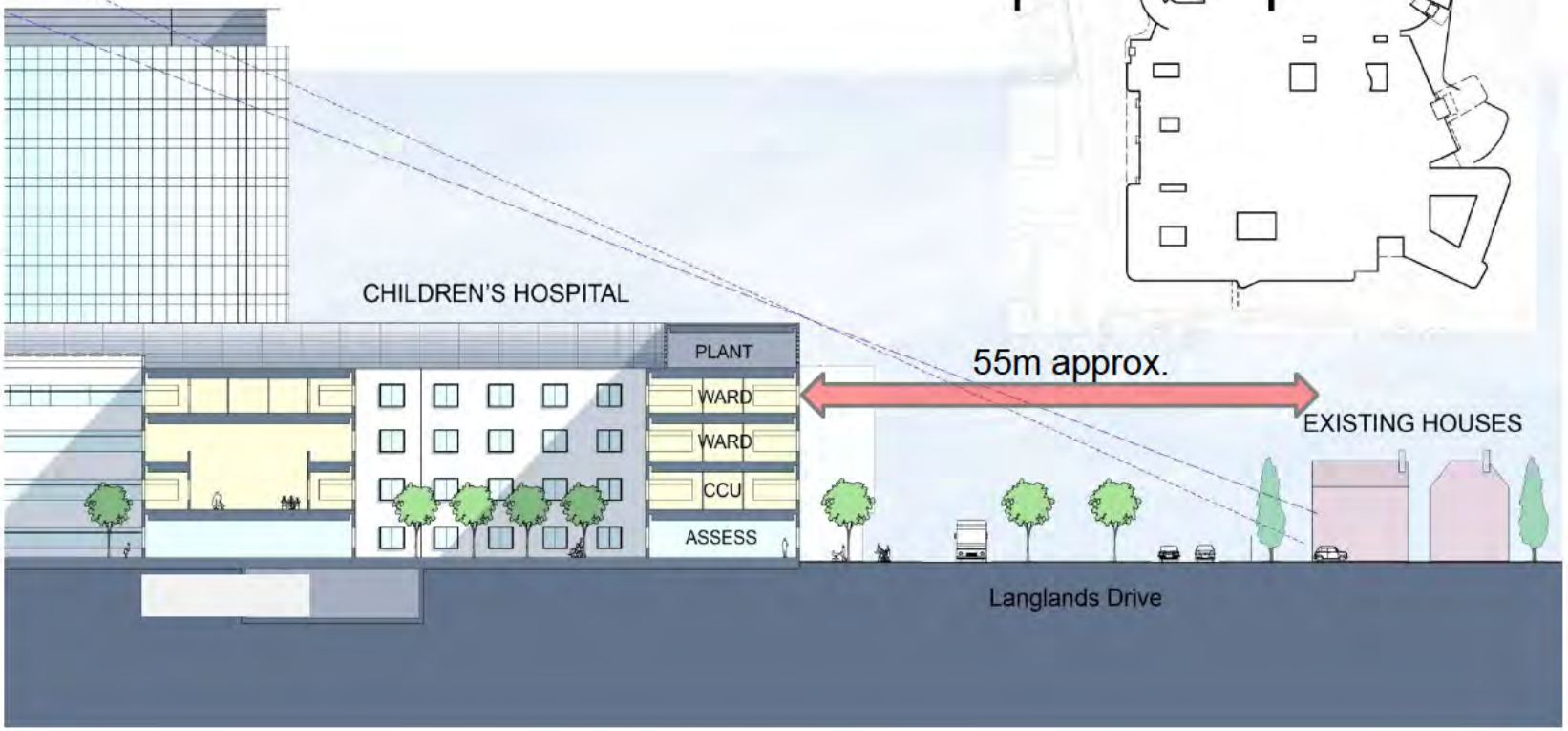
Children's Hospital treated as separate 'transient' form – ensuring identity as separate unit is maintained.

NHS Greater Glasgow and Clyde

Context







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Context - View from Residential Area to South

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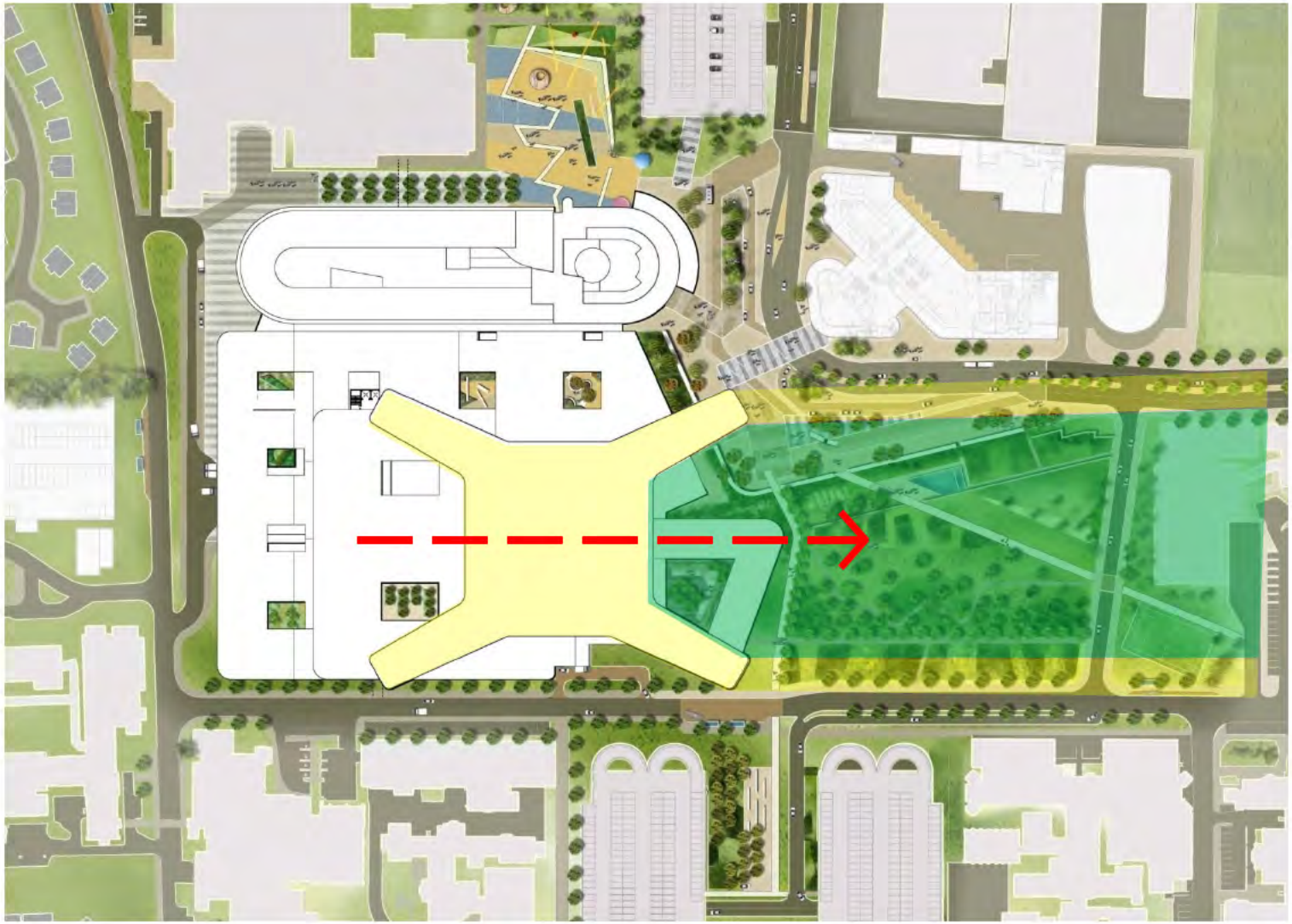
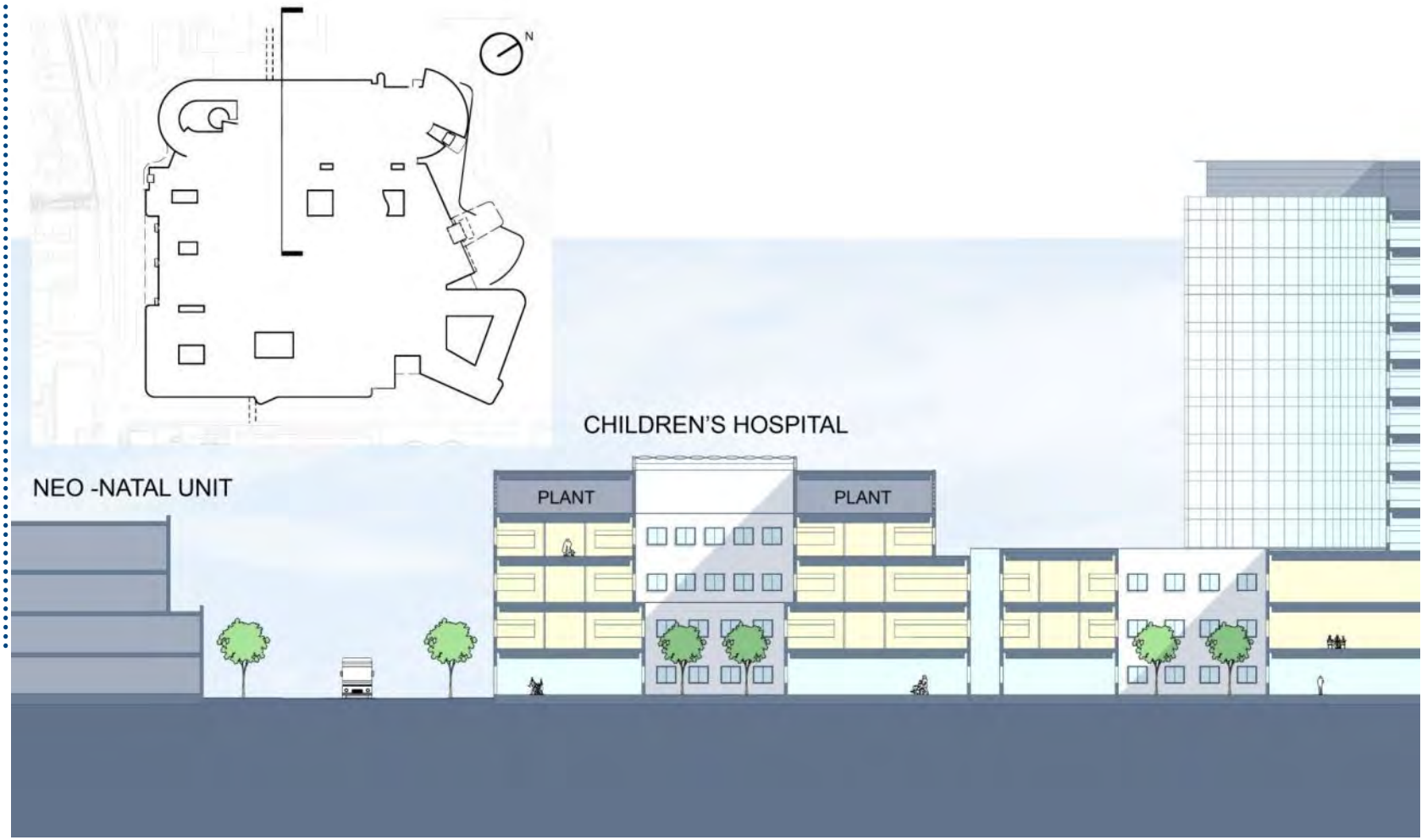
Integration with Masterplan

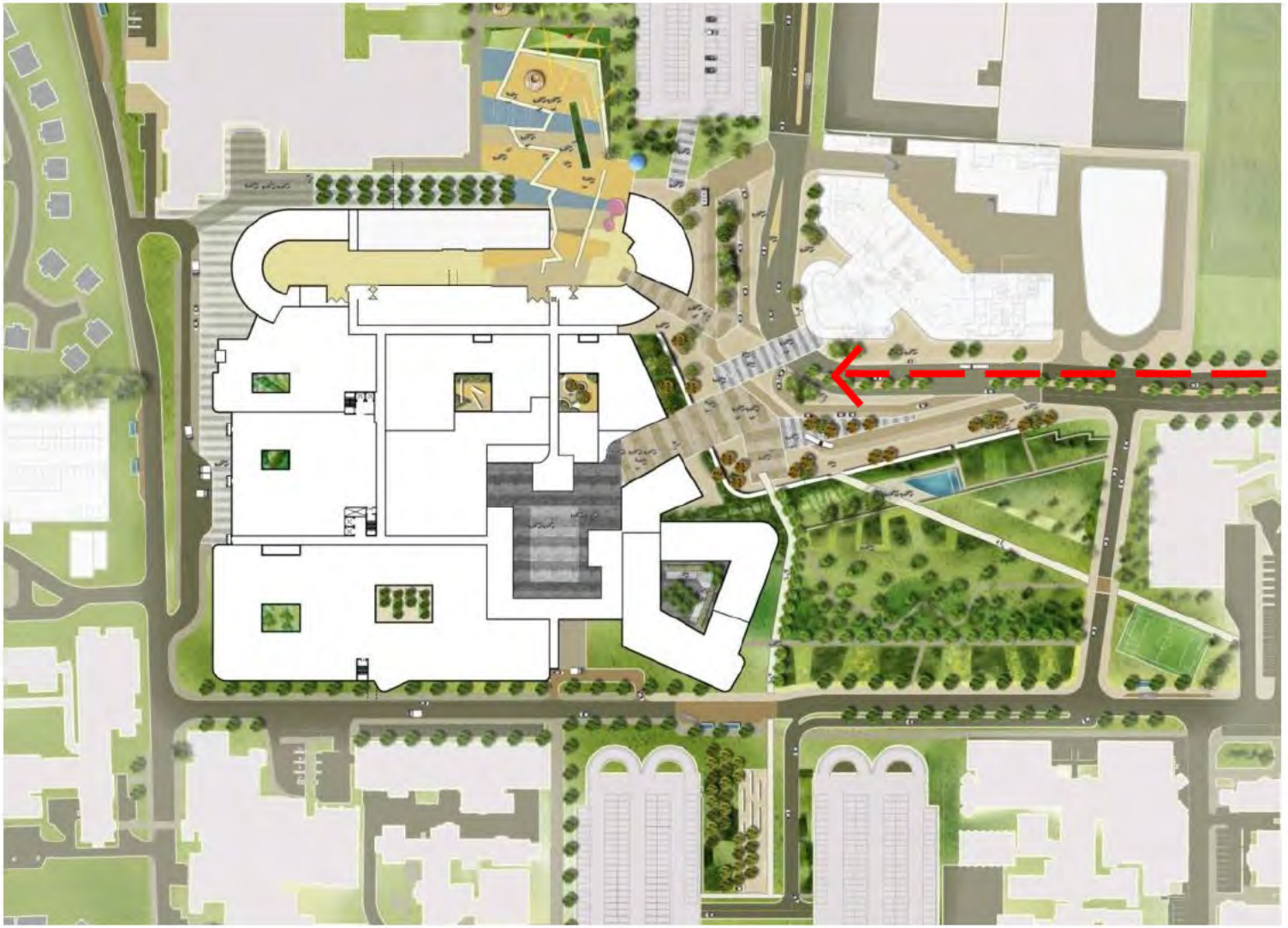


Context – Podium Limited to 3 or 4 Stories



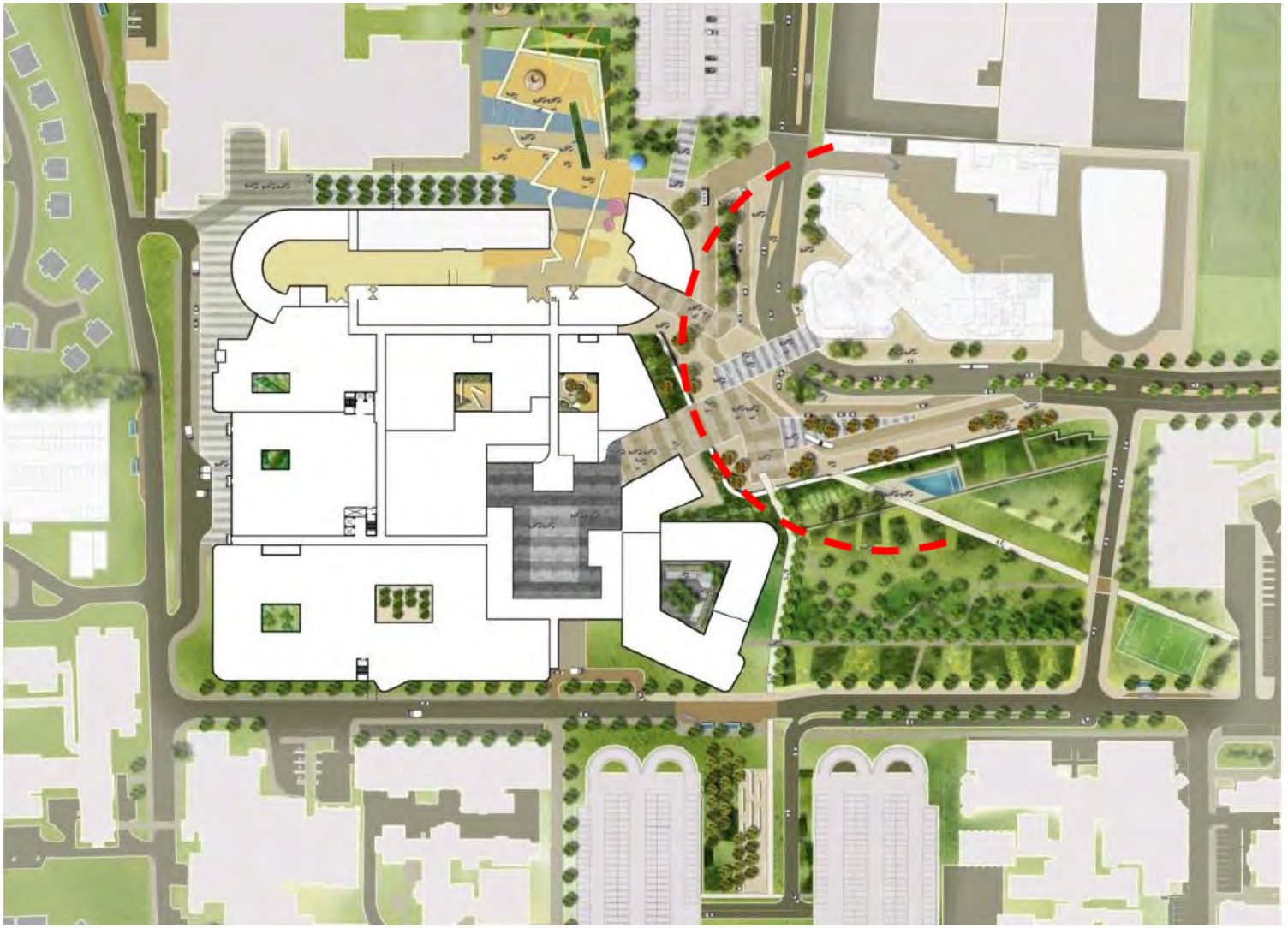
Context

Integration with Masterplan – Central Park



Integration with Masterplan

Integration with Masterplan



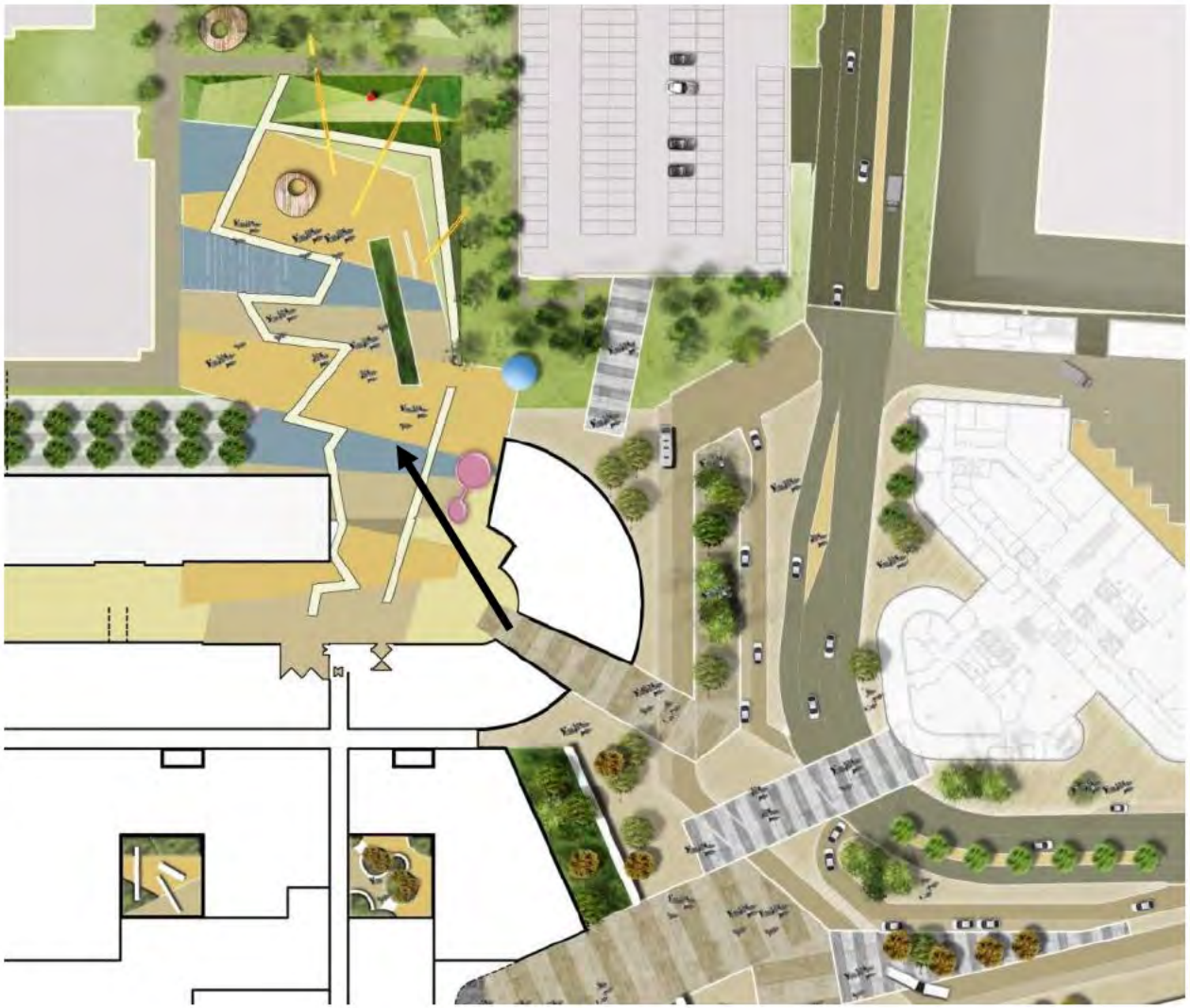
Integration with Masterplan

NHS Greater Glasgow and Clyde

Integration with Masterplan – DDM 05

NHS Greater Glasgow and Clyde

Integration with Masterplan – Current Design



NHS Greater Glasgow and Clyde

Integration with Masterplan

External Materials

Materials & Composition - Core Considerations

Elevation/ Material Strategy needs to respond to:

Context

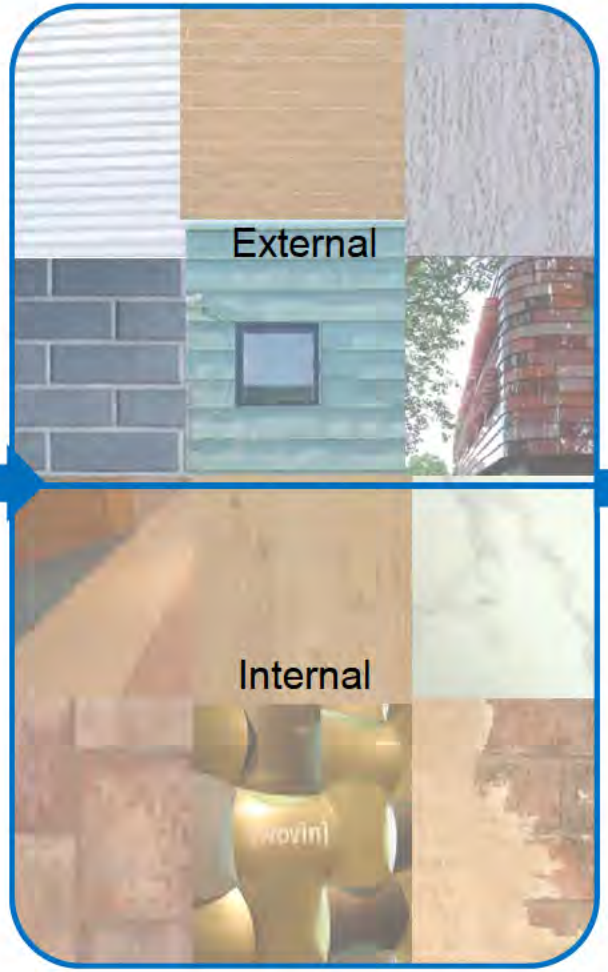
Robustness/ Life Span Requirements

Life Cycle and Sustainability

Buildability

Value for Money

Design Flexibility



Life Cycle – 30 Years Required

Durability

Sustainability

Architectural Merit

Local Products

Quality

Appearance

Embodied Energy

Recycled Products

Cleanability

Infection Control

References and Influences - Steel

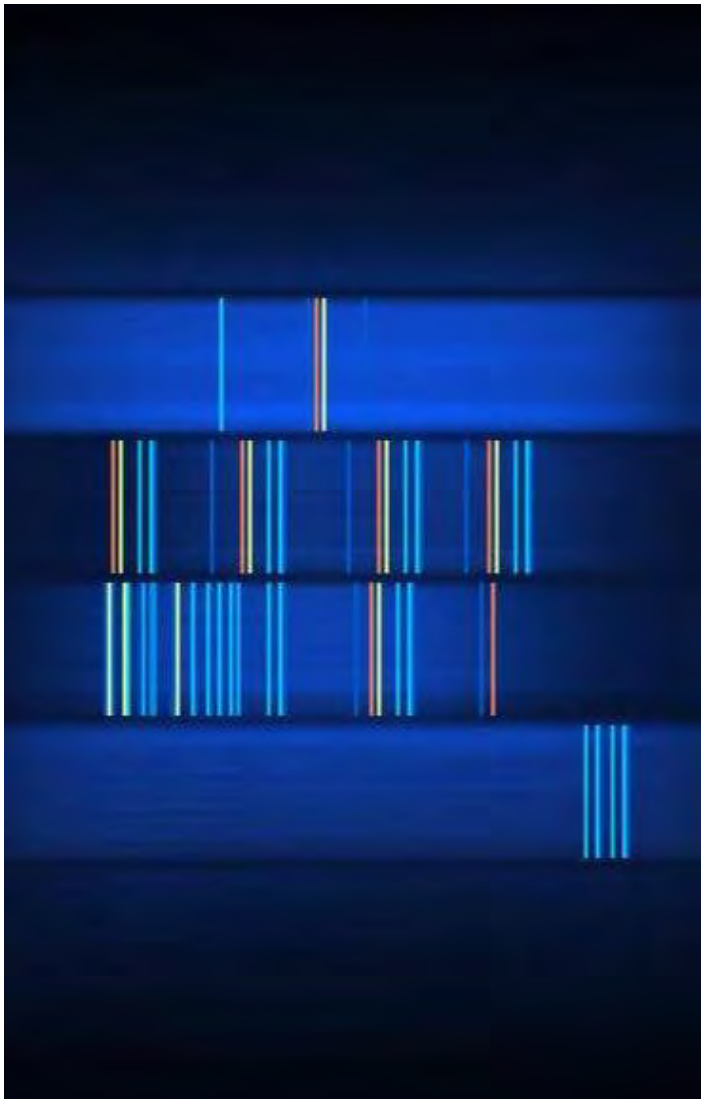
References and Influences – Shapes

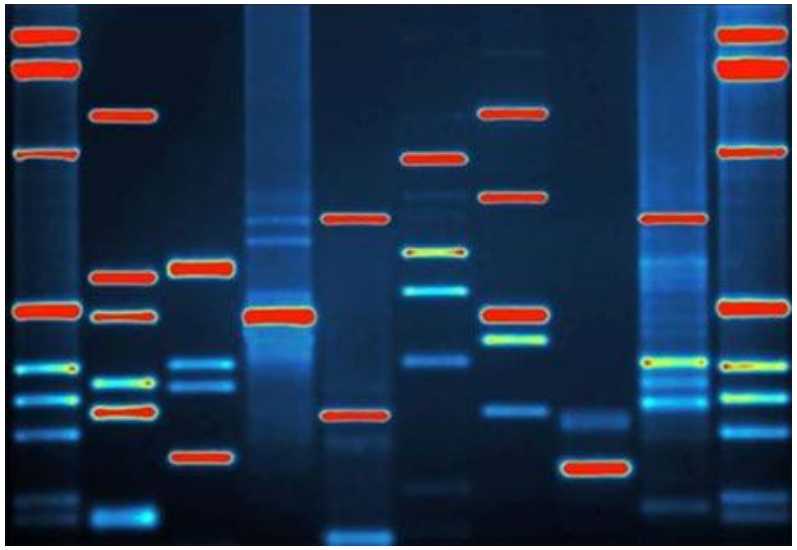


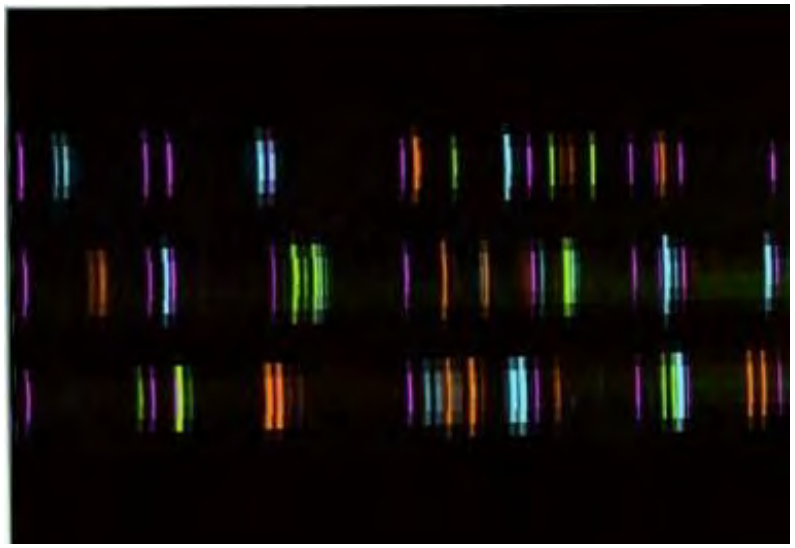





DNA Strands

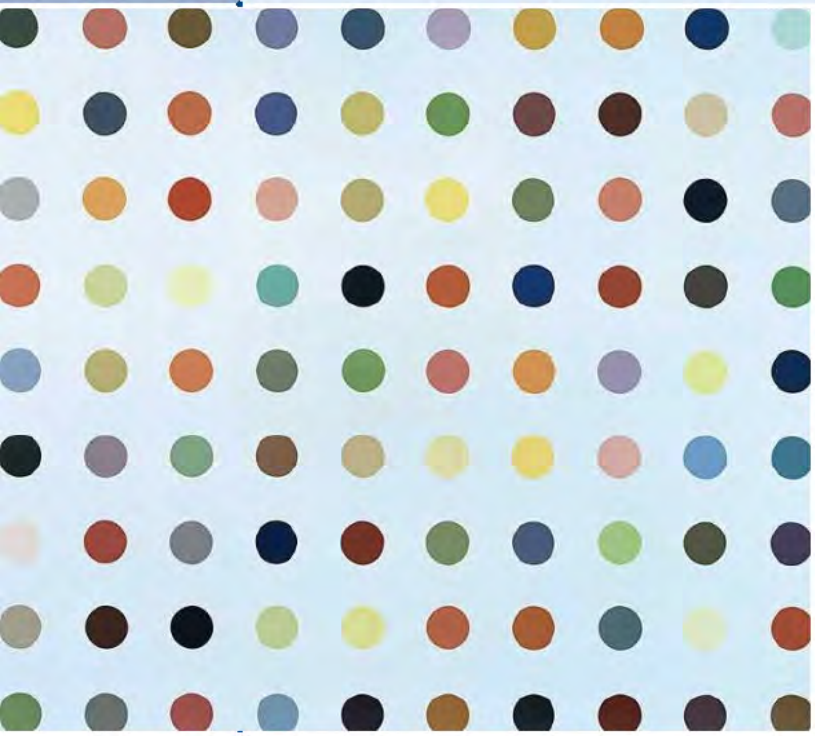






NHS Greater Glasgow and Clyde

Colours & Shapes

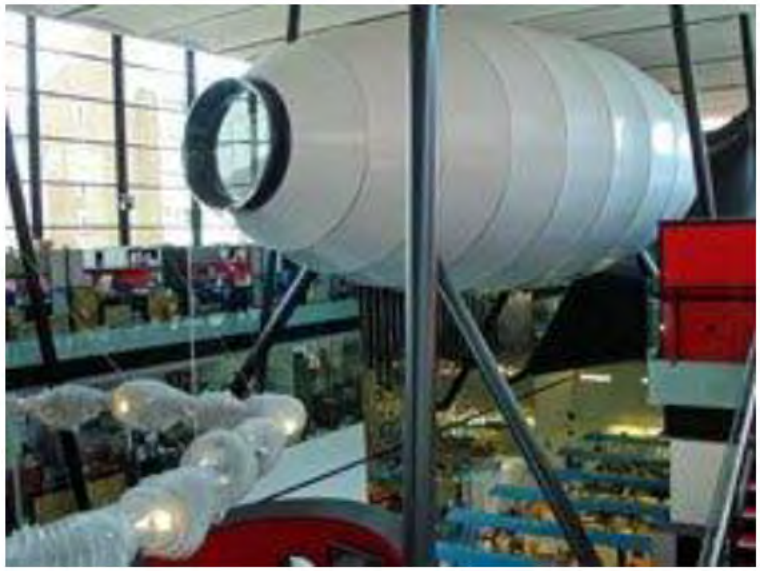


Brookfield

New South Glasgow Hospitals

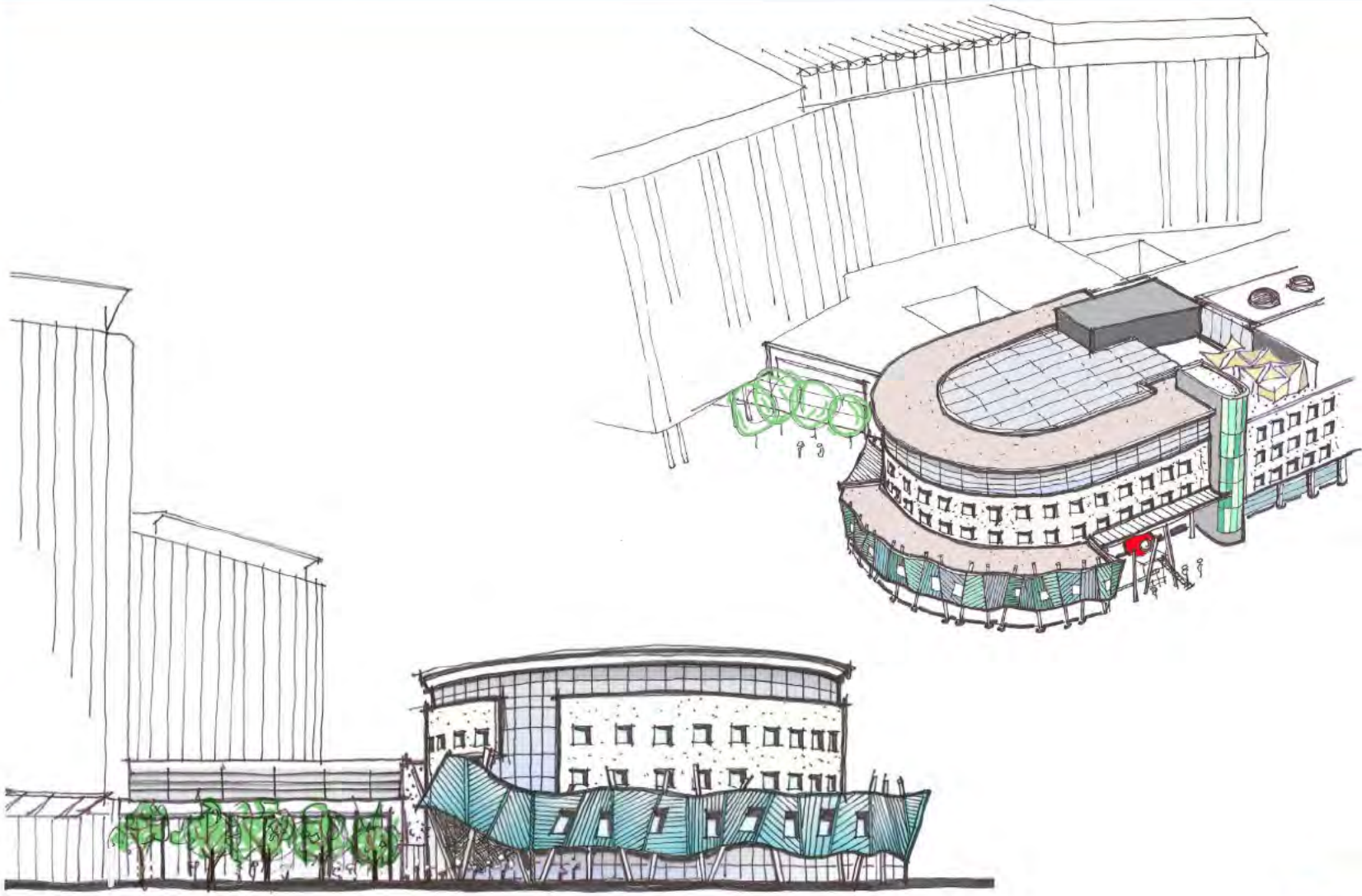
NHS Greater Glasgow and Clyde

Children's Favourites



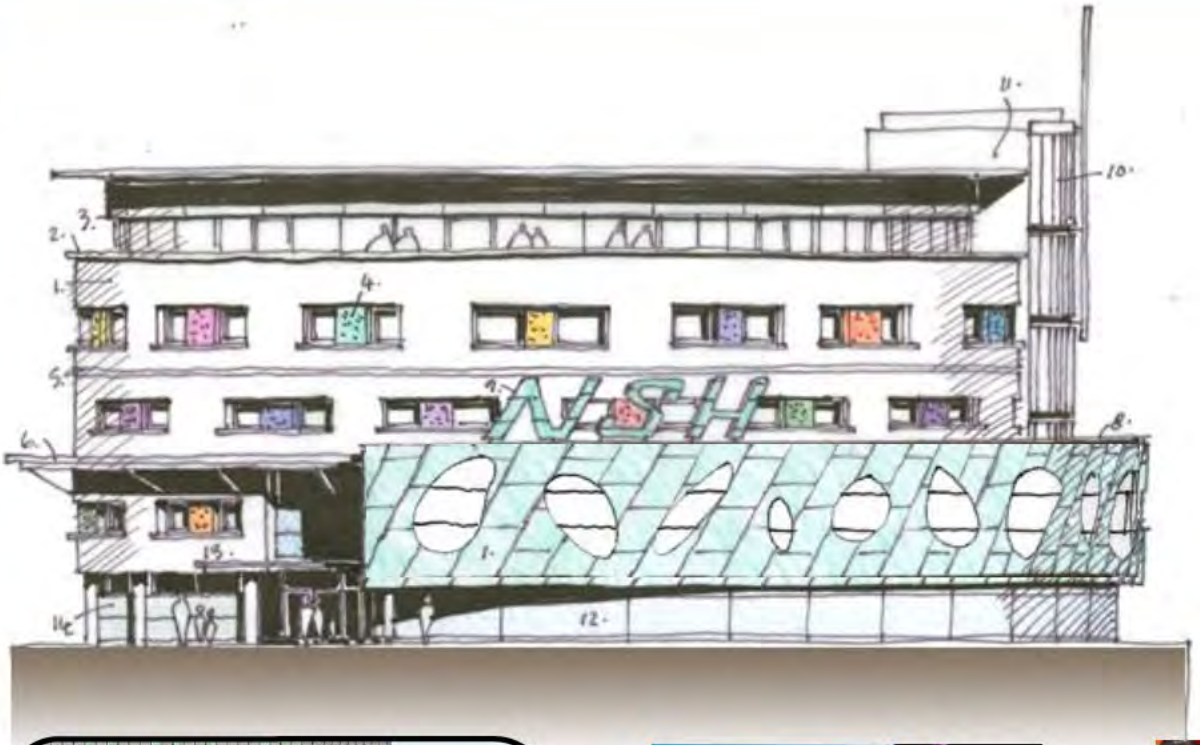
NHS Greater Glasgow and Clyde

Children's Hospital Entrance Identity



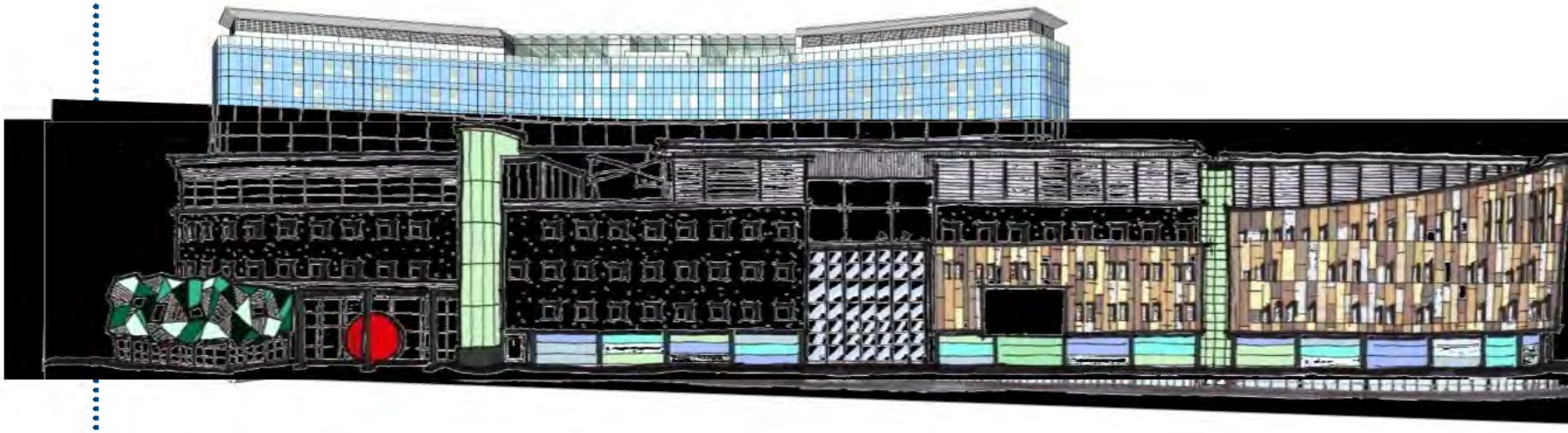
NHS Greater Glasgow and Clyde

Children's Hospital



NHS Greater Glasgow and Clyde

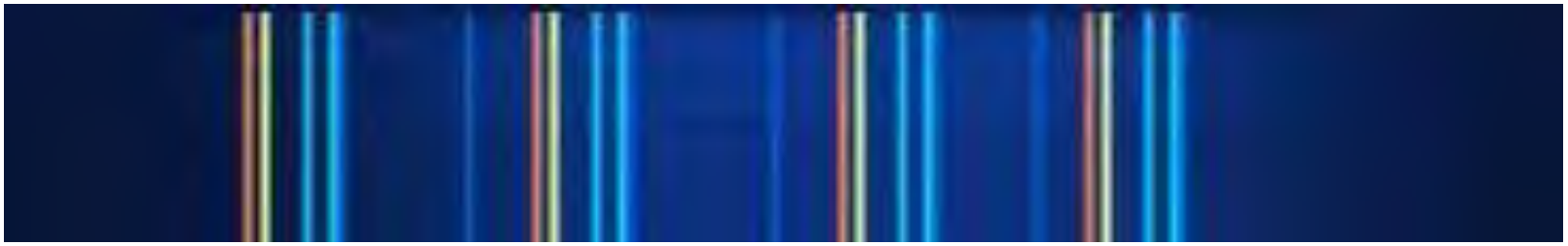
Children's Hospital Cladding Options



Children's Hospital

Podium

Podium – Cladding Pattern



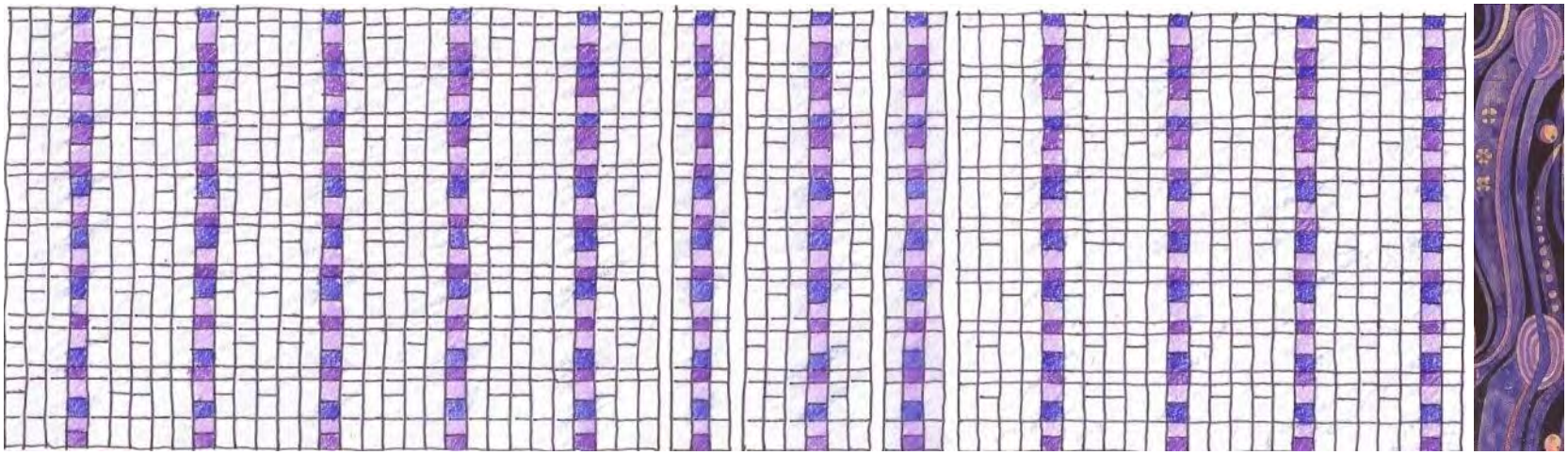
NHS Greater Glasgow and Clyde

Podium – DNA Strand Cladding Pattern

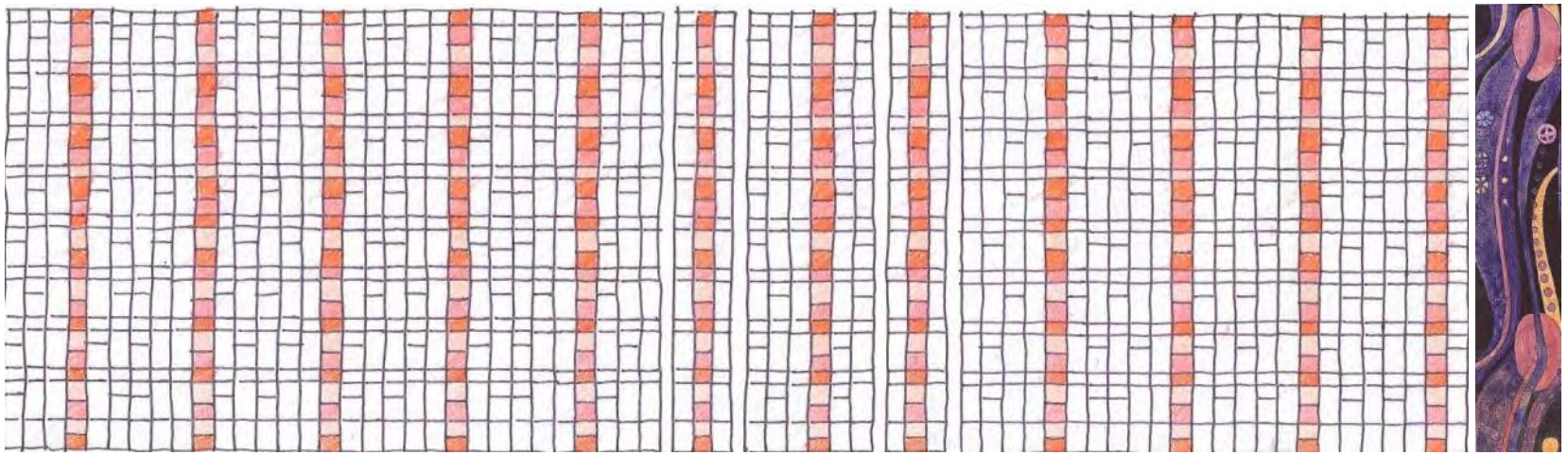
NHS Greater Glasgow and Clyde

Tower Cladding Options - Vertical

Tower Cladding Colour Identity

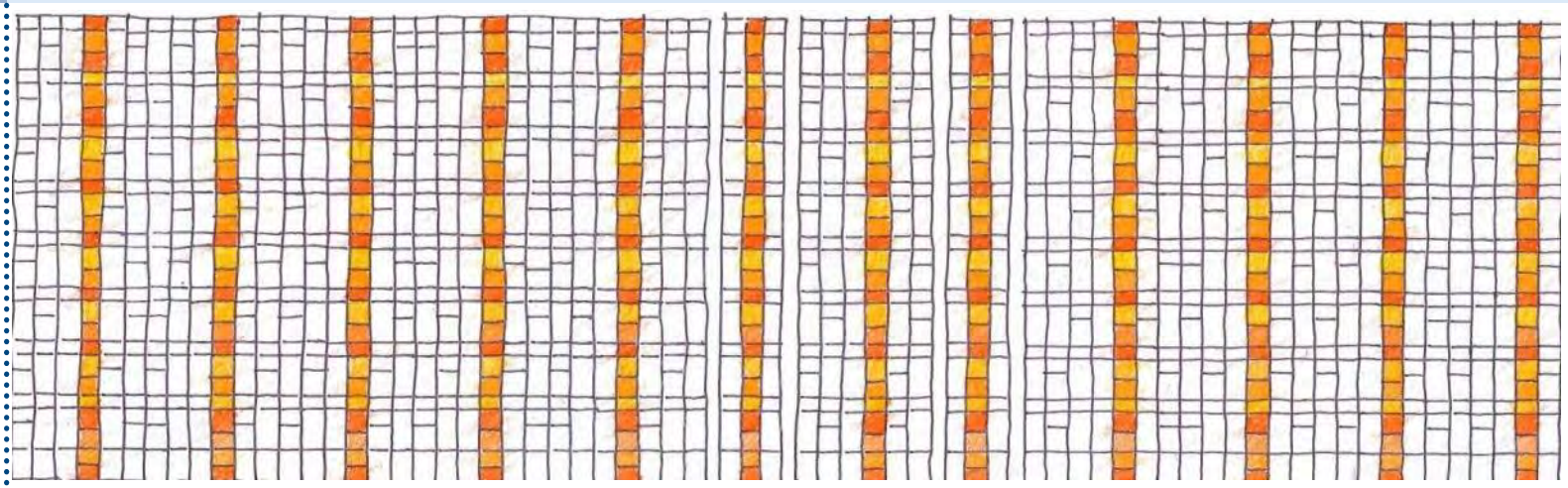


Violet Wing

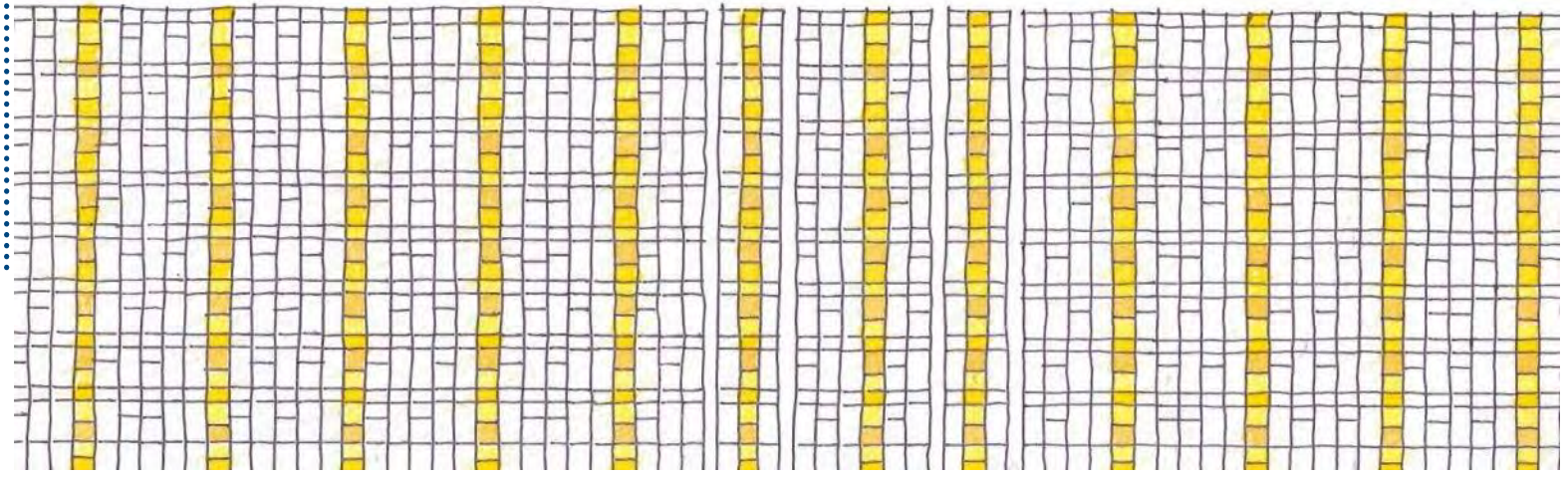


Rose Wing

Tower Cladding Colour Identity



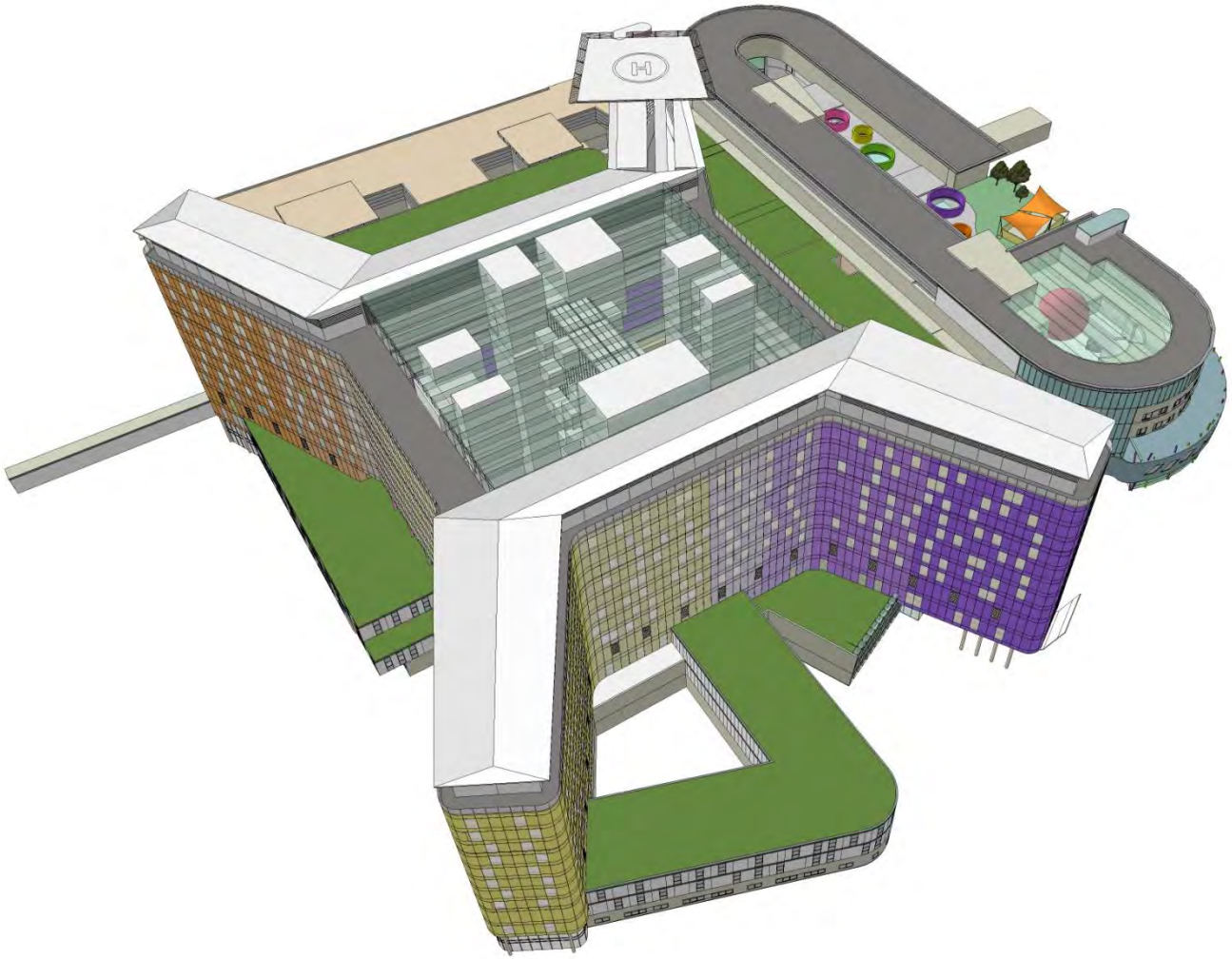
Umber Wing



Ochre Wing

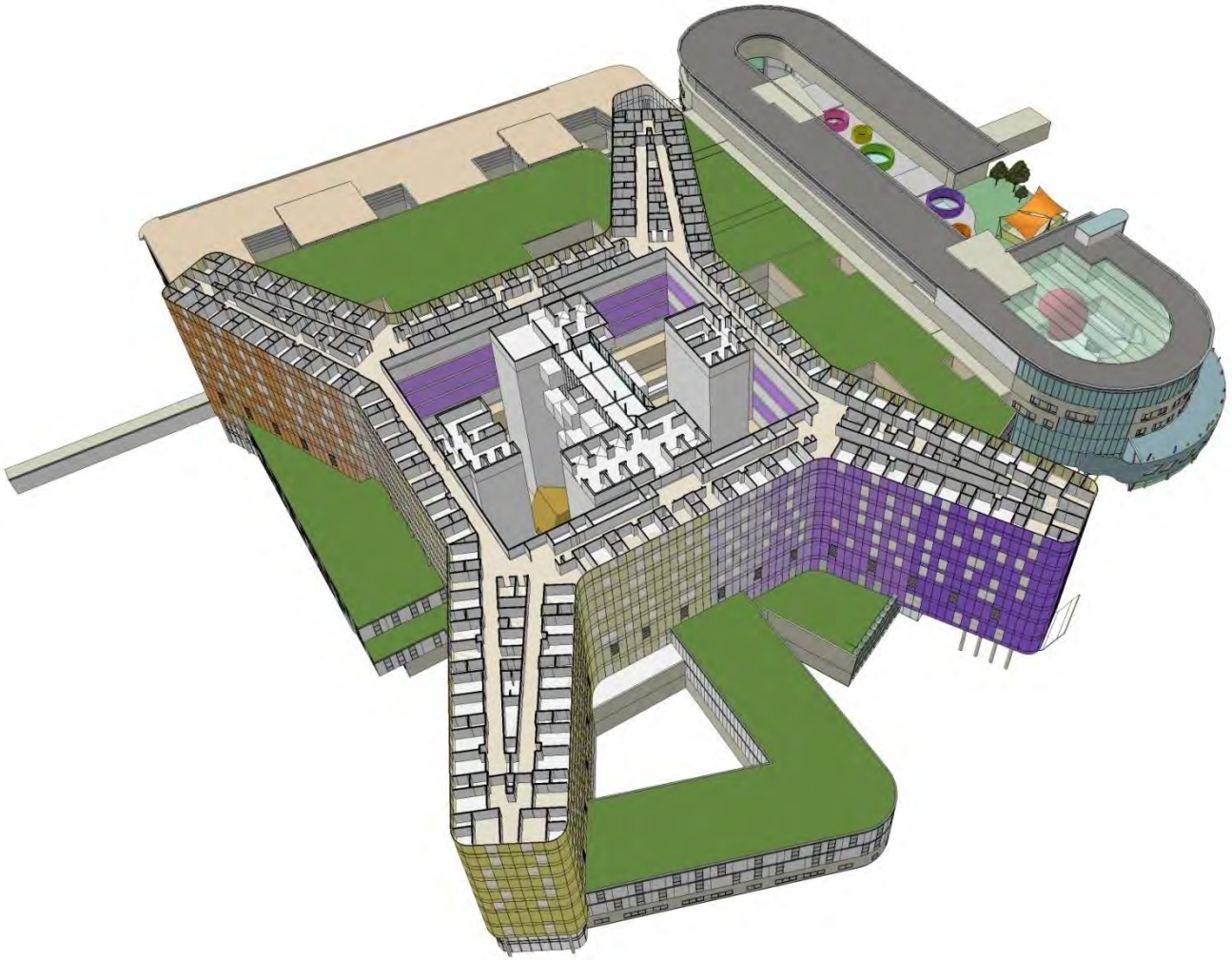
NHS Greater Glasgow and Clyde

Tower



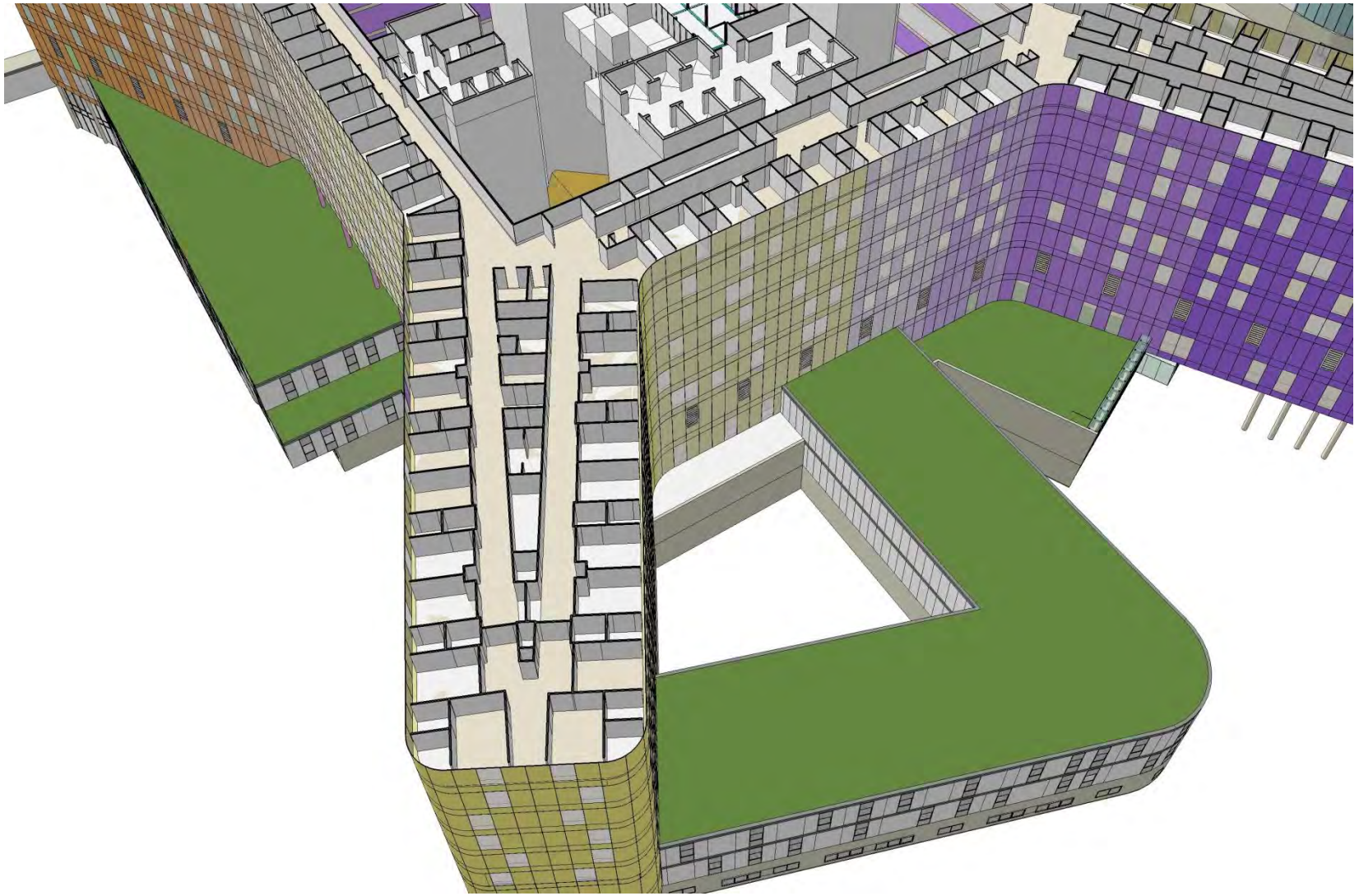
NHS Greater Glasgow and Clyde

Tower



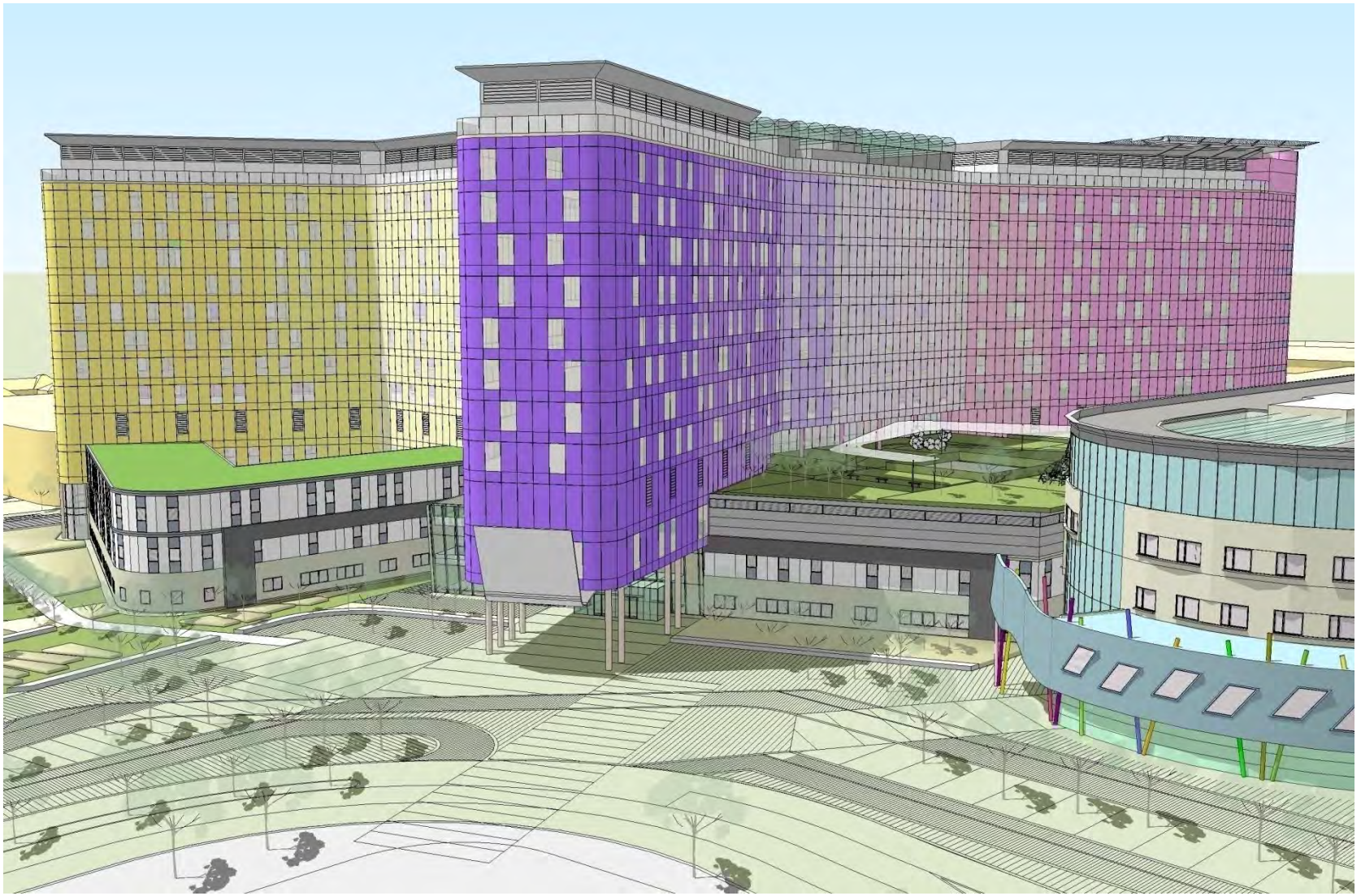
NHS Greater Glasgow and Clyde

Tower



NHS Greater Glasgow and Clyde

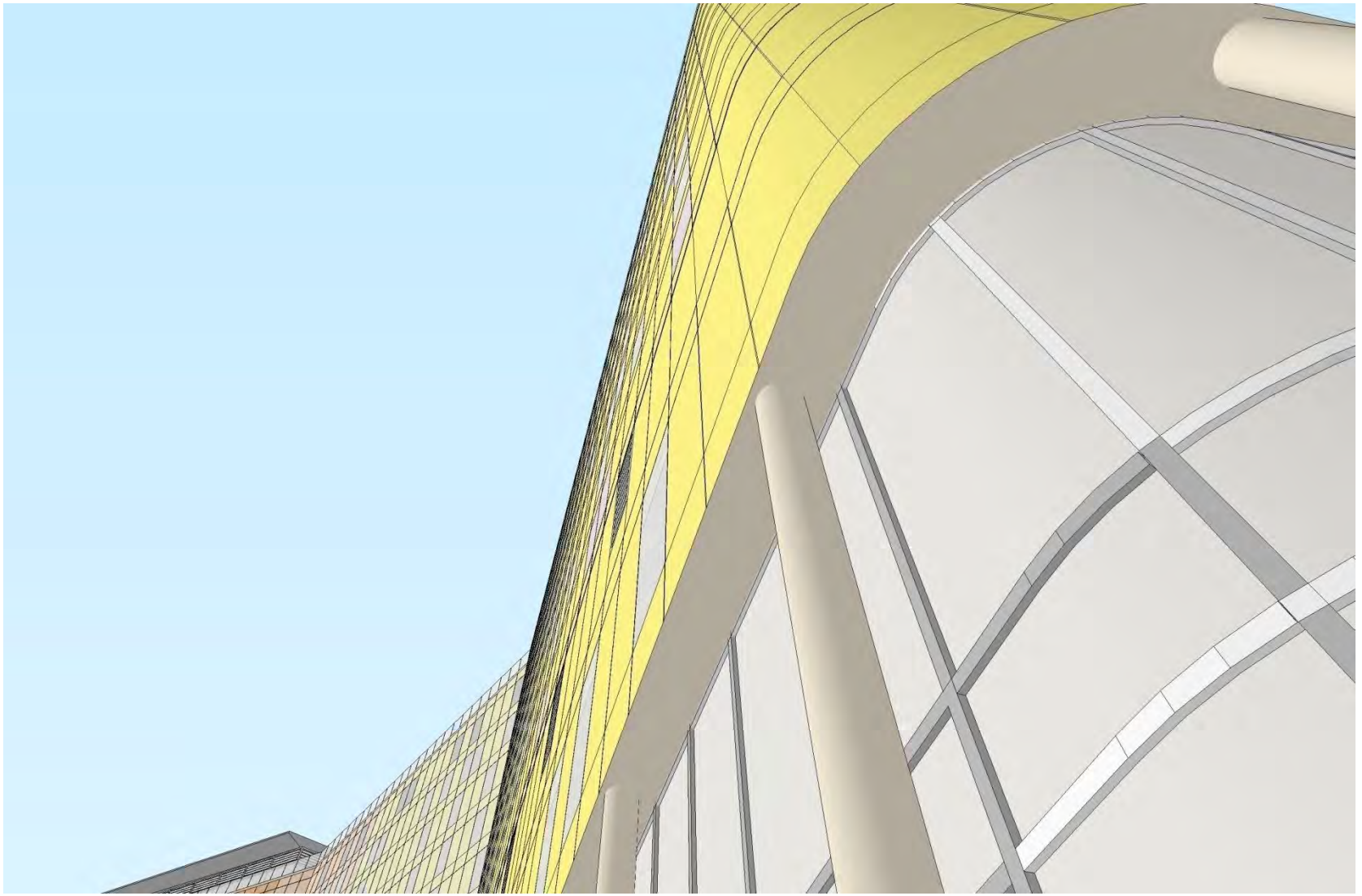
Tower



NHS Greater Glasgow and Clyde

Tower

Tower



NHS Greater Glasgow and Clyde

Environment

Environment and Perception

External Environment

Threshold

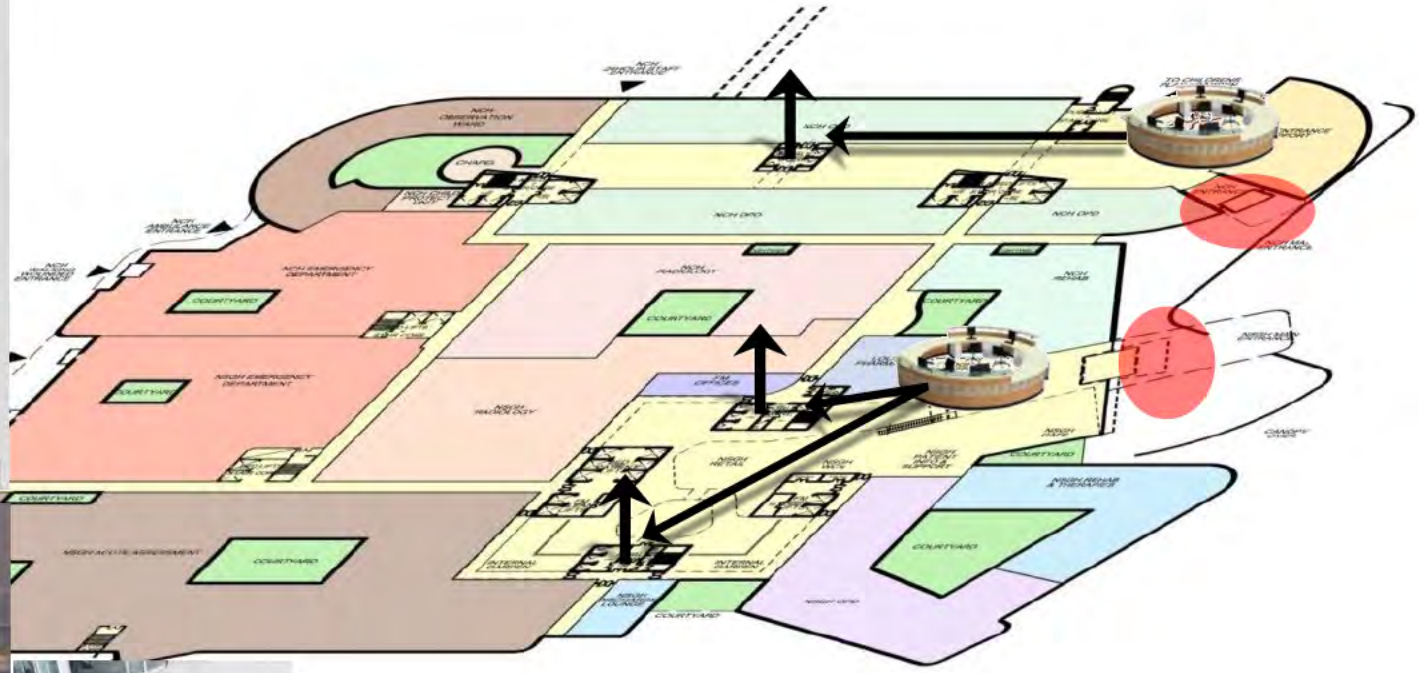
Internal Environment

NHS Greater Glasgow and Clyde

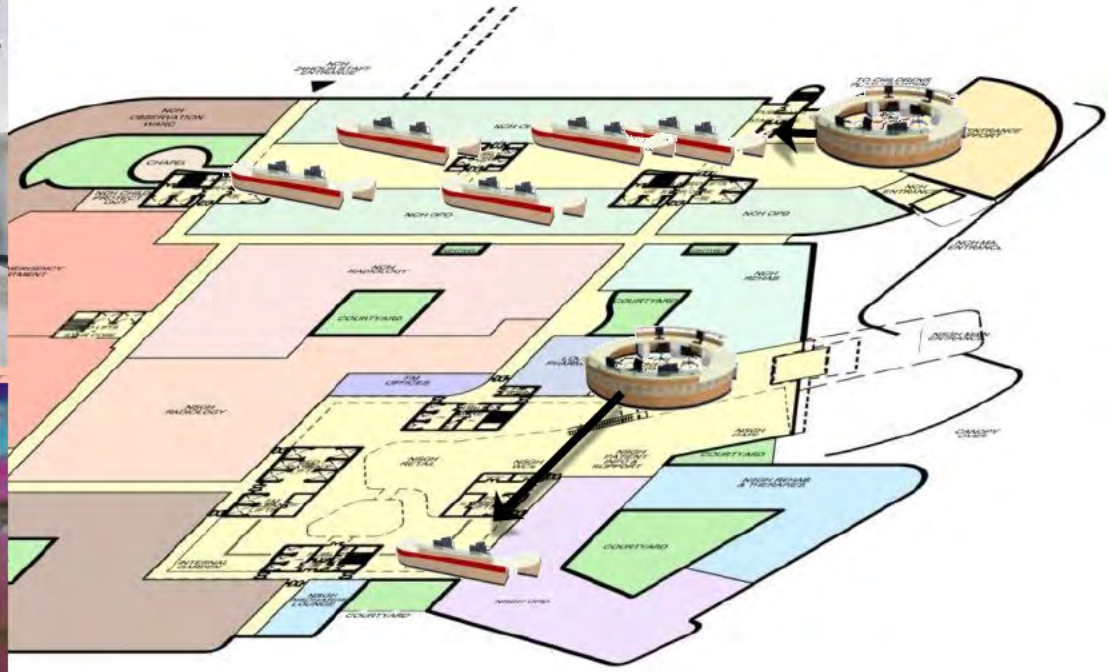
What Makes an Exemplar Health Environment

NHS Greater Glasgow and Clyde

Clear Wayfinding

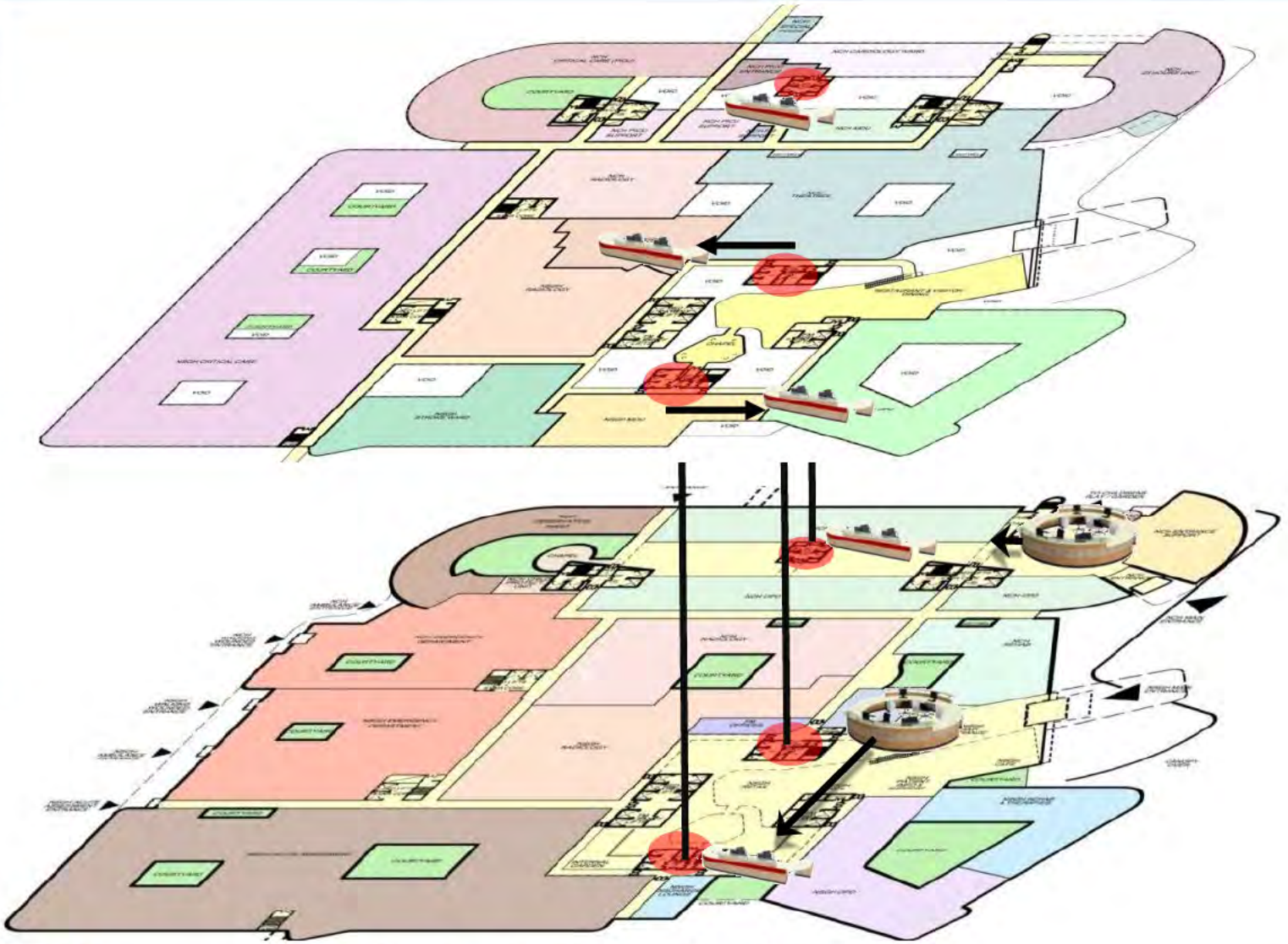


Clear Wayfinding

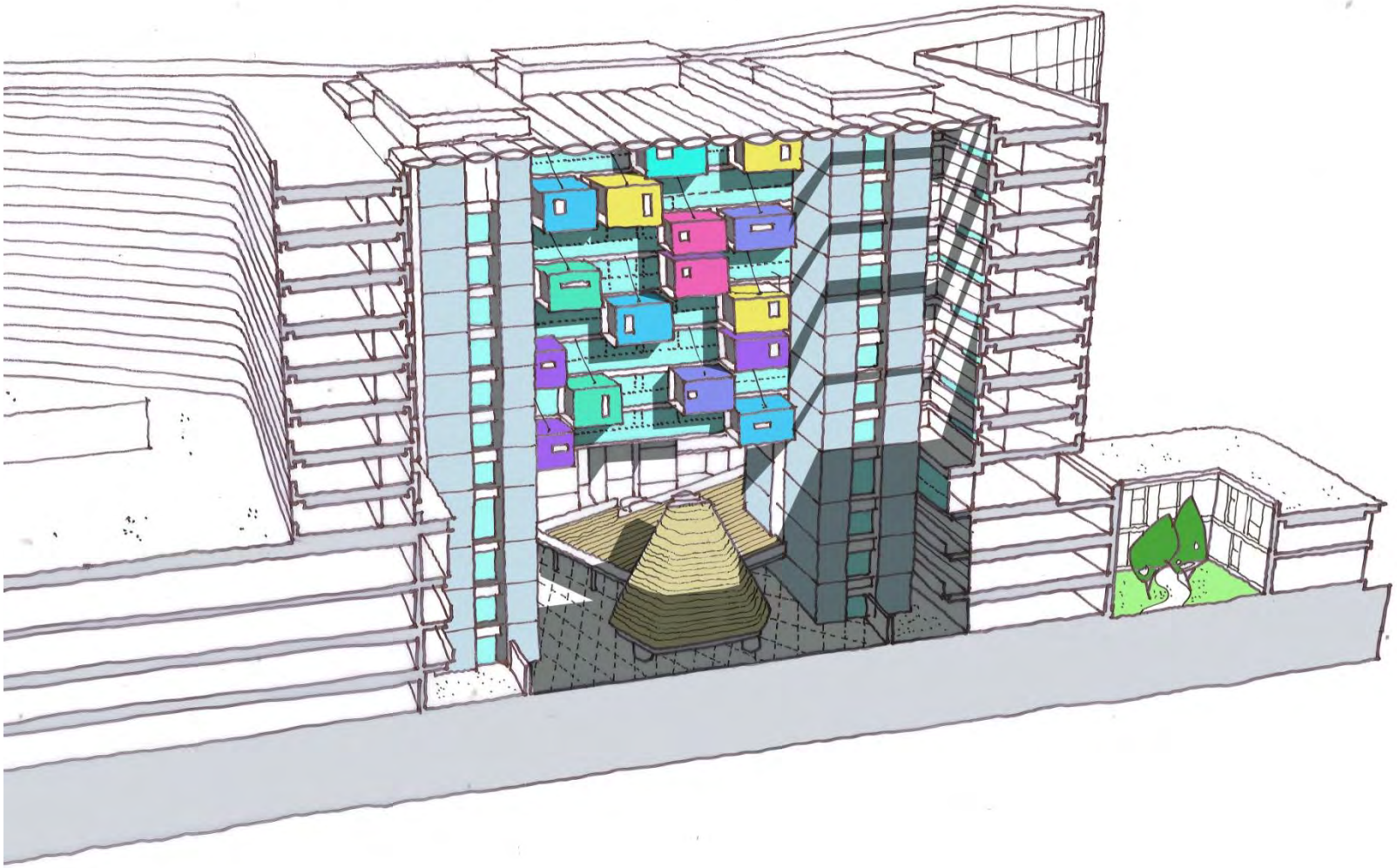


NHS Greater Glasgow and Clyde

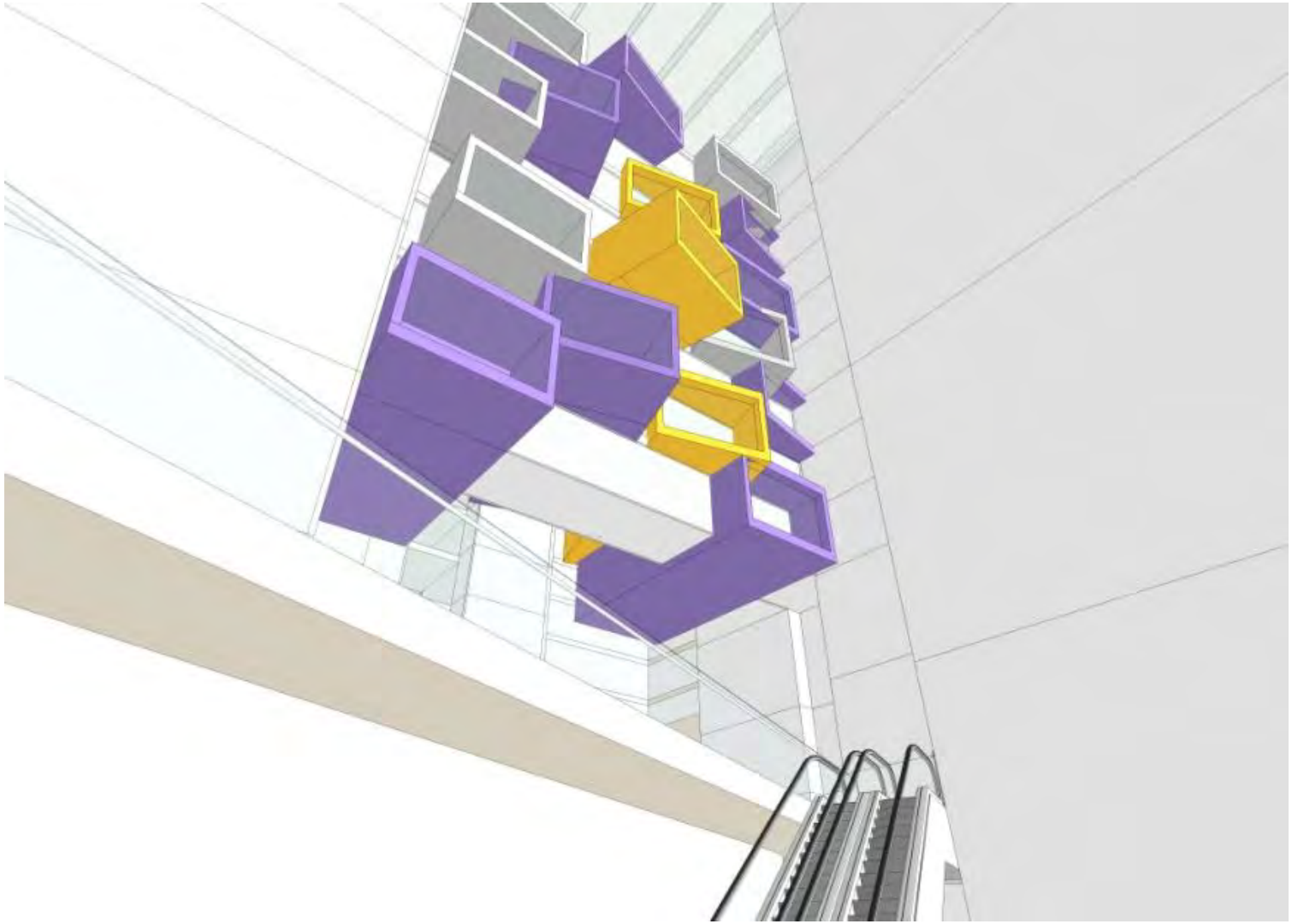
Clear Wayfinding



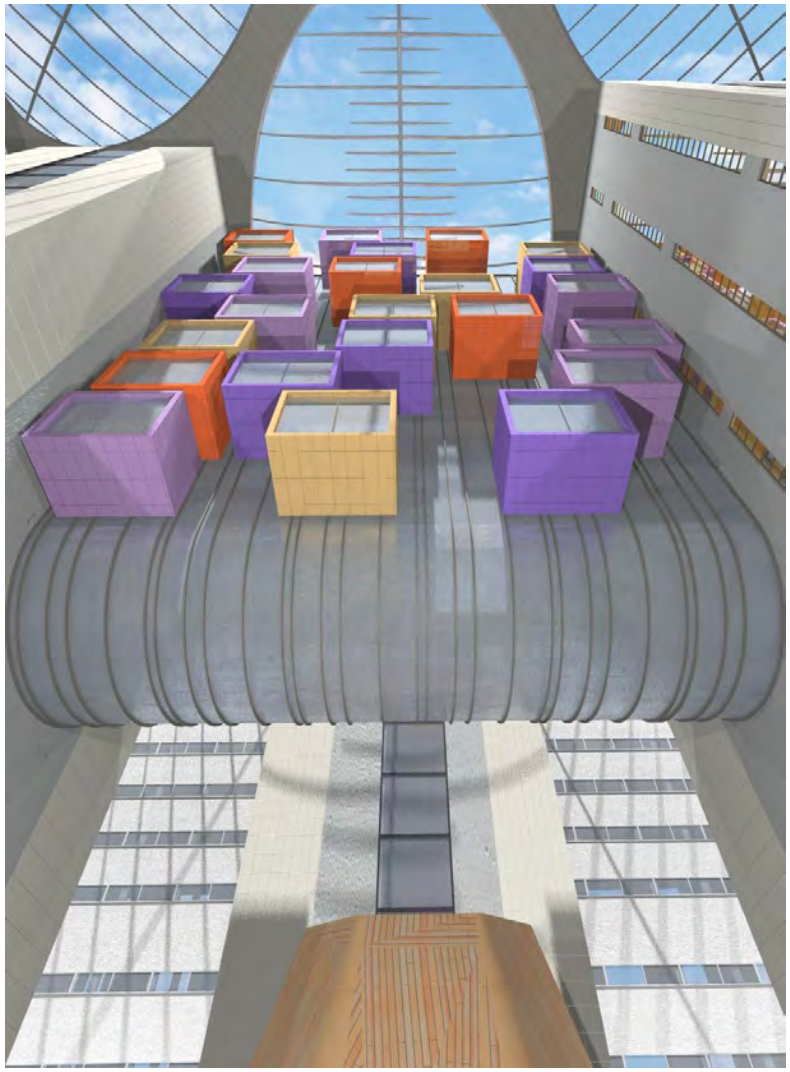
Welcoming /Art Forms - Adults



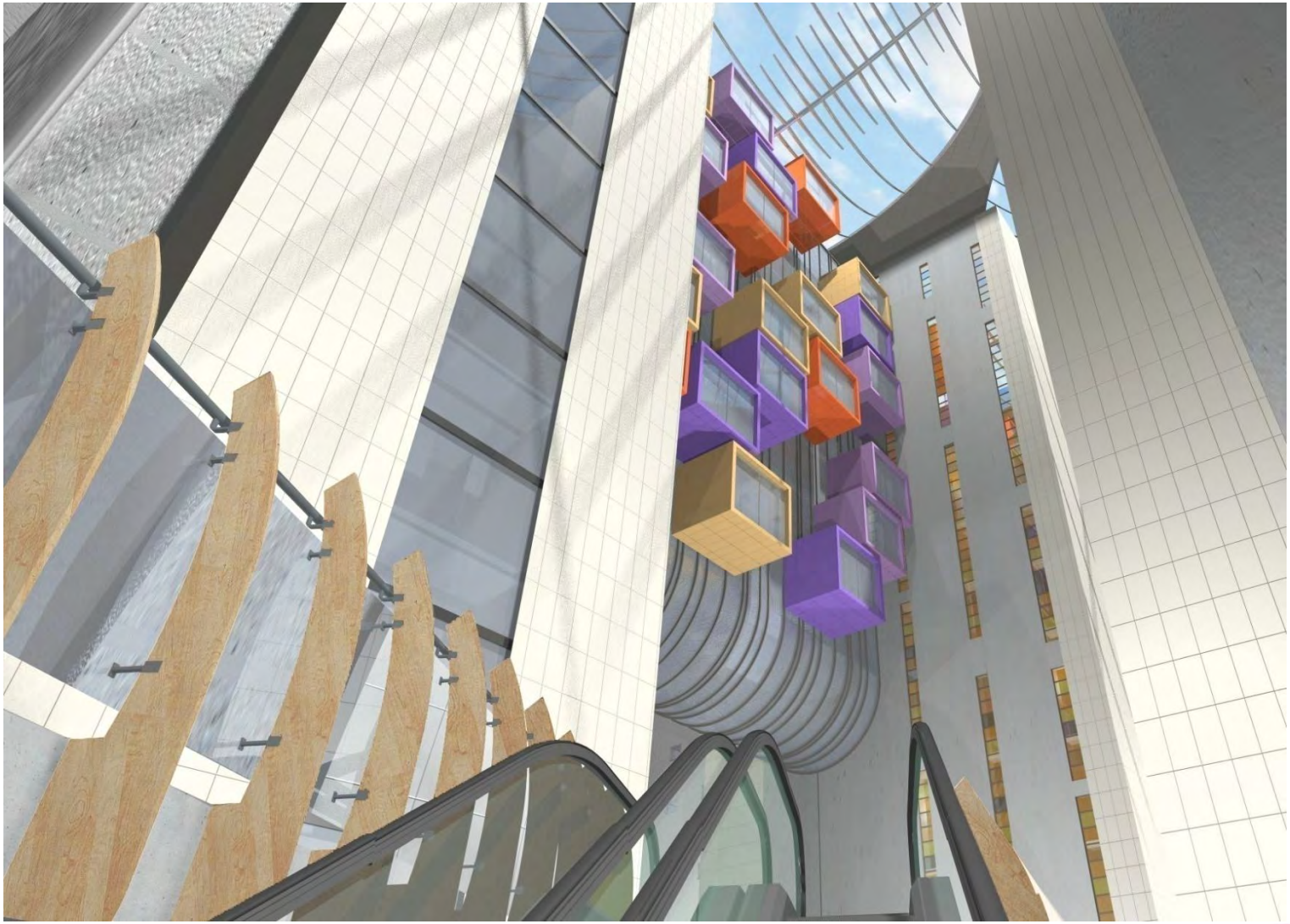
Welcoming /Art Forms - Adults



Welcoming /Art Forms - Adults

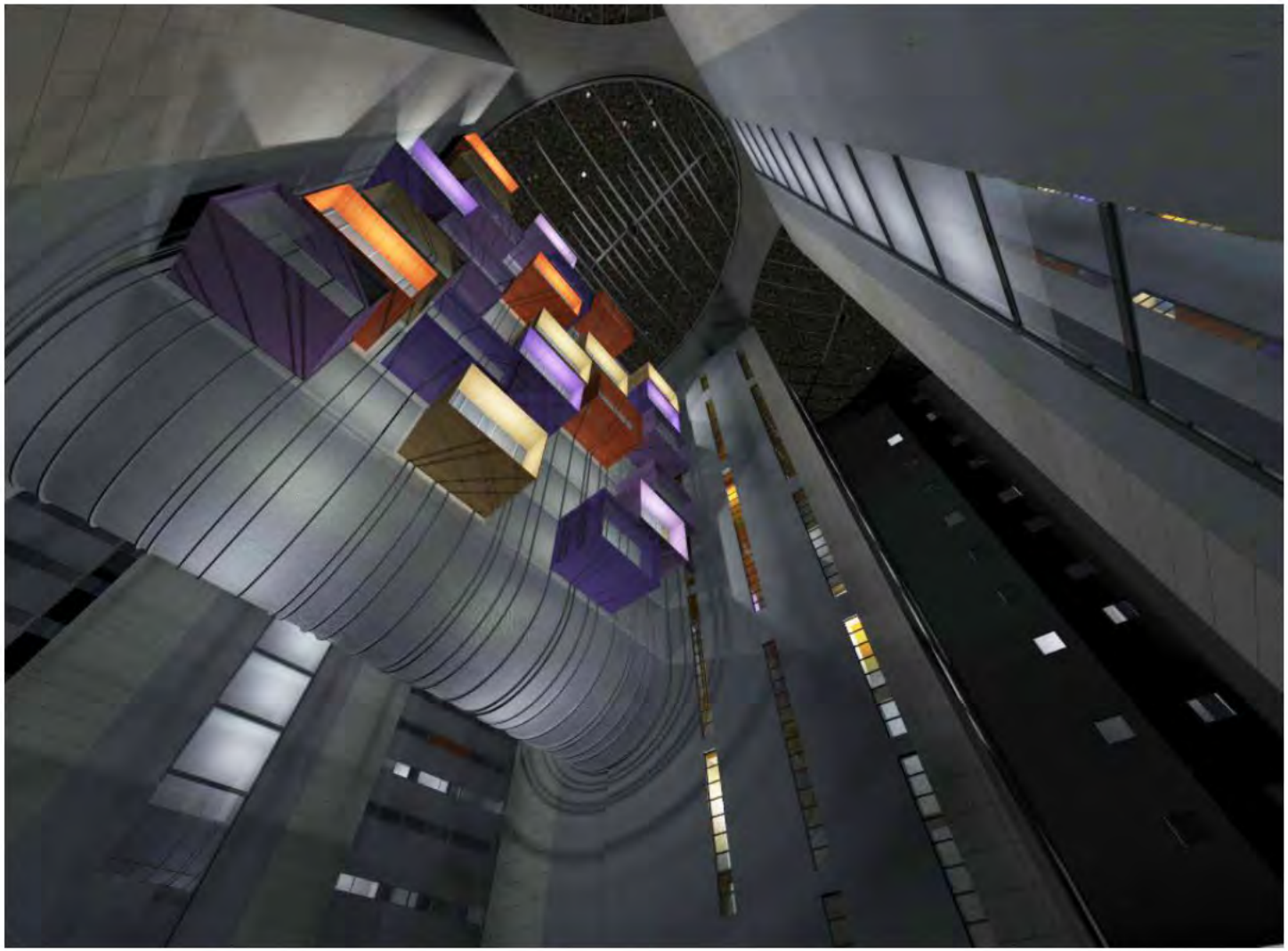


Welcoming /Art Forms - Adults

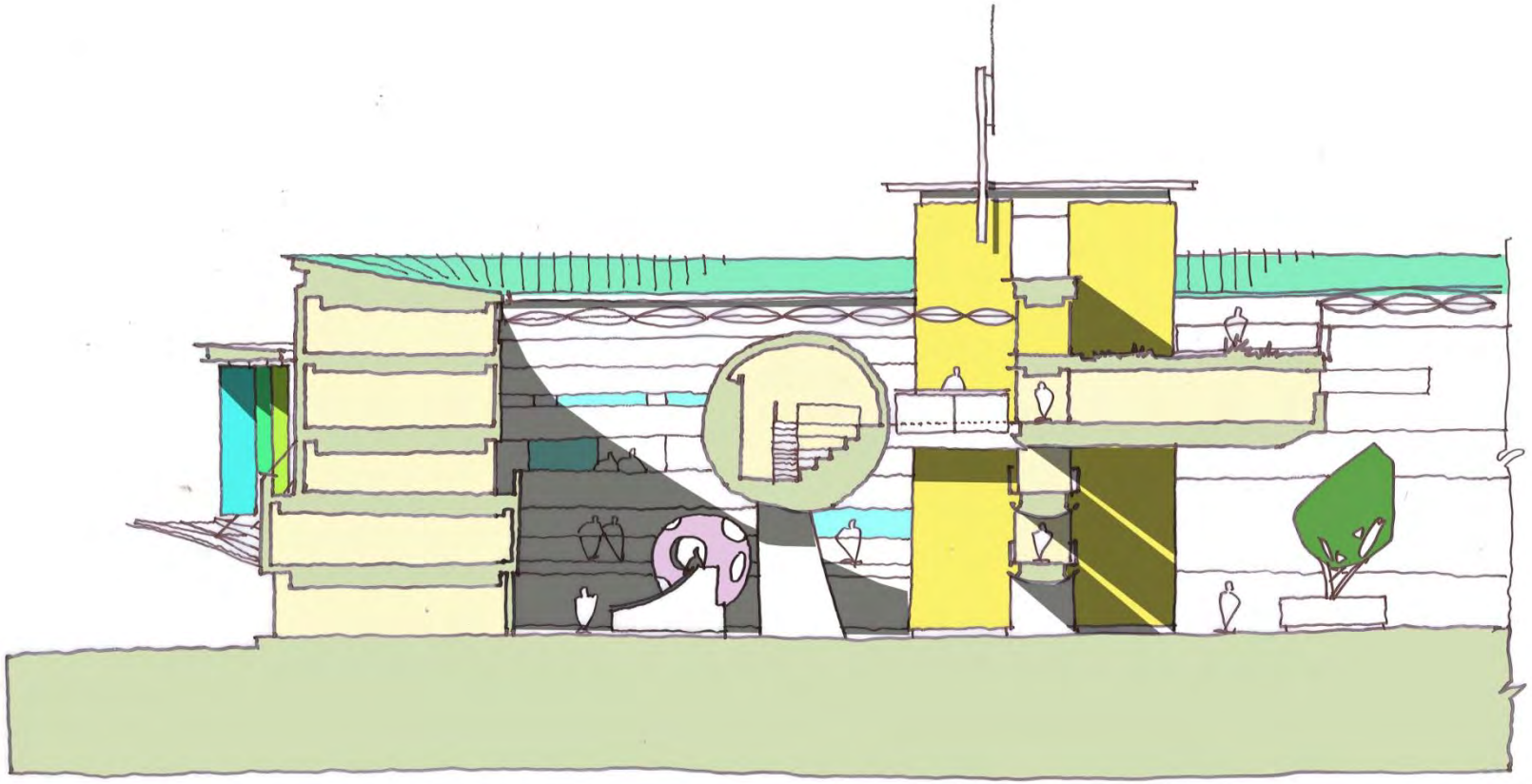


NHS Greater Glasgow and Clyde

Welcoming /Art Forms - Adults



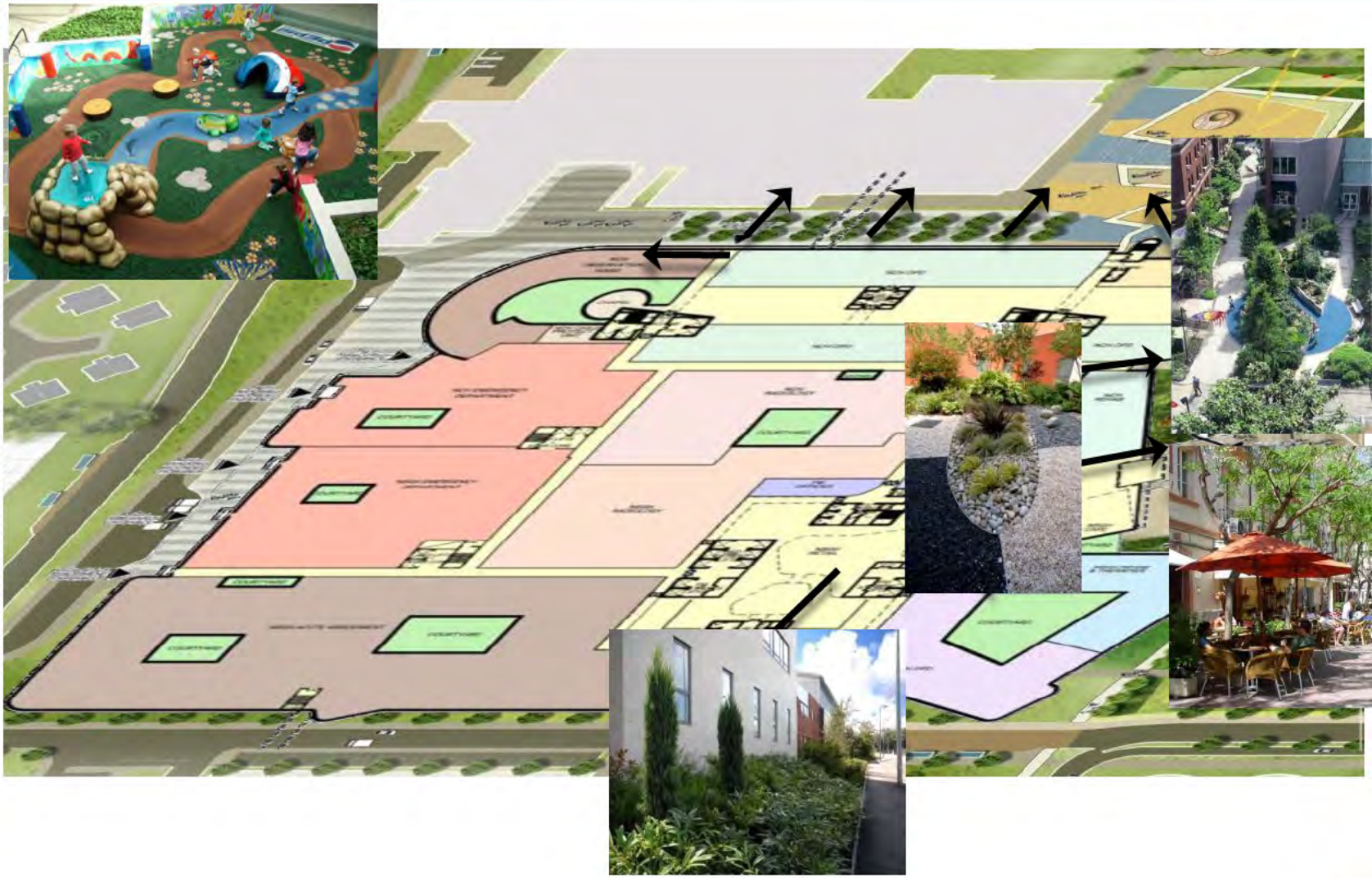
Welcoming /Art Forms – Children's



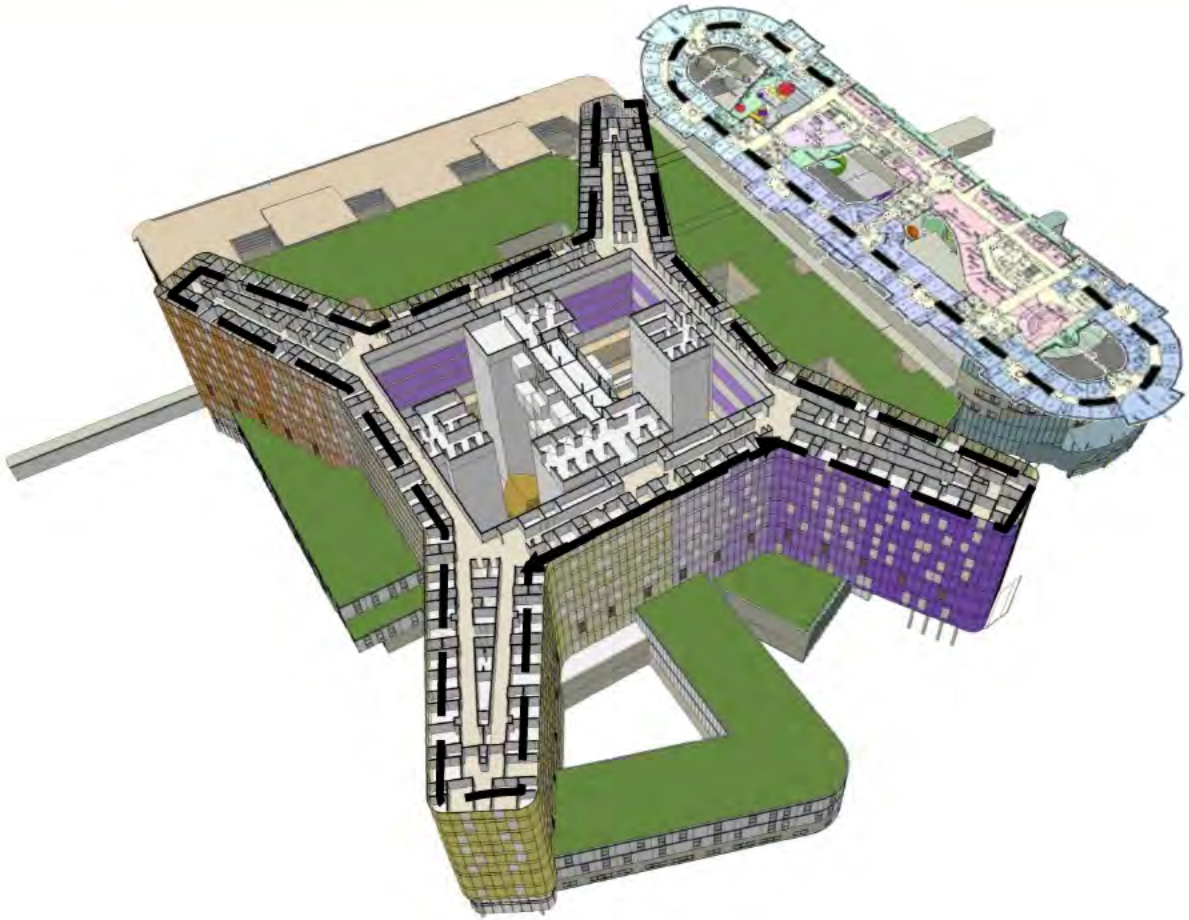
Welcoming /Art Forms – Children"s

Welcoming /Art Forms – Children's

Therapy/ Social Space - Views and Orientation



Flexibility & Security/ Nursing



Natural Daylight

Fifth to Twelfth Floors - Tower

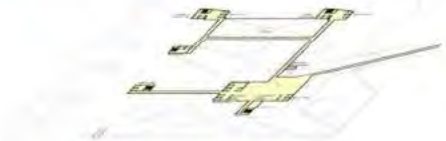
Fourth Floor - Tower

Third Floor - Tower

Second Floor - Podium

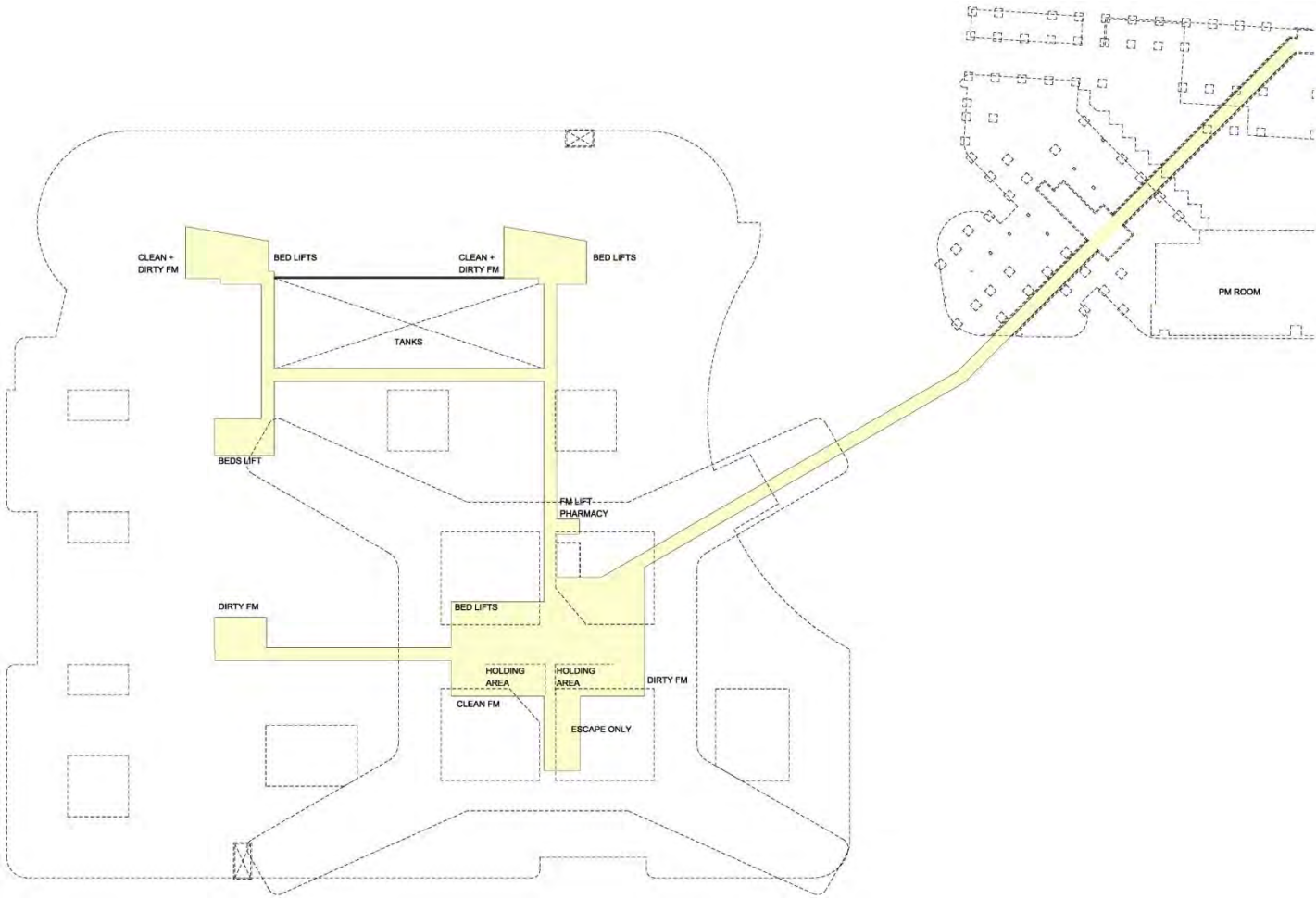
First Floor - Podium

Ground Floor - Podium

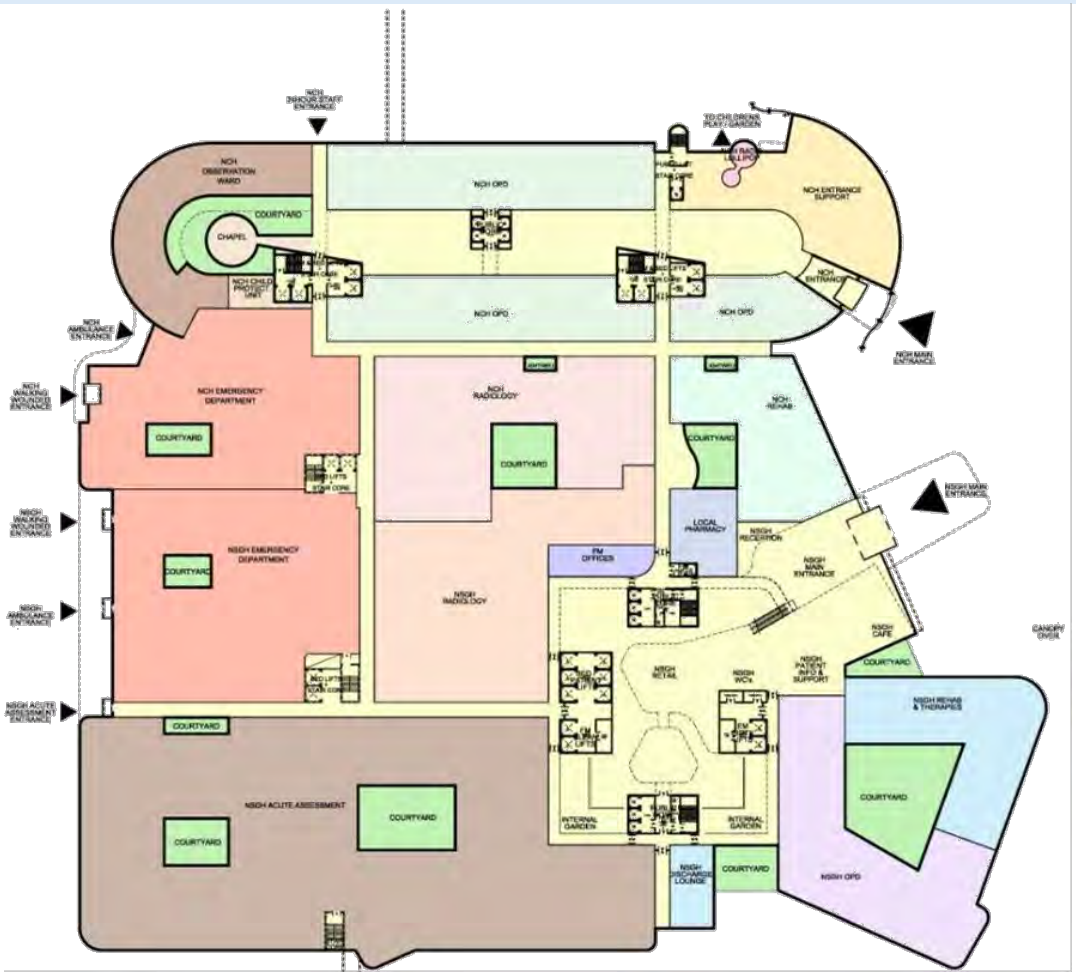


Basement

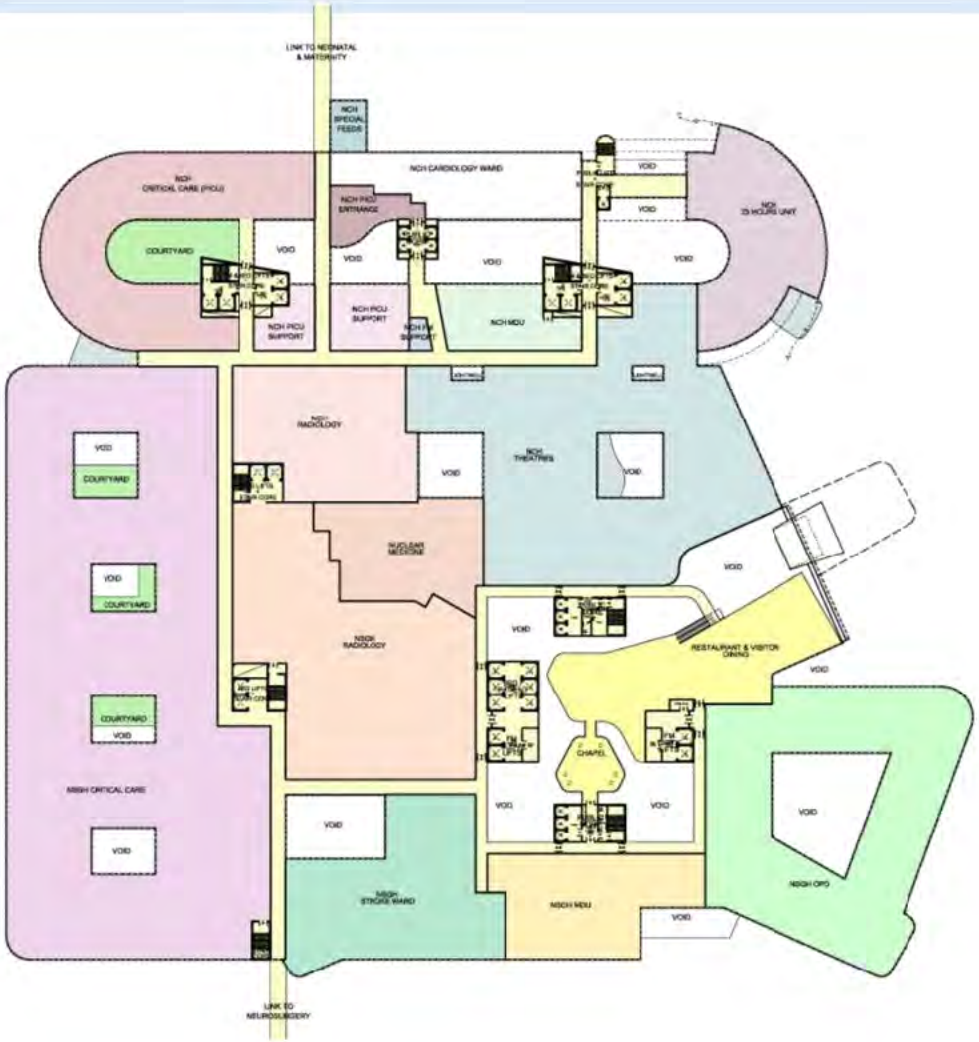
1:500 Plans – Basement



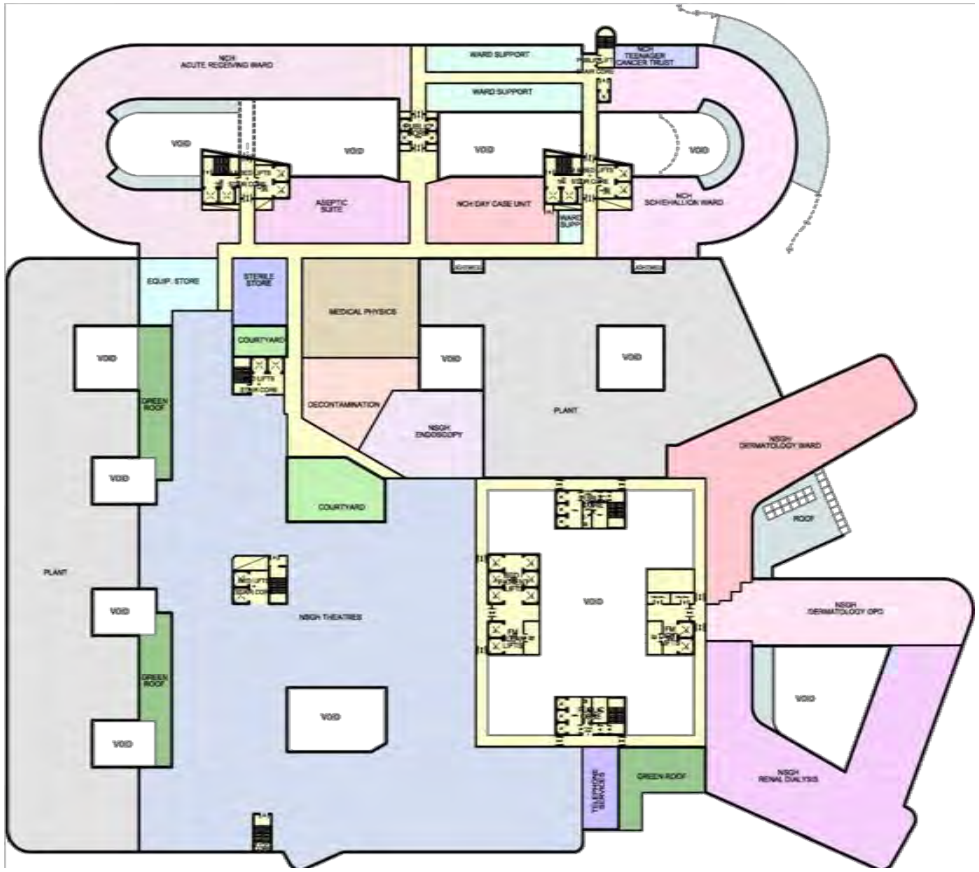
1:500 Plans – Ground Floor



1:500 Plans – 1st Floor

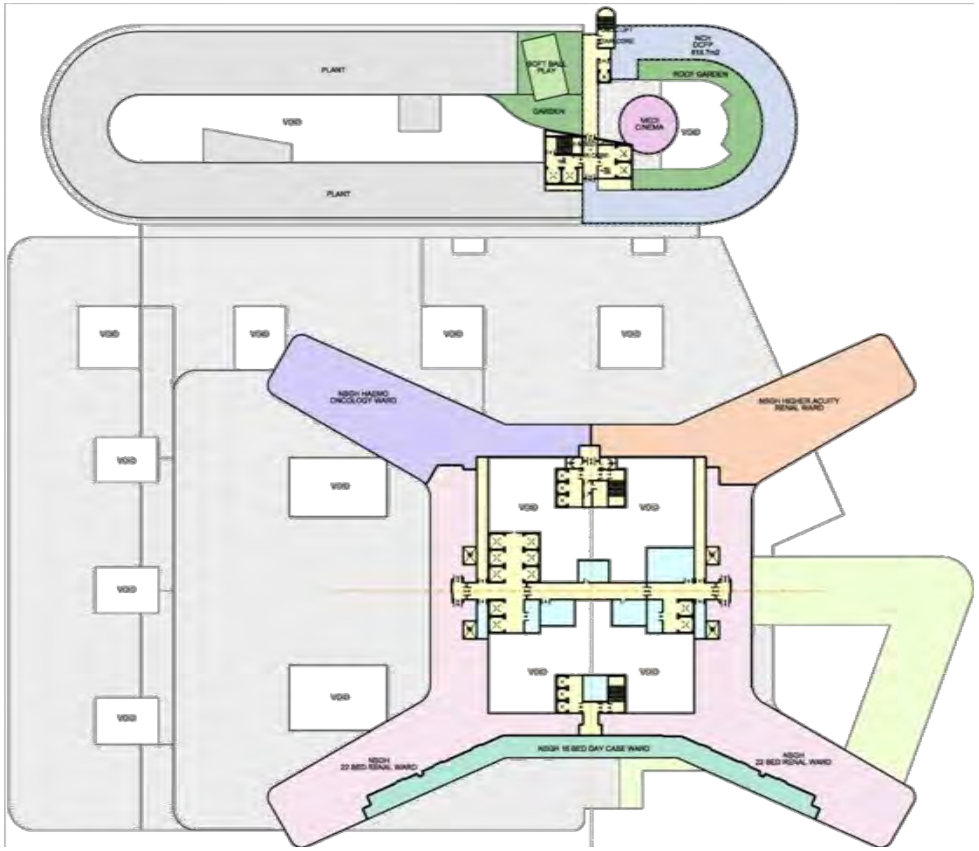


1:500 Plans – 2nd Floor

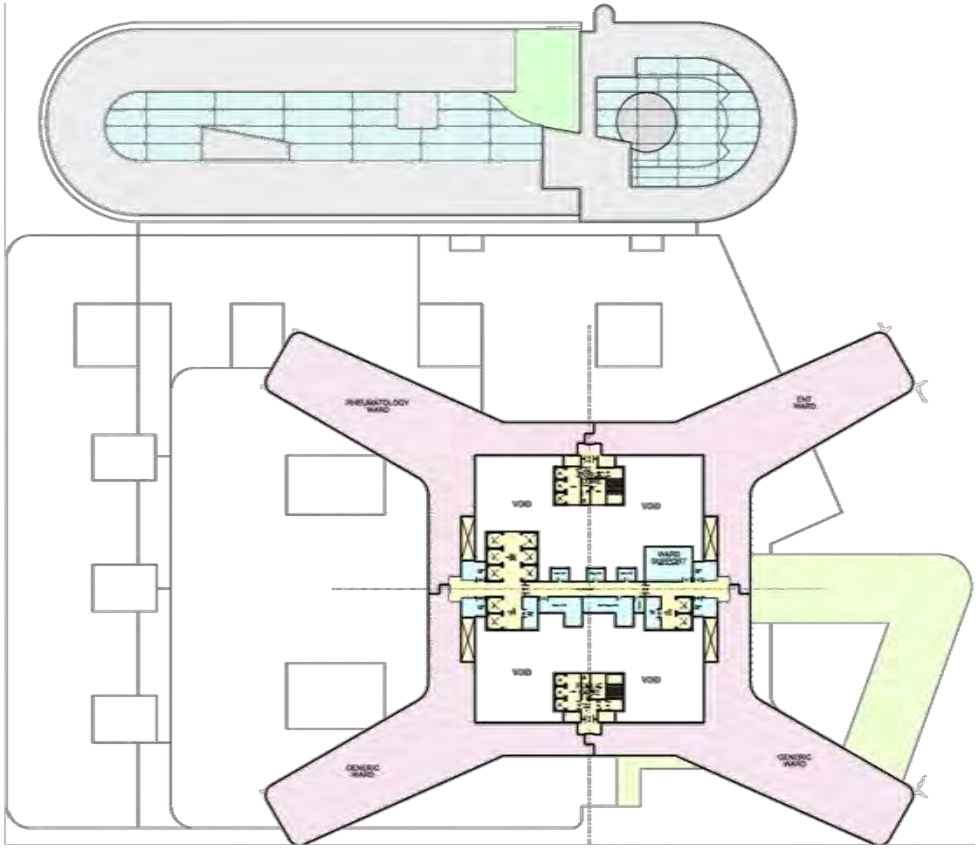


1:500 Plans – 3rd Floor

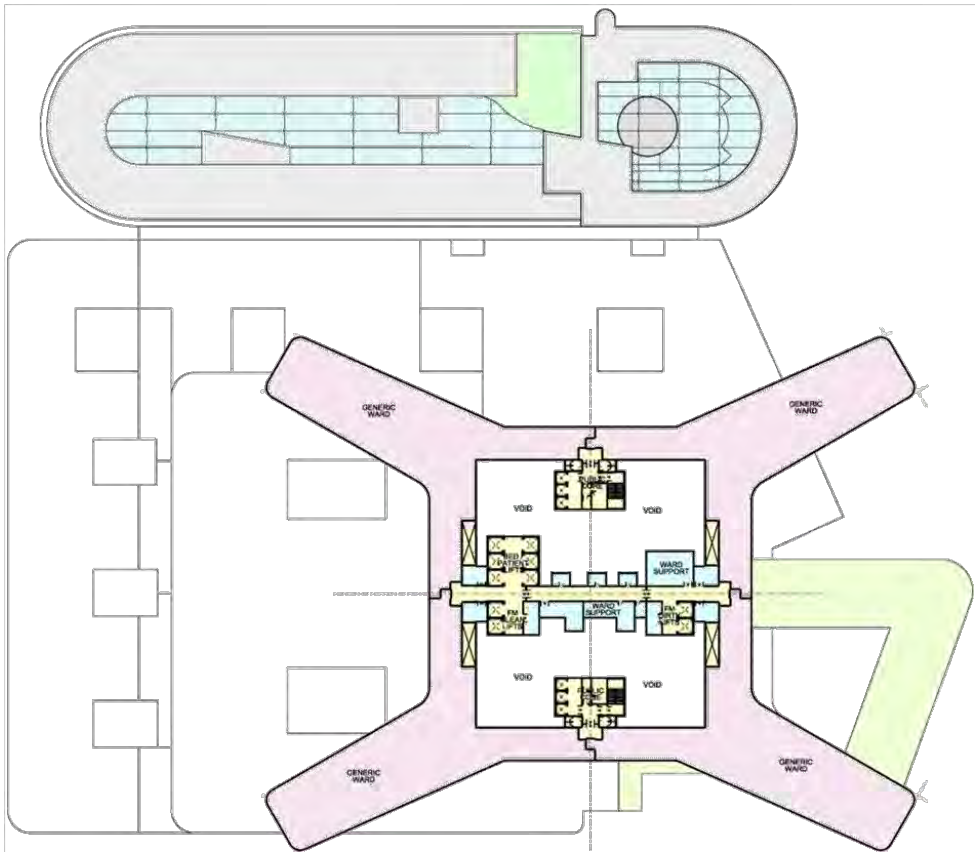
1:500 Plans – 4th Floor



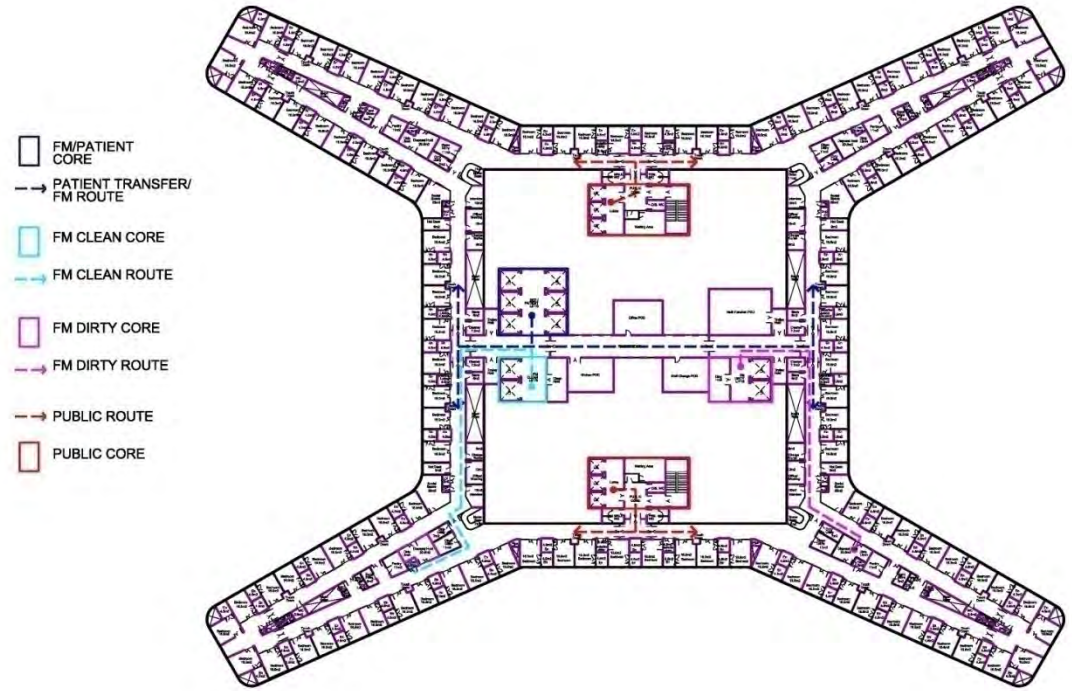
1:500 Plans – 5th Floor



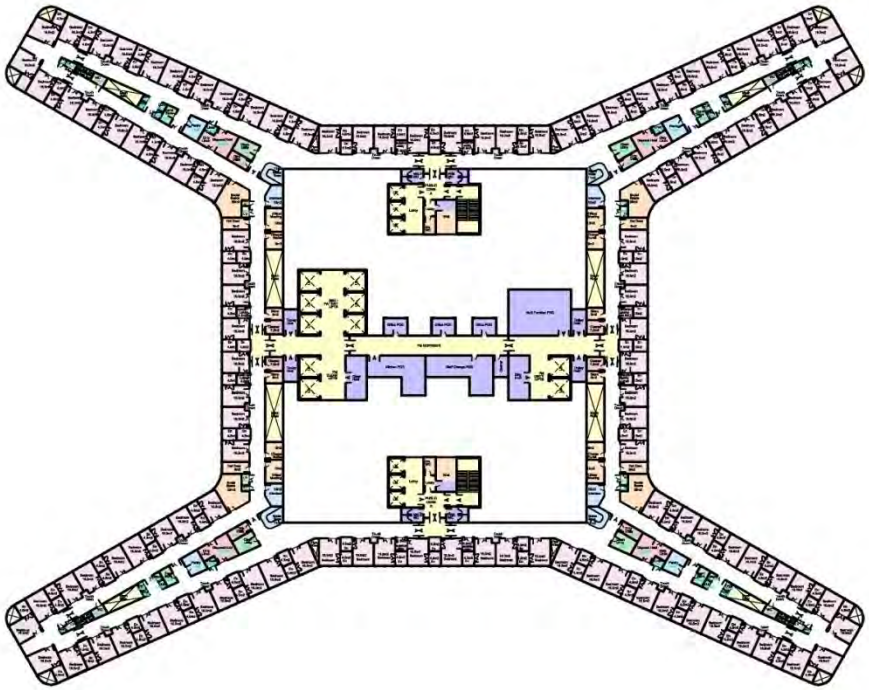
1:500 Plans – 6th Floor



1:200 Generic Ward Circulation Flow



1:200 Generic Ward Concept Plan



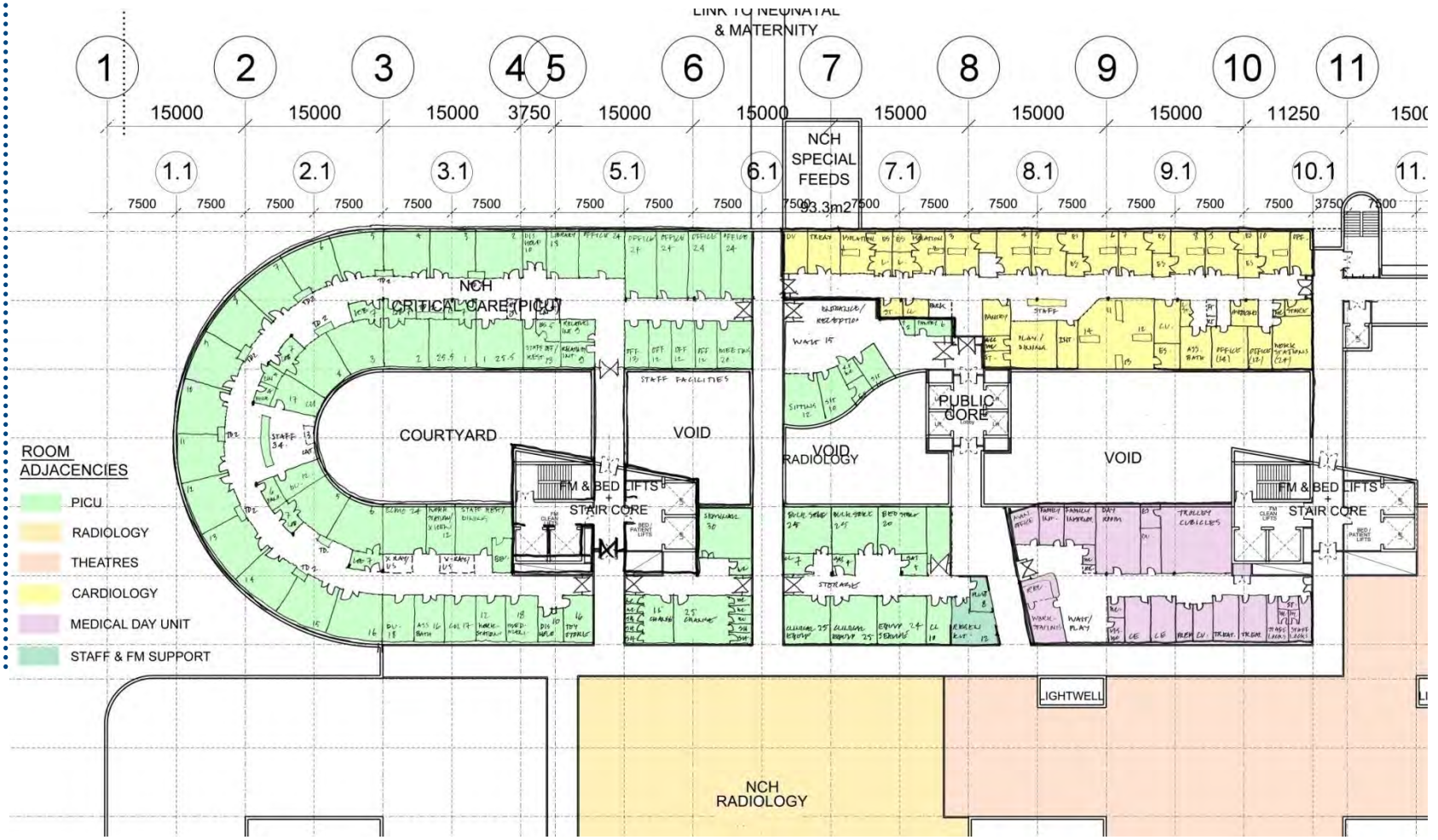
HOSPITAL STREET & LIFT / STAIRCASE
BED AREA FACILITIES
PATIENT SUPPORT FACILITIES
BACK-UP STORAGE
UTILITIES
OFFICE & ADMIN
SHARED WARD SUPPORT

1:200 Adult's Ground Floor - OPD

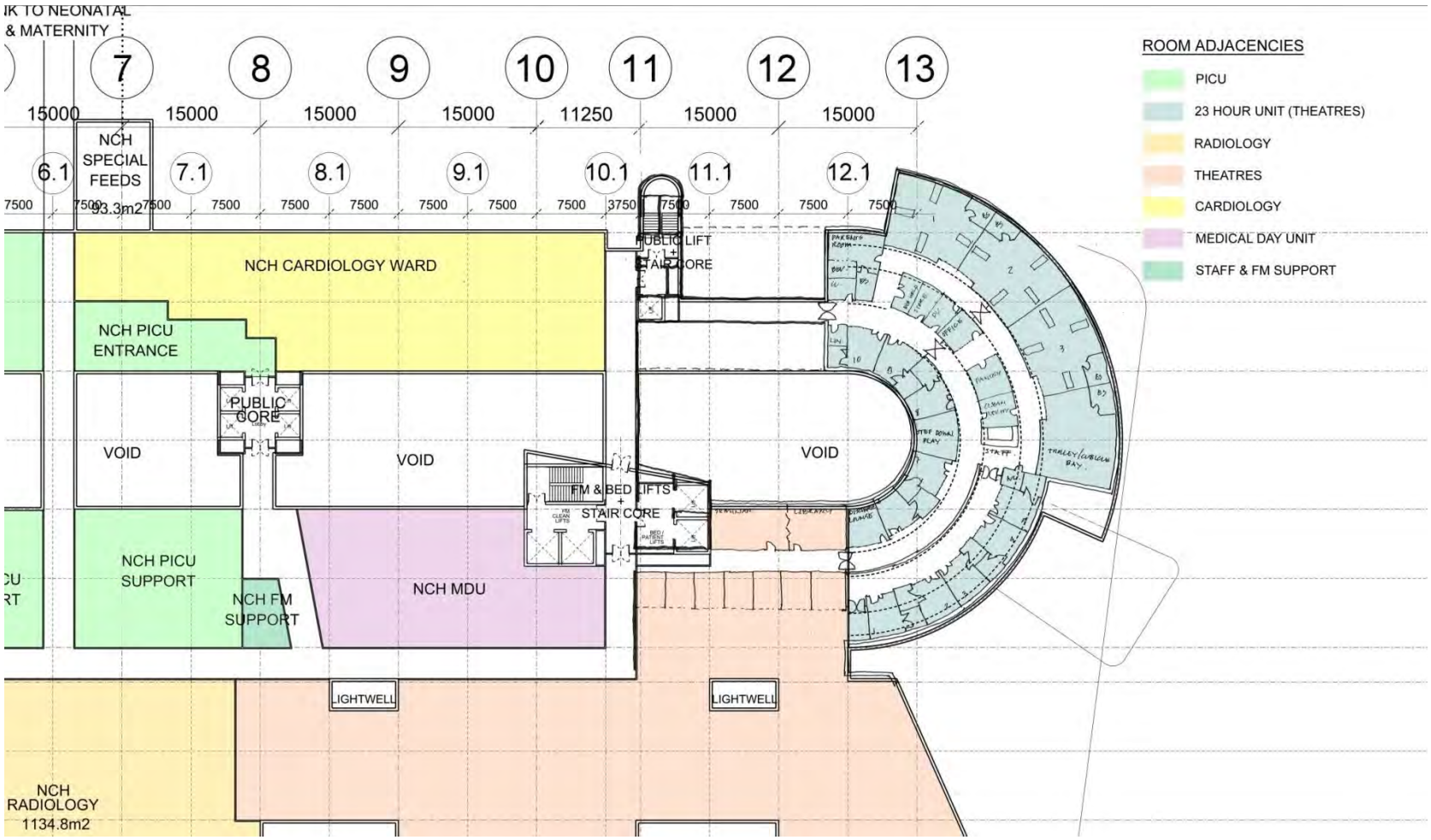
1:200 Adult's 1st Floor - OPD

1:200 Adult's 2nd Floor - OPD

1:200 Children"s 1st Floor - PICU

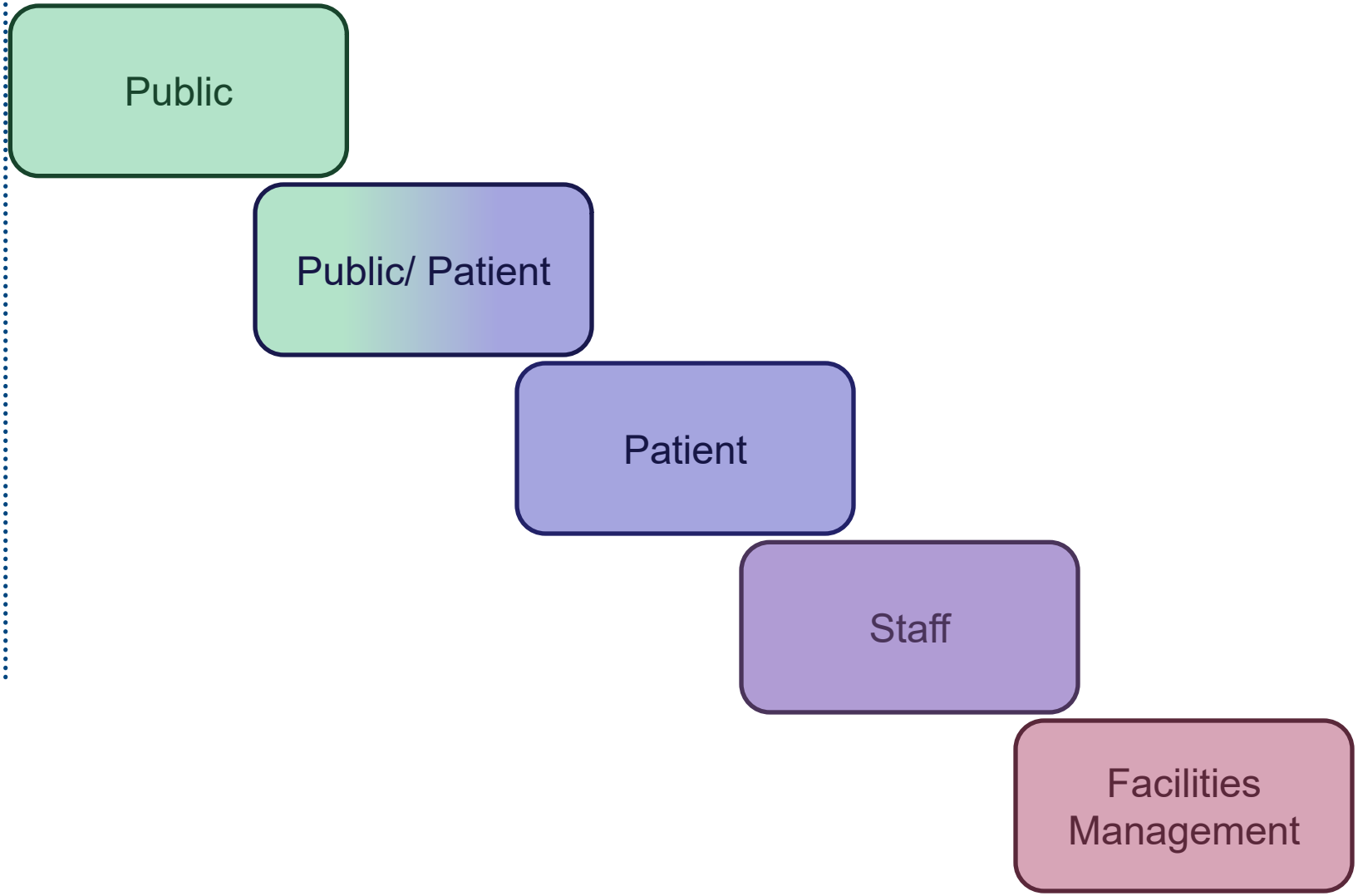


1:200 Children's 1st Floor - PICU



1:200 Children's 3rd Floor – Inpatients

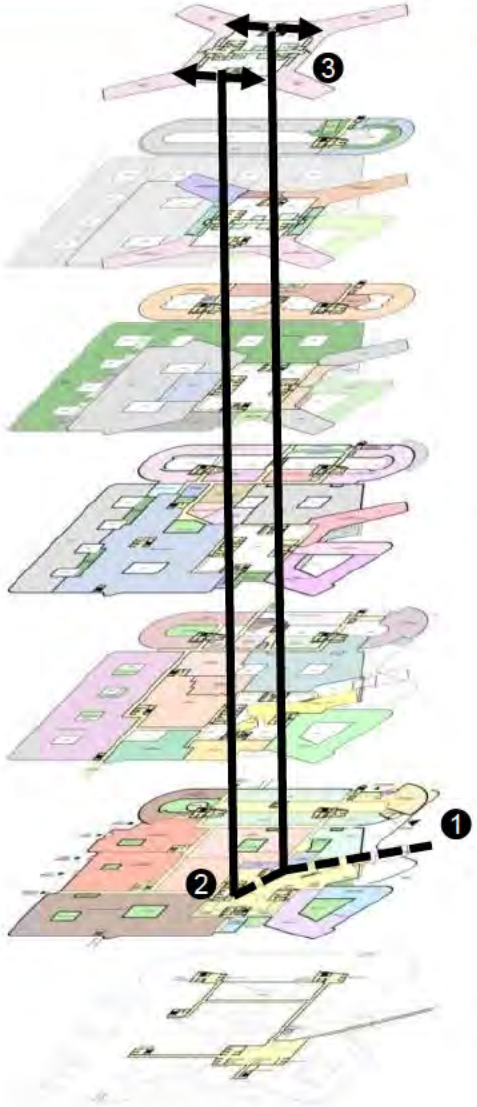
User Journey"s



Adult Flows – Visitors to Wards

Public

1. Visitors enter via main entrance having either arrived by car or public transport. Main reception advises visitor what ward they need to visit and what core to use.
2. Visitors use either of 2 visitor cores identified as per the wayfinding strategy. Lifts can be accessed on all levels below wards.
3. Visitors arrive at designated ward entrance. During visitor hours direct access to the wards if possible. Out of hours a small waiting zone and access control facilities provided to permit escorted access only.



Fifth to Twelfth Floors - Tower

Fourth Floor - Tower

Third Floor - Tower

Second Floor - Podium

First Floor - Podium

Ground Floor - Podium

Basement

Children's Flows – Visitors to Wards

Public

1. Visitors enter via main entrance having either arrived by car or public transport. Main reception advises visitor what ward they need to visit and what core to use.
2. Discreet entrance to DCFP 4th Floor.
3. Visitors to observation ward walk directly via Central Atria.
4. /5 Visitor discharge Central lifts at 1st floor to go to Wards
6. /7 Visitors discharge lift at 2nd floor to go into Acute receiving ward and Schiehallon Wards
8. Visitors discharge lift at 3rd floor to go into Main Inpatient Wards, directly or via Support accommodation.
9. Visitors for DCFP go directly up to fourth floor with no access onto / off other floors.

Fifth to Twelfth Floors - Tower

Fourth Floor - Tower

Third Floor - Tower

Second Floor - Podium

First Floor - Podium

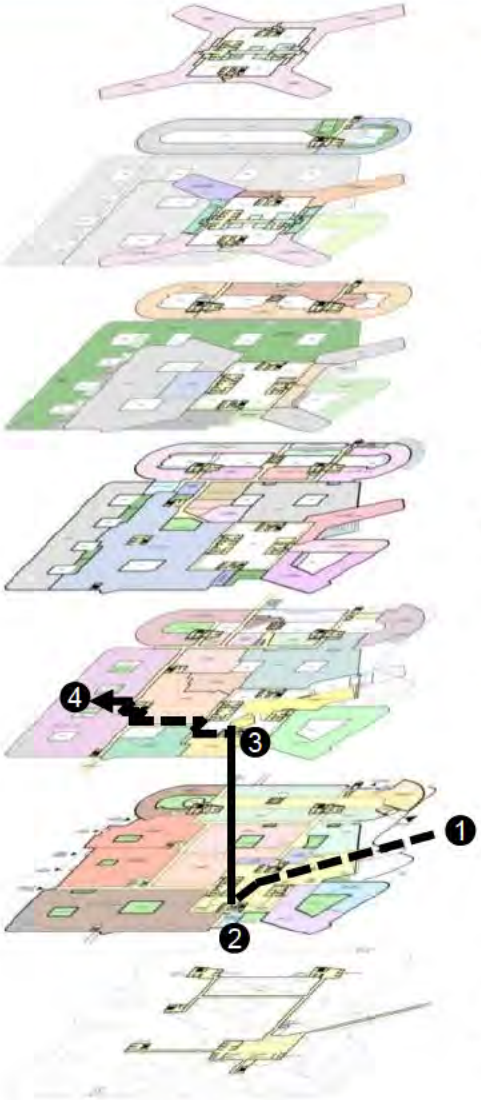
1 Ground Floor - Podium

Basement

Adult Flows – Visitors to Critical Care

Public

1. Visitors enter via main entrance having either arrived by car or public transport. Main reception advices visitor what lift core to take.
2. Visitors take designated lift core identified as per the wayfinding strategy.
3. Visitors arrive at Level 1 and take the corridor around the atrium to the clinical corridor.
4. Visitors requests access via access control and either walks down clinical corridor to CCU or are escorted.



Fifth to Twelfth Floors - Tower

Fourth Floor - Tower

Third Floor - Tower

Second Floor - Podium

First Floor - Podium

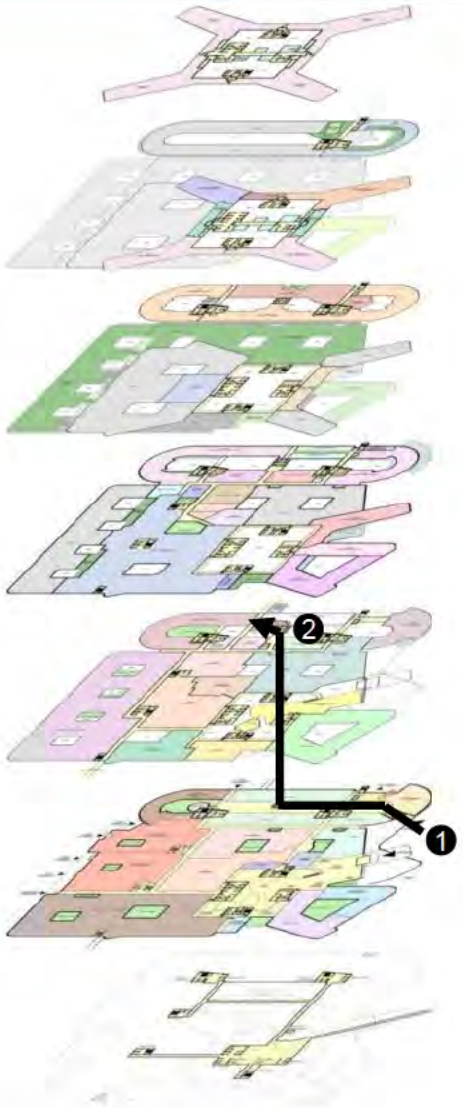
Ground Floor - Podium

Basement

Children's Flows – Visitors to Critical Care

Public

1. Visitors enter via main entrance having either arrived by car or public transport. Main reception advices visitor what lift core to take.
2. Discharge at 1st floor and go directly into friends / family wait / reception.



Fifth to Twelfth Floors - Tower

Fourth Floor - Tower

Third Floor - Tower

Second Floor - Podium

First Floor - Podium

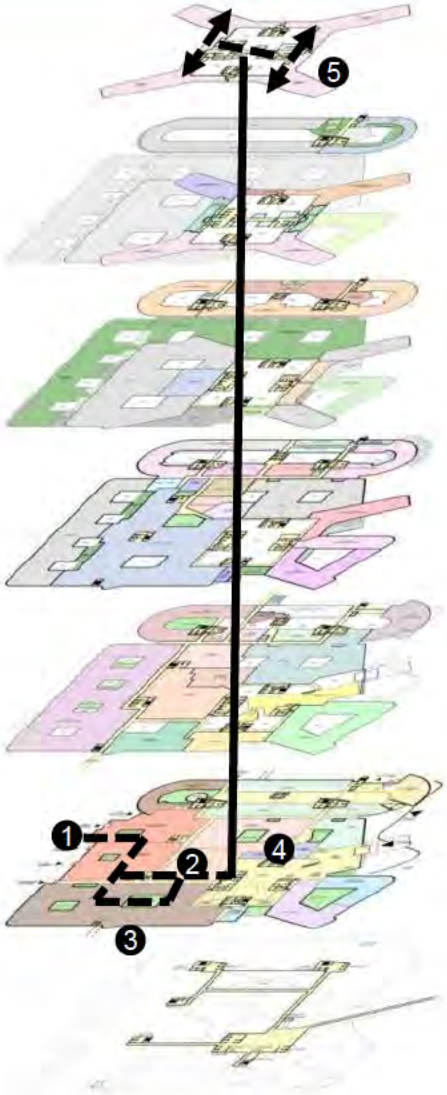
Ground Floor - Podium

Basement

Adult Flows – Emergency to Ward

Public/ Patient

1. Patient brought or self presented to Emergency Centre.
2. After assessment/ treatment taken via clinical corridor to main patient lift in Atrium.
3. Patient admitted into 24 hour assessment ward, if admitted, patient sent to wards as (2) above.
4. Patient admitted to wards by 1 of 6 bed lifts (no public access).
5. Patients arrive at ward floor and use clinical corridor to get direct access to wards. (no public access).



Fifth to Twelfth Floors - Tower

Fourth Floor - Tower

Third Floor - Tower

Second Floor - Podium

First Floor - Podium

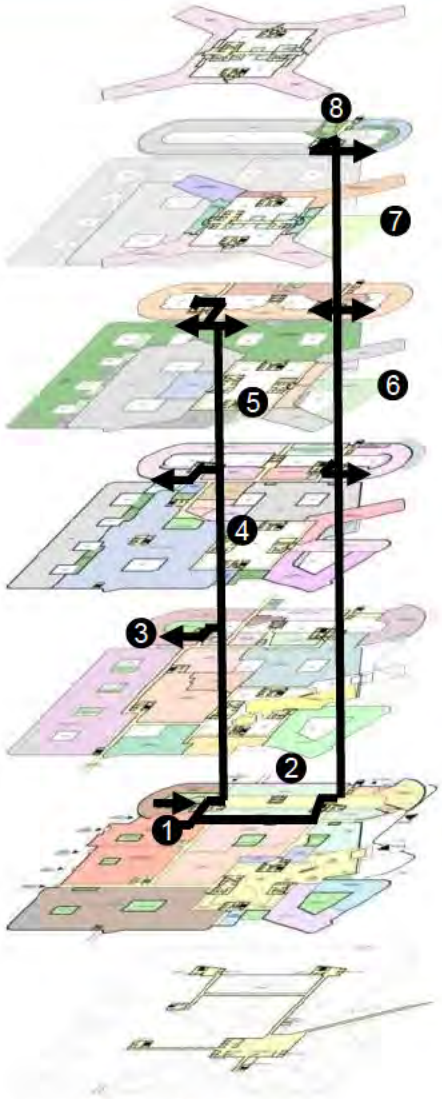
Ground Floor - Podium

Basement

Children's Flows – Emergency to Wards

Public/ Patient

1. Patient brought or self presented to Emergency Centre.
2. Patients will move to either of the 2 bed cores at ground floor via the clinical street direct from Emergency or Assessment Ward.
3. Patients access CCU at first floor separate to visitors.
4. Patients can access Schiehallon Ward at Second Floor.
5. Patients can access Adult Receiving Ward at Second Floor.
6. & 7. Patients access the 3 inpatient wards at third floor separate to visitor lifts.
8. Patients can access DCFP Ward from fourth floor.



Fifth to Twelfth Floors - Tower

Fourth Floor - Tower

Third Floor - Tower

Second Floor - Podium

First Floor - Podium

Ground Floor - Podium

Basement

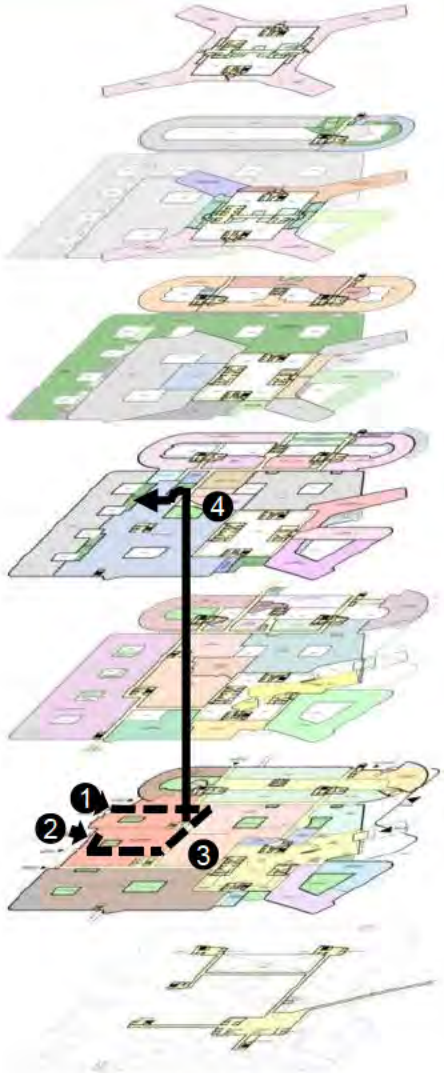
Adult Flows – Emergency to Theatre

Patient

❶&❷ Patient presents to Emergency via Ambulance taken to Resus. From Resus taken to adjacent bed lift cores.

❸ Twin bed lift take patients up two floors to theatres

❹ Patients arrive in centre of theatre floor go to reception/ recovery zone or direct to pre-booked theatre



Fifth to Twelfth Floors - Tower

Fourth Floor - Tower

Third Floor - Tower

Second Floor - Podium

First Floor - Podium

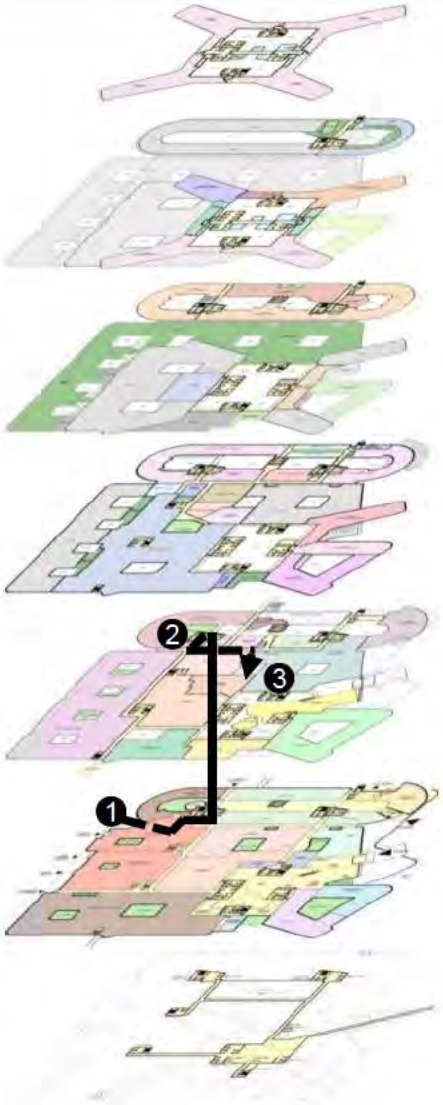
Ground Floor - Podium

Basement

Children's Flows – Emergency to Theatres

Patient

1. Patient presents to Emergency via Ambulance taken to Resus. From Resus taken to adjacent bed lift cores.
2. Patient leaves lift at 1st floor, enters clinical corridor. (No public access).
3. Patient taken into bed entry point in theatre department.



Fifth to Twelfth Floors - Tower

Fourth Floor - Tower

Third Floor - Tower

Second Floor - Podium

First Floor - Podium

Ground Floor - Podium

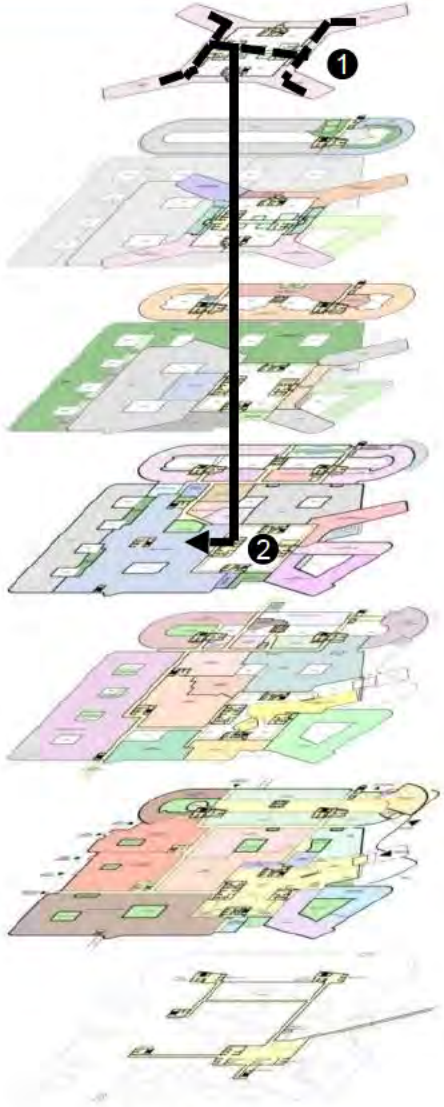
Basement

Adult Flows – Ward to Theatre

Patient

1. Patients brought to main patient lift core via separate clinical bridge corridor (no public access).

2. Lift descend to level 2, exit lift core directly into theatre reception / bed wait. (Separate to AODOS access) before going either directly into reception / recovery booths or direct to theatres.



Fifth to Twelfth Floors - Tower

Fourth Floor - Tower

Third Floor - Tower

Second Floor - Podium

First Floor - Podium

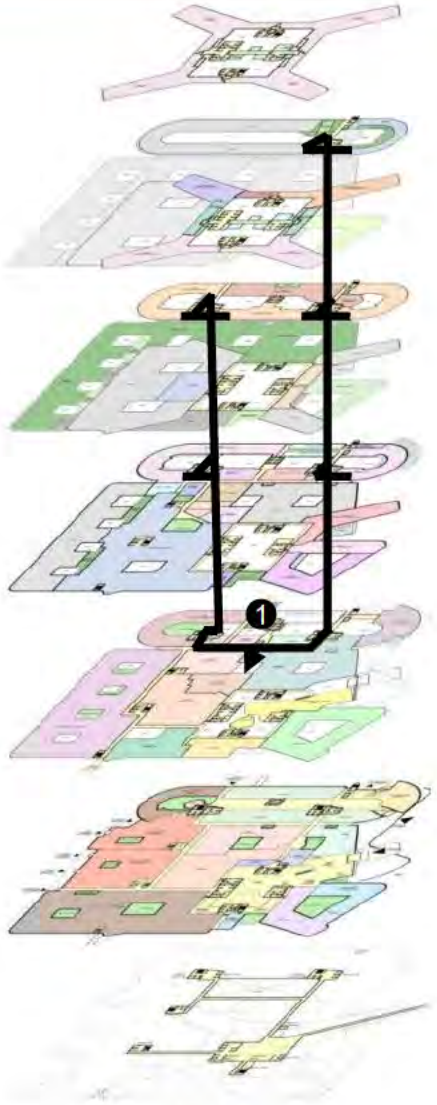
Ground Floor - Podium

Basement

Children's Flows –Wards to Theatres

Patient

❶ Patients can access one of two bed lifts on all floors. Lift is taken down to 1st floor. Patients discharge into clinical street and into bed patient entry point of theatres.



Fifth to Twelfth Floors - Tower

Fourth Floor - Tower

Third Floor - Tower

Second Floor - Podium

First Floor - Podium

Ground Floor - Podium

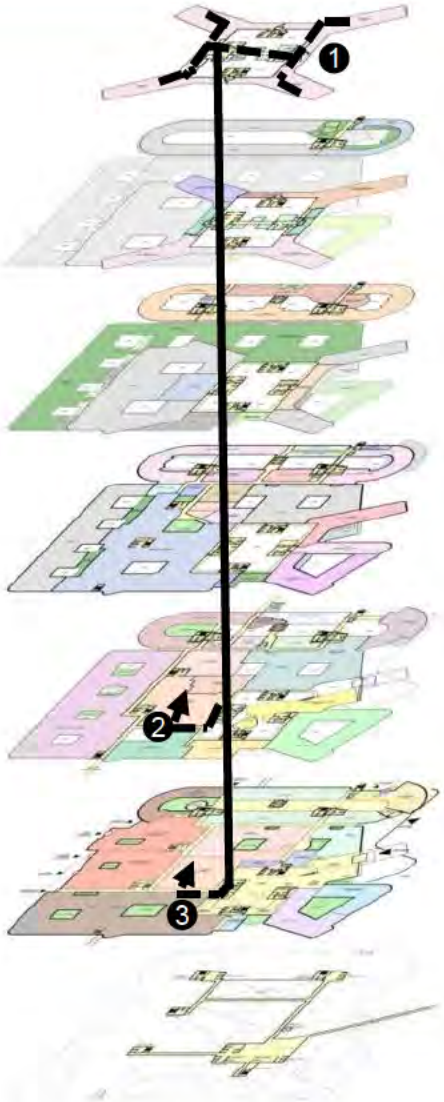
Basement

Adult Flows – Ward to Imaging

Patient

❶ Patients brought to the Patient bed lift core via clinical corridor (no public access).

❷/❸ Patients taken directly onto a clinical corridor and use dedicated bed patient access into required department, into designated bed parking zones.



Fifth to Twelfth Floors - Tower

Fourth Floor - Tower

Third Floor - Tower

Second Floor - Podium

First Floor - Podium

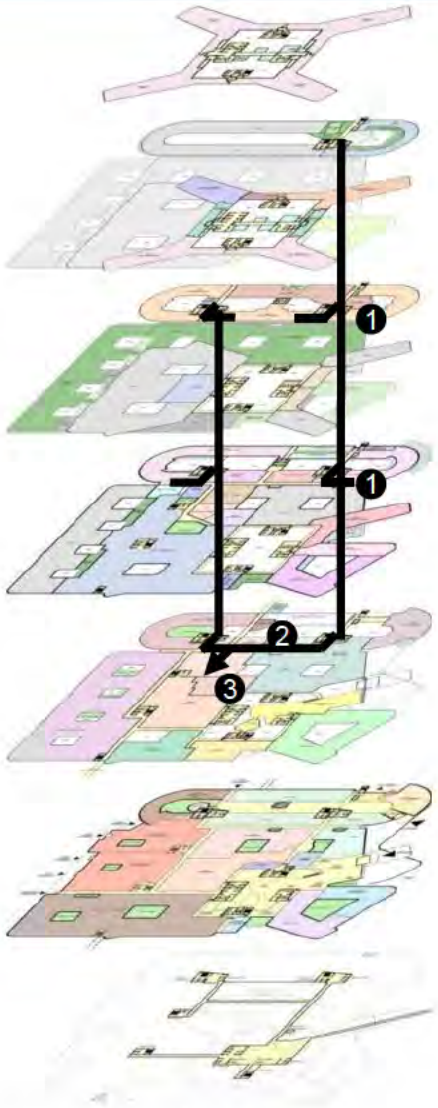
Ground Floor - Podium

Basement

Children's Flows – Ward to Imaging

Patient

1. Patients go direct to either of the two bed lift cores.
2. Patients discharge at 1st Floor onto non-public hospital street.
3. Imaging Department



Fifth to Twelfth Floors - Tower

Fourth Floor - Tower

Third Floor - Tower

Second Floor - Podium

First Floor - Podium

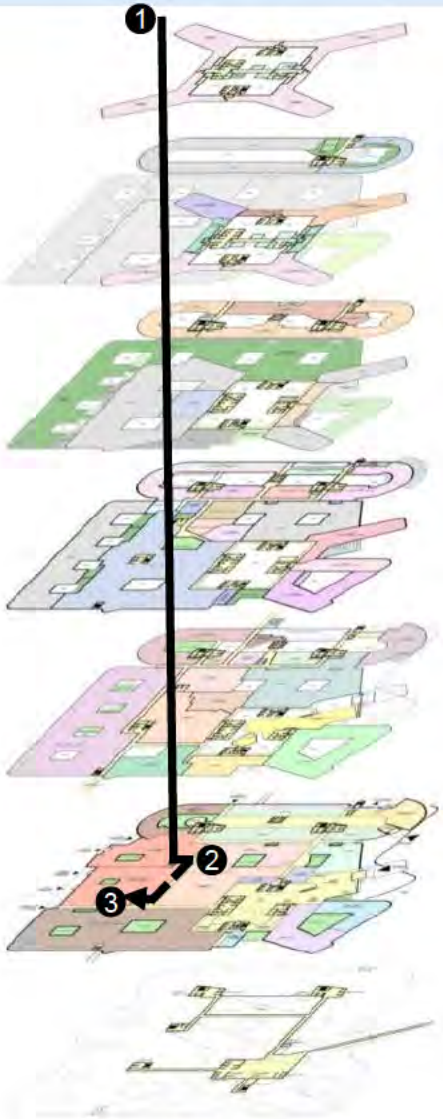
Ground Floor - Podium

Basement

Adult Flows – Helipad to Resus

Patient

1. Helicopter lands on top of tower. 1 of the 2 bed lifts is waiting using override facility. Lift descends to ground floor
2. Patient exit lift into emergency centre clinical corridor.
3. Patient taken into rear of resus.



Fifth to Twelfth Floors - Tower

Fourth Floor - Tower

Third Floor - Tower

Second Floor - Podium

First Floor - Podium

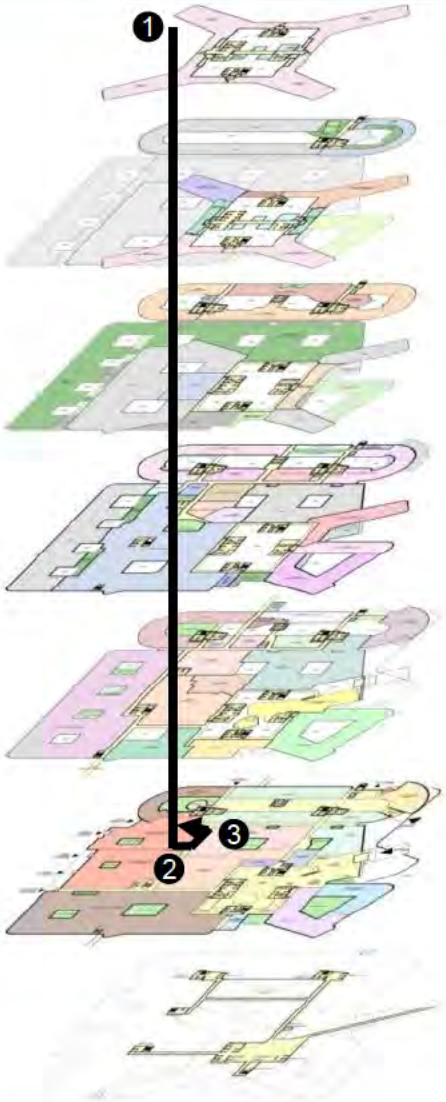
Ground Floor - Podium

Basement

Children's Flows – Helipad to Resus

Patient

1. Helicopter lands on top of tower. 1 of the 2 bed lifts is waiting using override facility. Lift descends to ground floor
2. Exit lift at ground floor into A&E Clinical corridor.
3. Enter into Children's Emergency Centre straight into resus.



Fifth to Twelfth Floors - Tower

Fourth Floor - Tower

Third Floor - Tower

Second Floor - Podium

First Floor - Podium

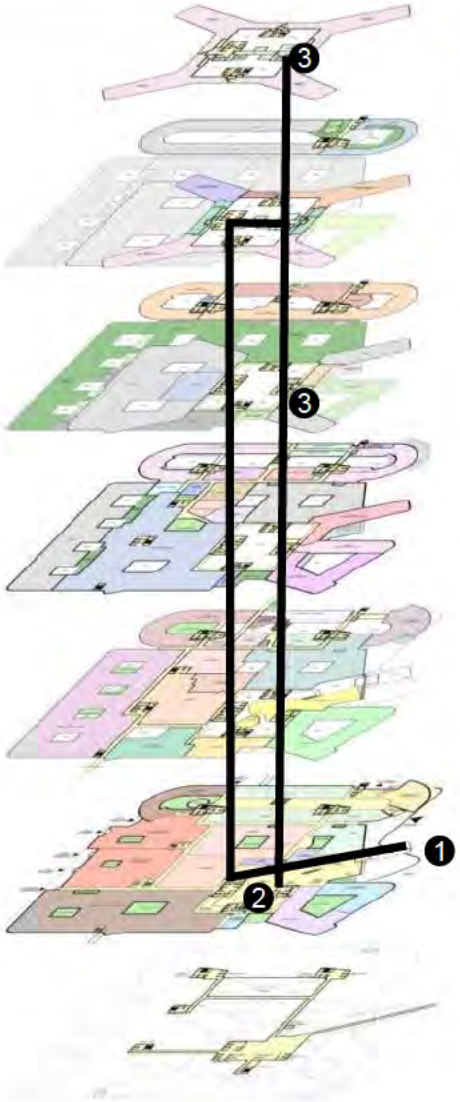
Ground Floor - Podium

Basement

Adult Flows – Staff to Staff Change

Staff

1. Staff arrive via main entrance.
2. Travel via appropriate lift to appropriate department.
3. Change in the staff change associated with the department that they are working in or in the main staff change on level 4.



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Fourth Floor - Tower

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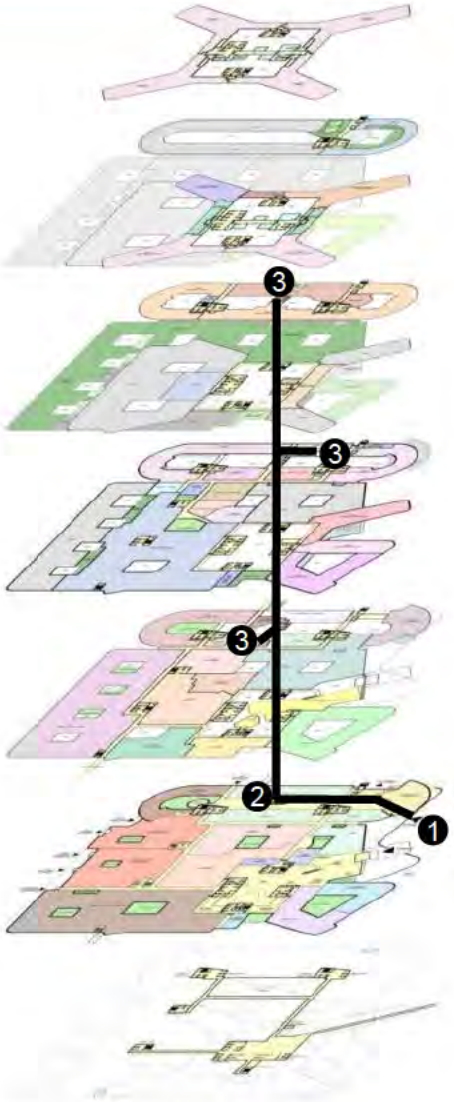
Basement

Children's Flows – Staff to Staff Change

Staff

1. Staff arrive via main entrance.
2. Travel via appropriate lift to appropriate department.
3. Change in the staff change associated with the department that they are working in.



Fifth to Twelfth Floors - Tower

Fourth Floor - Tower

Third Floor - Tower

Second Floor - Podium

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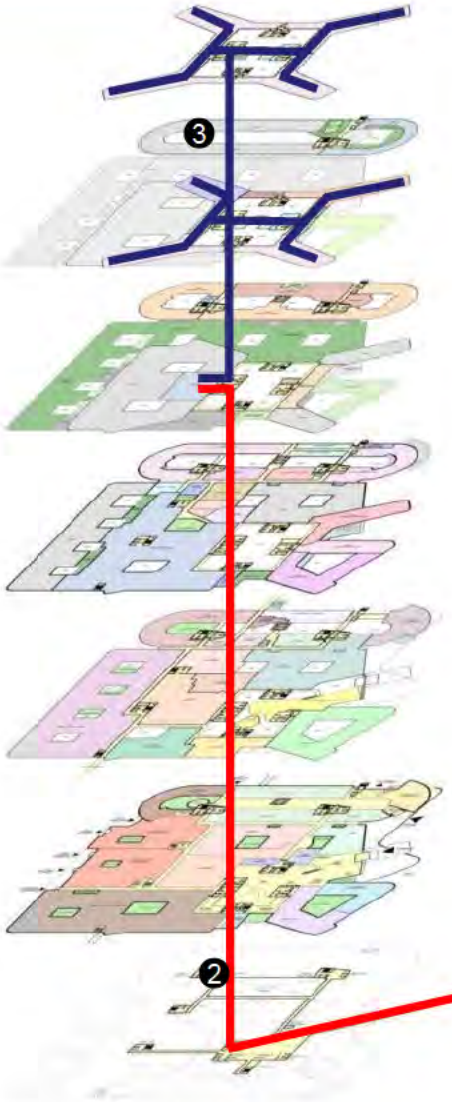
Ground Floor - Podium

Basement

Adult Flows – Food to Wards

Facilities Management

1. Food delivered to FM facility. Delivered to basement by robots through FM basement tunnel.
2. Robots arrive at basement level and travel via lift to kitchen on 3rd floor. Goods collected by FM staff and distributed.
3. Cook/ Chill food is delivered to the ward floor by robot where it is distributed by FM staff.



Fifth to Twelfth Floors - Tower

Fourth Floor - Tower

Third Floor - Tower

Second Floor - Podium

First Floor - Podium

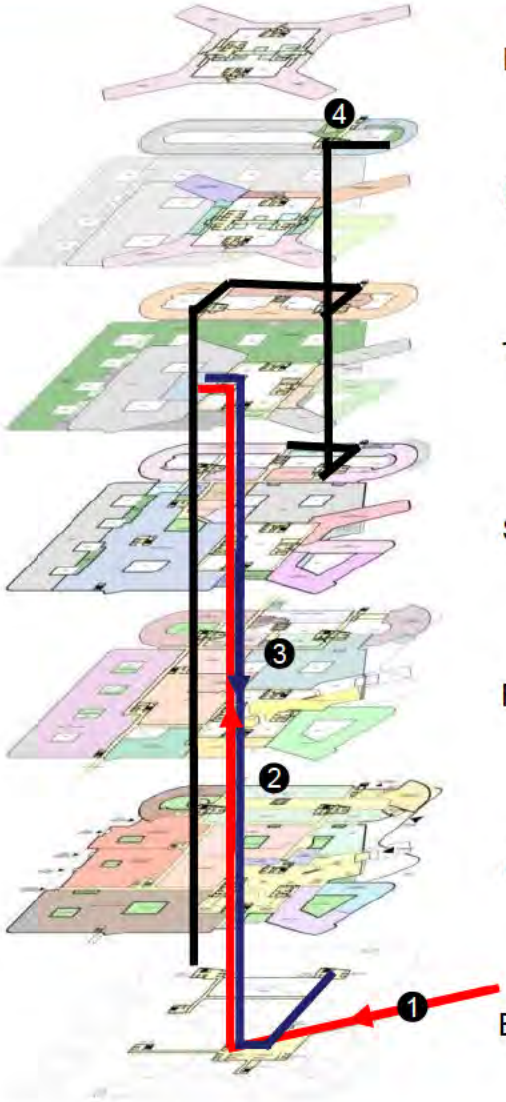
Ground Floor - Podium

Basement

Children's Flows – Food to Wards

Facilities Management

1. Food delivered to FM facility. Delivered to basement by robots through FM basement tunnel.
2. Robots arrive at basement level and travel via lift to kitchen in Acute Facility on 3rd floor.
3. Cook/ Chill food is taken to basement level by robot and across to children's FM lift cores.
4. Food delivered to wards and distributed by FM staff.



Fifth to Twelfth Floors - Tower

Fourth Floor - Tower

Third Floor - Tower

Second Floor - Podium

First Floor - Podium

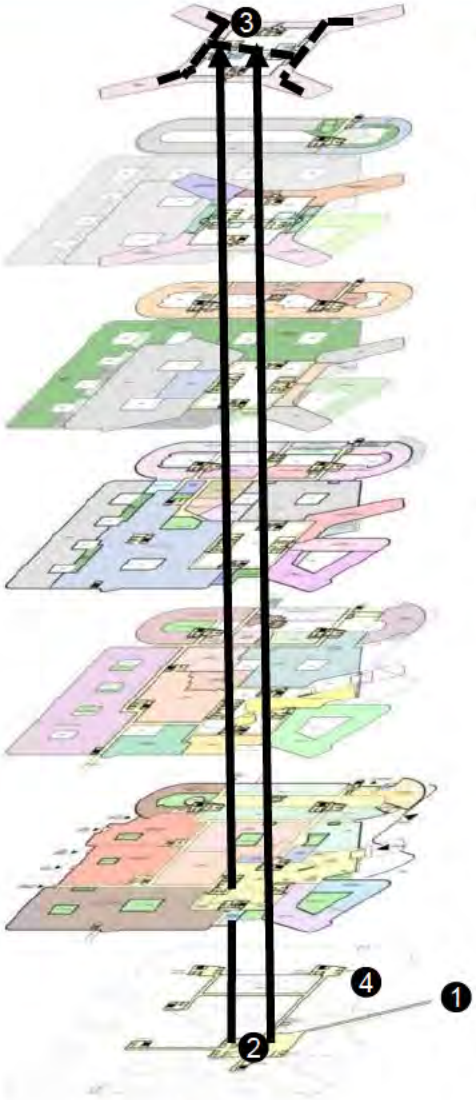
Ground Floor - Podium

Basement

Adult Flows – FM to Wards

Facilities Management

1. Clean supplies loaded into twin clean core lifts from basement tunnel from FM delivery yard with robots.
2. Robots arrive at basement level and travel via lift to 'goods in'/ 'clean hold' on all floors. Goods collected by FM staff and distributed clinical corridor to final destinations.
3. FM staff collect dirty waste from ward holds and place in different bins in central disposal hold.
4. FM Staff take dirty waste to dirty core lifts where robots take basement and to FM Delivery Yard via basement tunnel.



Fifth to Twelfth Floors - Tower

Fourth Floor - Tower

Third Floor - Tower

Second Floor - Podium

First Floor - Podium

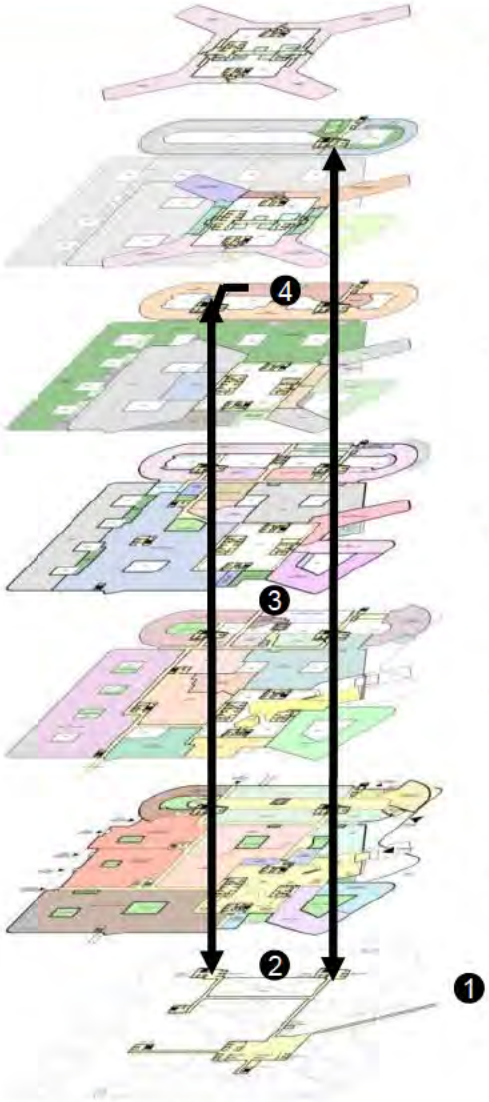
Ground Floor - Podium

Basement

Children's Flows – FM to Wards

Facilities Management

1. Clean supplies loaded into twin clean core lifts from basement tunnel from FM delivery yard with robots.
2. Robots arrive at basement level and travel via lift to 'goods in'/ 'clean hold' on all floors. Goods collected by FM staff and distributed clinical corridor to final destinations.
3. FM staff collect dirty waste from ward holds and place in different bins in central disposal hold.
4. FM Staff take dirty waste to dirty core lifts where robots take basement and to FM Delivery Yard via basement tunnel.



Public art: Culture Embedded

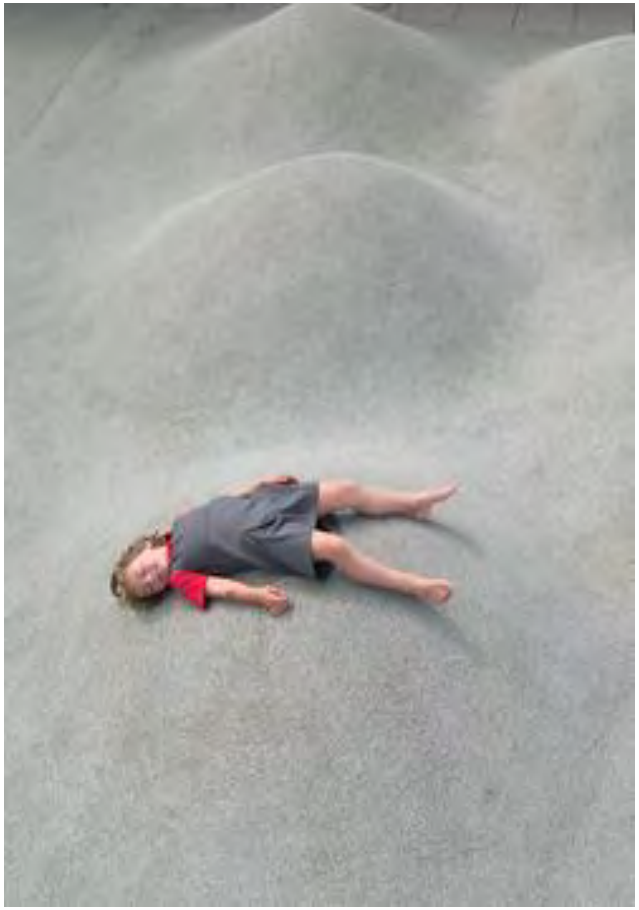
Art is important because it helps to:

- **humanise the hospital environment**
- **create connections between the building and surrounding community interests**
- **provides aesthetic enhancement and enrichment**

Public art: Culture Embedded

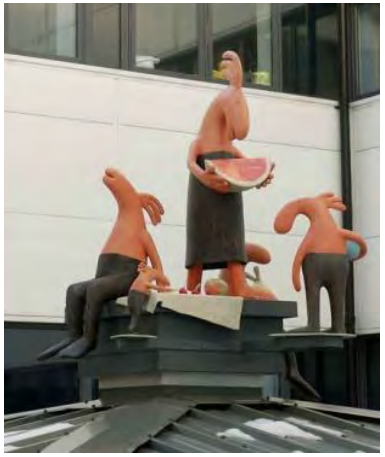
A cohesive art programme that :

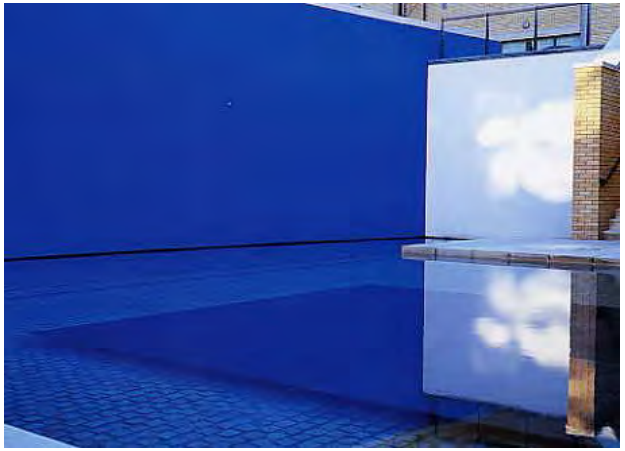
- **is grounded , incorporating a wide range of creative activity and practice**
- **builds on the wider design objectives, especially those of identity and waymarking**
- **connects people to place through revealing and embedding ideas, aspirations and craftmanship**
- **Integrates the creative skills of surrounding local communities and harnesses the wider cultural potential of the city's arts organisations**
- **builds on the current work of existing art providers**



Public art: Culture Embedded

Design team collaboration





- Sculpture
- Surfaces / textures
- Courtyard design
- Lighting
- Literature
- Sound

Public art: Culture Embedded

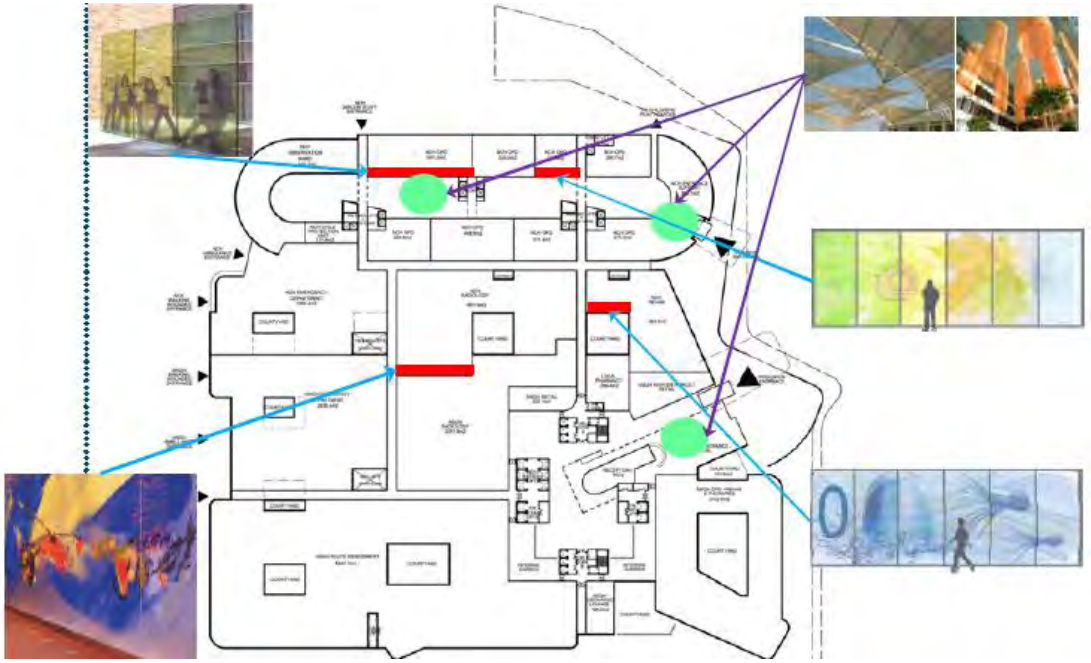
Design team collaboration

Placemaking

Functional elements

Public art: Culture Embedded

Design team collaboration



Way marking and legibility

Public art: Culture Embedded

Artist residencies

:

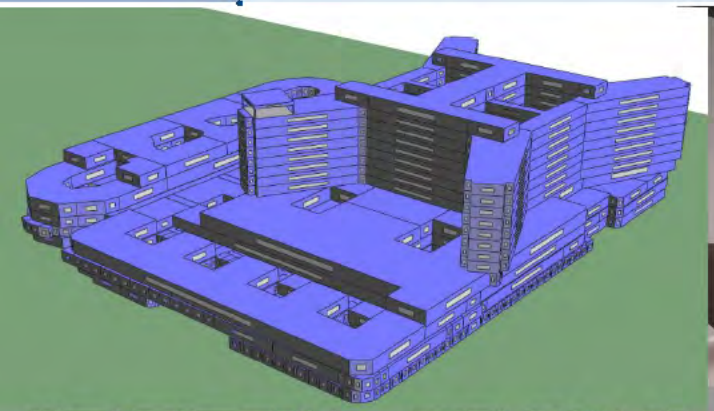
Public art: Culture Embedded

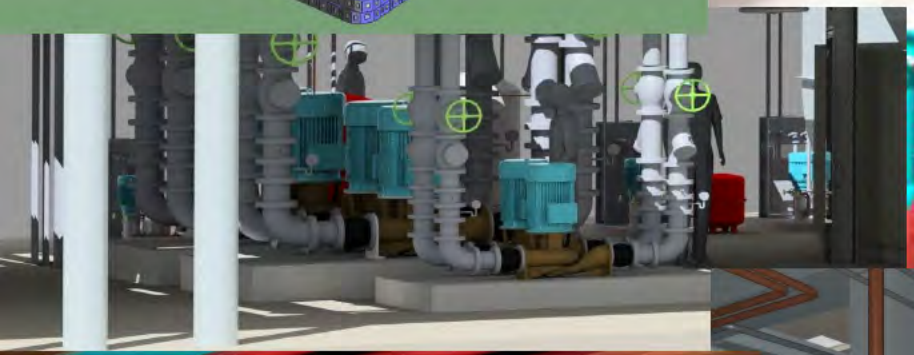
Showcasing and exhibition

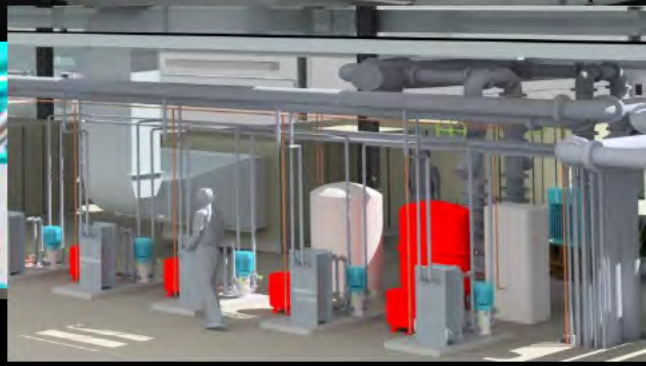
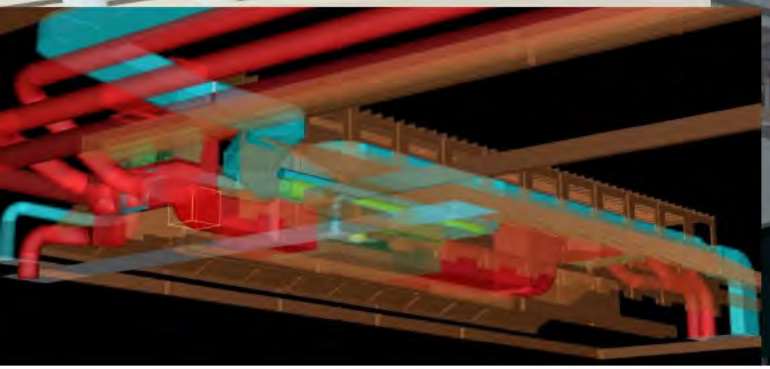
- Permanent and temporary

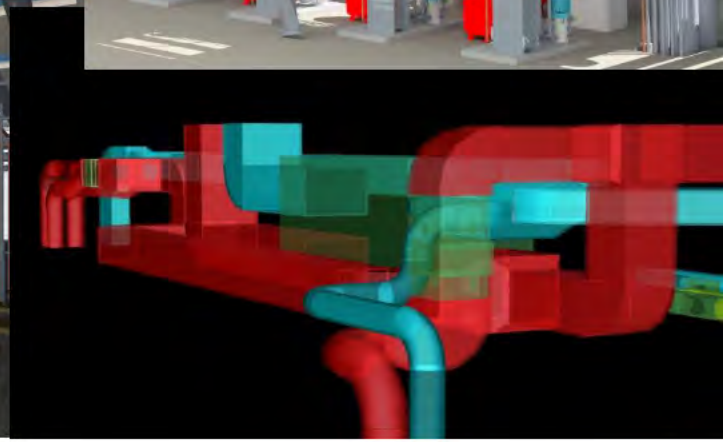
NHS Greater Glasgow and Clyde

Mechanical and Electrical Services



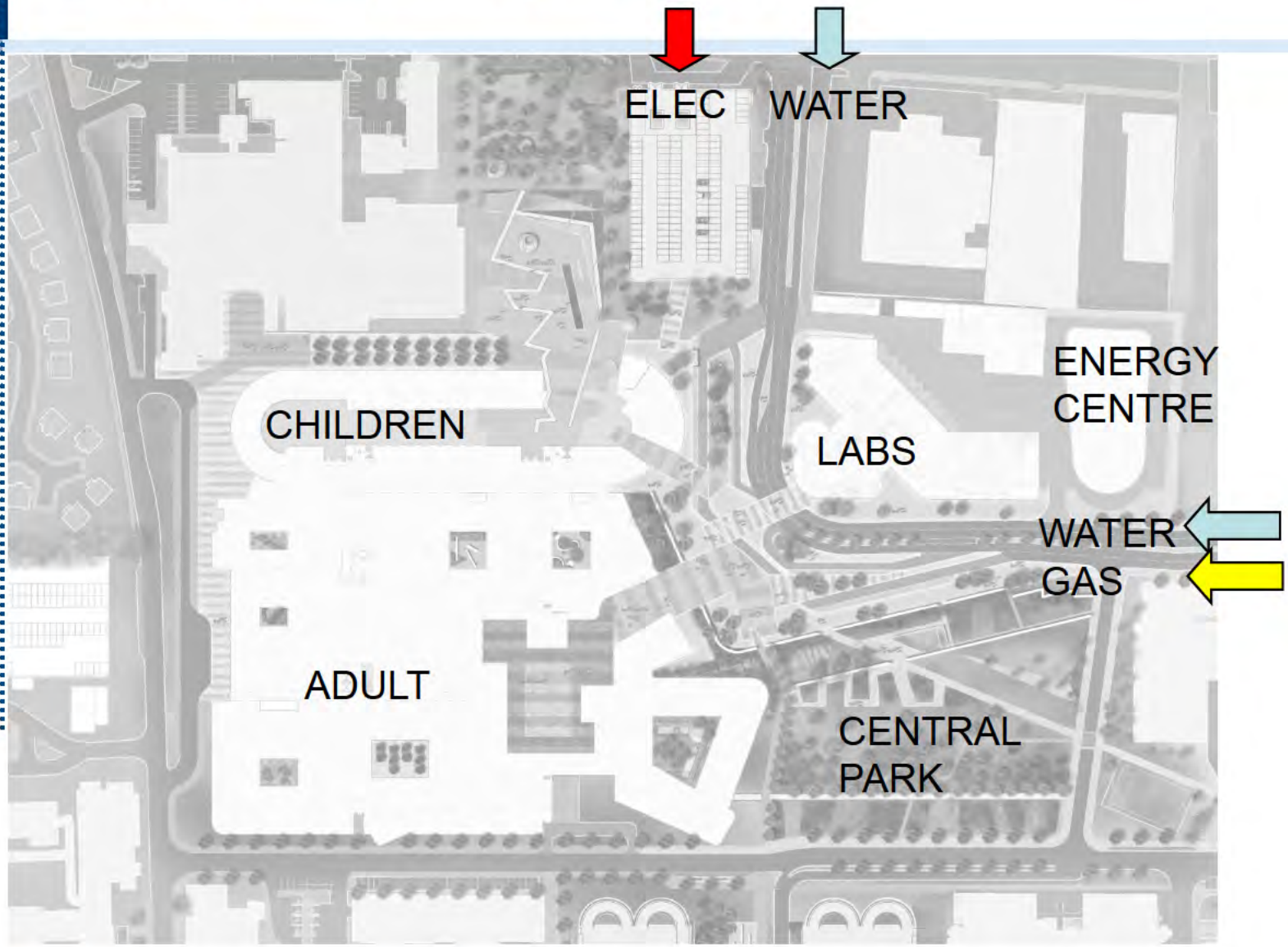





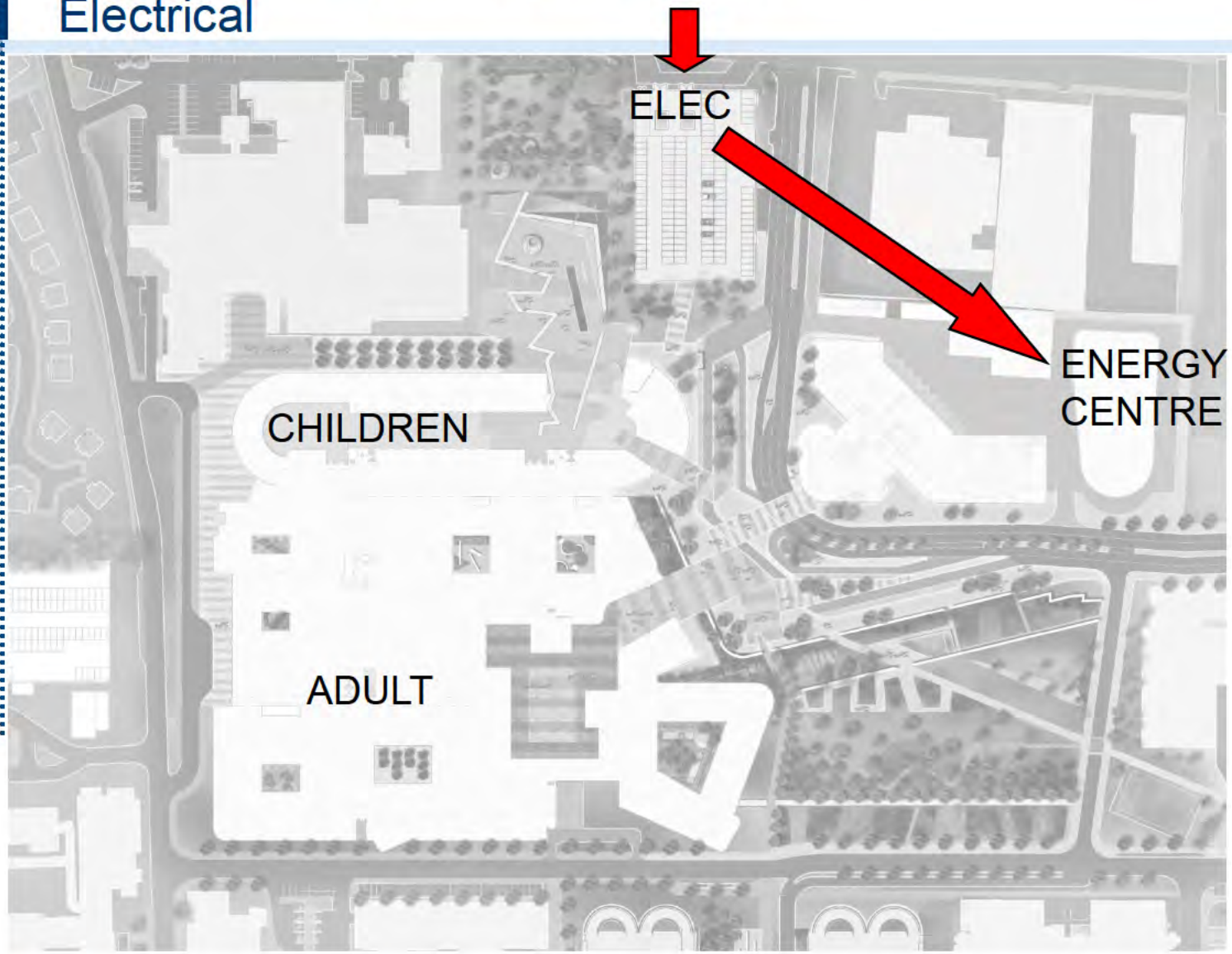
NHS Greater Glasgow and Clyde

Master Plan – Utilities, an Overview

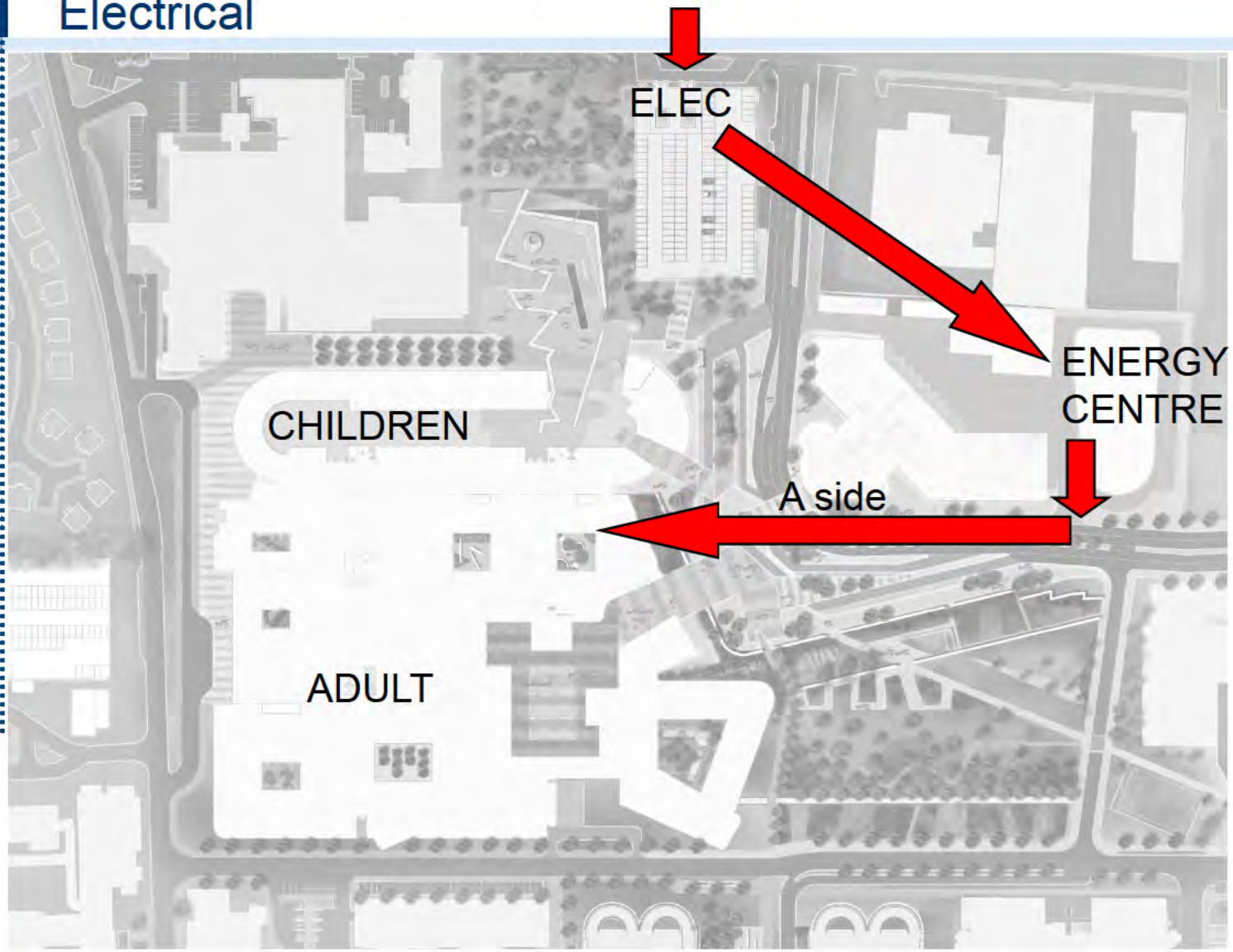


NHS Greater Glasgow and Clyde

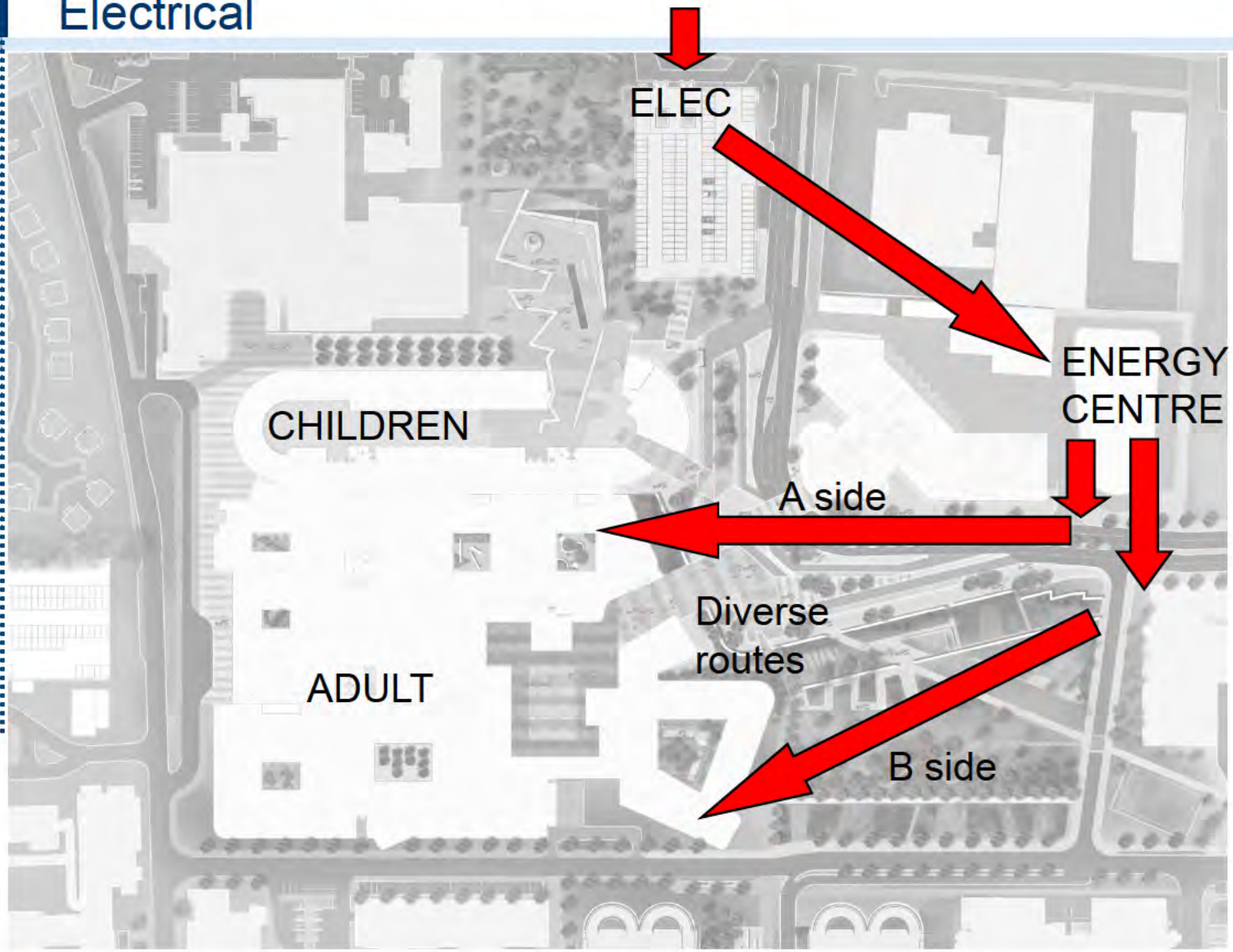
Master Plan – Utilities, an Overview
Electrical



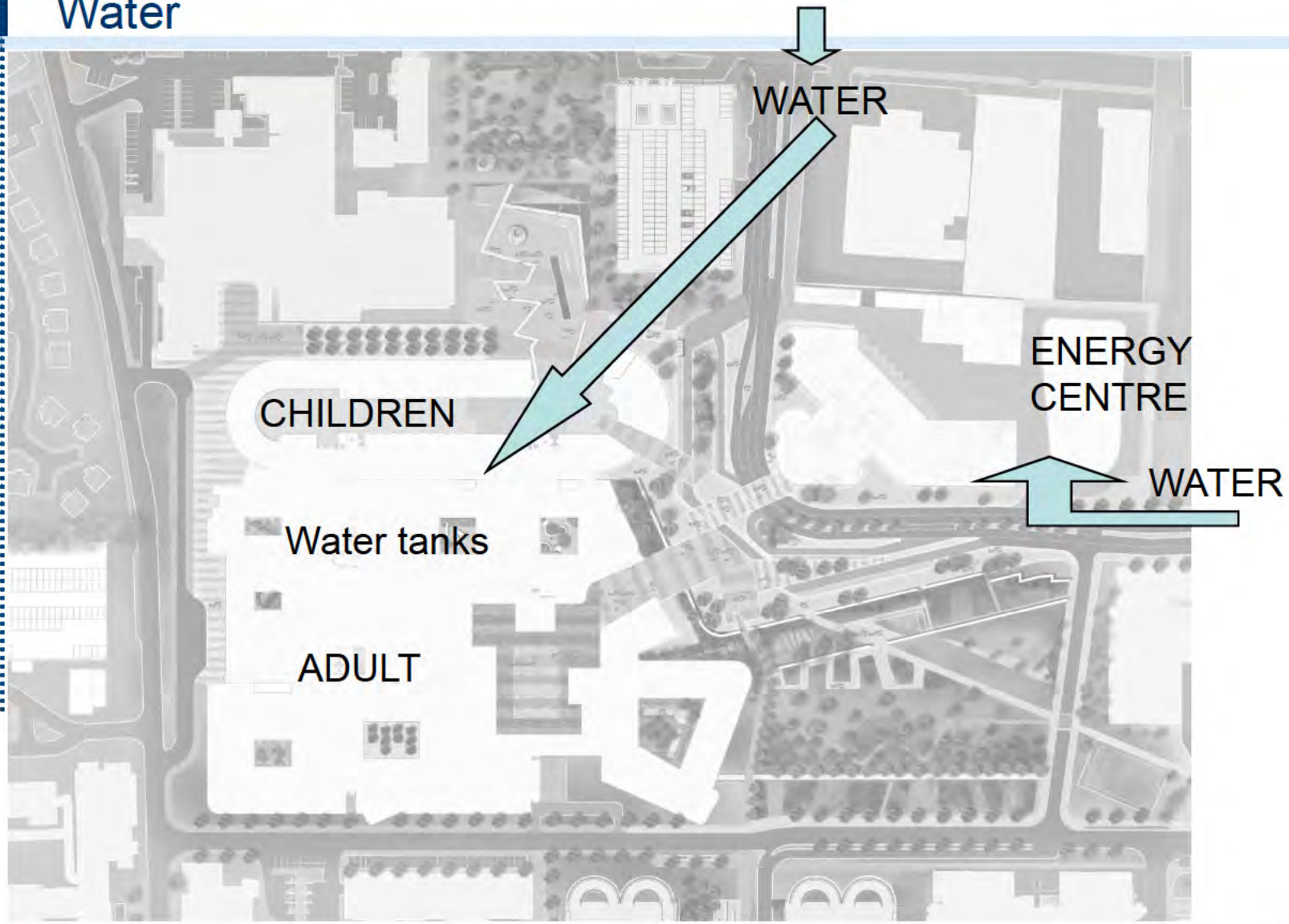
Master Plan – Utilities, an Overview
Electrical



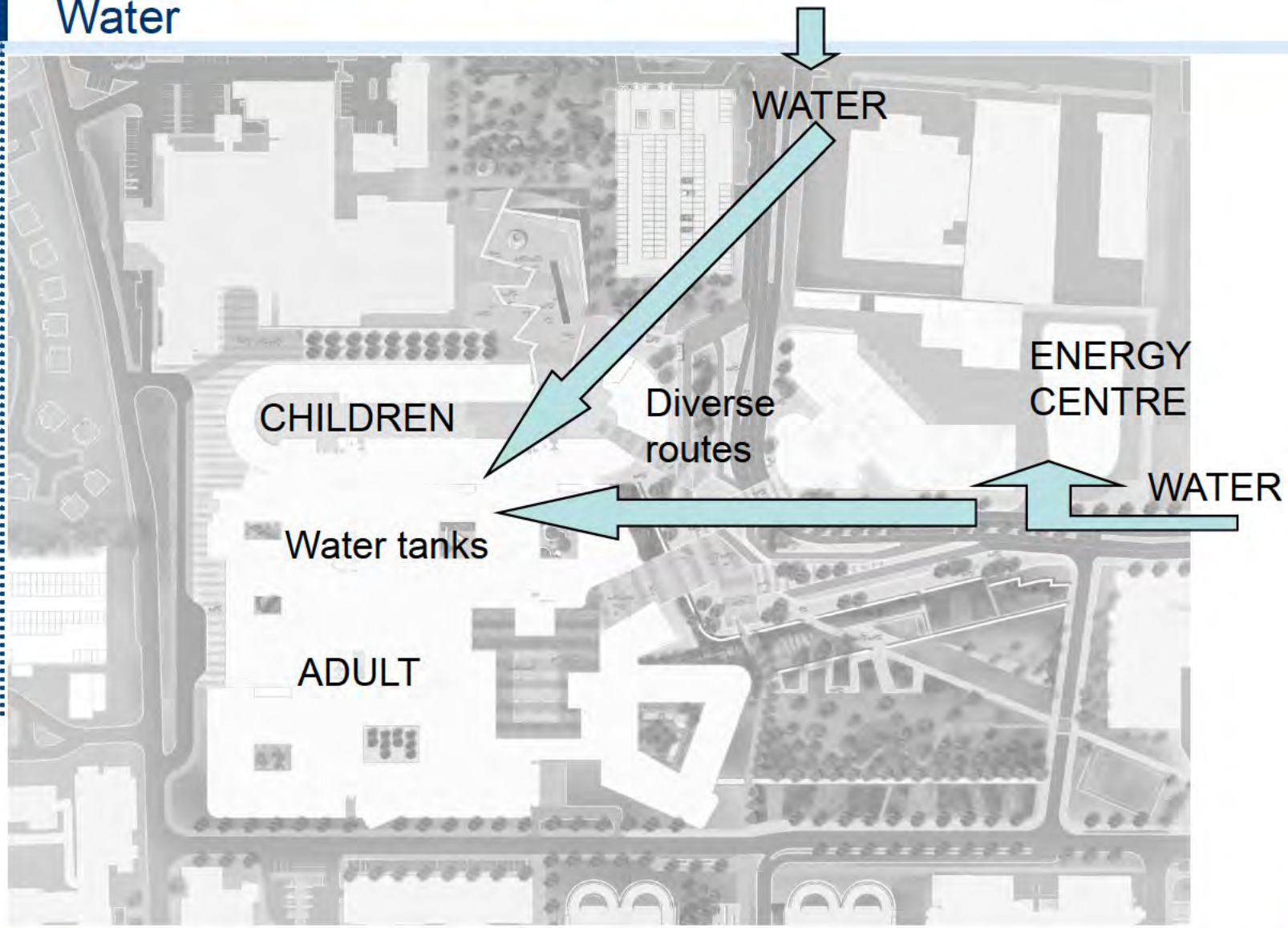
Master Plan – Utilities, an Overview
Electrical



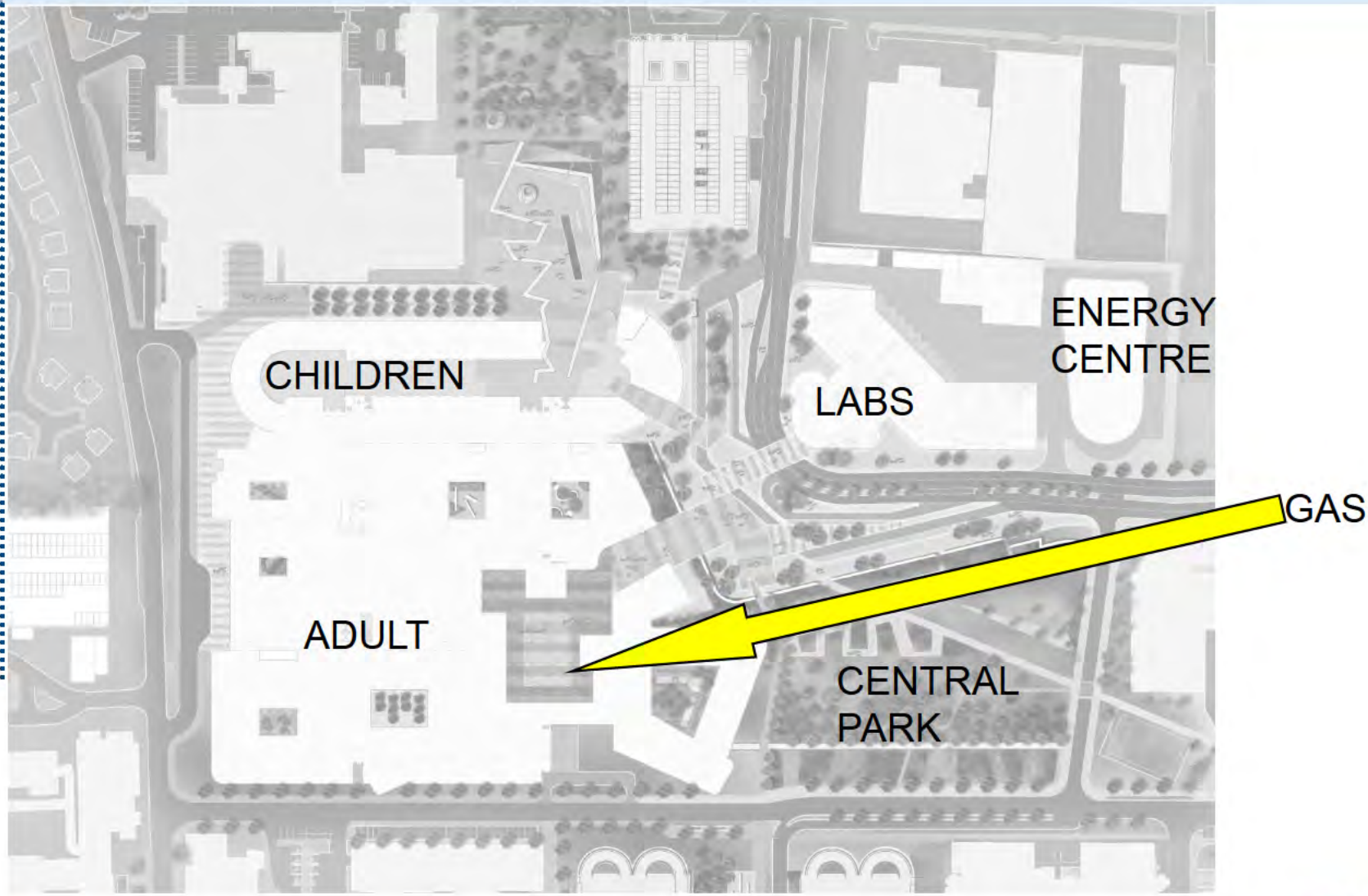
Master Plan – Utilities, an Overview
Water



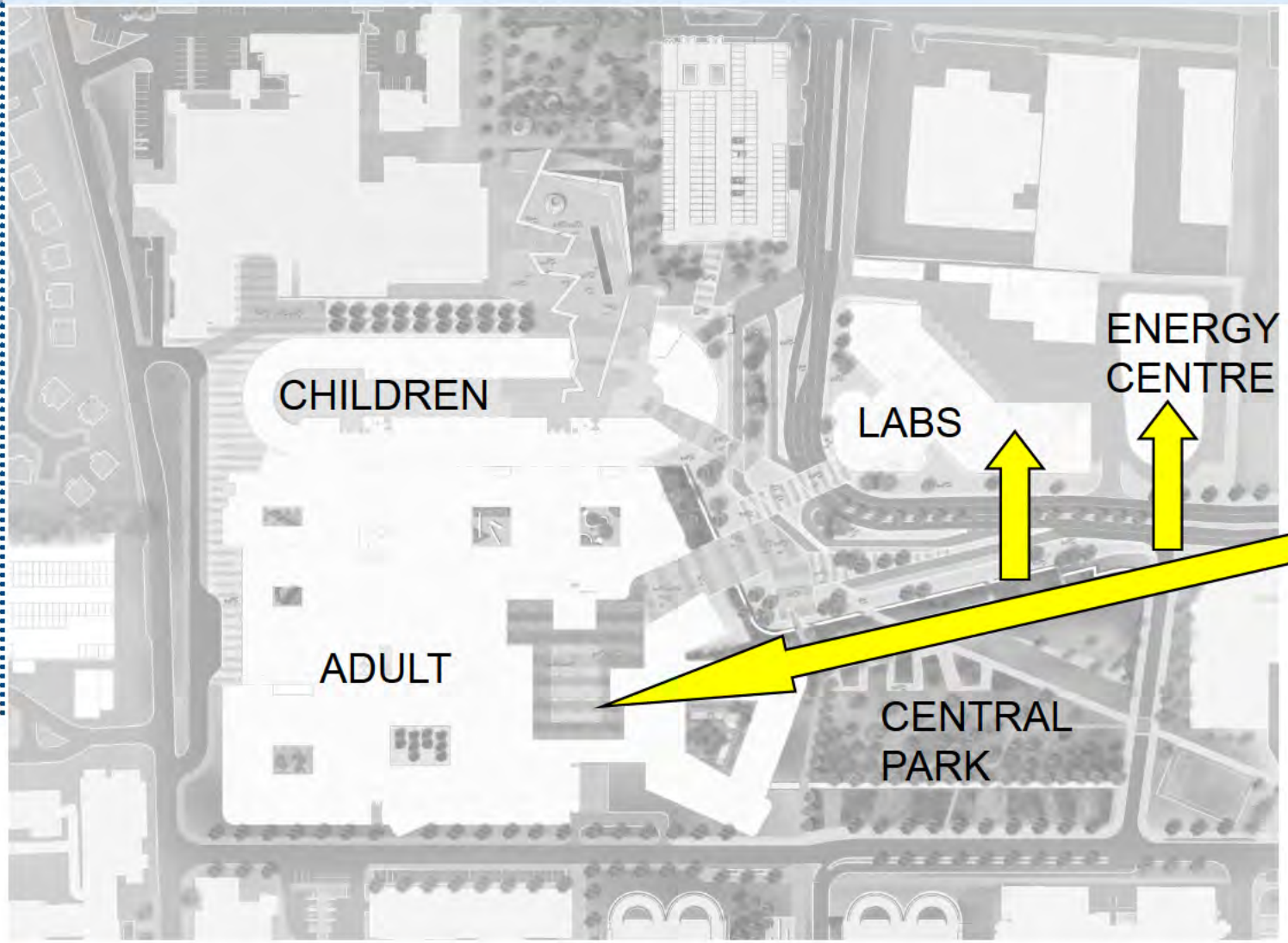
Master Plan – Utilities, an Overview
Water



Master Plan – Utilities, an Overview
Gas

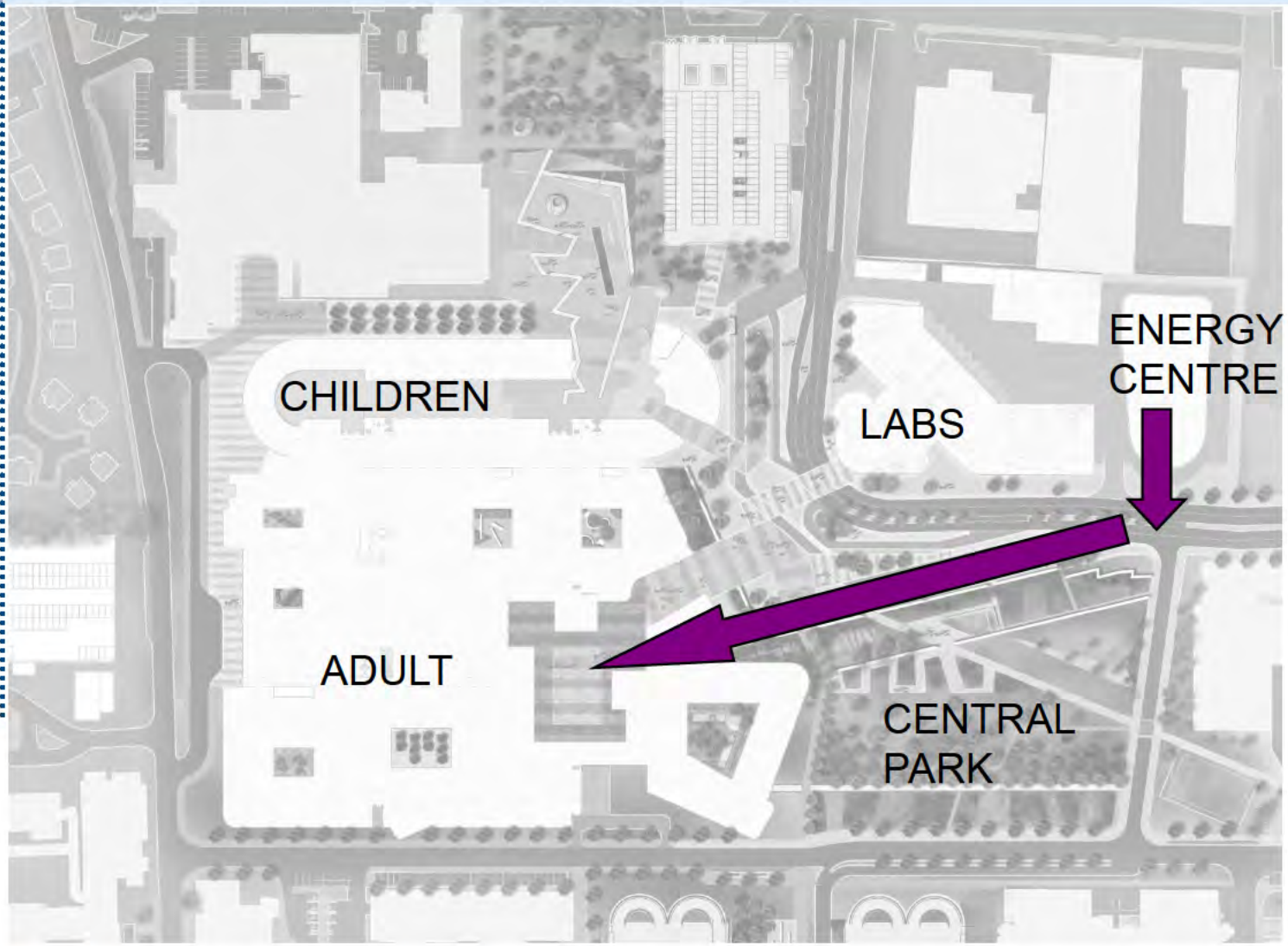


Master Plan – Utilities, an Overview
Gas

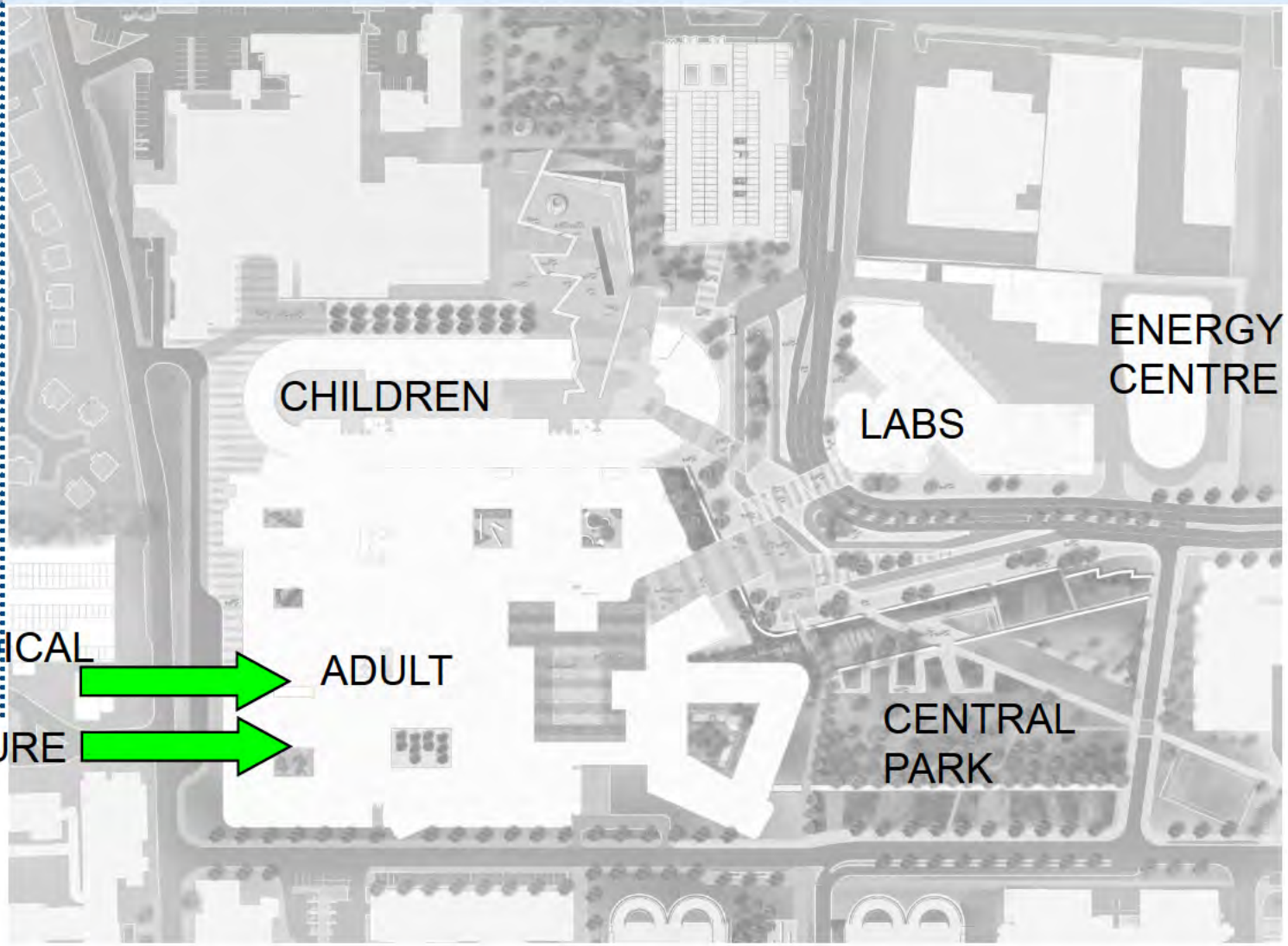


NHS Greater Glasgow and Clyde

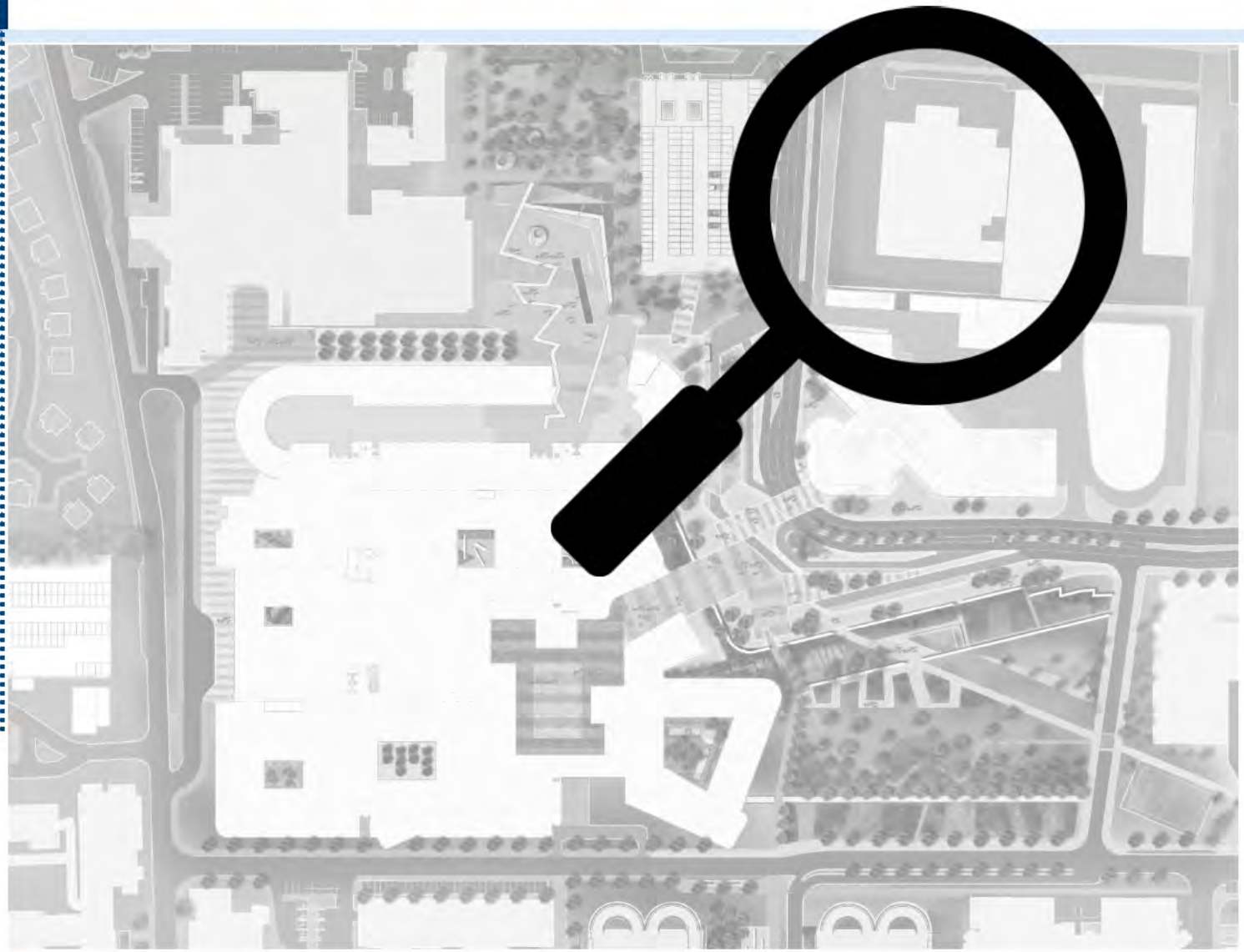
Master Plan – Hot Water / Chilled Water



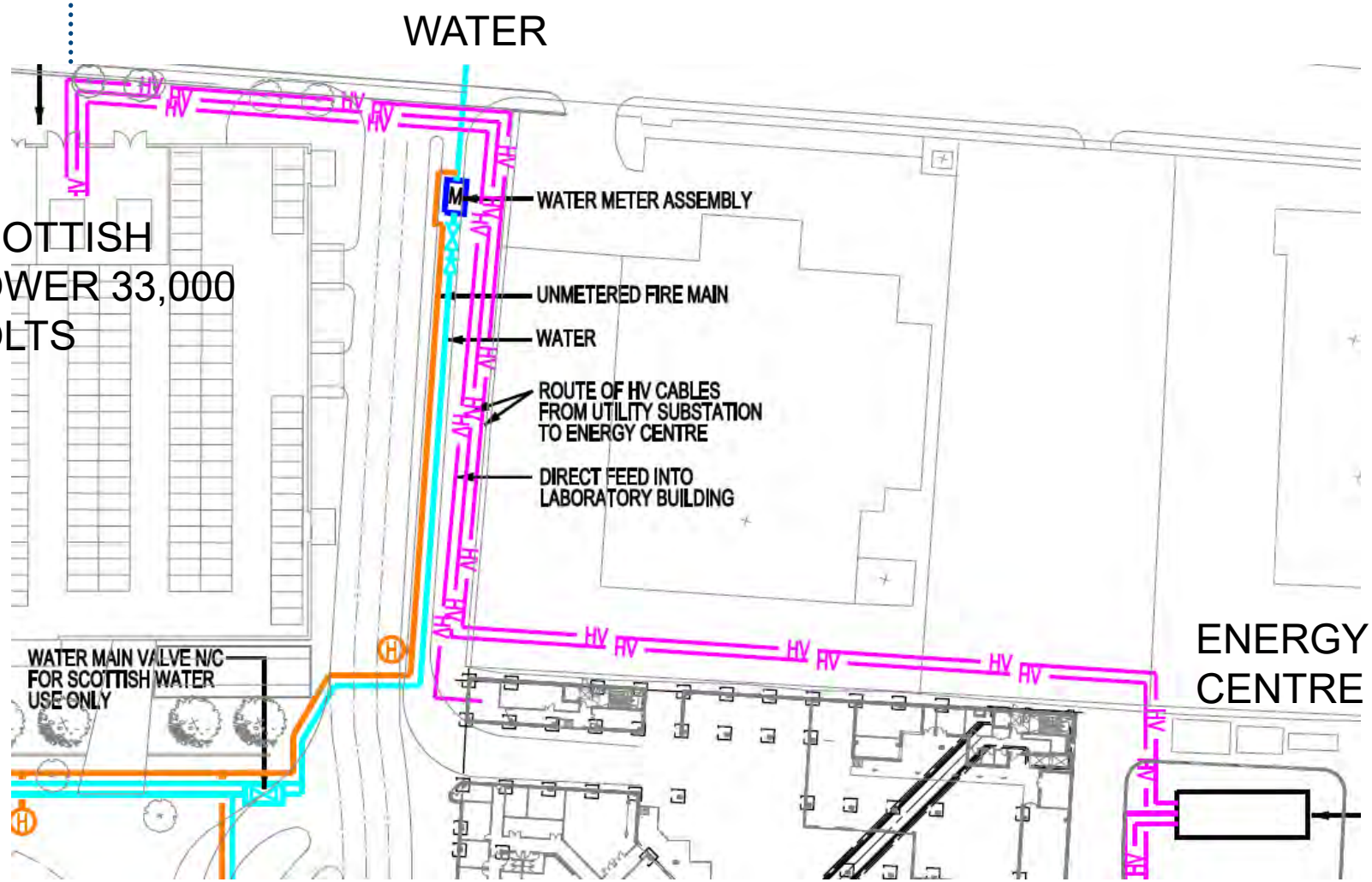
Master Plan – Medical Gases



Master Plan – Services Distribution

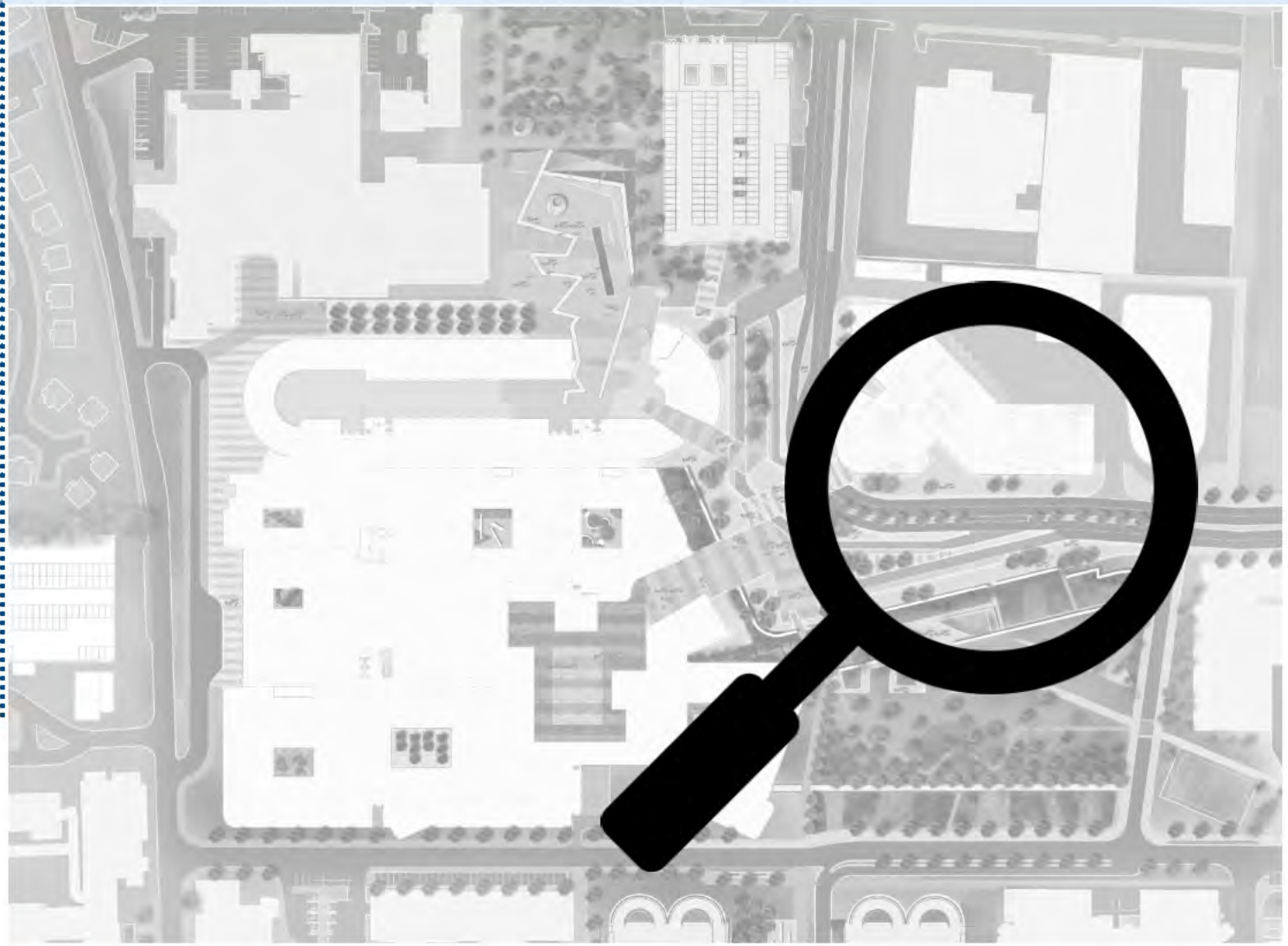


Master Plan – Services Distribution

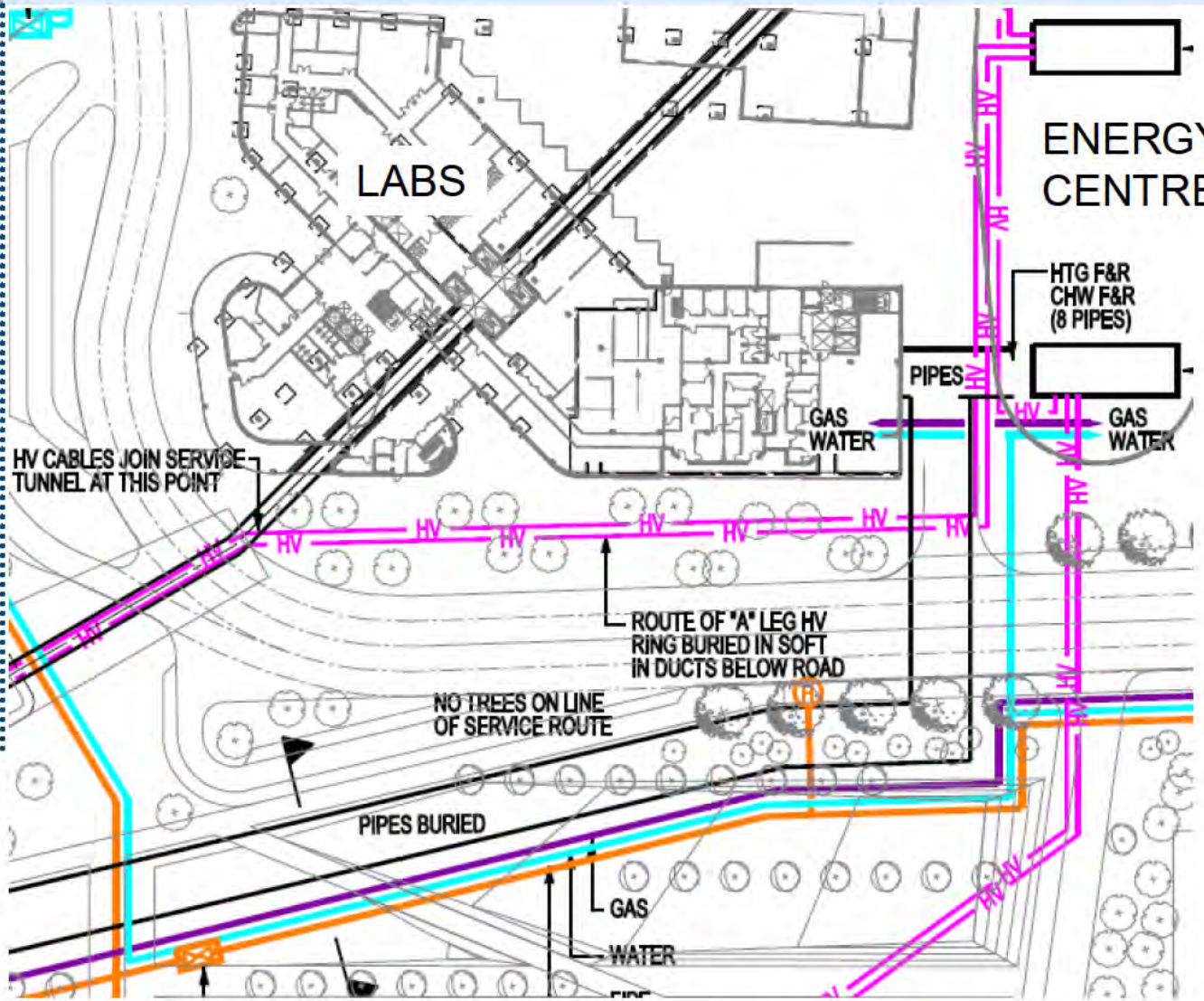


NHS Greater Glasgow and Clyde

Master Plan – Services Distribution



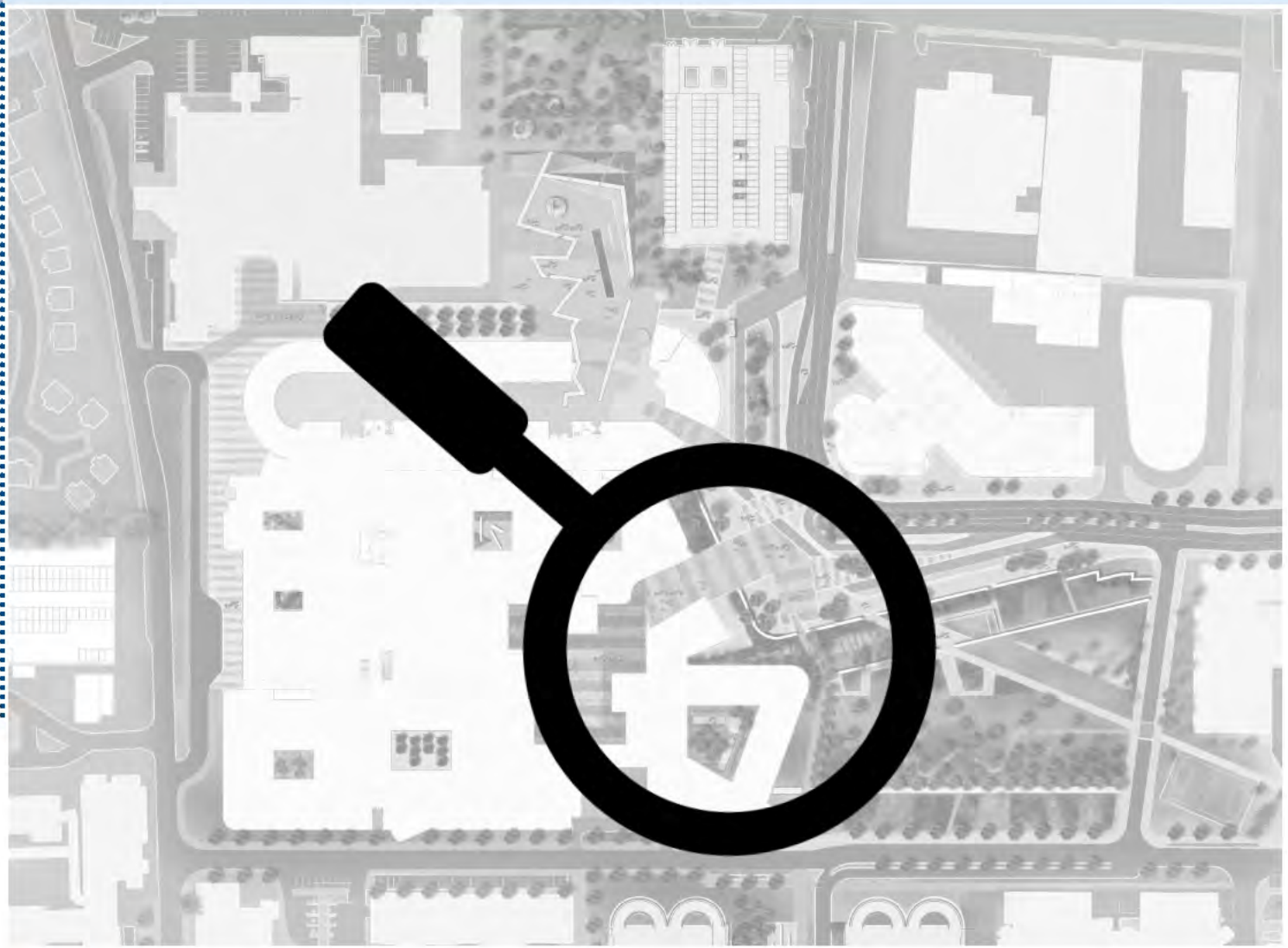
Master Plan – Services Distribution



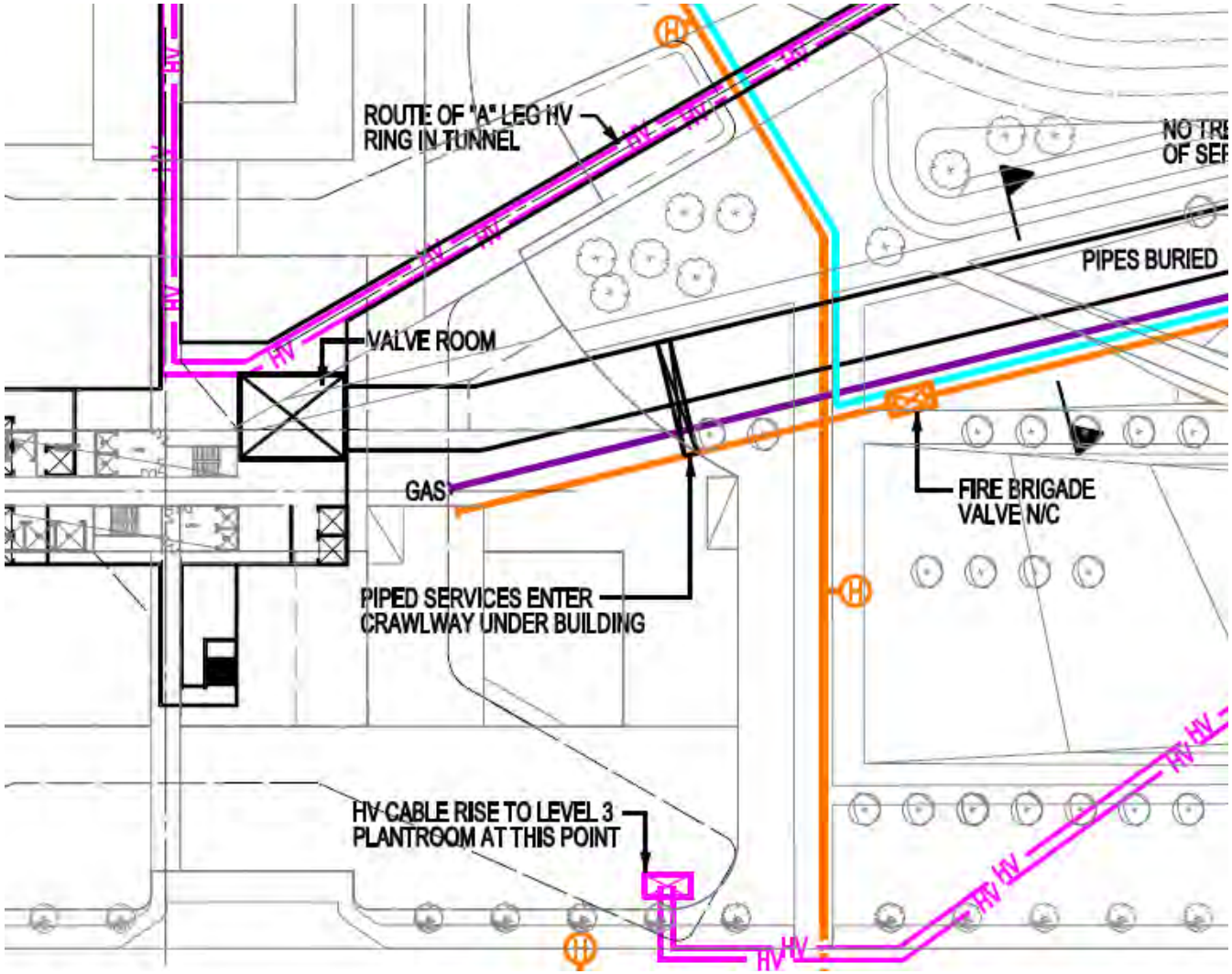
WATER
GAS

NHS Greater Glasgow and Clyde

Master Plan – Services Distribution

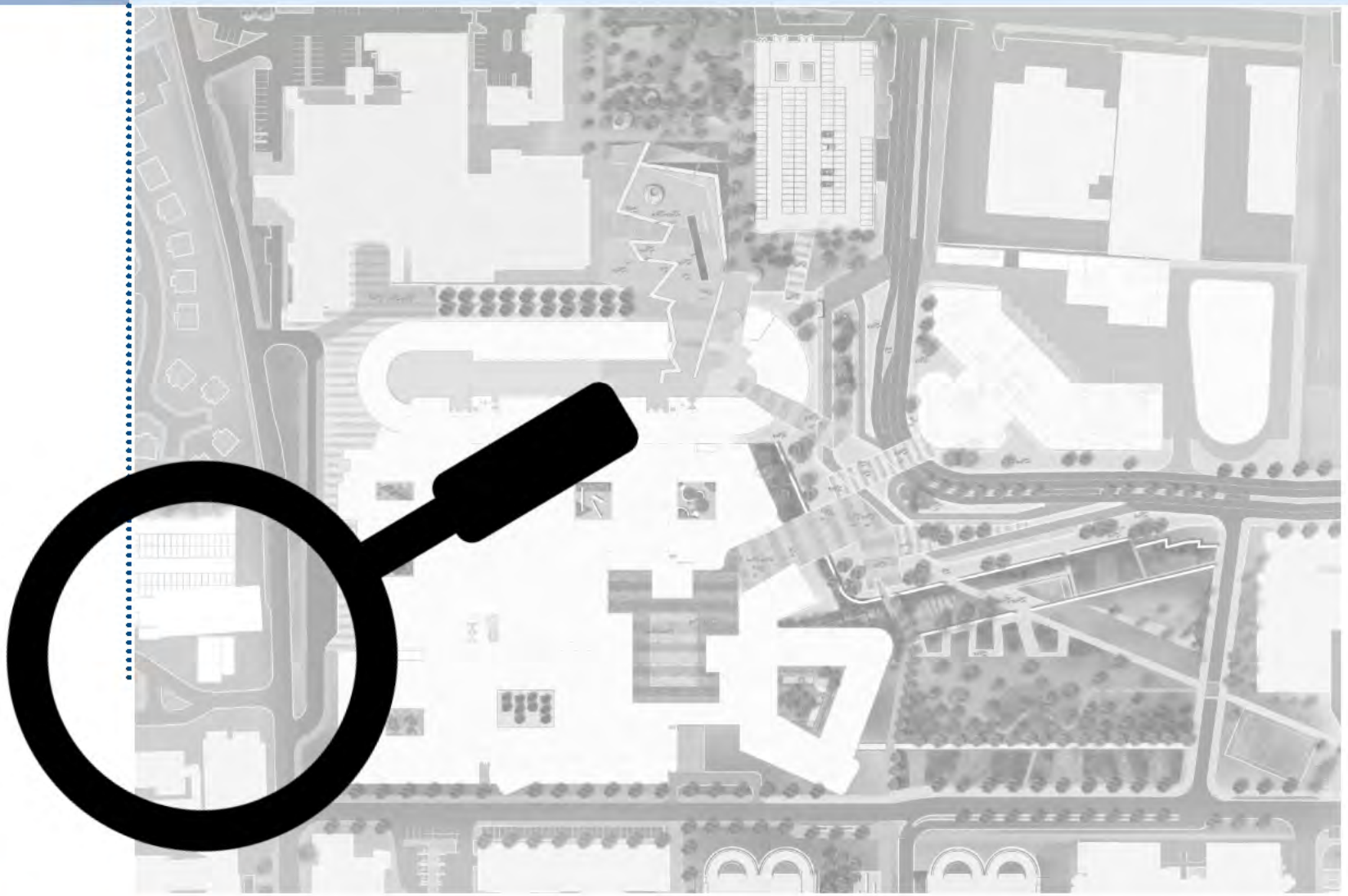


Master Plan – Services Distribution

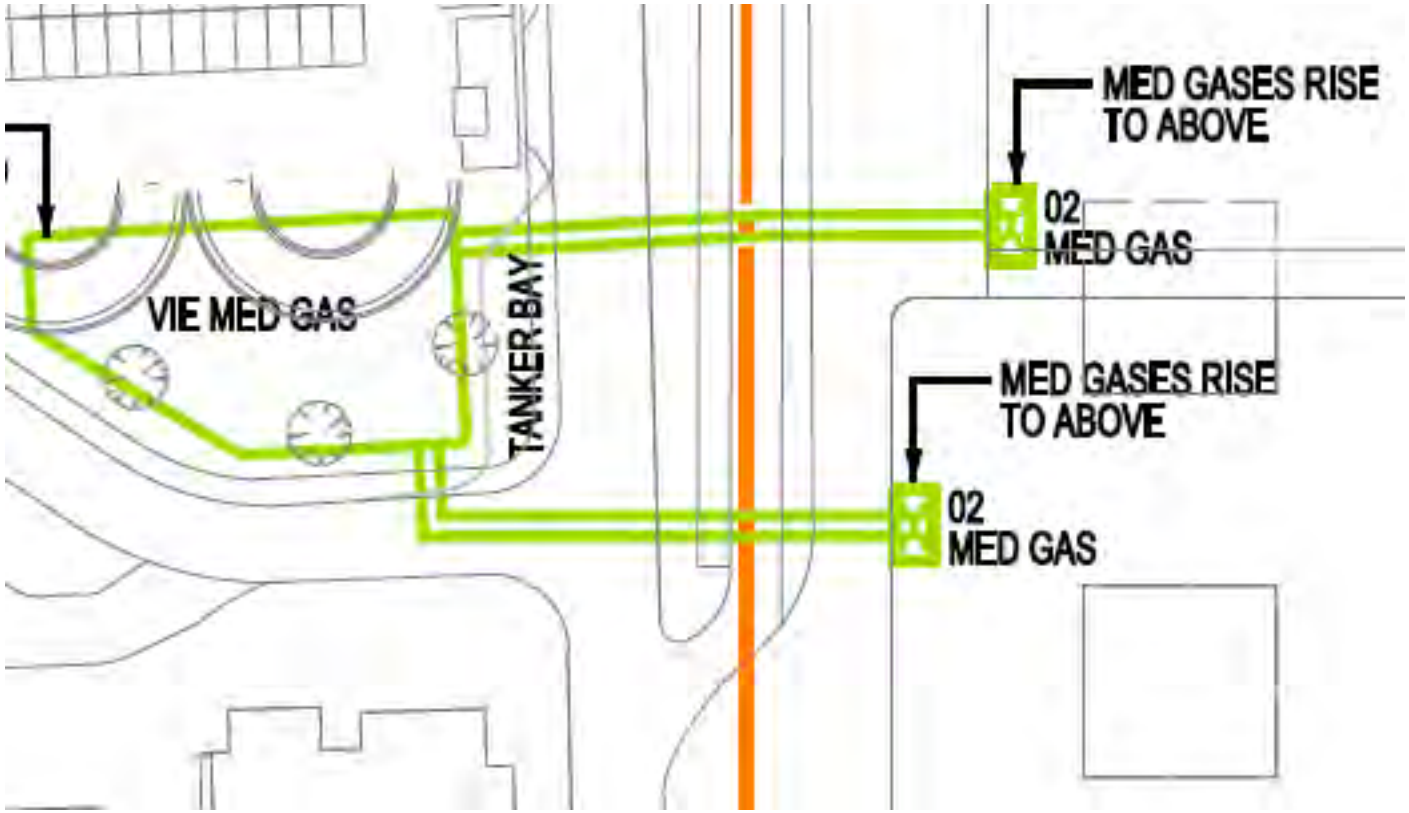


NHS Greater Glasgow and Clyde

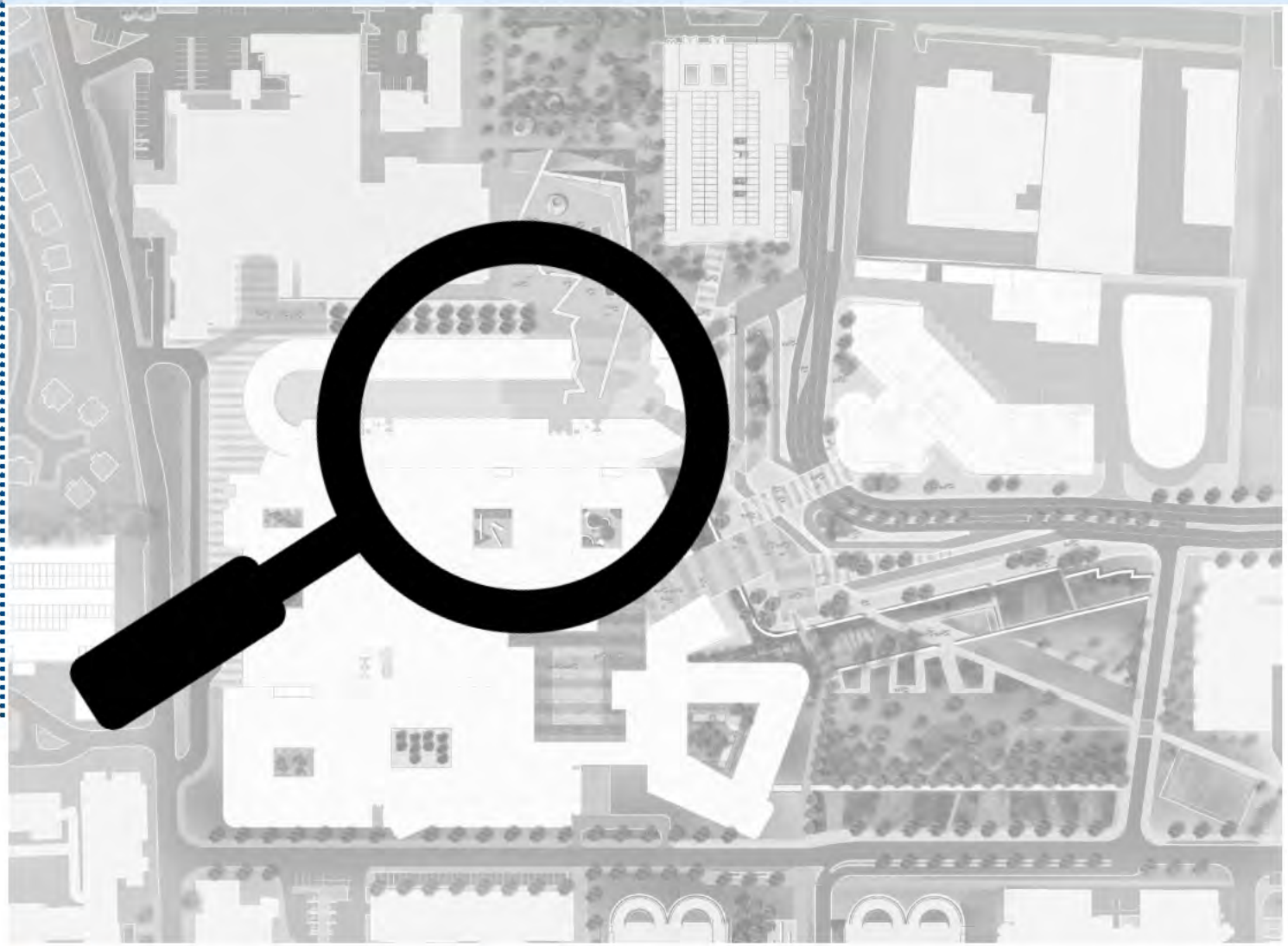
Master Plan – Services Distribution



Master Plan – Services Distribution

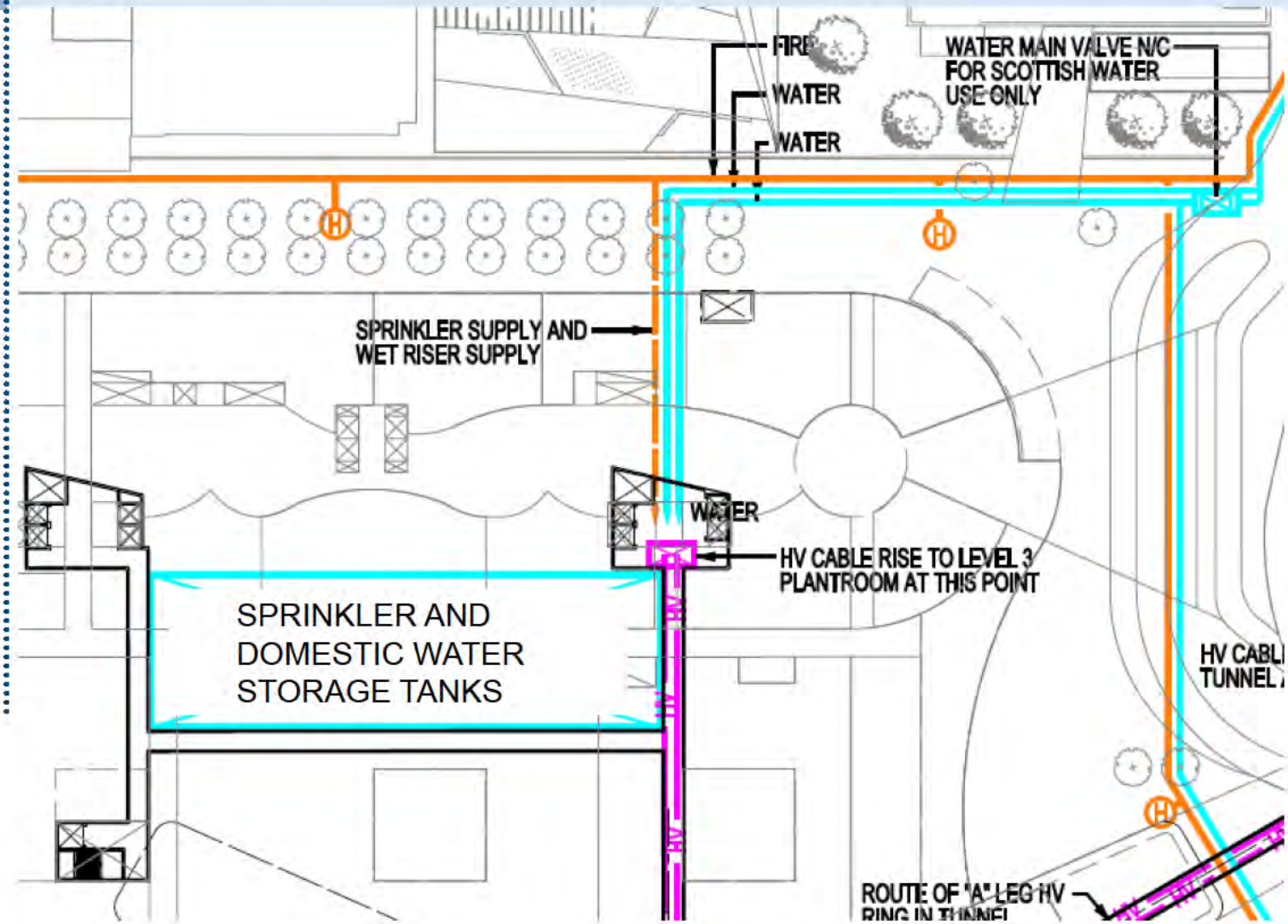


Master Plan – Services Distribution



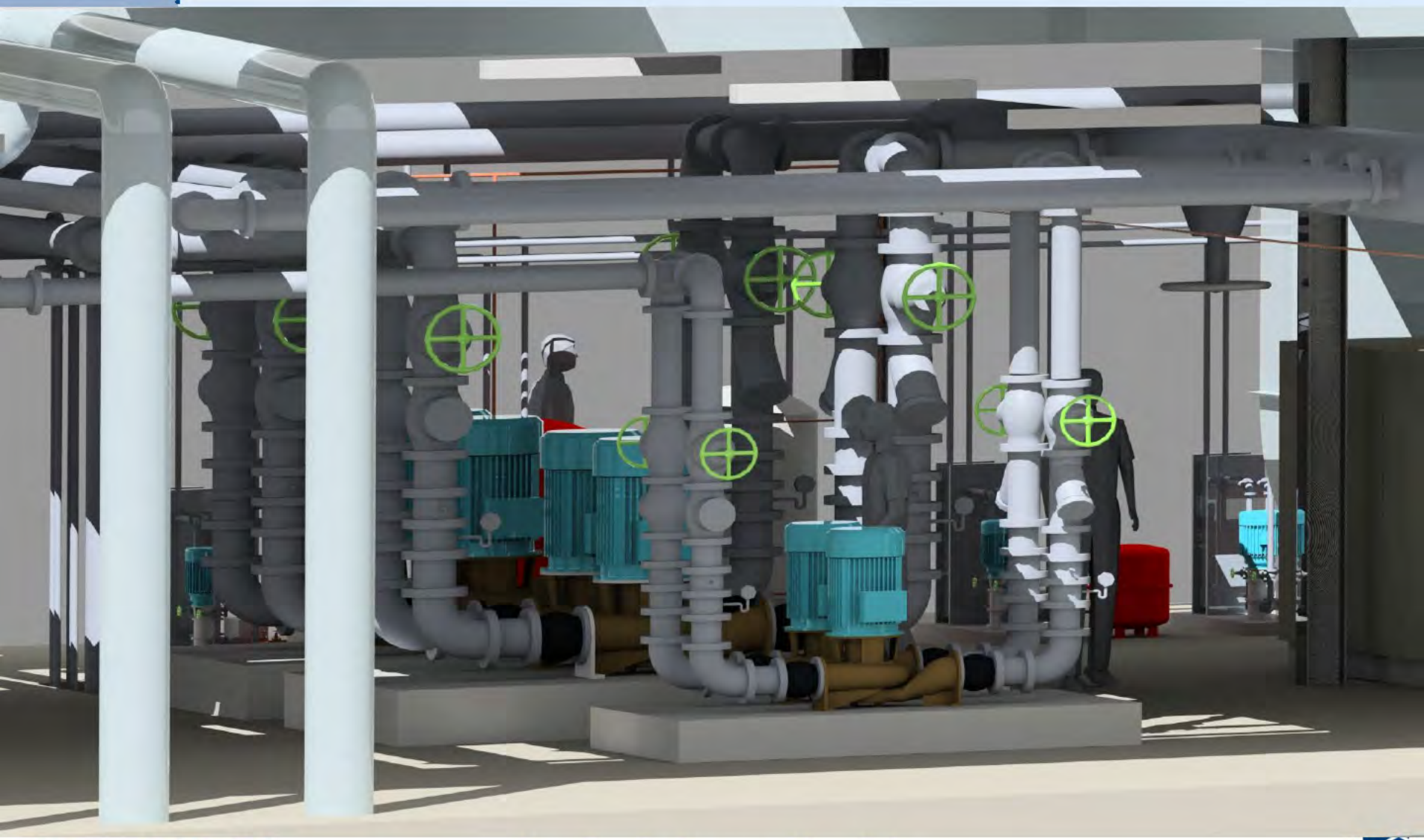
NHS Greater Glasgow and Clyde

Master Plan – Services Distribution

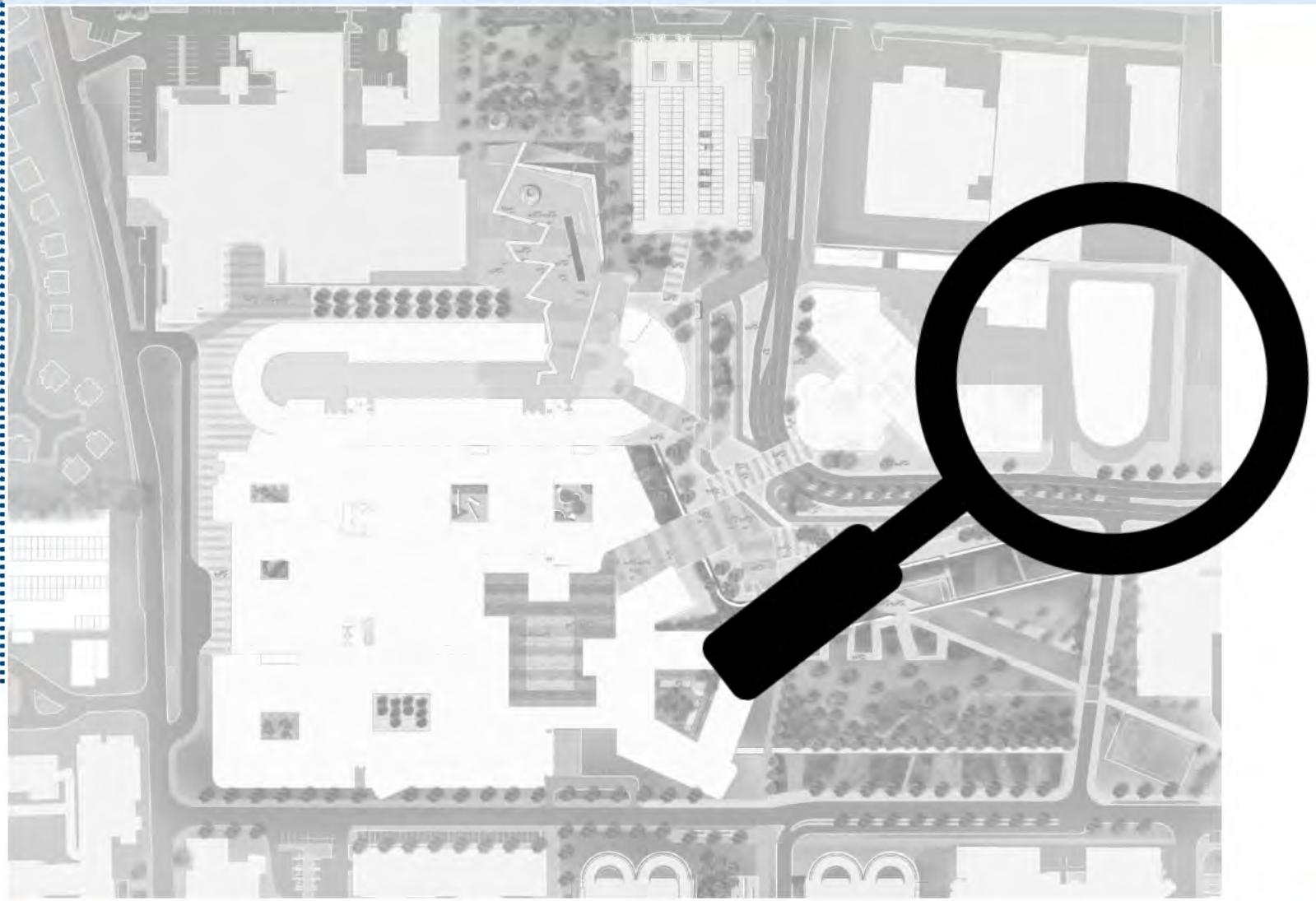


NHS Greater Glasgow and Clyde

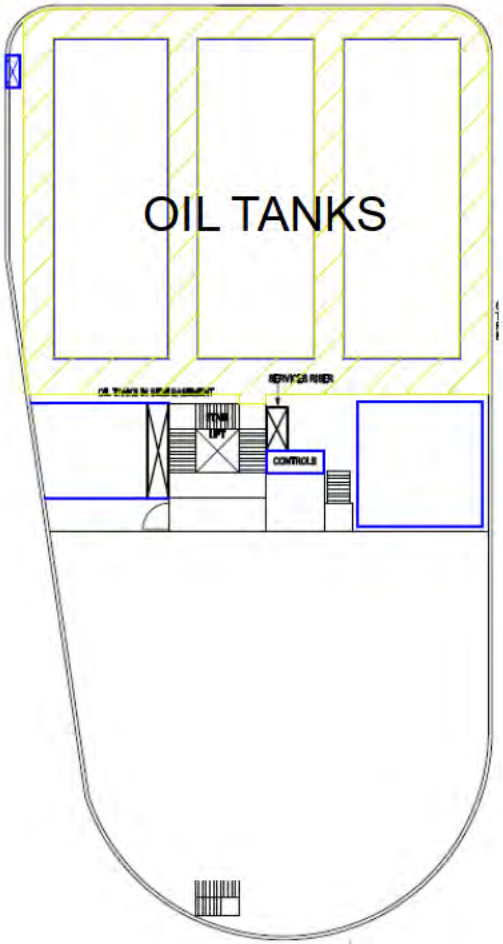
Energy Centre



Energy Centre - Context

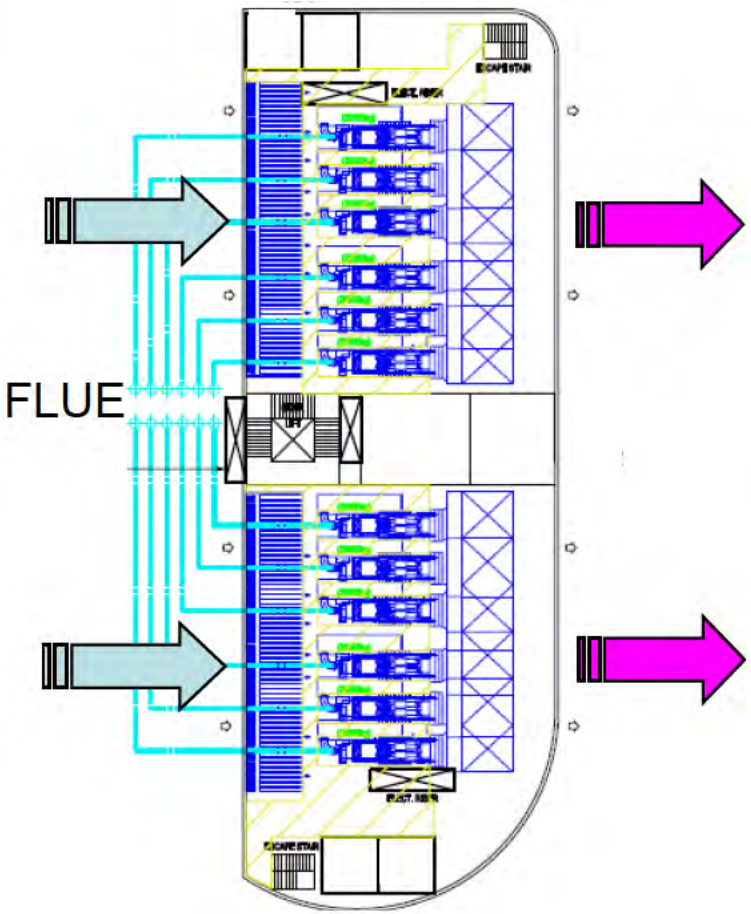


Energy Centre – Ground Floor

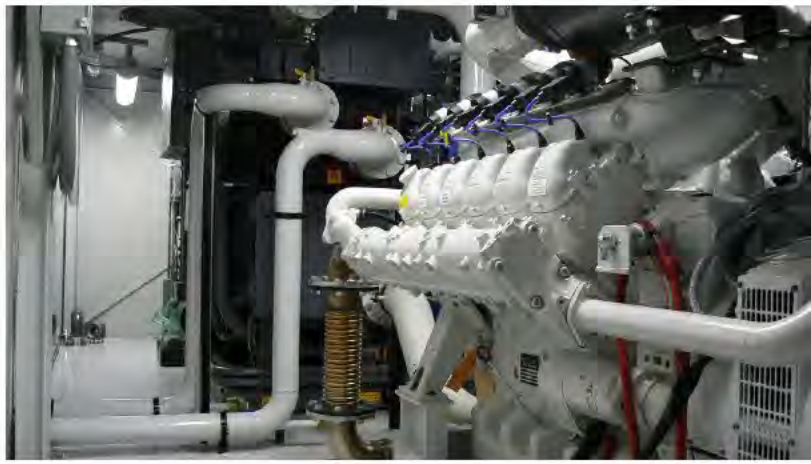


Fuel storage for:
- generators
- Combined Heat and Power (CHP)
- boilers

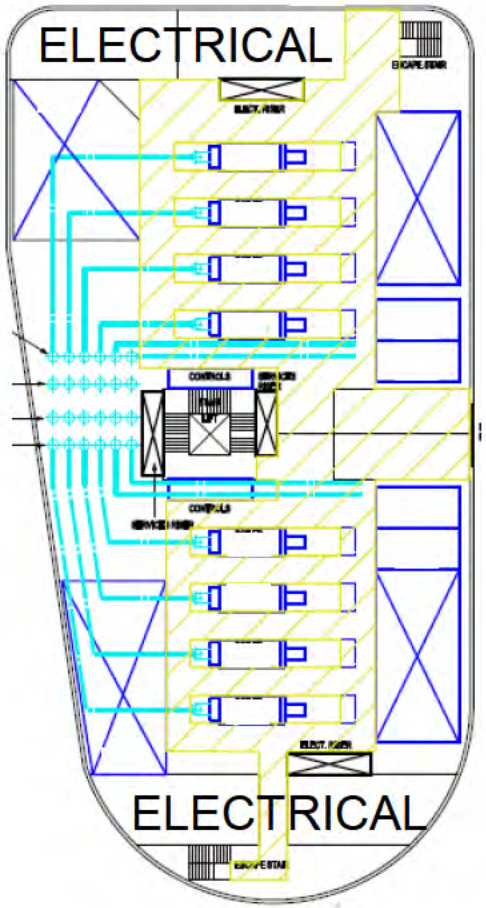
Energy Centre – First Floor



Generators
Good cross ventilation
Combined flue tower

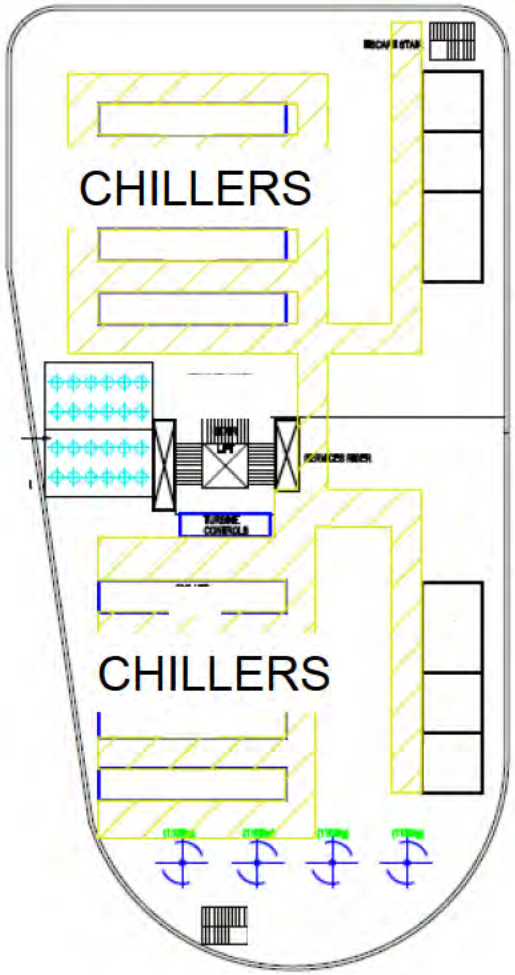


Energy Centre – Second Floor



Boilers
CHP
Electrical Rooms

Energy Centre - Roof



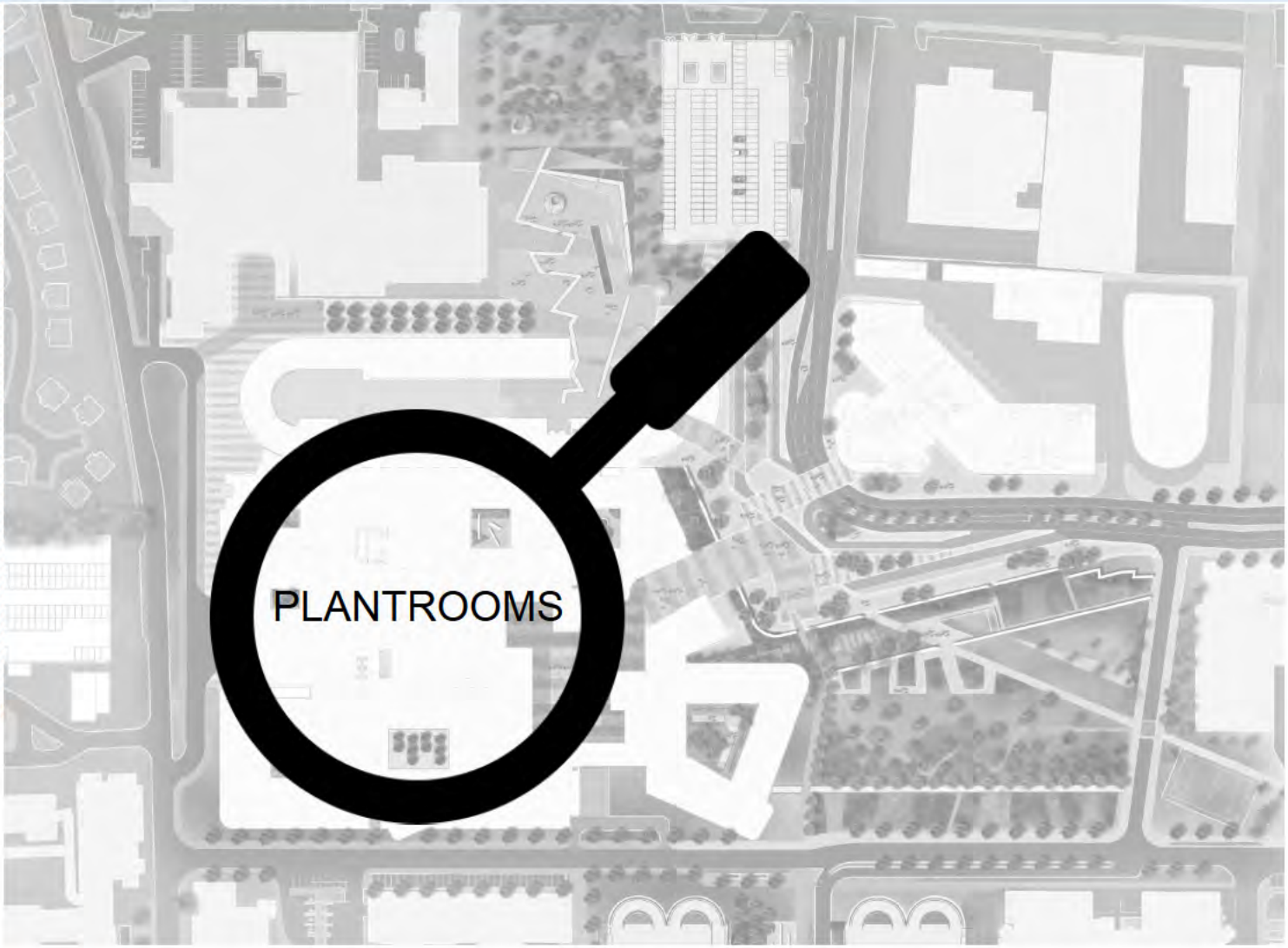
Chillers
Plant screening

NHS Greater Glasgow and Clyde

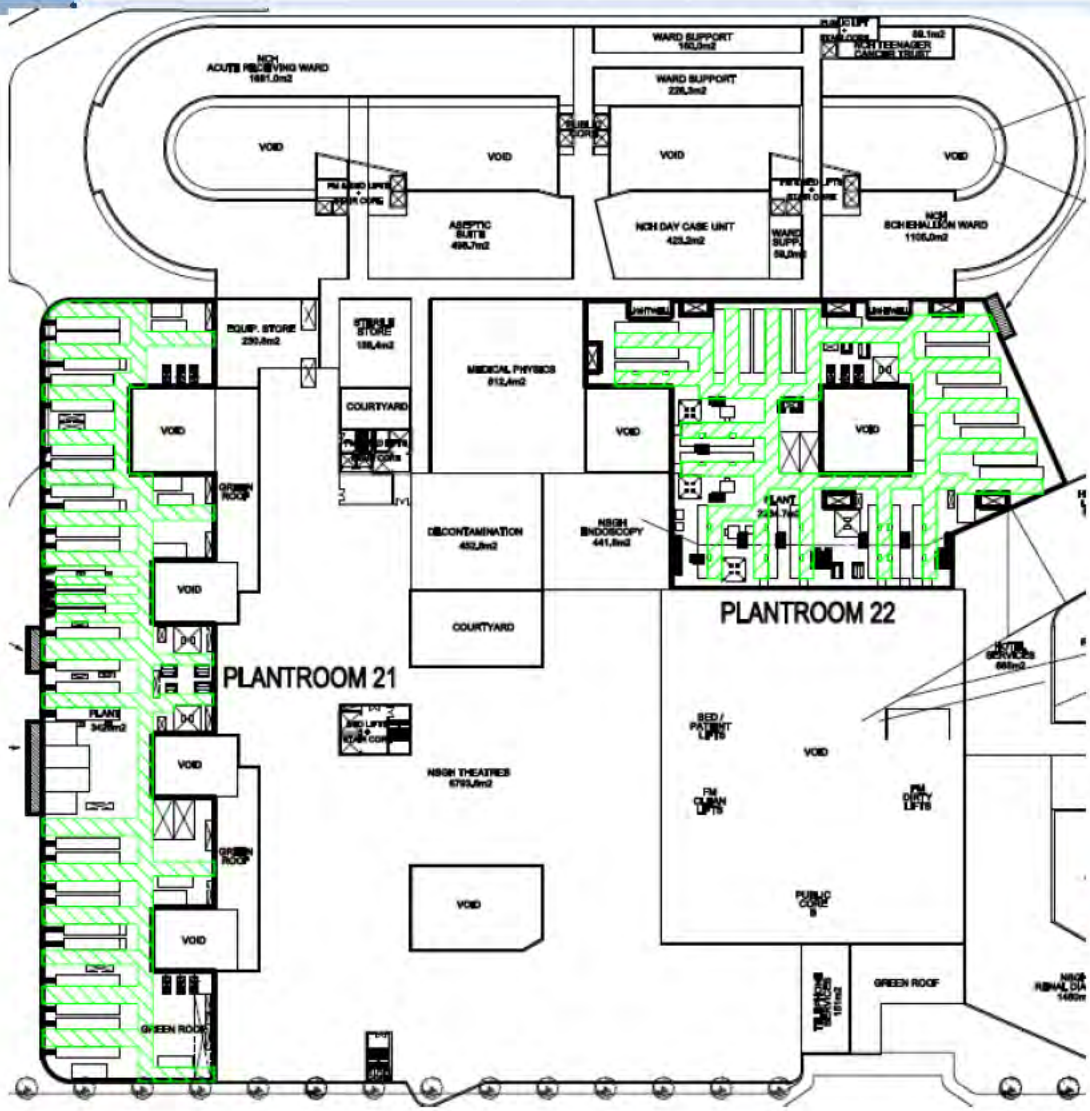
Plantrooms

NHS Greater Glasgow and Clyde

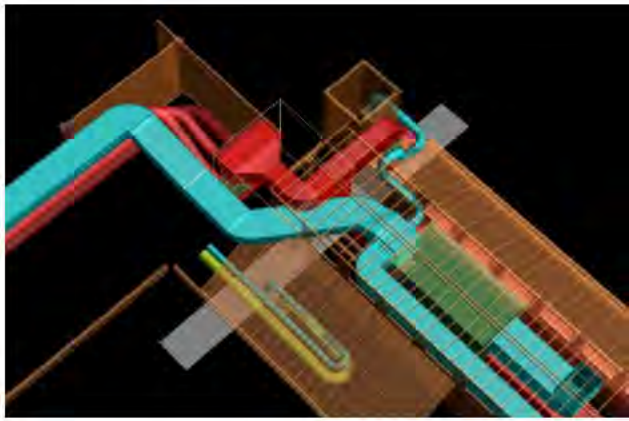
Plantrooms - Context



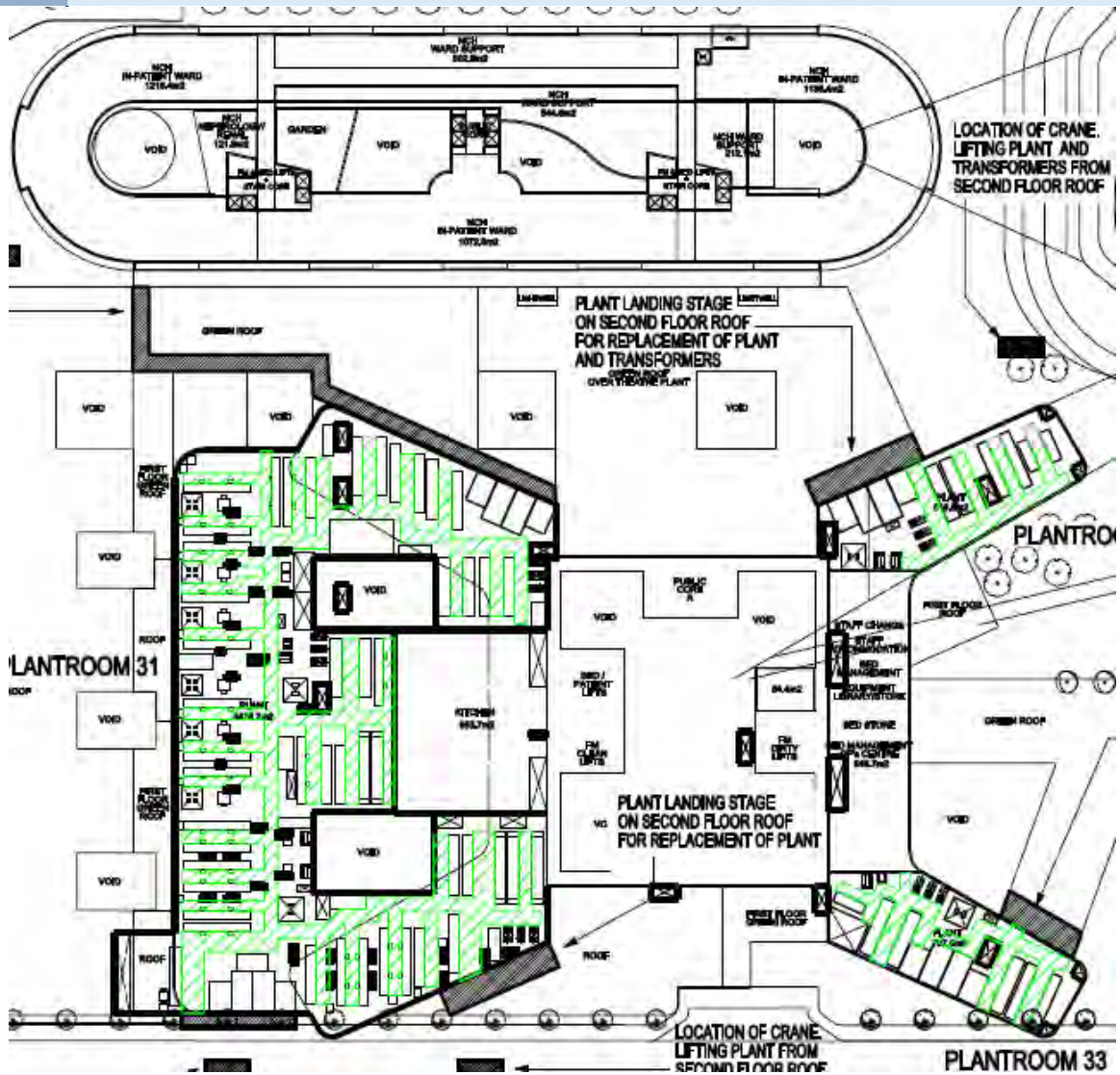
Plantrooms – Second Floor



Children's theatres
Critical care
A&E

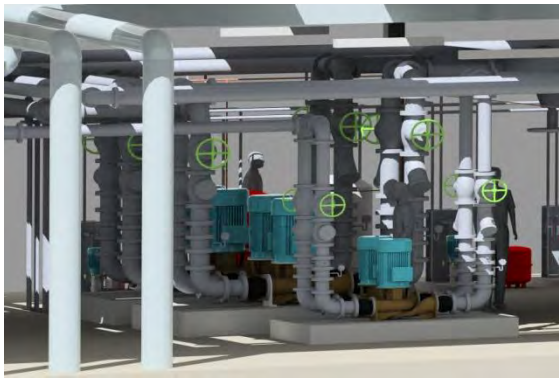


Plantrooms – Third Floor

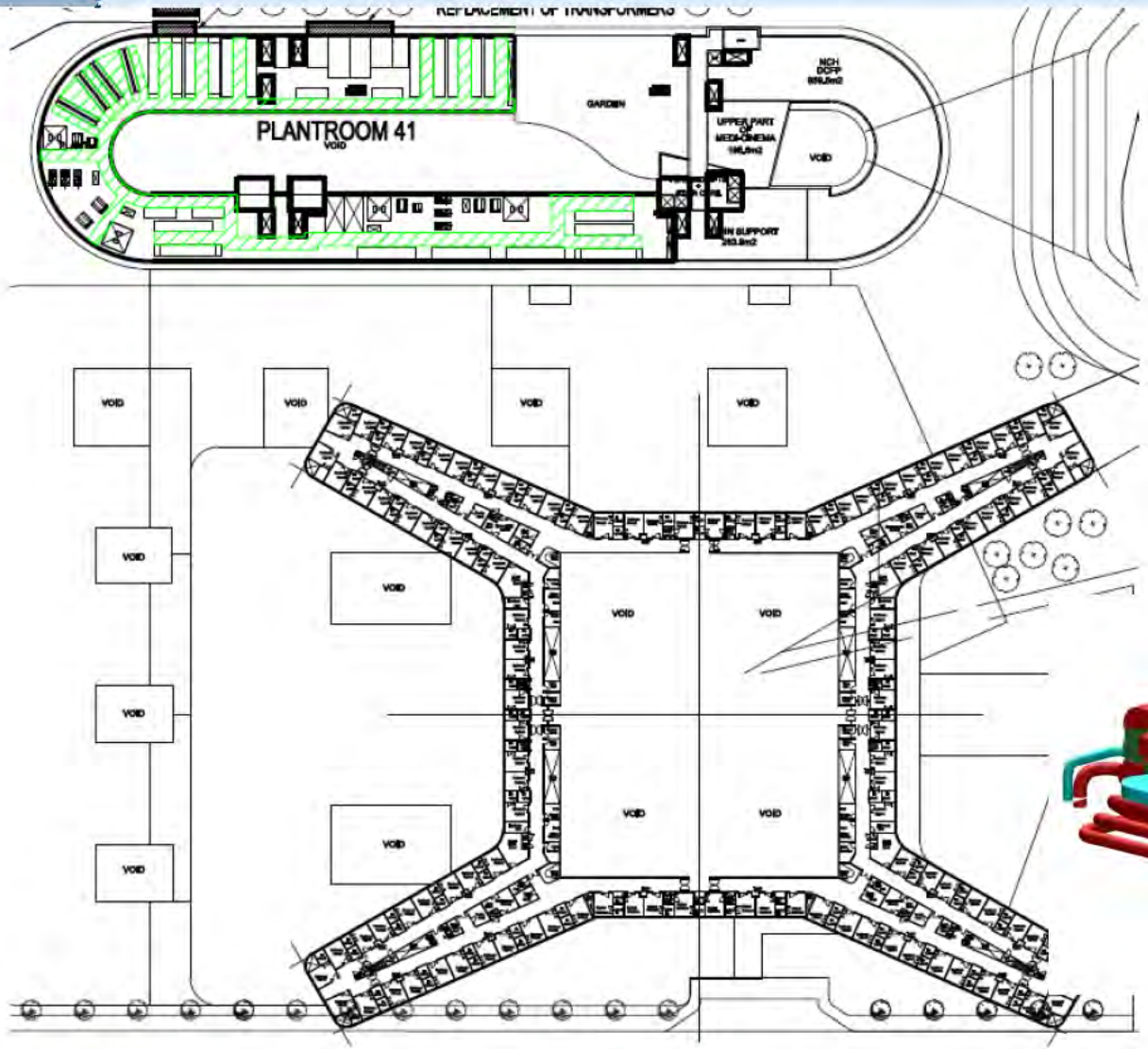


Theatres
Radiology
OPD

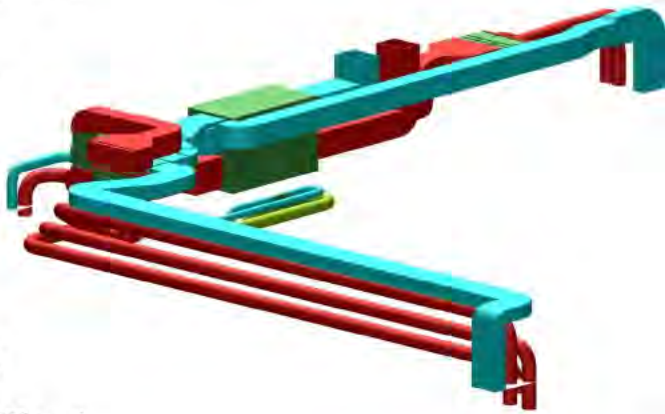
Plant co-ordinated with structure.



Plantrooms – Fourth Floor

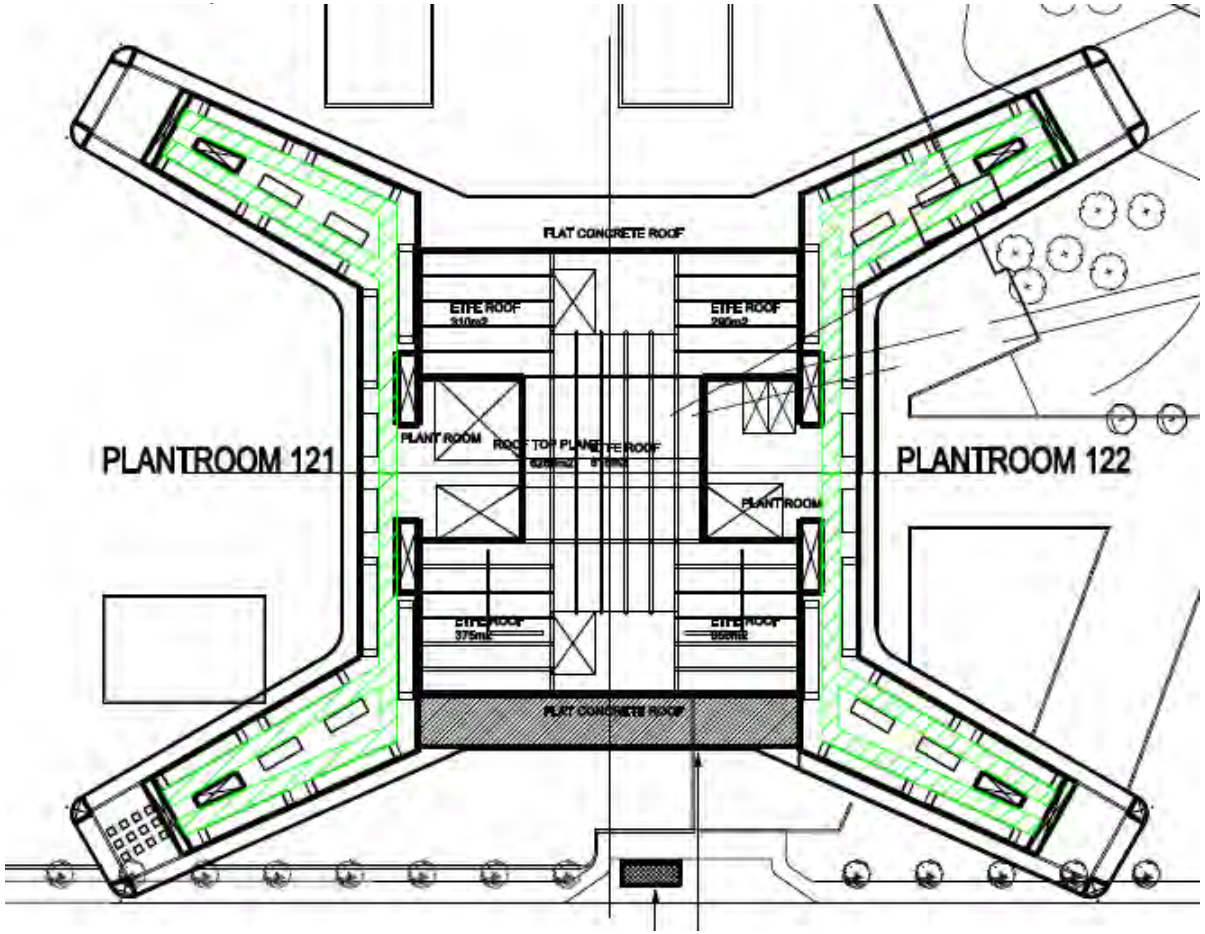


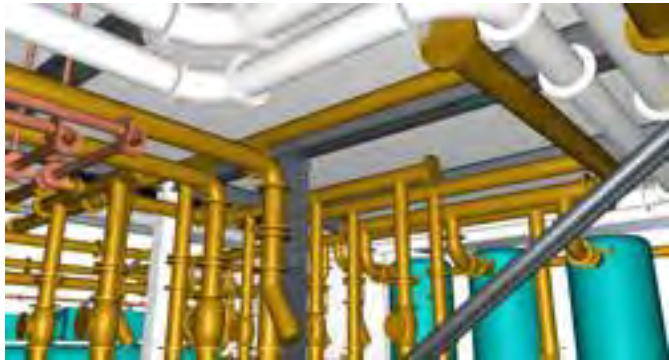
Children's Hospital



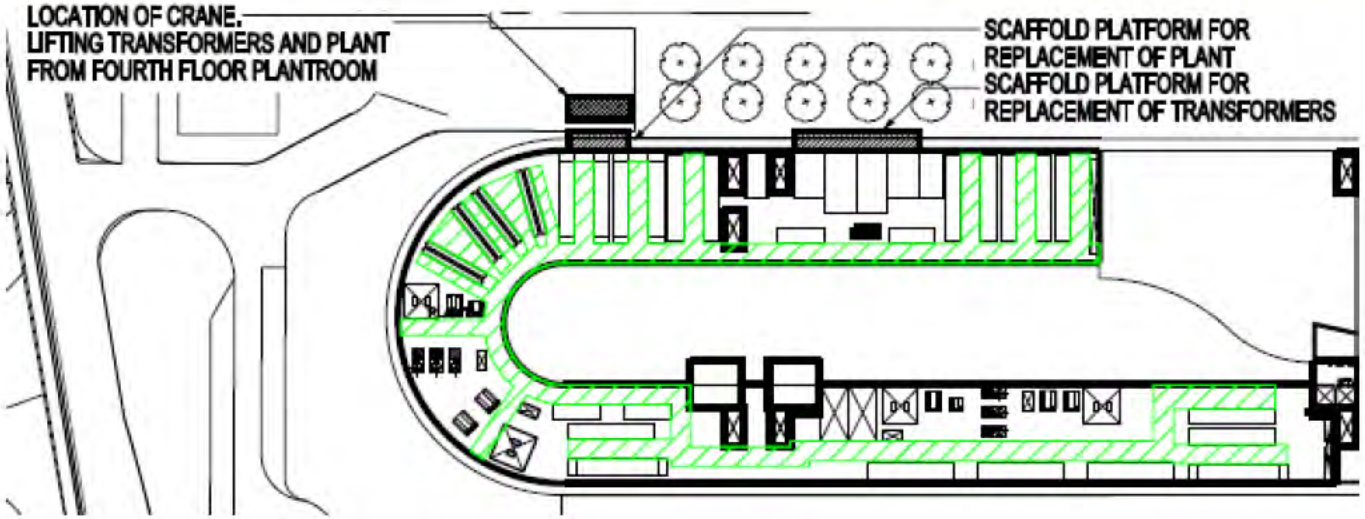
Plantrooms – Tower Roof

Serving Wards

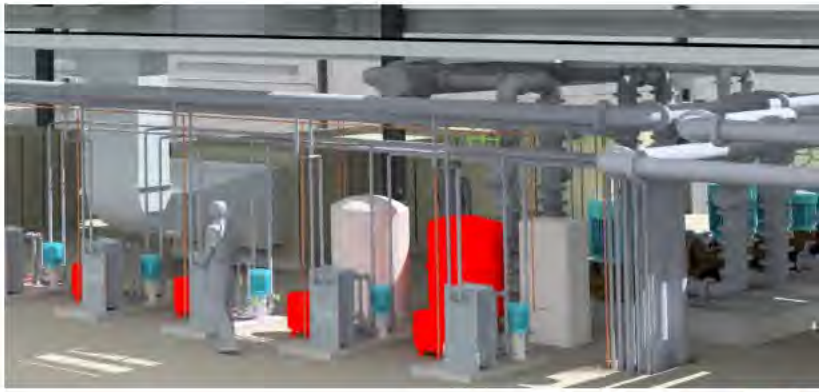




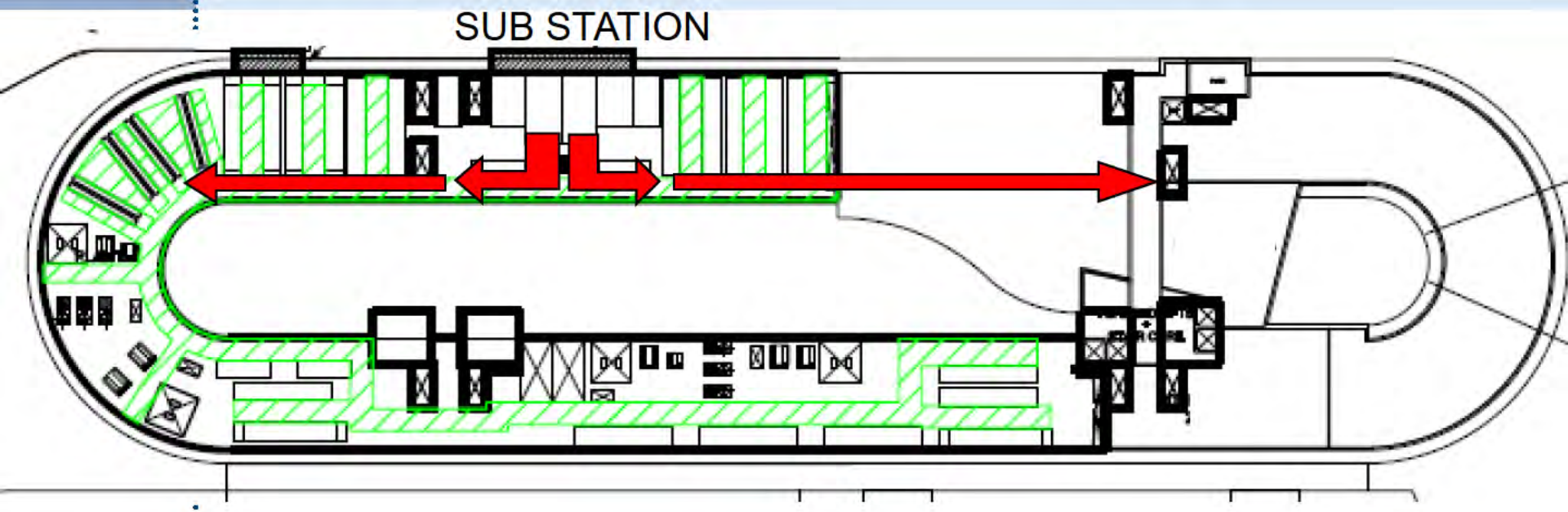
Plant replacement



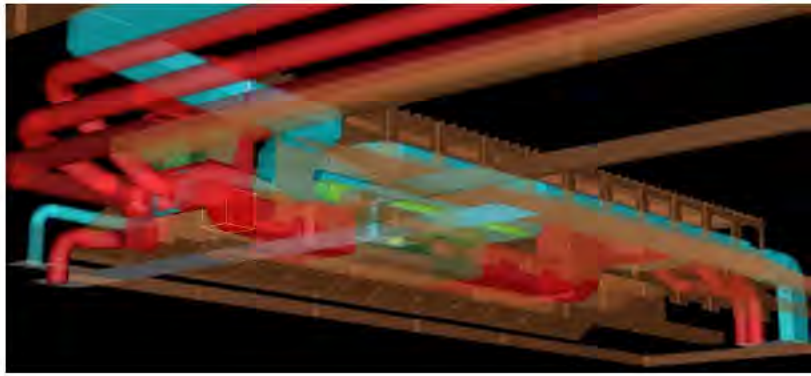
Defined access routes
Set down platforms
Crane locations



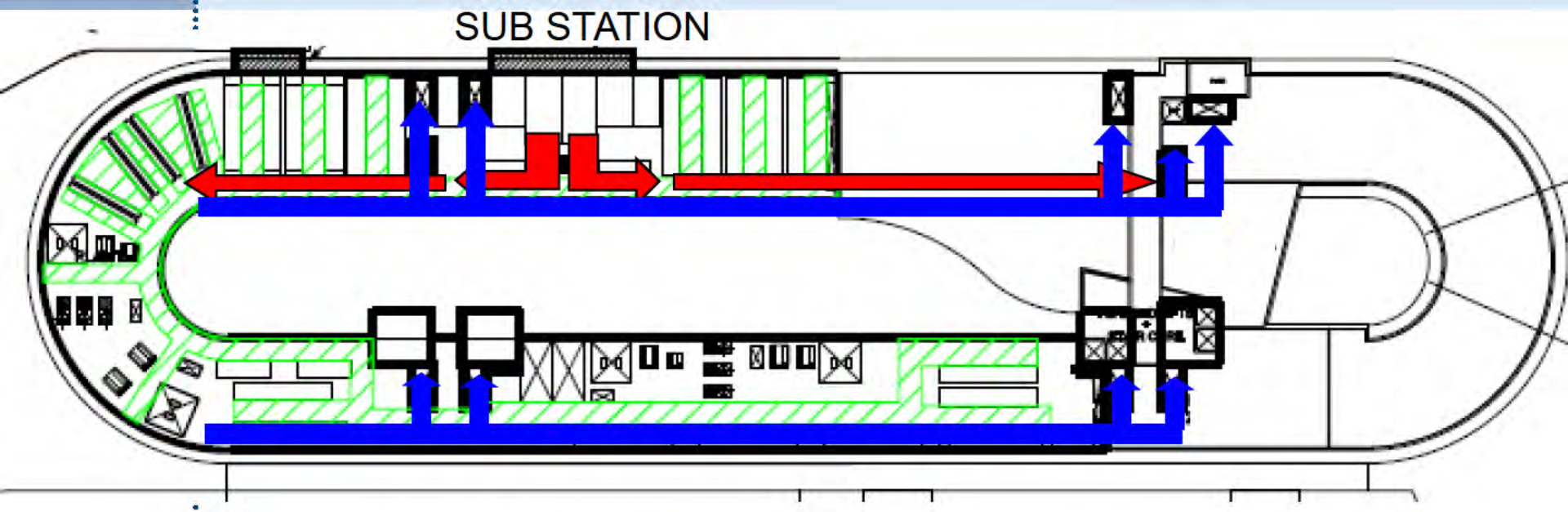
Services distribution



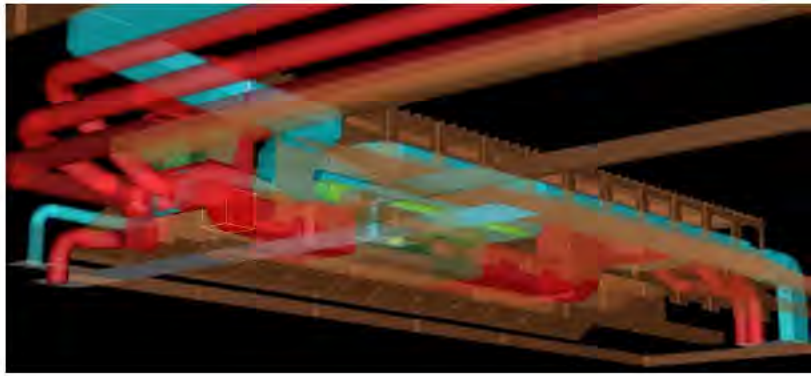
Horizontal distribution
Risers
Diverse routes



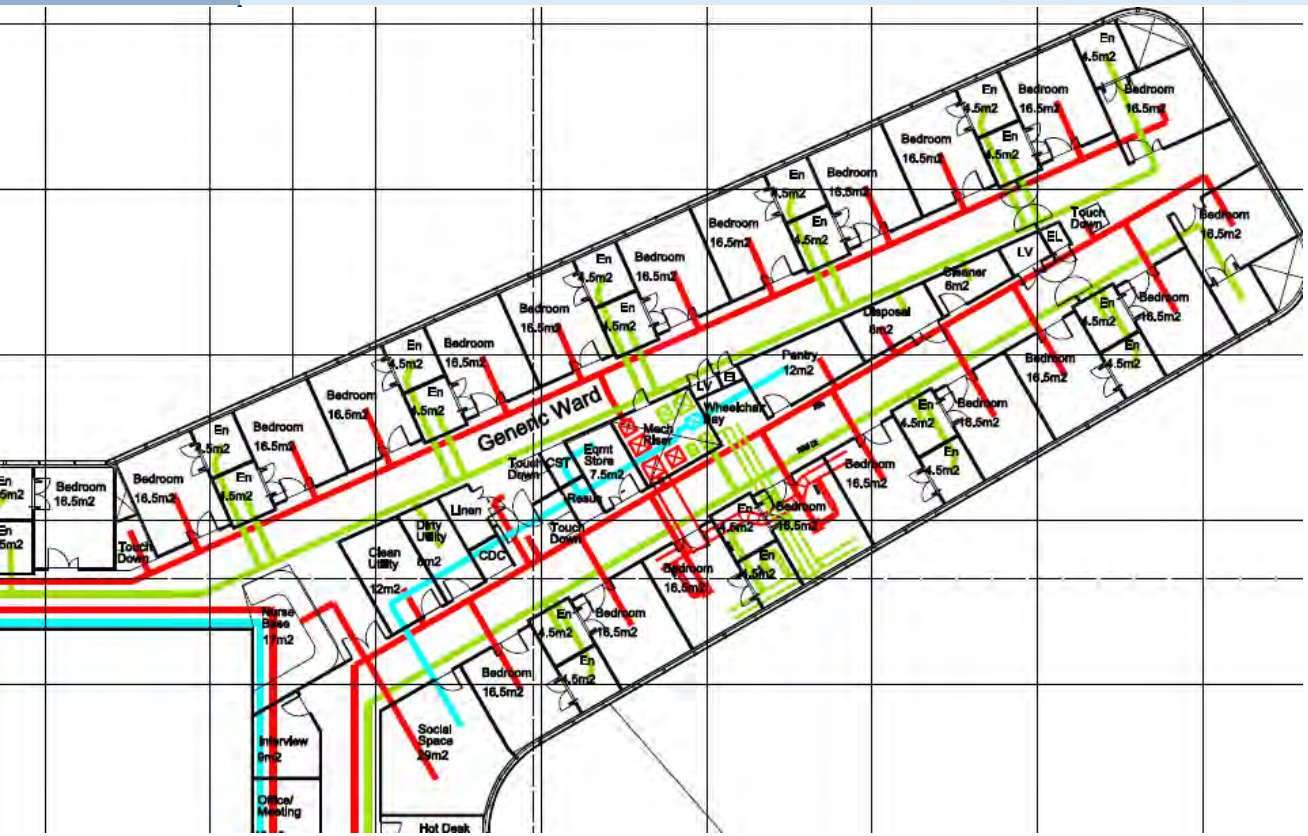
Services distribution



Horizontal distribution
Risers
Diverse routes



Services distribution – Typical Tower Ward

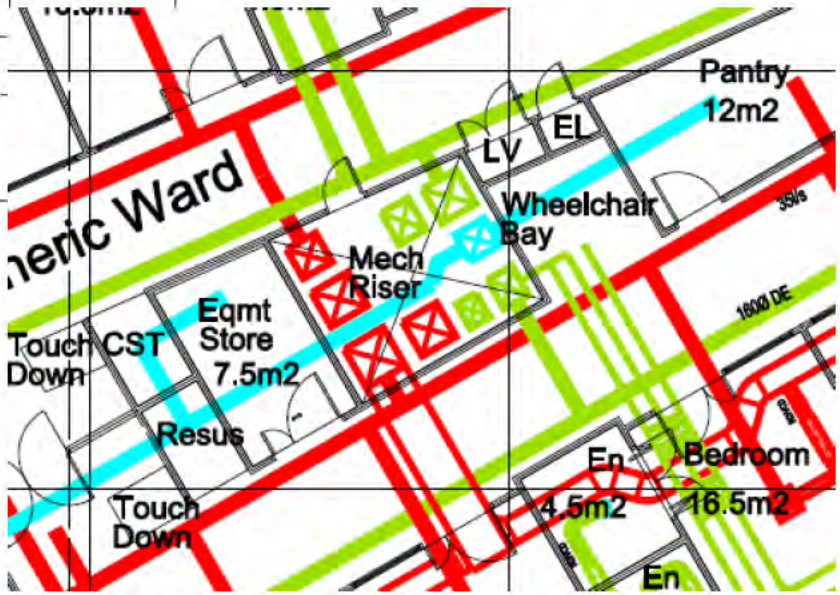


Distribution within corridors
Defined M&E risers
2 electrical risers - resilience

SUPPLY
EXTRACT
DIRTY EXTRACT

Services distribution – Typical Tower Ward

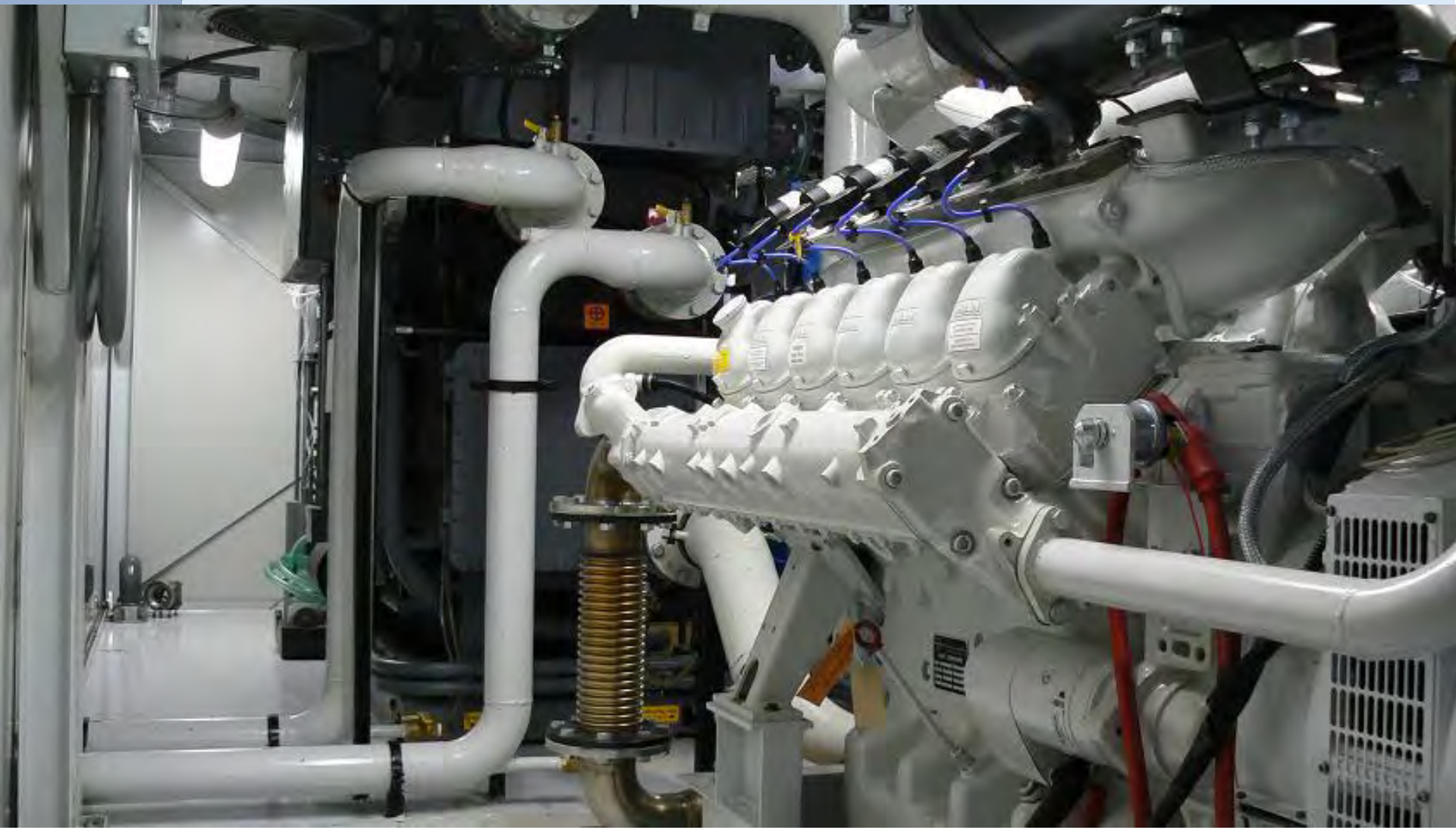
Distribution within corridors
Defined M&E risers
2 electrical risers - resilience



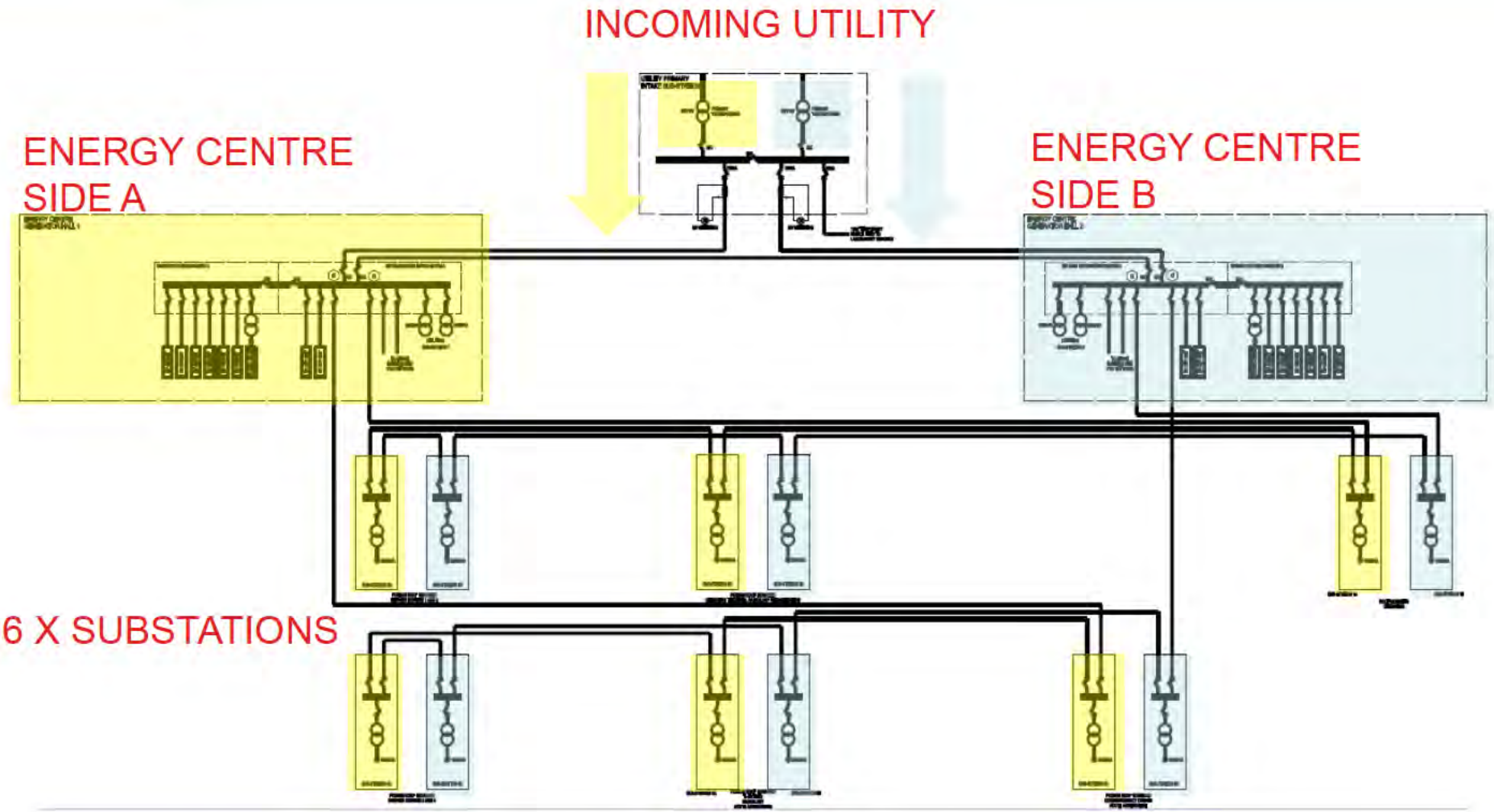
SUPPLY
EXTRACT
DIRTY EXTRACT

NHS Greater Glasgow and Clyde

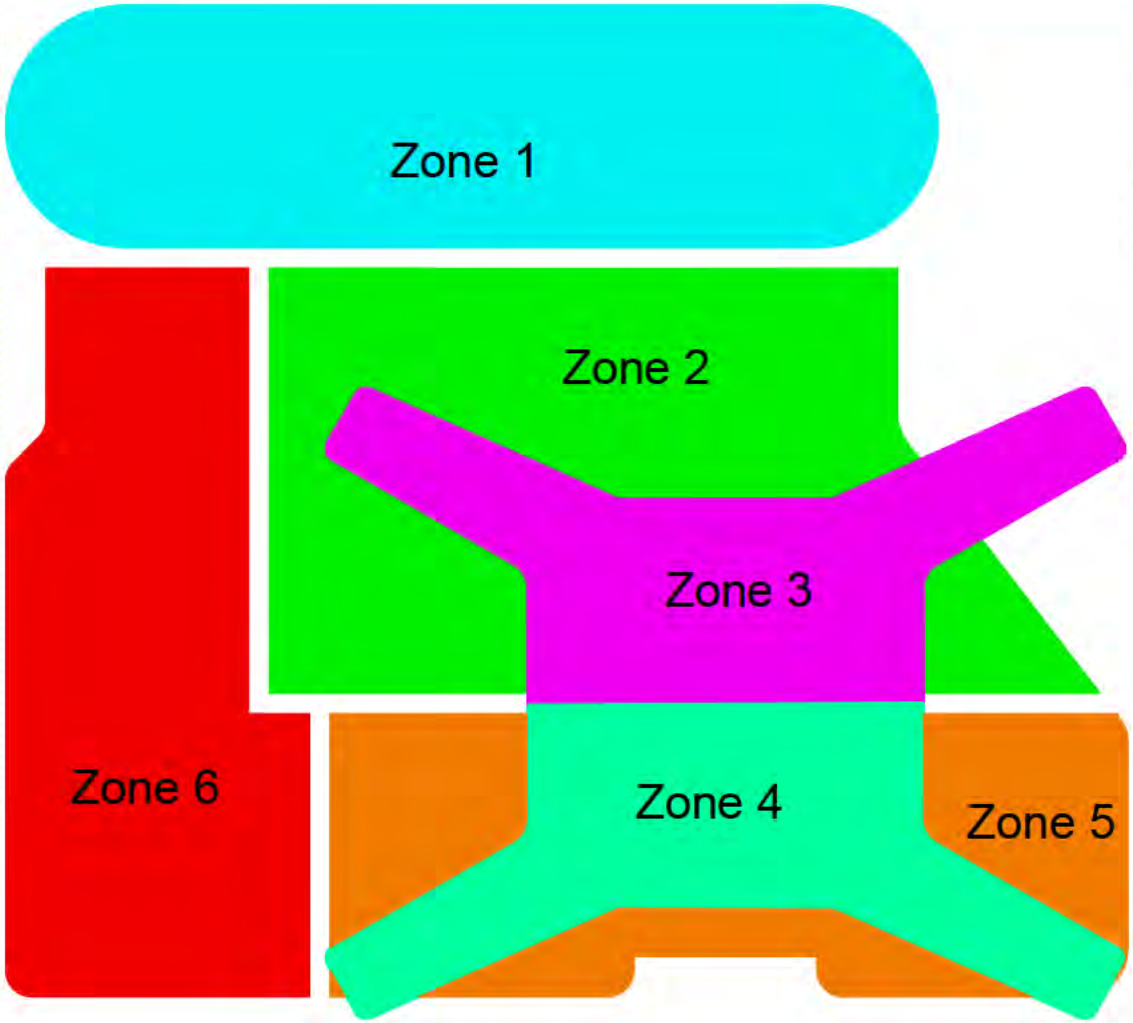
Resilience



Resilience – High Voltage Network



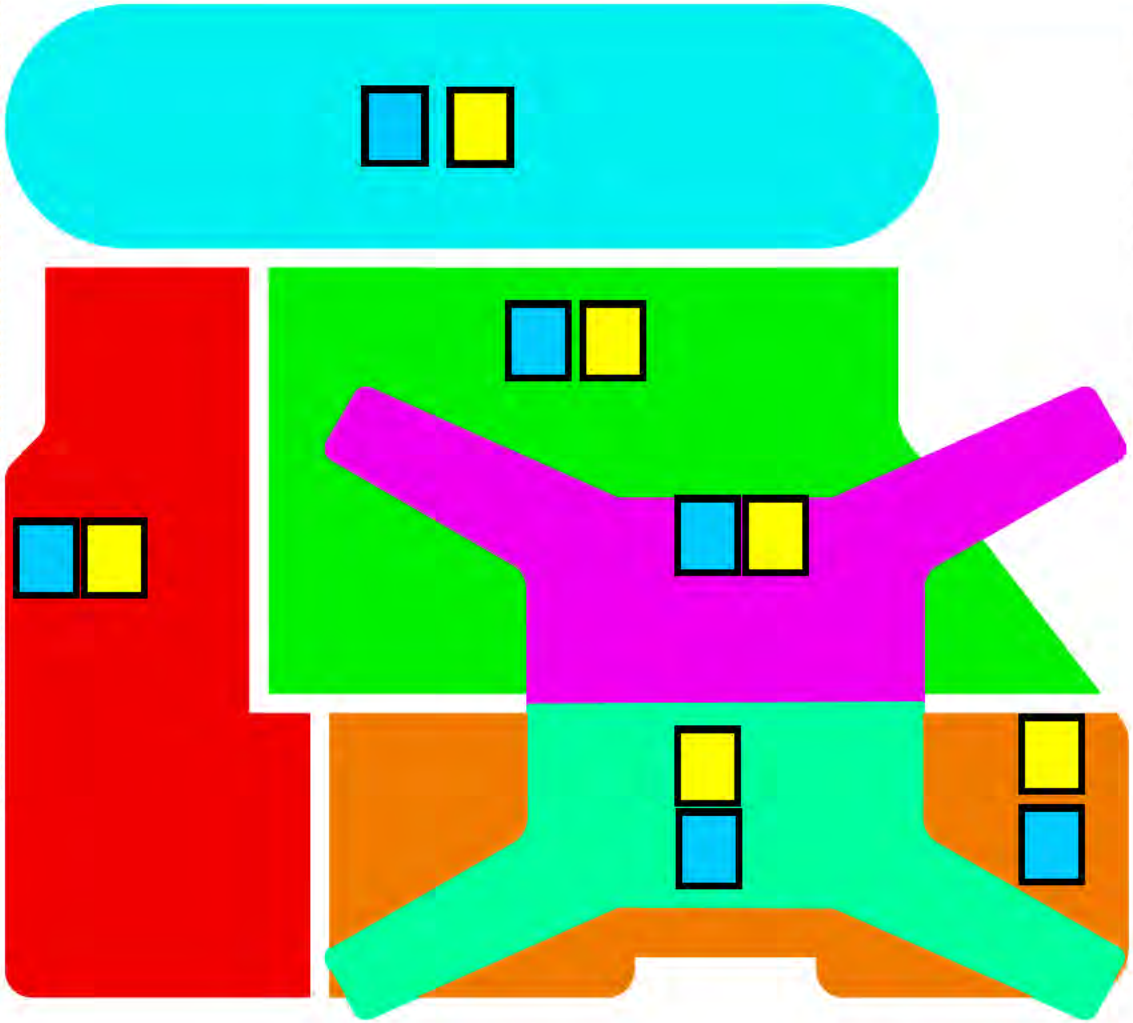
Resilience – electrical



6 electrical zones

One substation per zone

Resilience – electrical

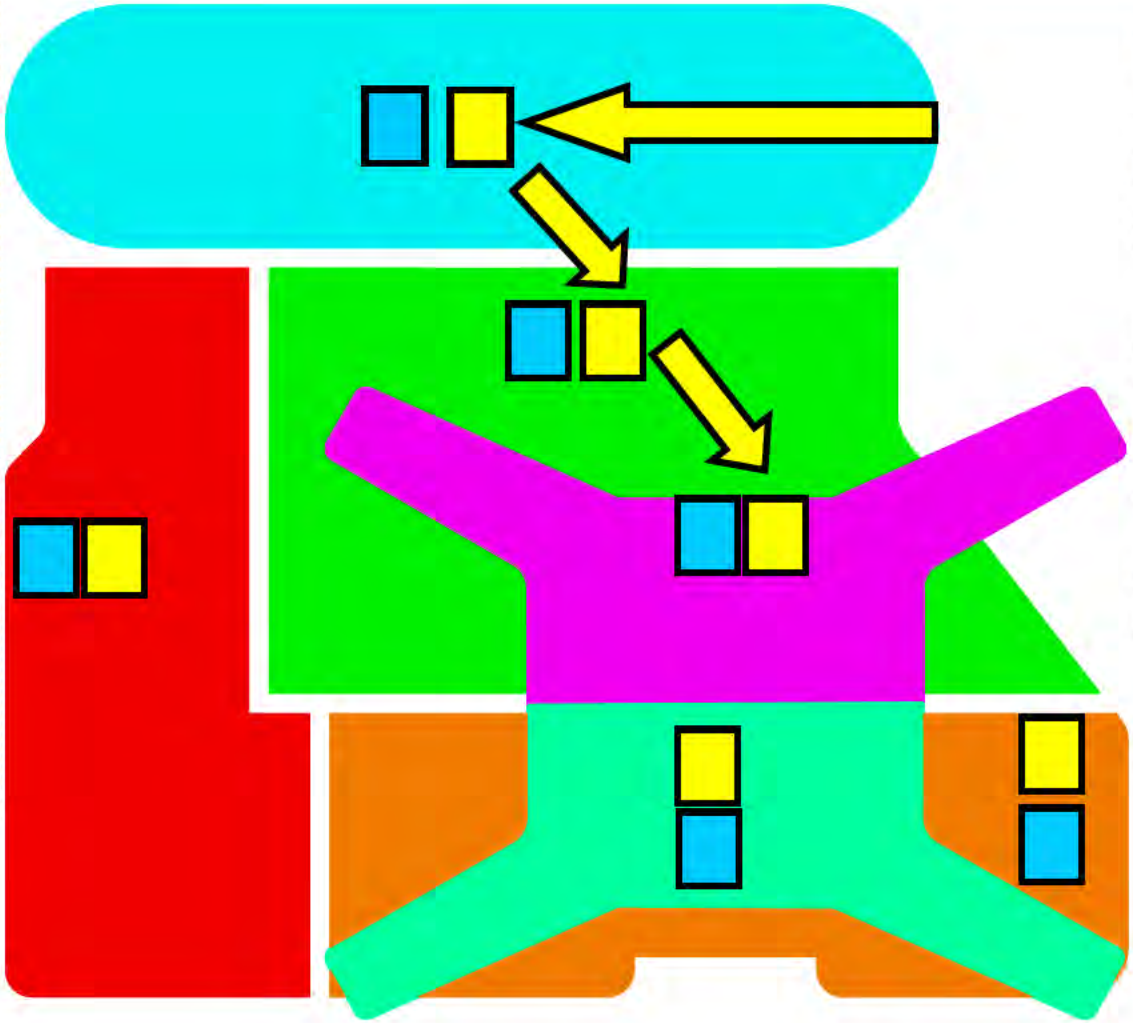


6 electrical zones

One substation per zone

Pair of transformers per substation

Resilience – electrical



6 electrical zones

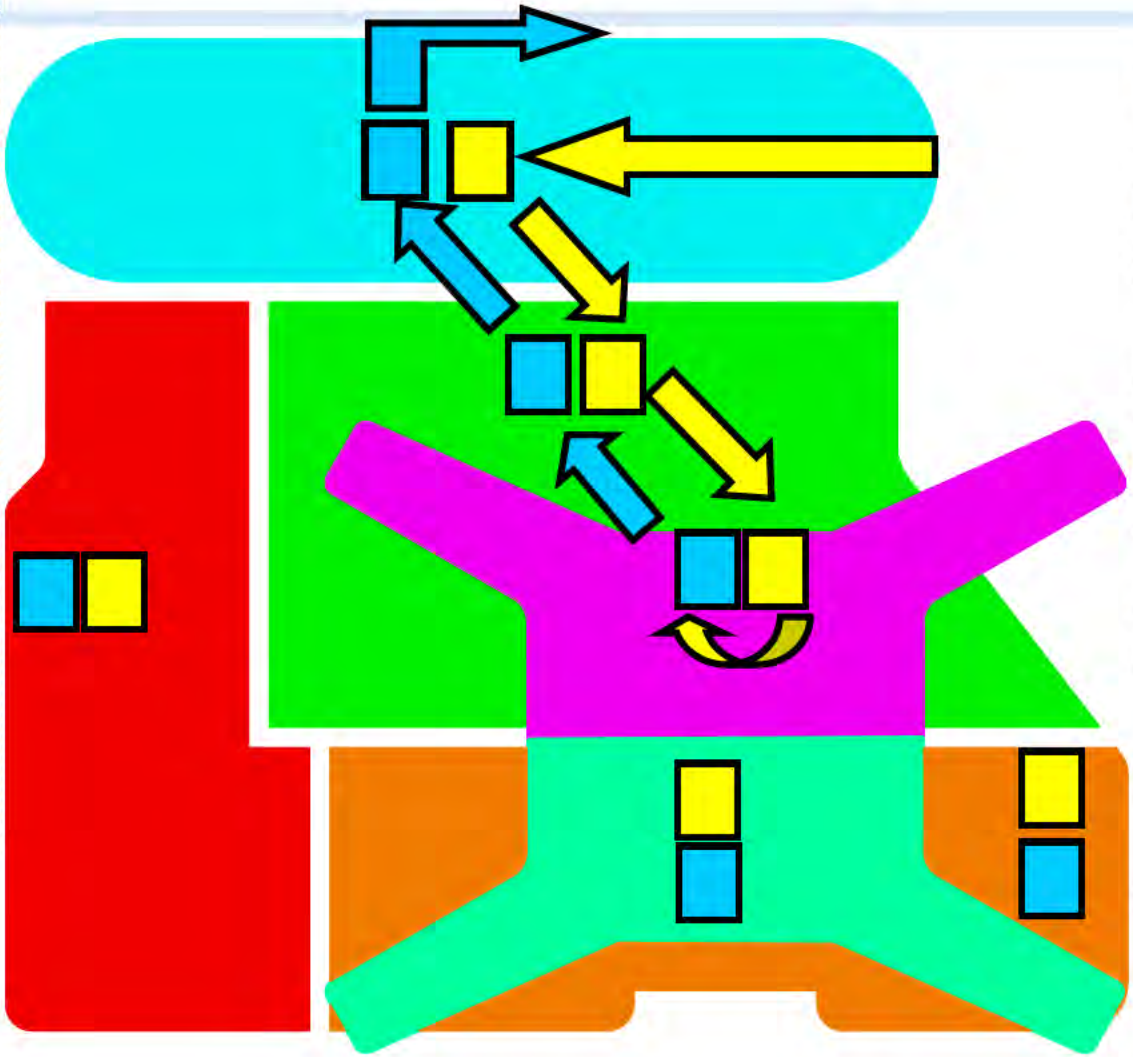
One substation per zone

Pair of transformers per substation

Transformers fed from different parts of the High Voltage network

A side

Resilience – electrical



6 electrical zones

One substation per zone

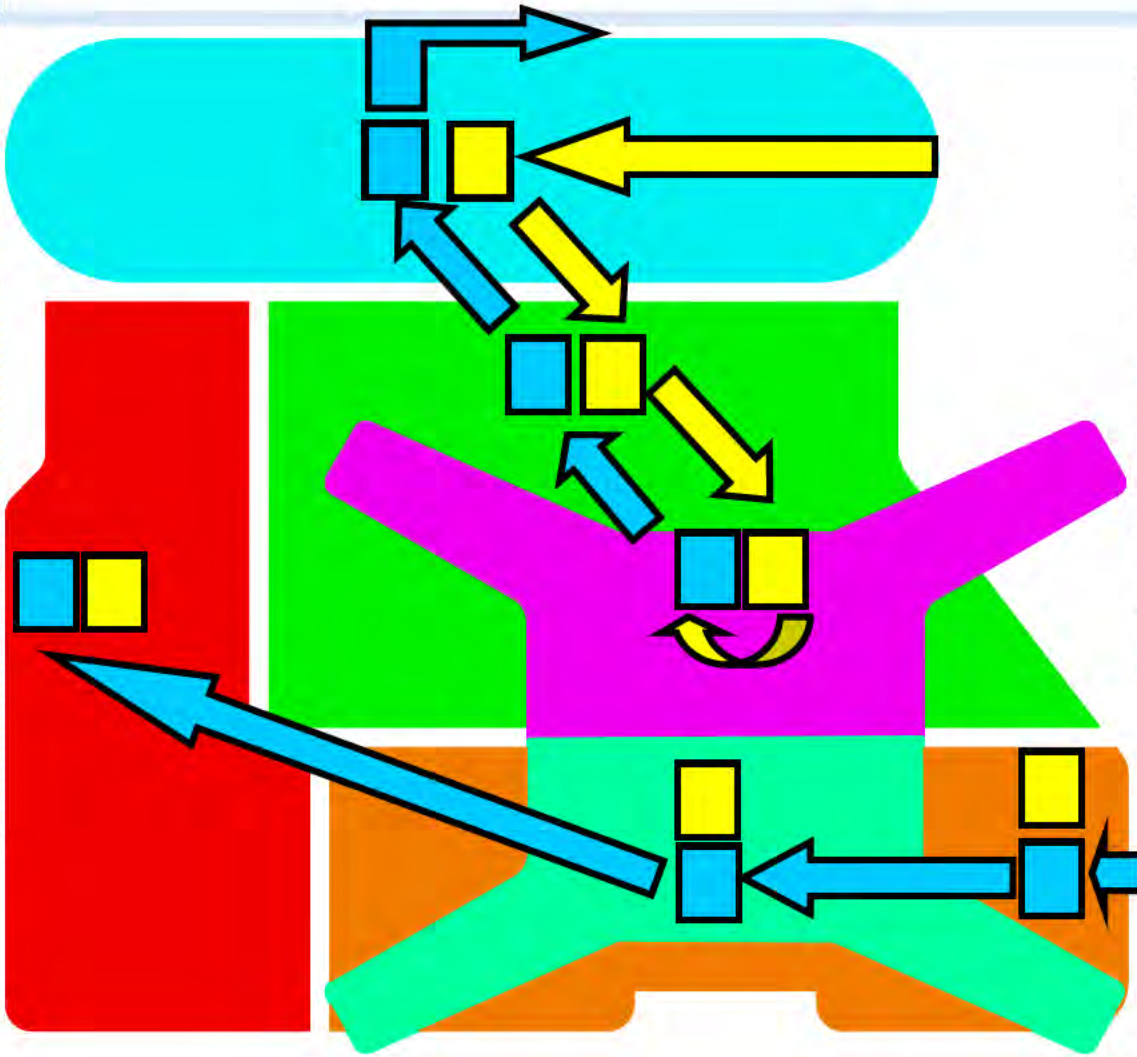
Pair of transformers per substation

Transformers fed from different parts of the High Voltage network

A side

and B side

Resilience – electrical



6 electrical zones

One substation per zone

Pair of transformers per substation

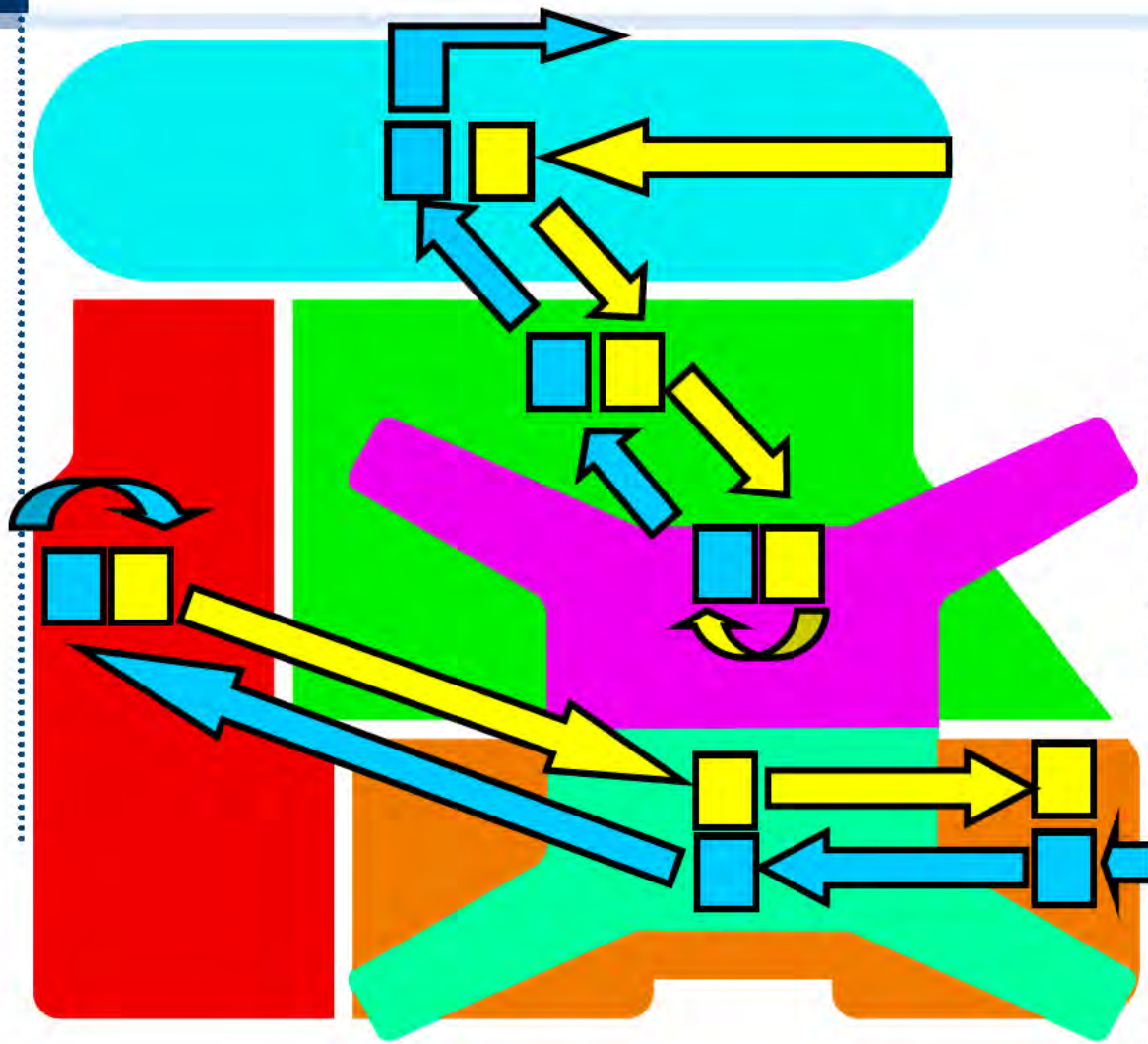
Transformers fed from different parts of the High Voltage network

A side

and B side

2 x 11,000V rings

Resilience – electrical



6 electrical zones

One substation per zone

Pair of transformers per substation

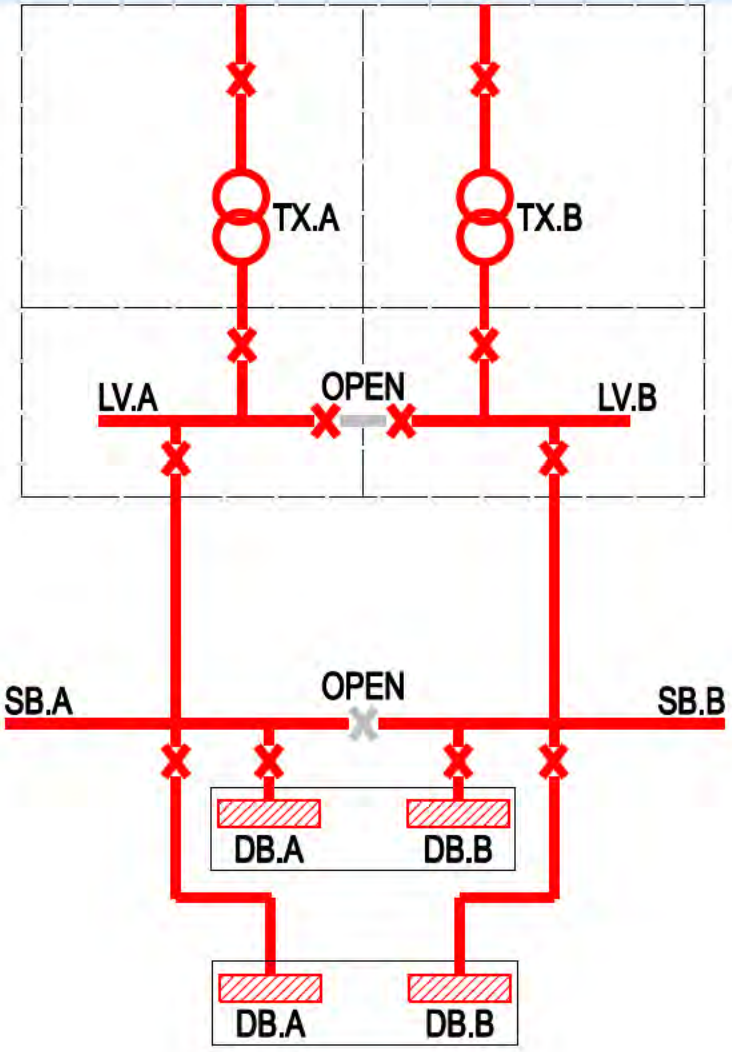
Transformers fed from different parts of the High Voltage network

A side

and B side

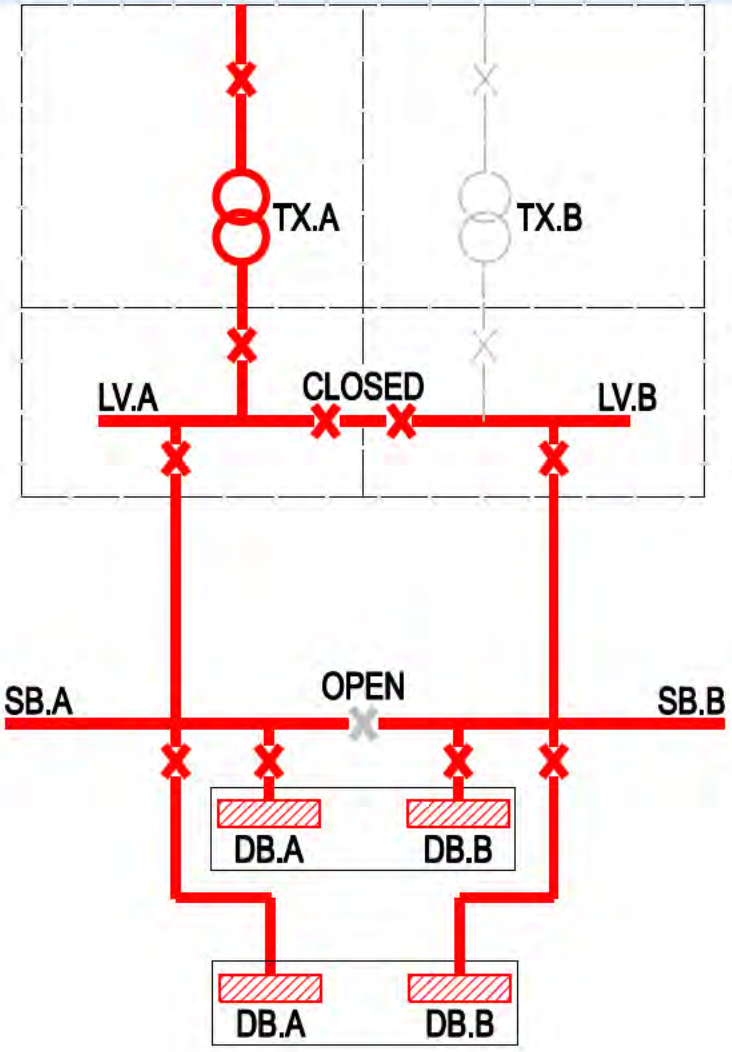
2 x 11,000V rings

Resilience - power



Mains healthy condition
- dual redundancy
- 4h fire separation ----

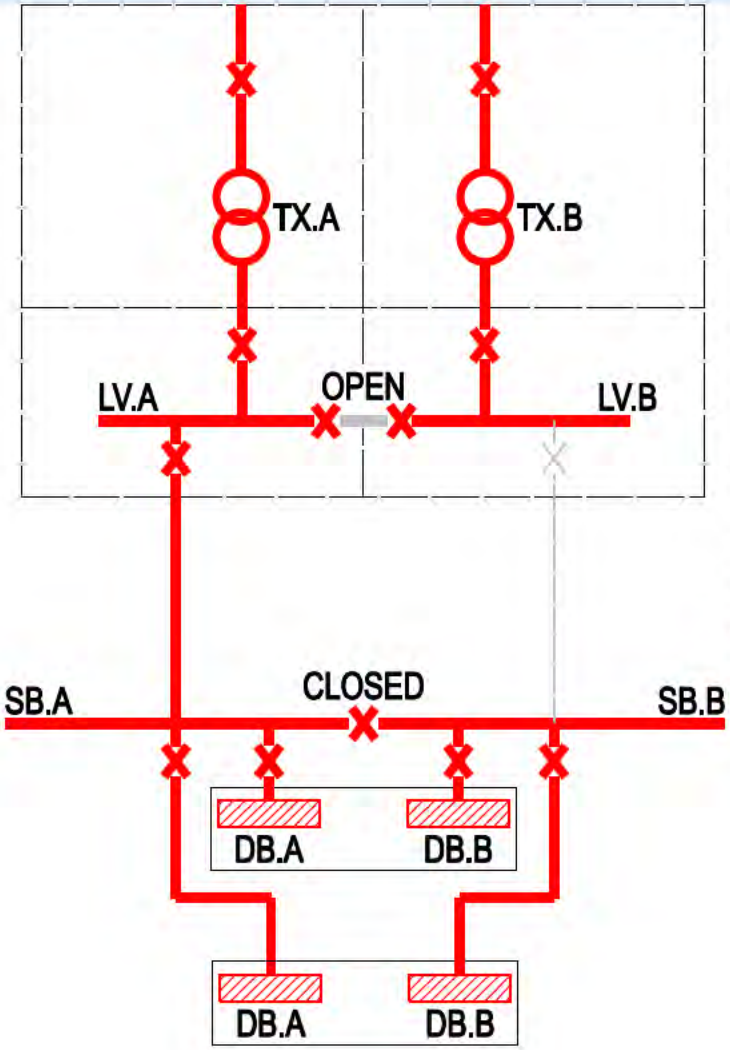
Resilience - power



Mains healthy condition
-dual redundancy
-4h fire separation

Loss of one transformer
- transformers 100% rated

Resilience - power

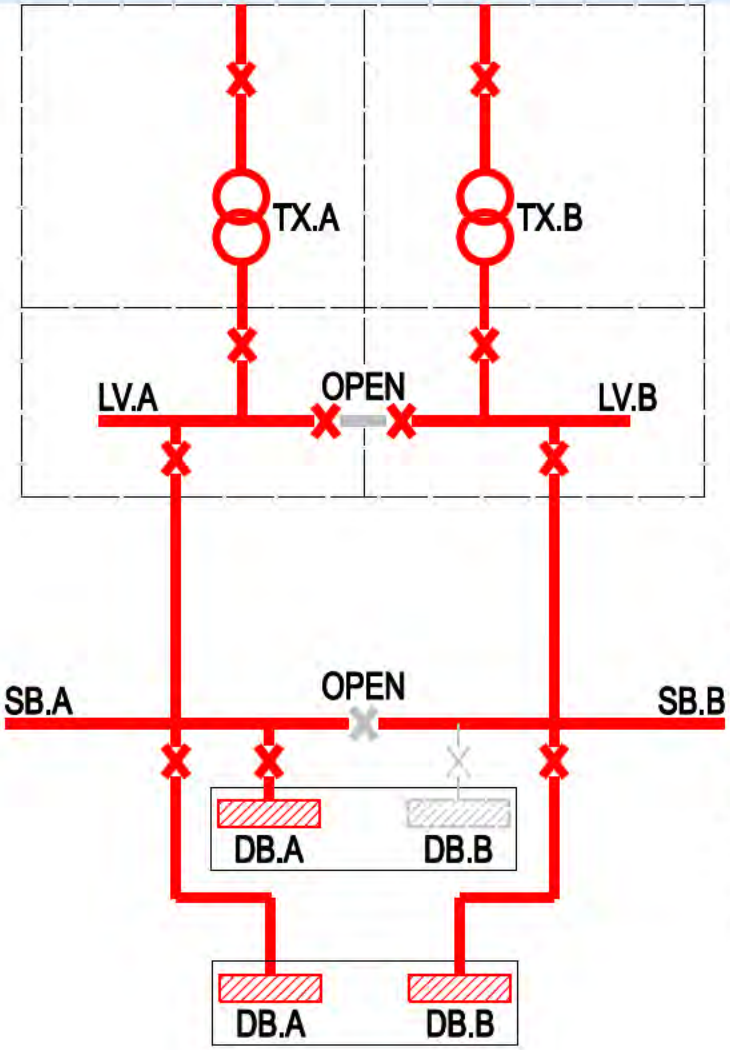


Mains healthy condition
-dual redundancy
-4h fire separation

Loss of one transformer
-transformers 100% rated

Loss of sub-mains
-sub-mains 100% rated

Resilience - power



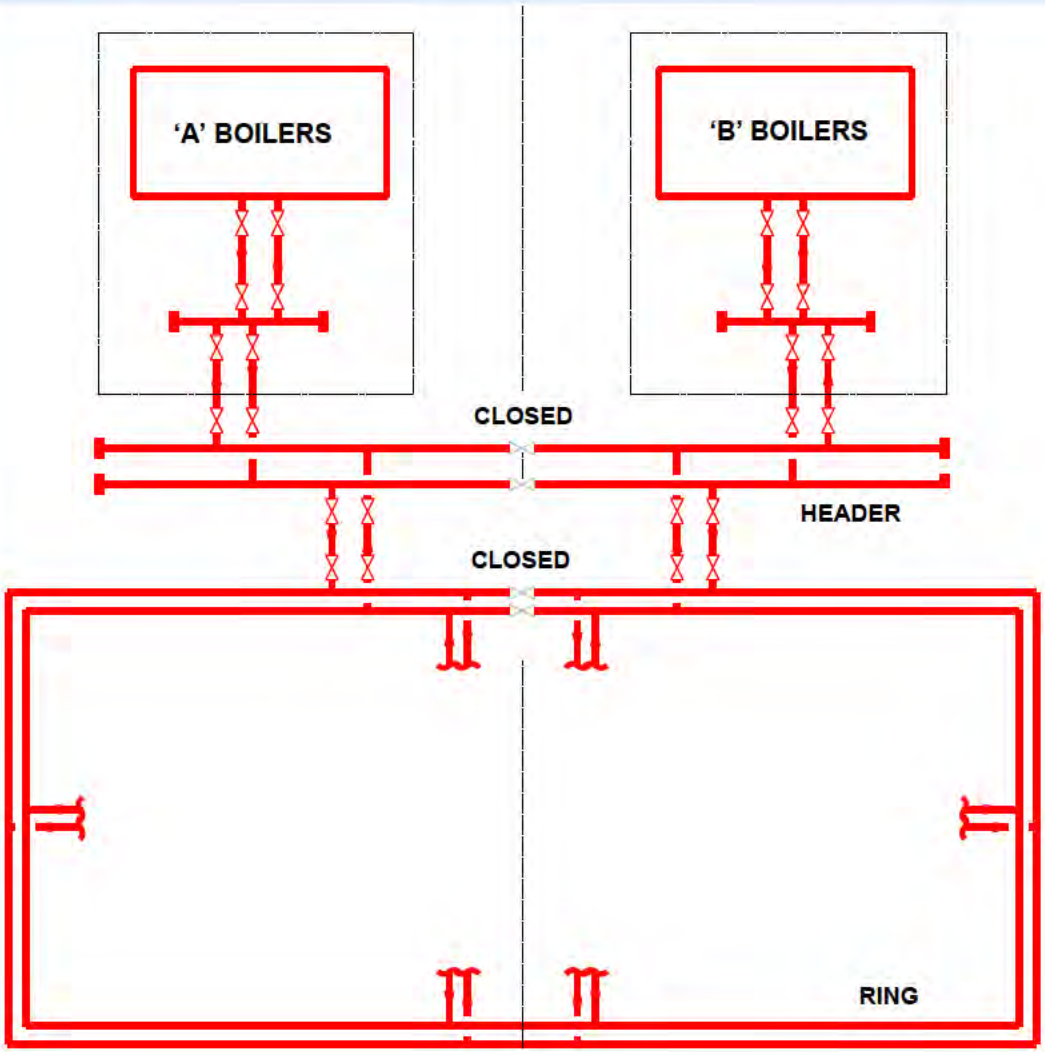
Mains healthy condition
-dual redundancy
-4h fire separation

Loss of one transformer
-transformers 100% rated

Loss of sub-mains
-sub-mains 100% rated

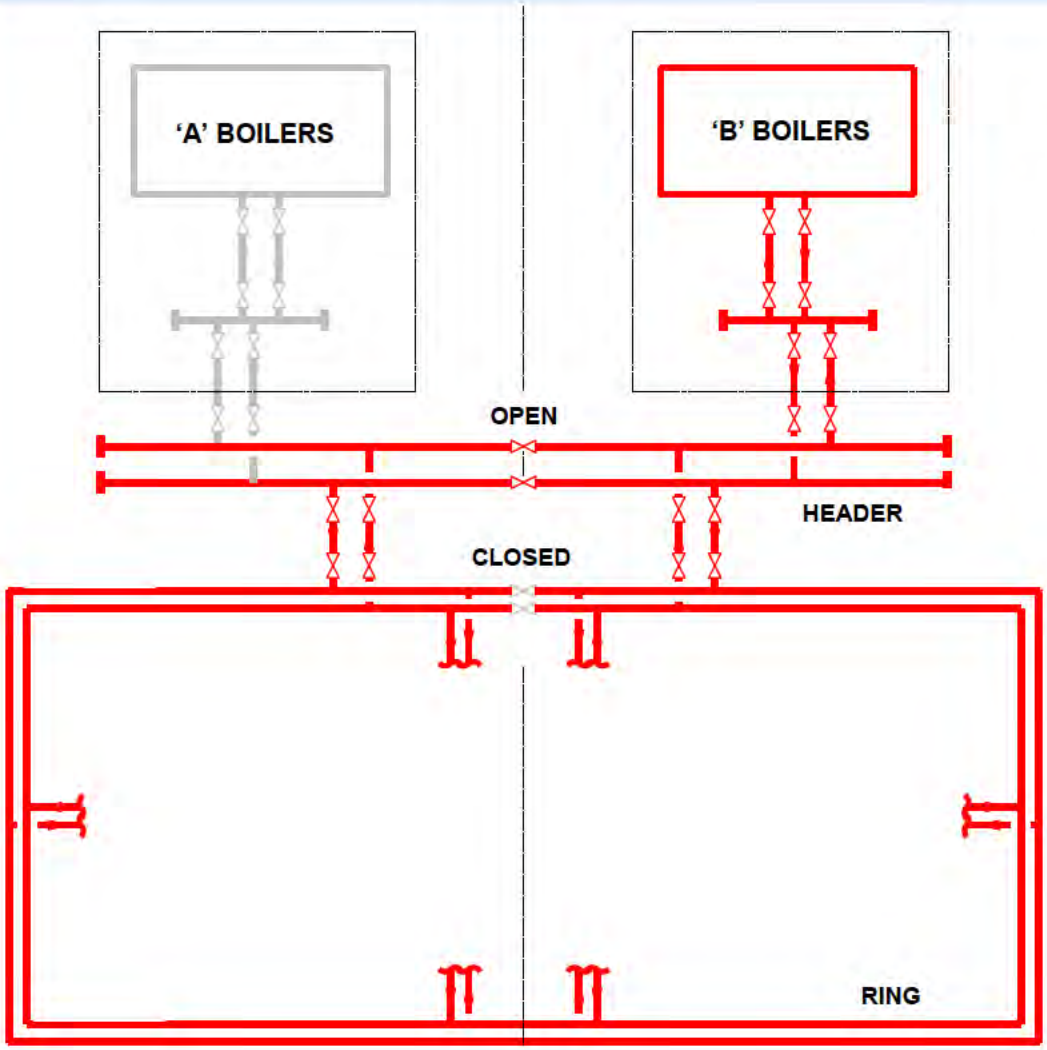
Loss of final distribution board
- Final circuits interleaved

Resilience - heating



Normal Operation
-redundancy
-fire separation

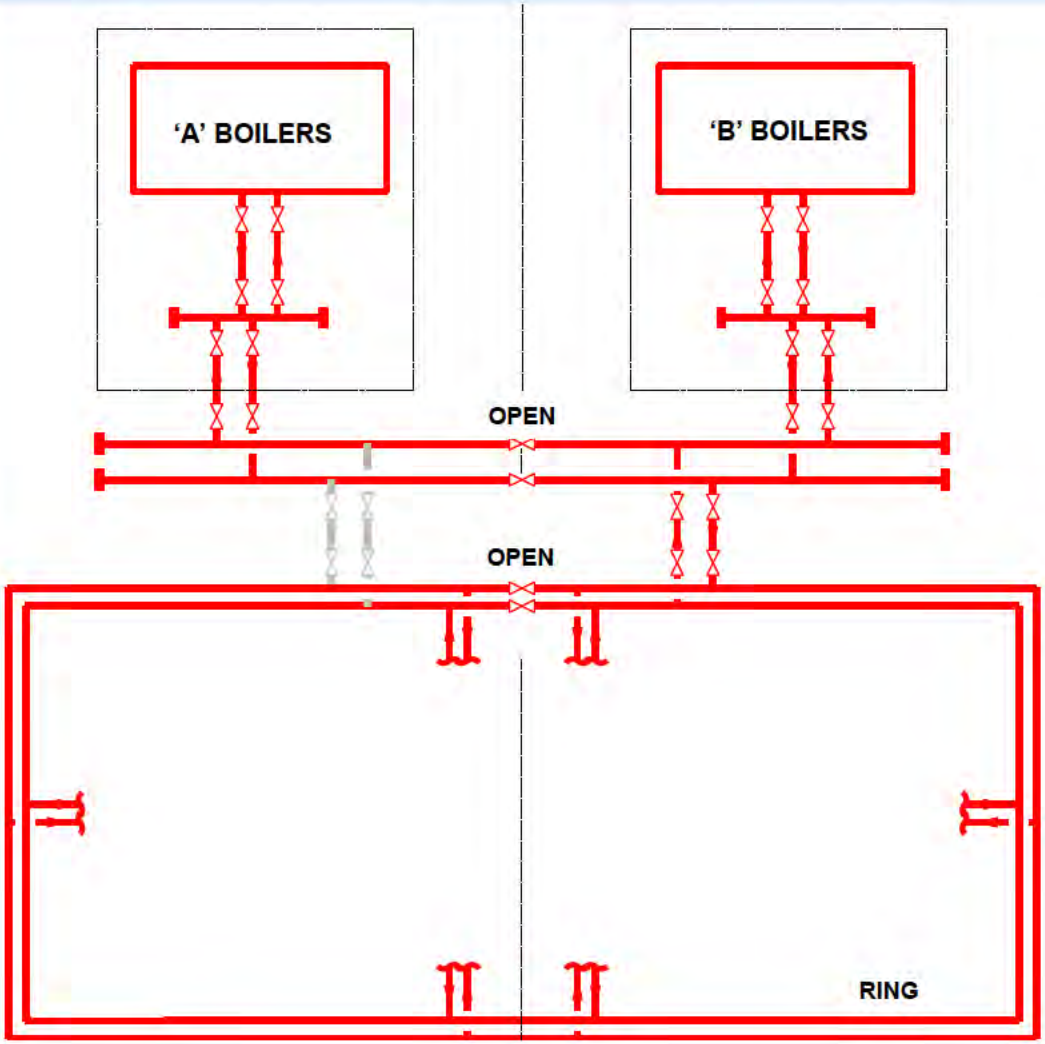
Resilience - heating



Normal Operation
-redundancy
-fire separation

Loss of one boiler room
-88% capacity available

Resilience - heating



Normal Operation
-redundancy
-fire separation

Loss of one boiler room
-88% capacity available

Loss of riser
-100% capacity available

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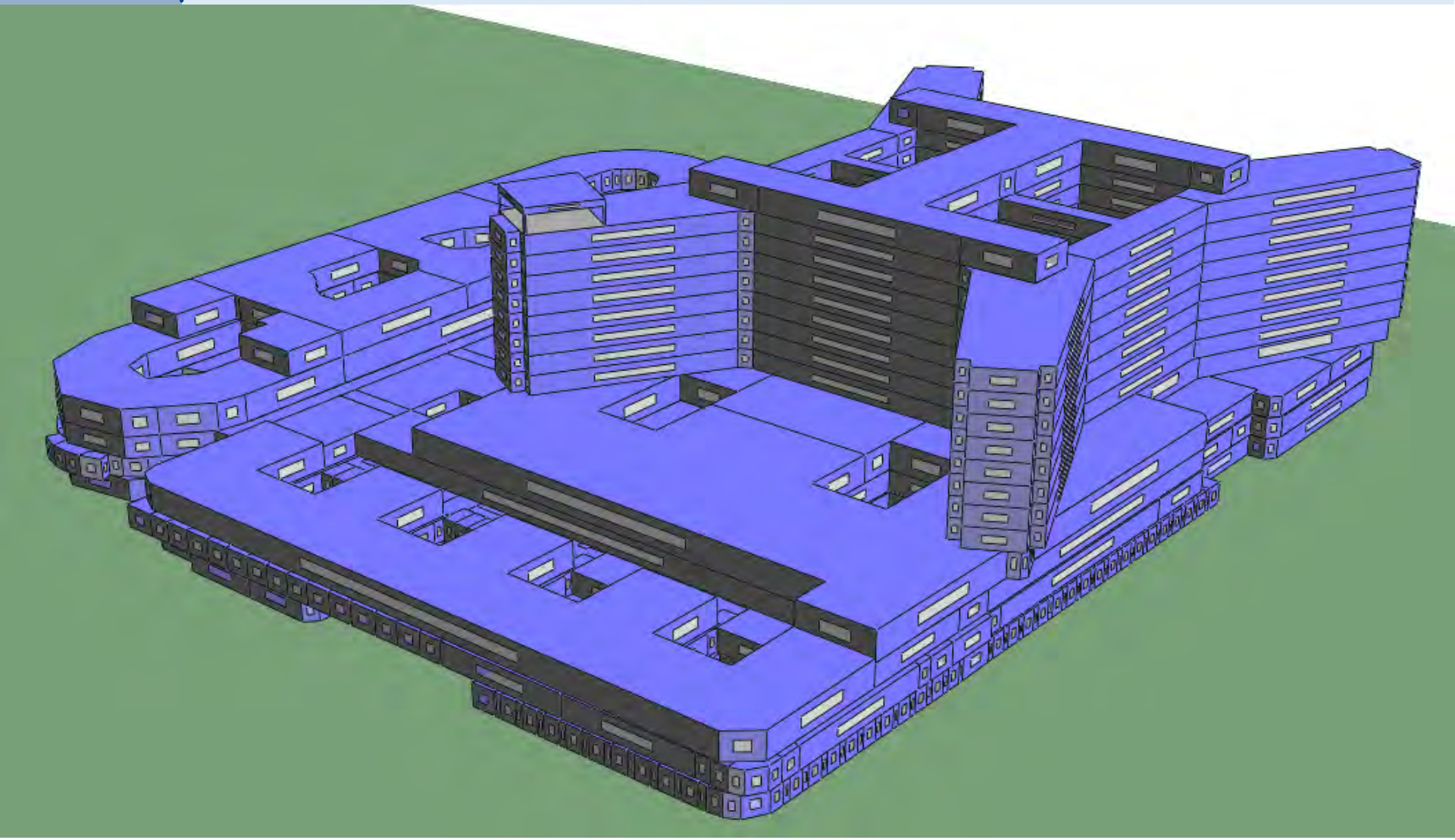
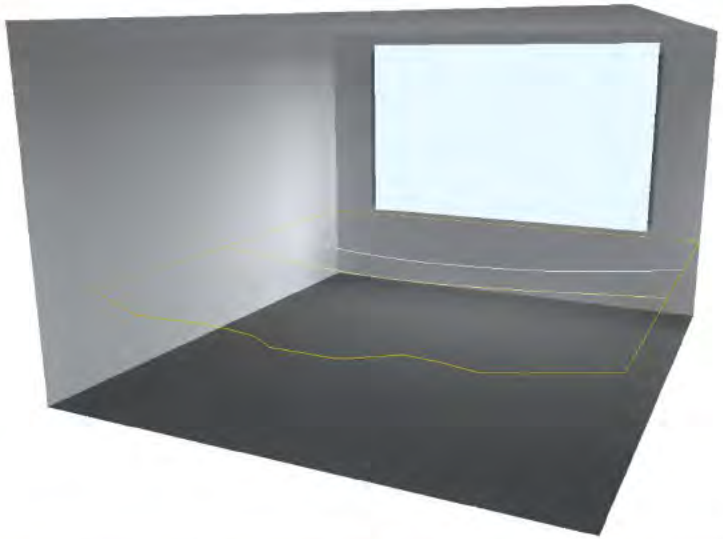
Design tools



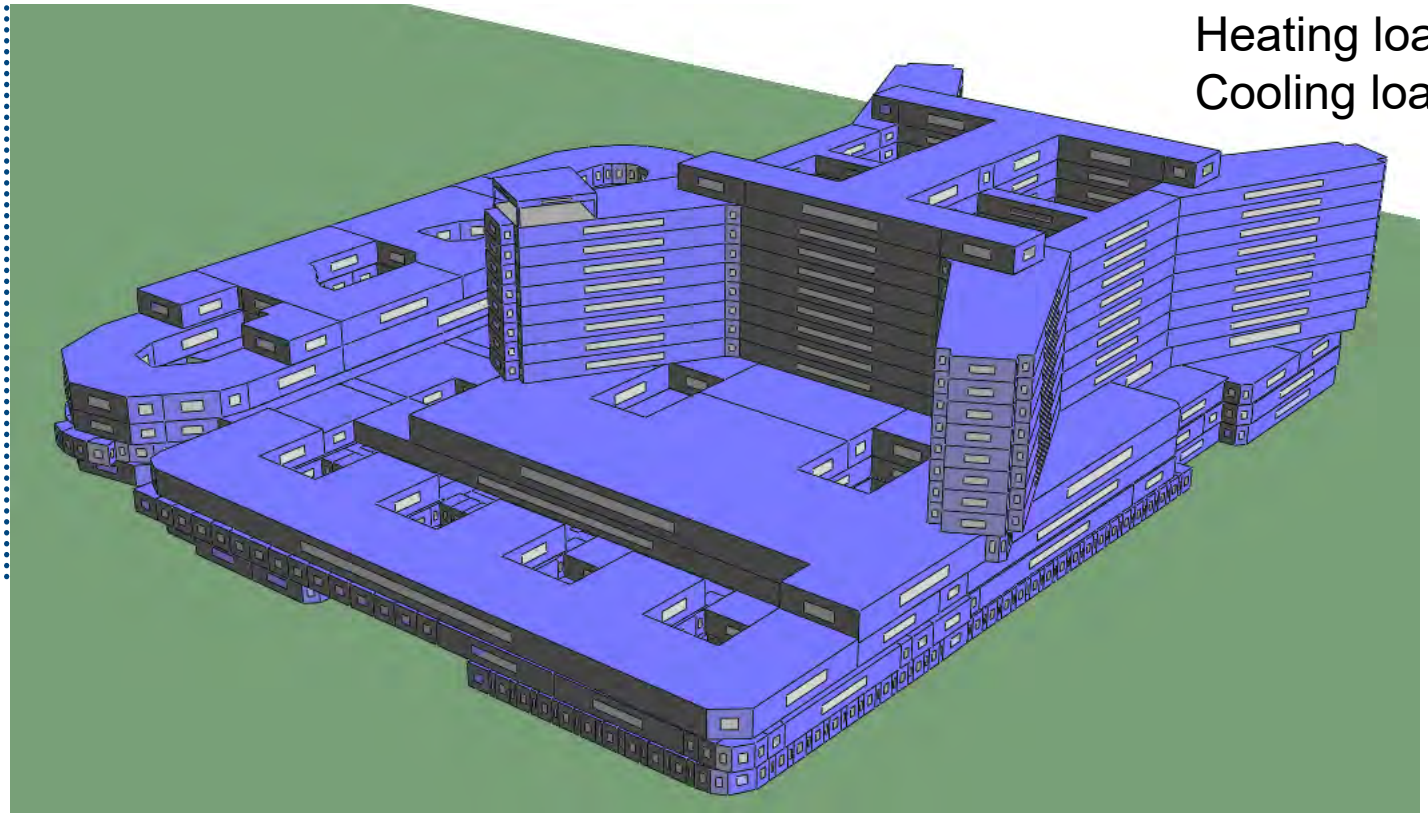
Design tools – Lighting Design



Daylight calculations.
Artificial lighting control linked to daylight.
Bi directional link between calculation and CAD software.
3D modelling.
Automatic materials scheduling.

Design tools – Thermal Modelling

Energy Performance Certificate (EPC).
Natural ventilation.
Hours of overheating.
Heating load.
Cooling load.



NHS Greater Glasgow and Clyde

Low Carbon Design

Energy & Carbon Targets

1) Energy Consumption

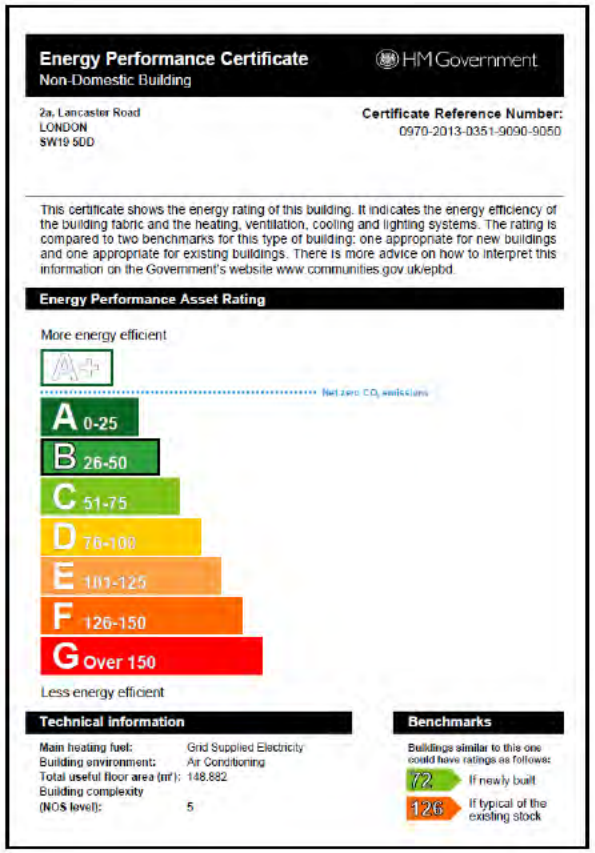
- Below 55GJ/100M^3/Year

2) Carbon Emissions

- Below 80kgCO^2/M^2/Year

3) Energy Performance Certificate Asset Rating

- Less than 40



Energy Performance Certificate
Non-Domestic Building

HM Government

2a, Lancaster Road
LONDON
SW19 5DD

Certificate Reference Number:
0970-2013-0351-9090-9050

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information on the Government's website www.communities.gov.uk/epbd.

Energy Performance Asset Rating

More energy efficient

Net zero CO_2 emissions

A 0-25
B 26-50
C 51-75
D 76-100
E 101-125
F 126-150
G Over 150

Less energy efficient

Technical information

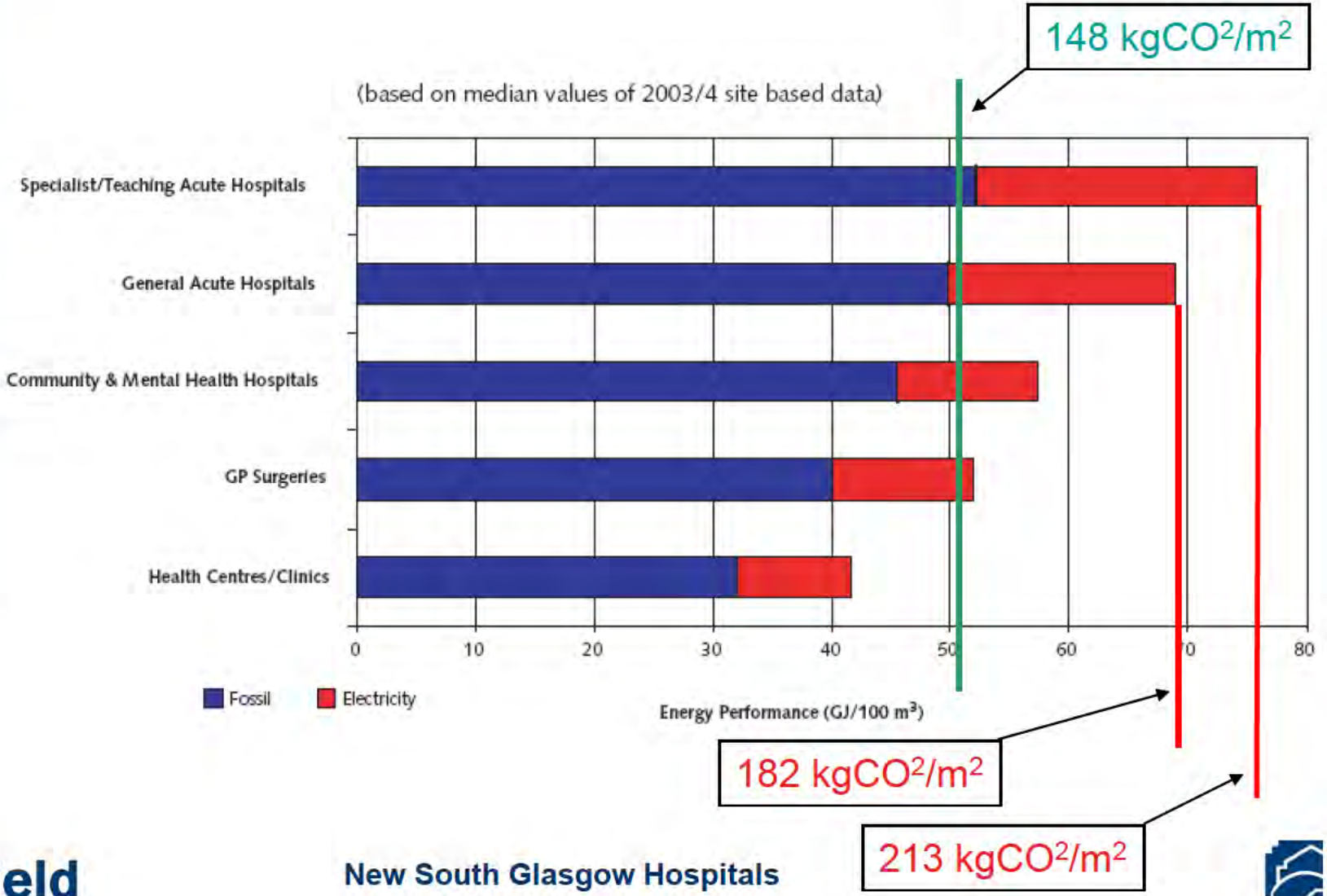
Main heating fuel:	Grid Supplied Electricity
Building environment:	Air Conditioning
Total useful floor area (m^2):	148,882
Building complexity (NOS level):	5

Benchmarks

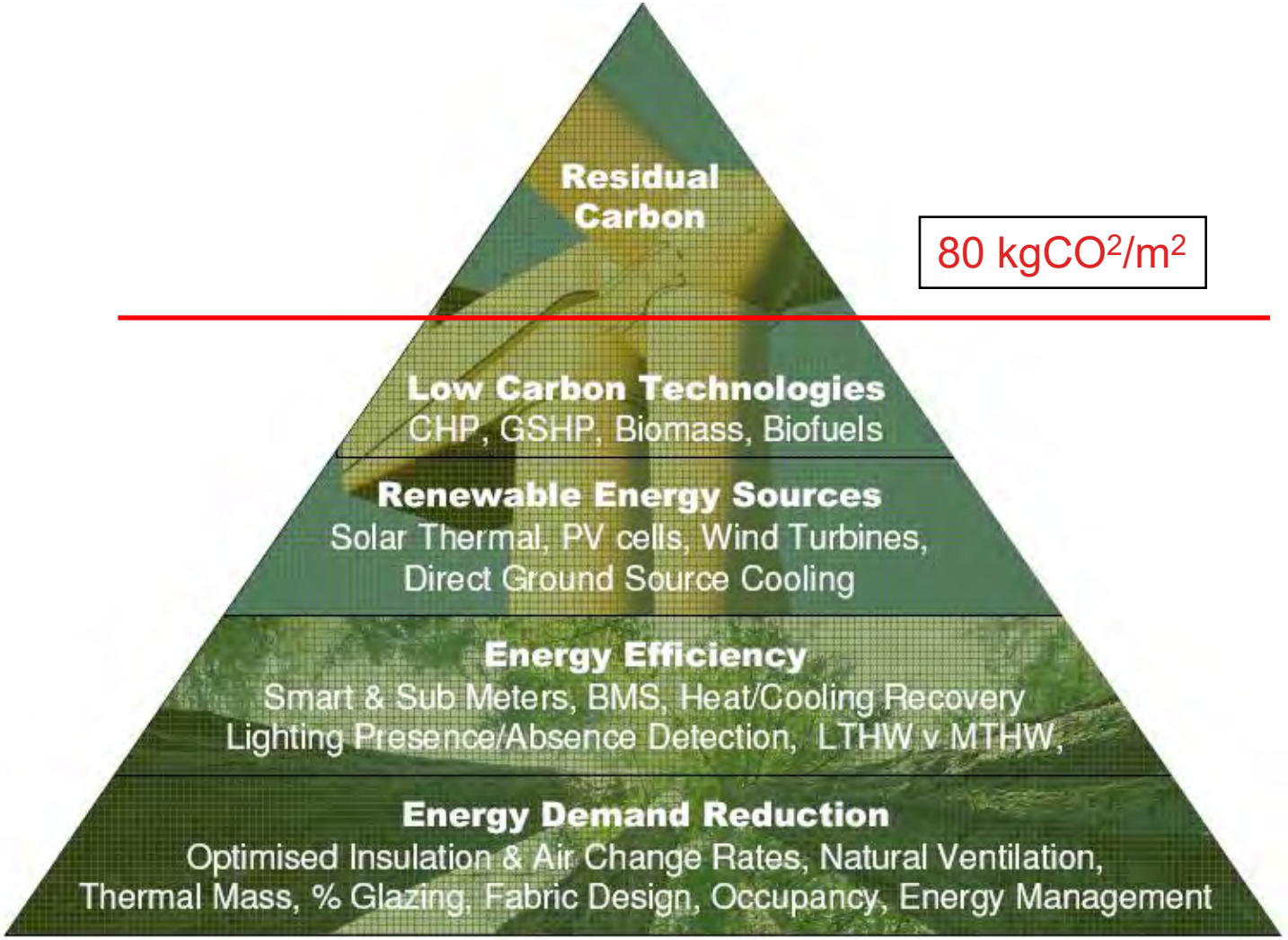
Buildings similar to this one could have ratings as follows:

72 If newly built
126 If typical of the existing stock

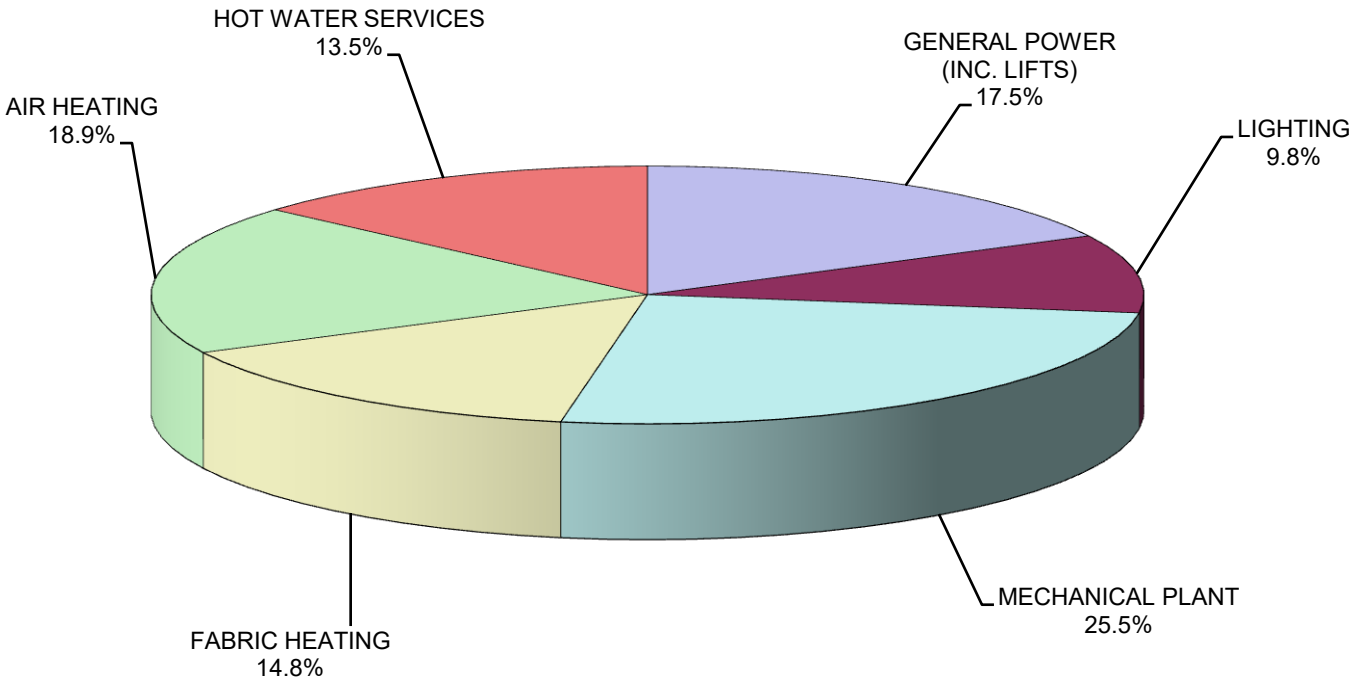
Extent of the CO^2 Challenge



Energy Reduction Process

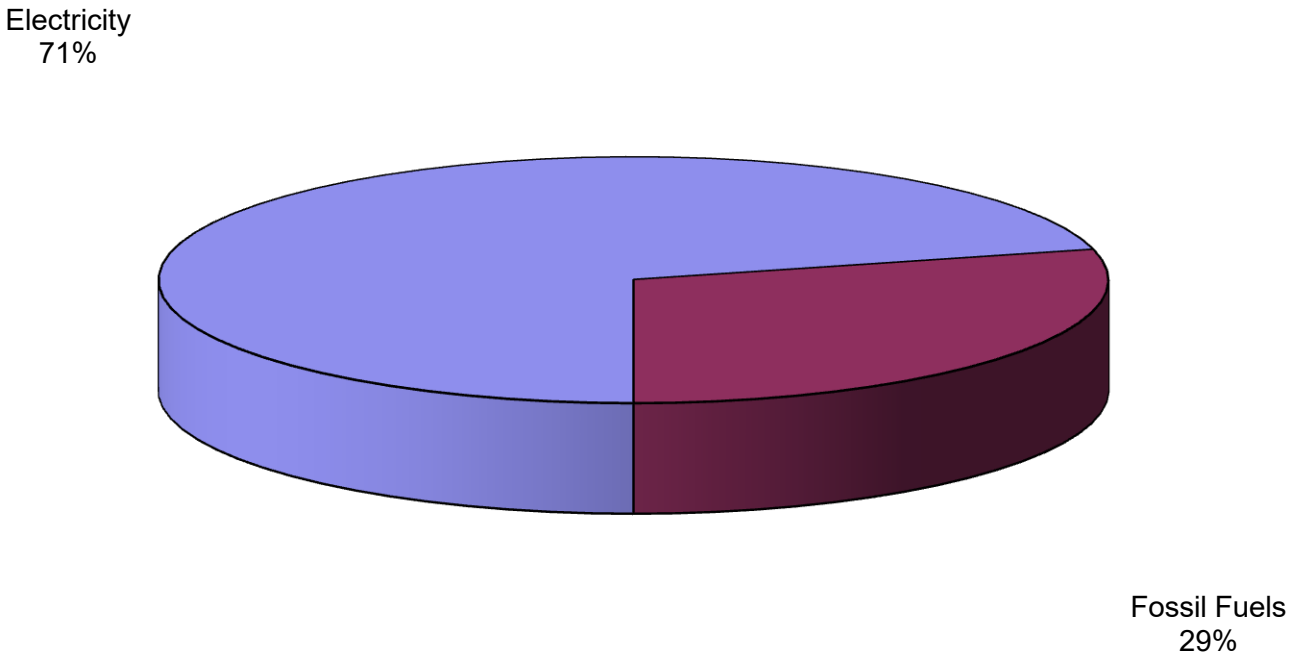


NSGH Energy Consumption Assessment



Predicted Energy Demand 42 to 44 GJ/100M^3/Year

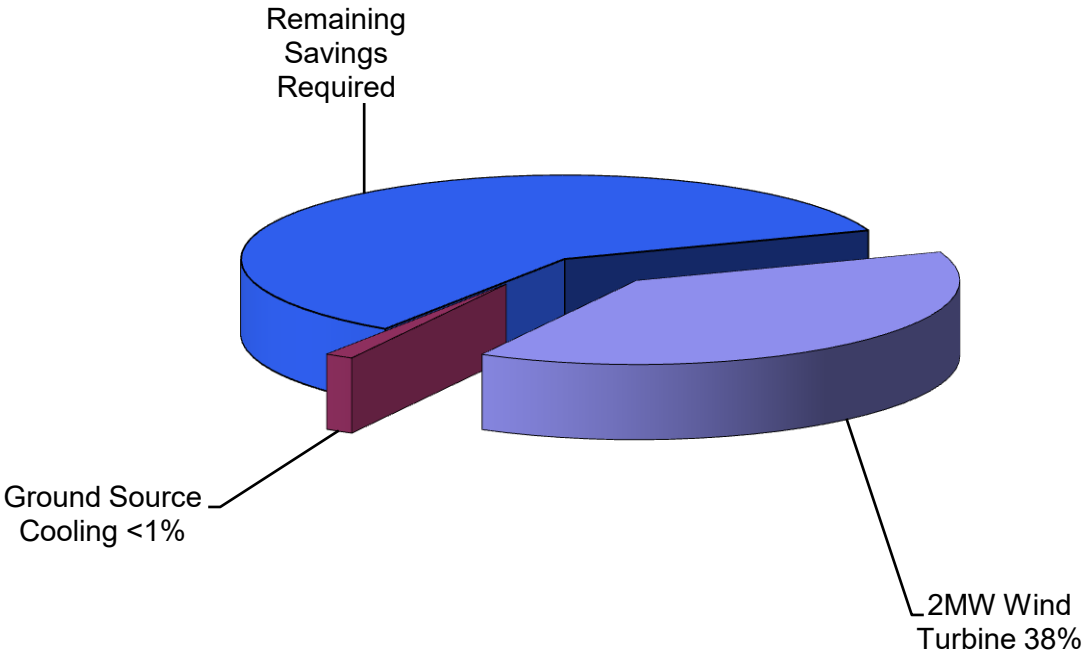
NSGH CO^2 Emissions



Predicted Carbon Before Supply Consideration 135 $kgCO^2/m^2$

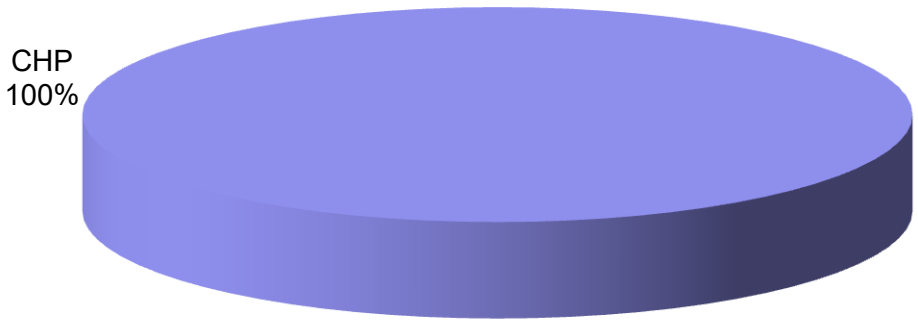
CO^2 Supply Reduction Alternatives

Off Site Wind Turbine & Direct Cooling



CO^2 Supply Reduction Proposal

CHP & Absorption Cooling



Final CO^2 Emissions 80 $kgCO^2/m^2$

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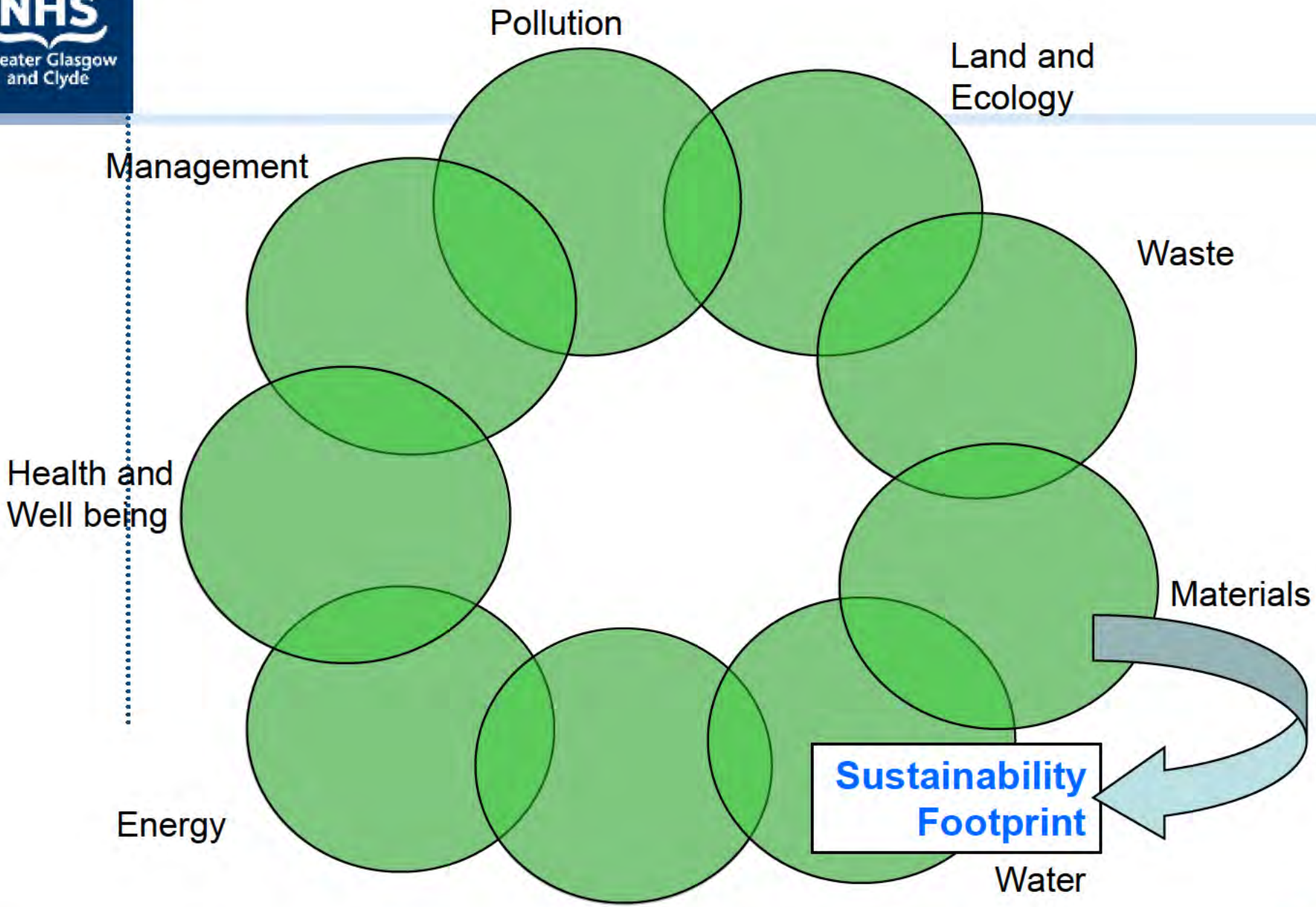
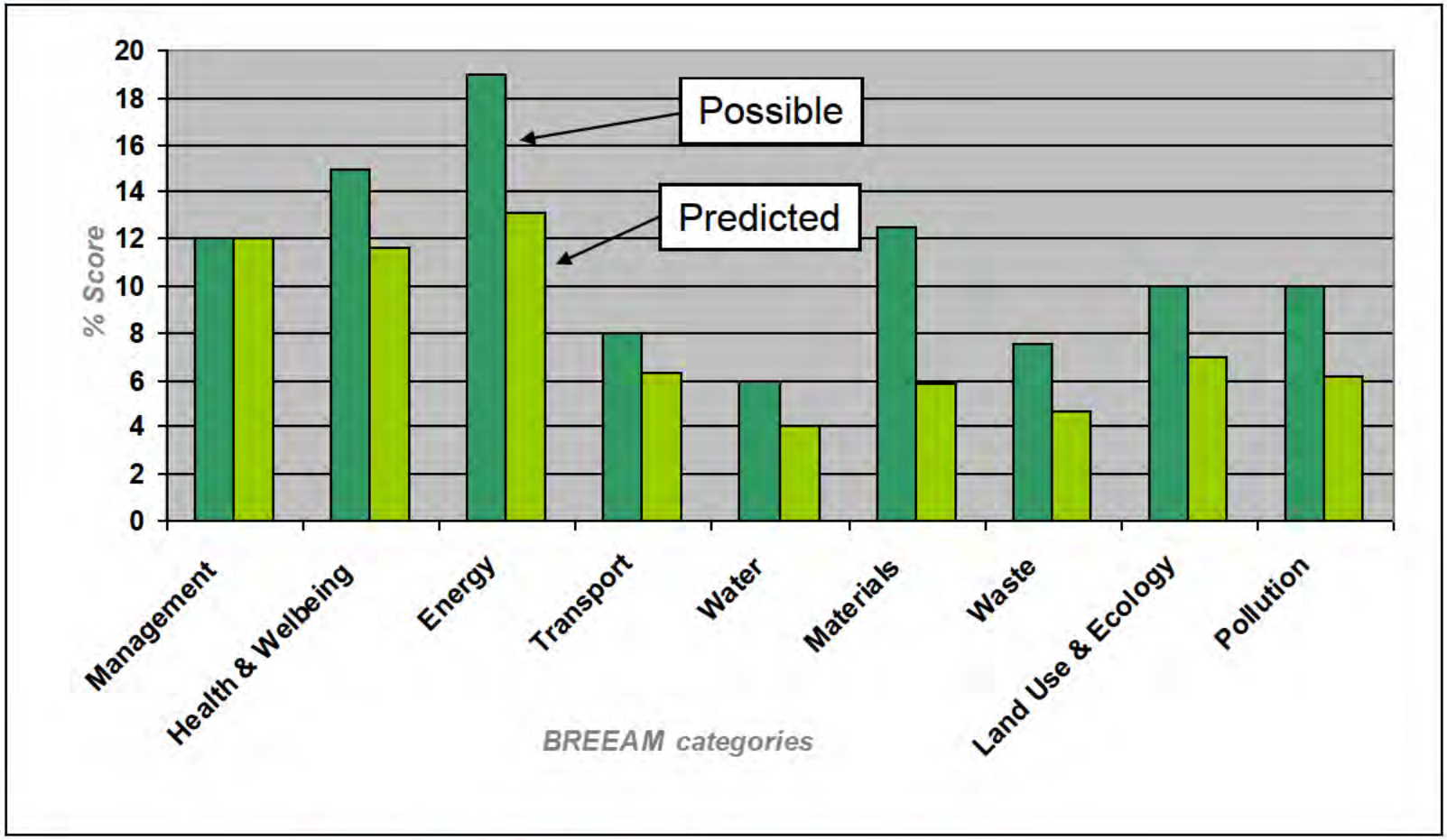
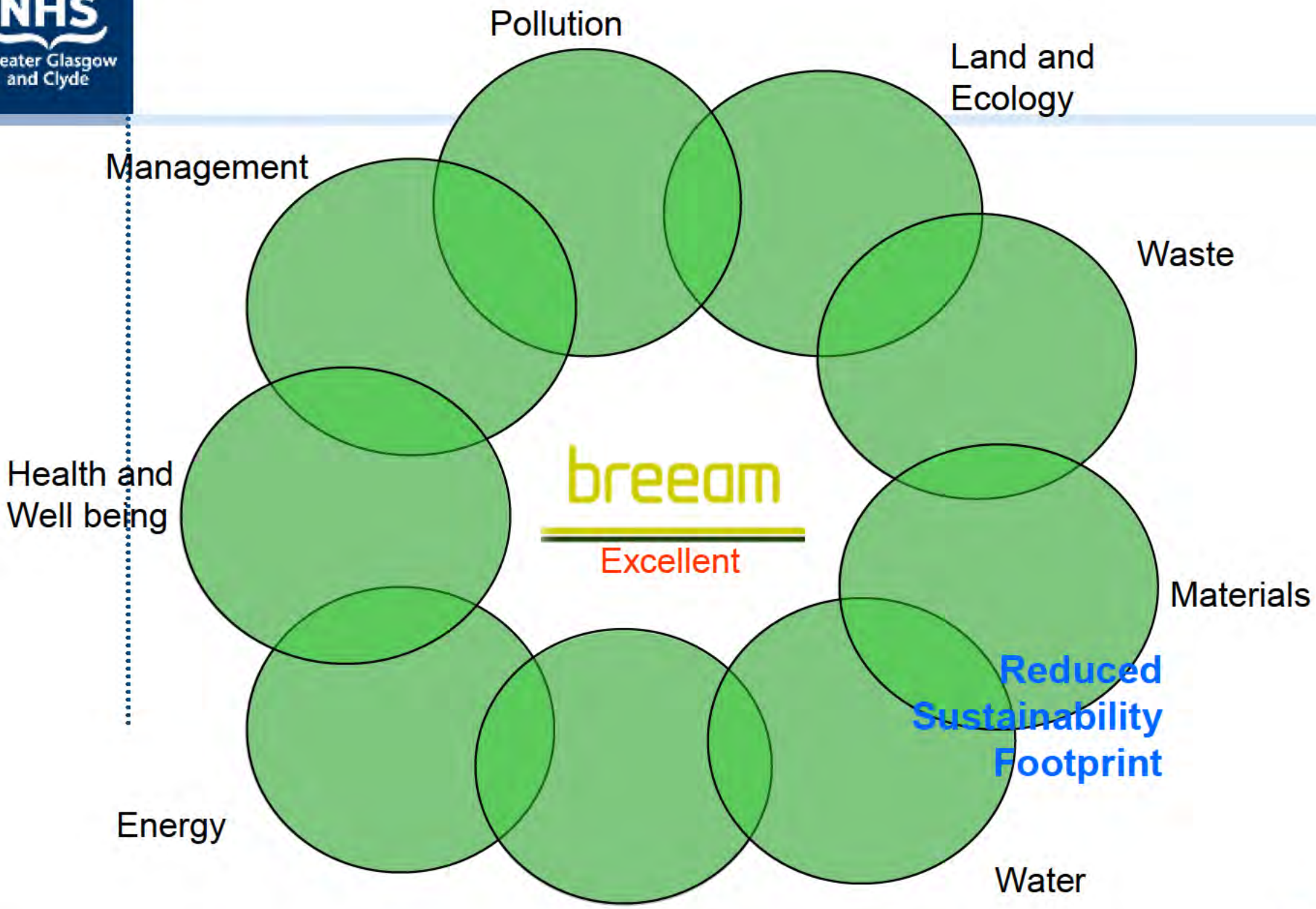
Sustainability - BREEAM


Pollution
Land and Ecology
Management
Waste
Health and Well being
Materials
Sustainability Footprint
Energy
Water
Transport

BREEAM Score



Predicted Score 72.8 Excellent Rating


Pollution
Land and Ecology
Management
Waste
Health and Well being
breeam
Excellent
Materials
Reduced Sustainability Footprint
Energy
Water
Transport

Logistics

Overview of our Logistics Strategy

- Delivery Vehicle / Plant Movements
- Accommodation / Welfare Facilities
- Car Parking / Importation of Personnel

Recap of Key Considerations Influencing Strategy

The Site Location

Traffic Congestion on Surrounding Roads

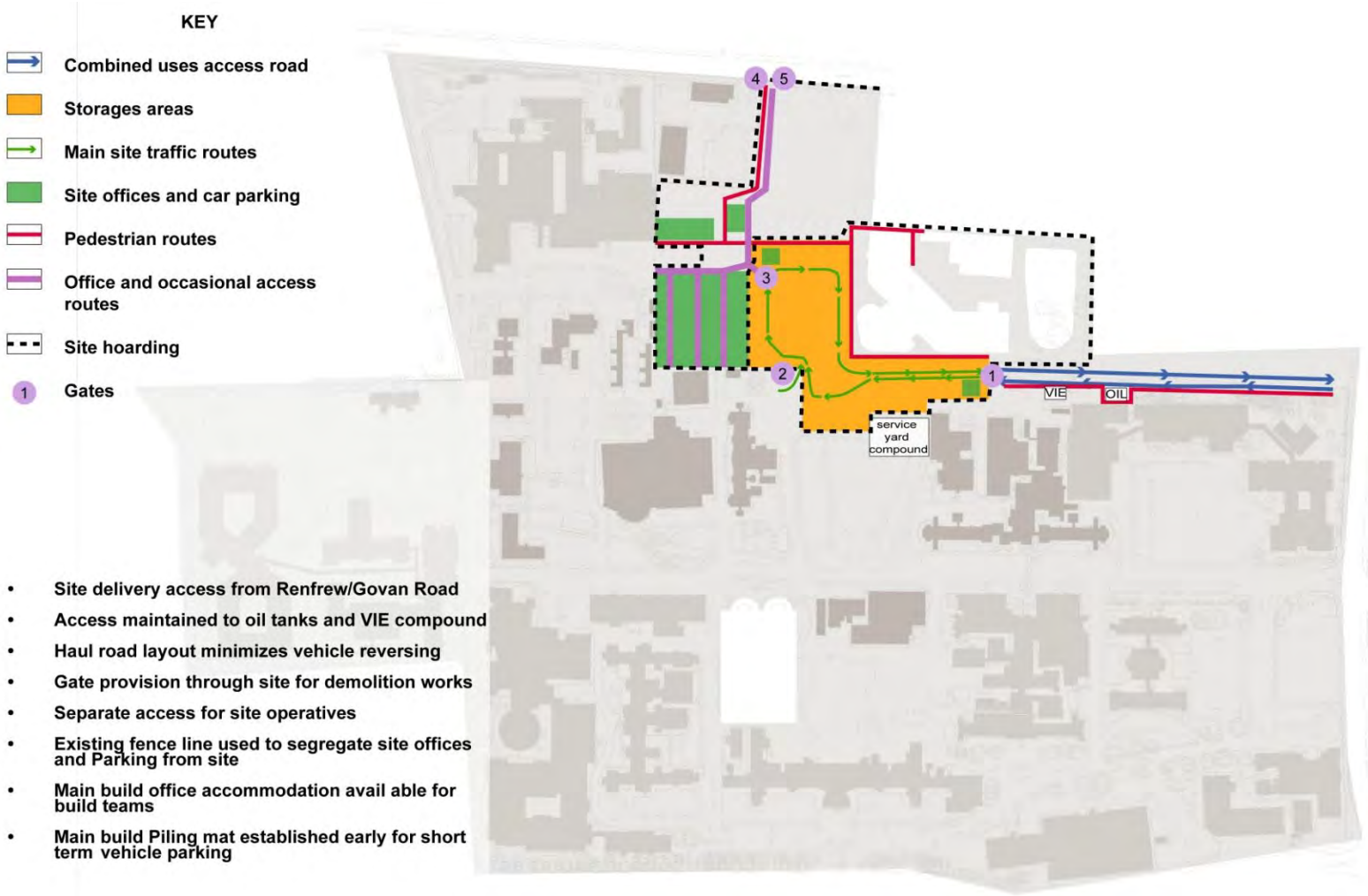
NHS Greater Glasgow and Clyde

Potential Impact on NHS Board Staff Parking

Broo

Preventing Disruption to Existing Hospital Operations

Phase 1 - Laboratories/ FM Build

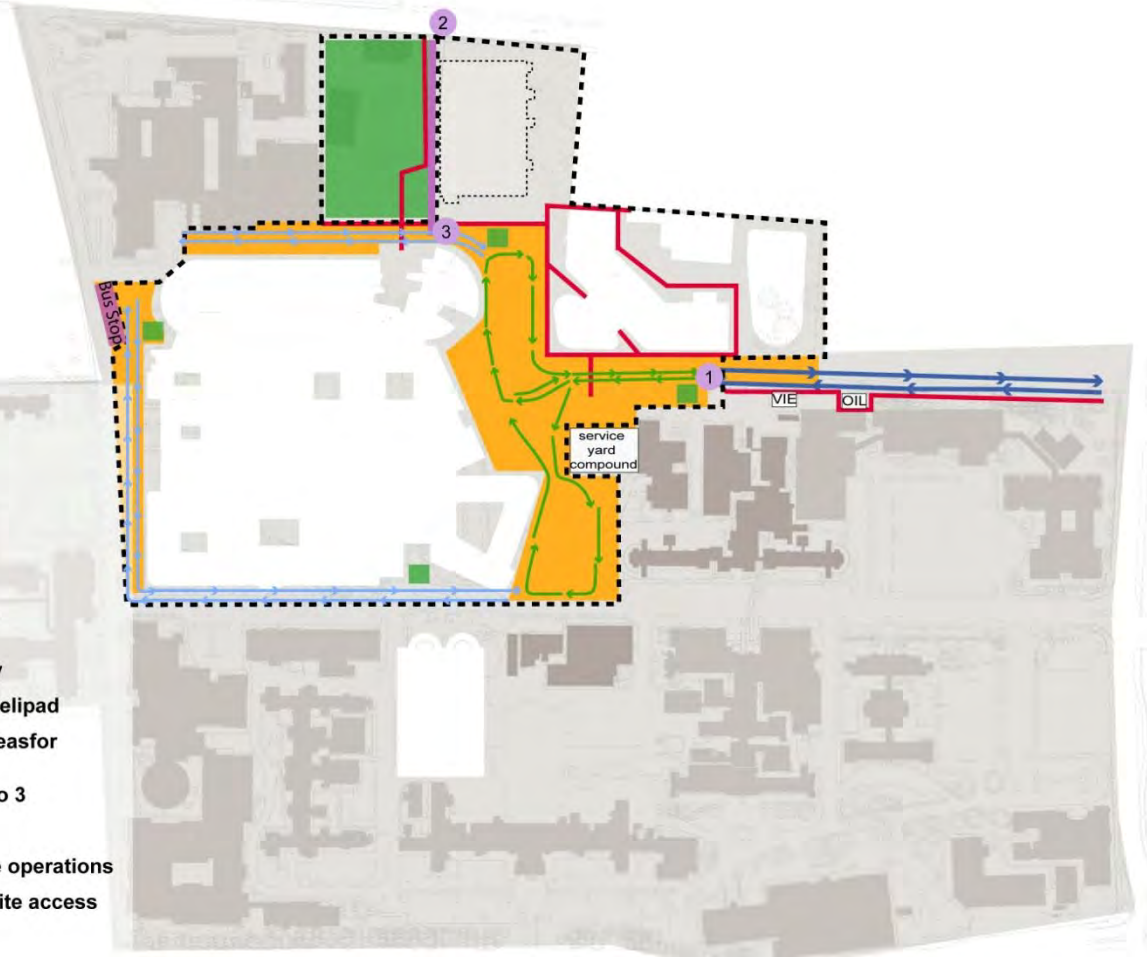


- Site delivery access from Renfrew/Govan Road
- Access maintained to oil tanks and VIE compound
- Haul road layout minimizes vehicle reversing
- Gate provision through site for demolition works
- Separate access for site operatives
- Existing fence line used to segregate site offices and Parking from site
- Main build office accommodation avail able for build teams
- Main build Piling mat established early for short term vehicle parking

Phase 2 – Main Hospital and Laboratories

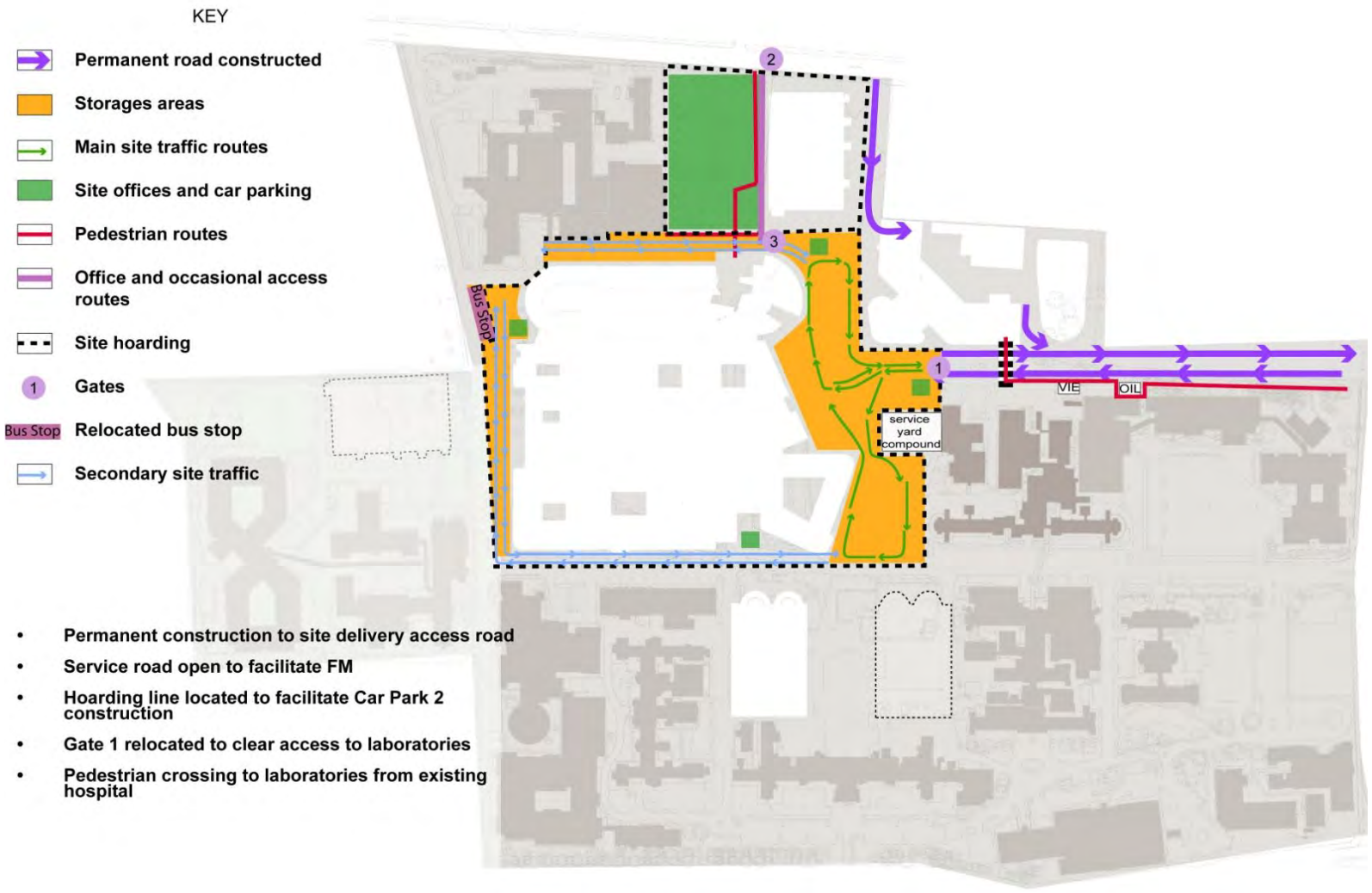
KEY

- Combined uses access road
- Storages areas
- Main site traffic routes
- Site offices and car parking
- Pedestrian routes
- Office and occasional access routes
- Site hoarding
- 1 Gates
- Bus Stop Relocated bus stop
- Secondary site traffic



- Site delivery access maintained from Renfrew/Govan Road
- Bus stop relocated towards Maternity
- Main site haul roads extended over Helipad
- Secondary haul route with turning areasfor material distribution
- Cabin set up extended from 1 block to 3
- Welfare facilities provided on site
- Hoarding segregating office from site operations
- Security cabin and turnstile control site access

Phase 3 – Main Hospital only



- Permanent construction to site delivery access road
- Service road open to facilitate FM
- Hoarding line located to facilitate Car Park 2 construction
- Gate 1 relocated to clear access to laboratories
- Pedestrian crossing to laboratories from existing hospital

Site Office & Welfare Accommodation (Including Associated Car Parking)

Brookfield

New South Glasgow Hospitals (NSGH) Project
Preliminary Summary Programme

Brookfield

Line	Name	Start	End
1	STAGE 1 Laboratory Building and Energy Centre	16/11/2009	14/08/2012
2	LABORATORIES	16/11/2009	14/08/2012
3	Award Contract (say mid Nov 2009)	16/11/2009	16/11/2009
4	Place order for site set up (mid Nov 2009)	16/11/2009	16/11/2009
5	Mobilisation/Site establishment	16/11/2009	01/02/2010
6	Start on site (date as per Addendum 16 (Feb 2010))	02/02/2010	02/02/2010
7	Construction Period	02/02/2010	14/08/2012
8	ENERGY CENTRE	09/02/2010	14/08/2012
9	Laboratory & Energy Centre Completion Date (Summer 2012)	14/08/2012	14/08/2012
10	Availability of Ambulance Site	18/08/2010	18/08/2010
11	STAGE 2 Design and FBC Approval Acute and Children Hospital	16/11/2009	15/11/2010
12	Design/Mobilisation of Adult, Children's and Infrastructure	16/11/2009	12/11/2010
13	FBC Approval	15/11/2010	15/11/2010
14	STAGE 3 Construction Acute and Children Hospital	15/11/2010	31/07/2015
15	Approval to Proceed with Stage 3 Construction (mid Nov 2010)	15/11/2010	15/11/2010
16	Place order for site set up (mid Nov 2010)	15/11/2010	15/11/2010
17	Mobilisation/Site establishment	15/11/2010	31/01/2011
18	Construction	03/01/2011	30/01/2015
19	Acute and Children Hospital Construction Completion Jan 2015	30/01/2015	30/01/2015
20	Hospital Commissioning	30/01/2015	31/07/2015
21	Hospital Operational Summer 2015	31/07/2015	31/07/2015
22	STAGE 3A Demolition of Surgical Block and associated buildings, and completion of soft landscaping	31/07/2015	02/08/2016

Laboratories and Energy Centre Completion - Summer 2012

Hospital Construction Completion Jan 2015.

Hospital Operational Summer 2015

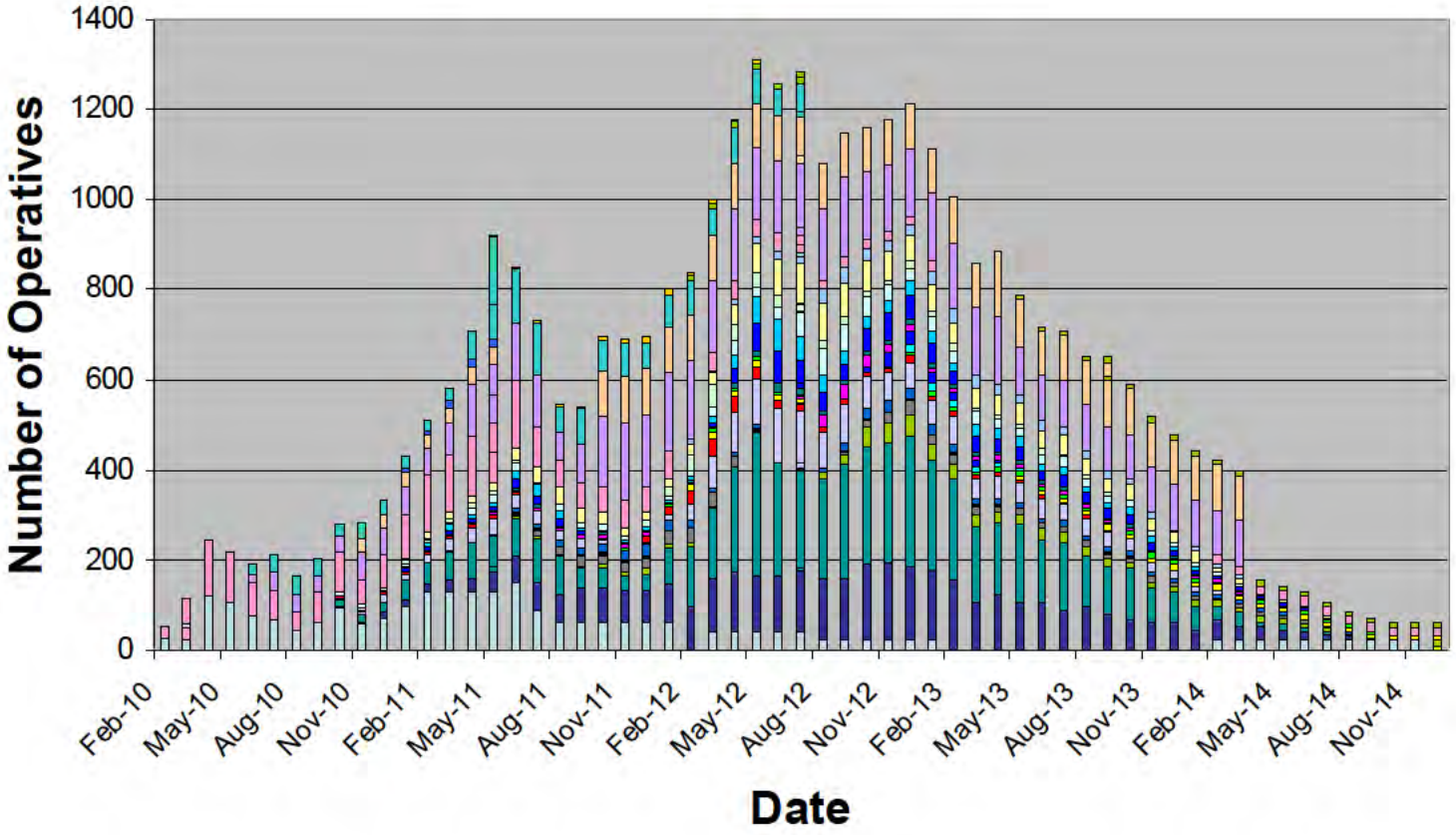
Date of Issue: 03/08/2009 Drawn By:
Print Date: 03/08/2009 Page 1 of 1

Comments: Preliminary Programme

Programme No.:
Revision: Revision Date:

Site Office & Welfare Accommodation (Including Associated Car Parking)

Preliminary Planned Labour Requirements



Site Office & Welfare Accommodation (Including Associated Car Parking)

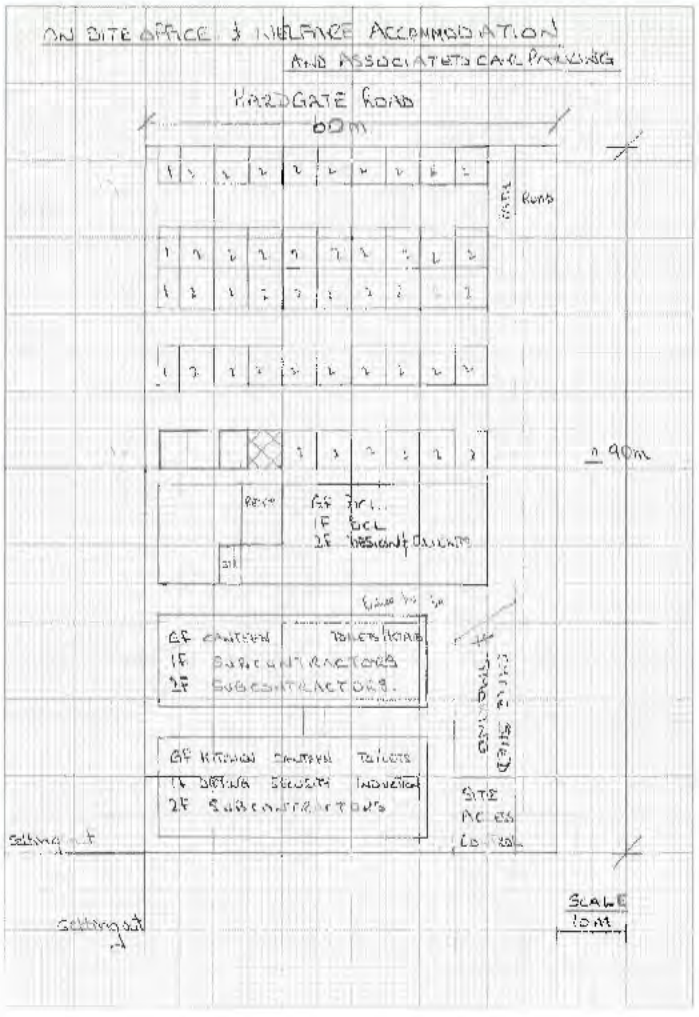
ON SITE LOCATION (Ambulance Station and Part Phase 2 Site)

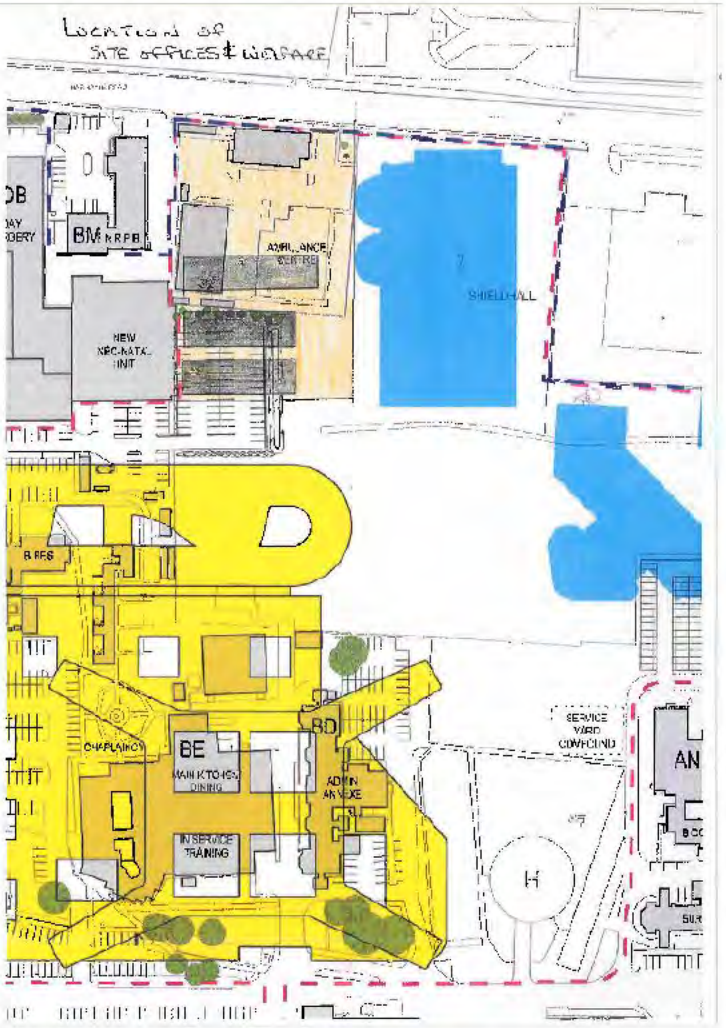
Ogilvie site! We needed an alternative
Not dependent upon 3rd Party negotiations
Not subject to Planning Consent
Closer to site Activities

This Layout reduced footprint by stacking 3 high in 3 blocks.

Principle to erect 1 or 2 Blocks on initial land available and extending later for Phase 2/3 when further areas becomes available

Site Office Layout and Location

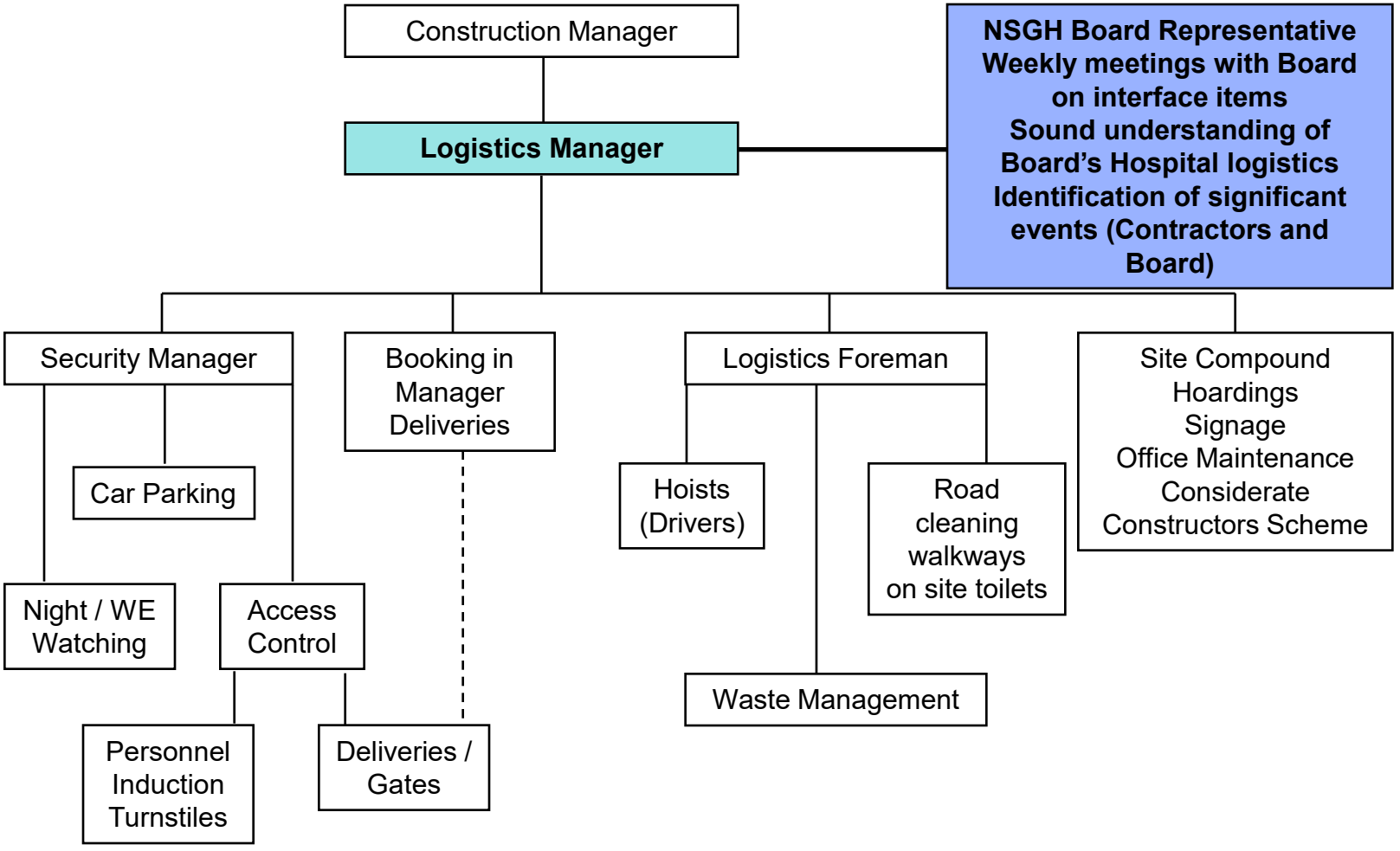




Car Parking and Importation Provision for Site Personnel

- 1,300 „at peak" Operatives and Staff = approx 750 – 850 parking space requirement
- Initially we can accommodate some parking on site. As numbers increase Options are:
- **EARLY CONSTRUCTION OF CAR PARK 2** for BCL use (1000 spaces)
- **OFF SITE PARKING WITHIN WALKING DISTANCE**
  Examples: Ogilvie Site, Linthouse Road Site
- **PARK AND RIDE**
  From existing car park facilities or newly created ones. Potential sites have been identified
- **COMBINATIONS OF THE ABOVE**
- **OTHER IDEAS**
  Discussions with local transport companies
  Encouraging car sharing and cycling
  Providing transport from strategic points such as train stations high density pick up points.

Management of Logistics



Our Objective

- Our objective is endorsed by a quote in last Thursday‟s Peterborough Evening Newspaper by Nigel Hards – NHS Trust Chairman.

“At times there were 1,000 people on site, and disruption to patients and staff at Edith Cavell was kept to a minimum”

- Community Engagement/Benefits
  - New South Glasgow Hospitals

Community Engagement/Benefits

- Introduction
- Engagement (Post Contract Award)
- Benefits (Pre and Post Contract Award)
- Strategy
- KPI's
- Summary

Community Engagement (Post contract award)

Work with Community Engagement Manager

- Adult Hospital
  - Design/patients
  - Community and staff involvement
- Children's Hospital
  - Engagement Advisory Panel
  - Family Panel
  - Youth Panel
- Neighbourhood Engagement through Logistics Manager
  - Relationships in and around Southern General
  - Local bodies/awareness
  - No surprises/kept informed

Community Engagement (Post contract award)

- Brookfield Corporate Social Responsibility

- Local Residents/Local Groups
  - Liaison/Engagement
  - Feedback
  - Involve local projects eg Elder Park/Linthouse Café
  - Collaboration with Arts strategy

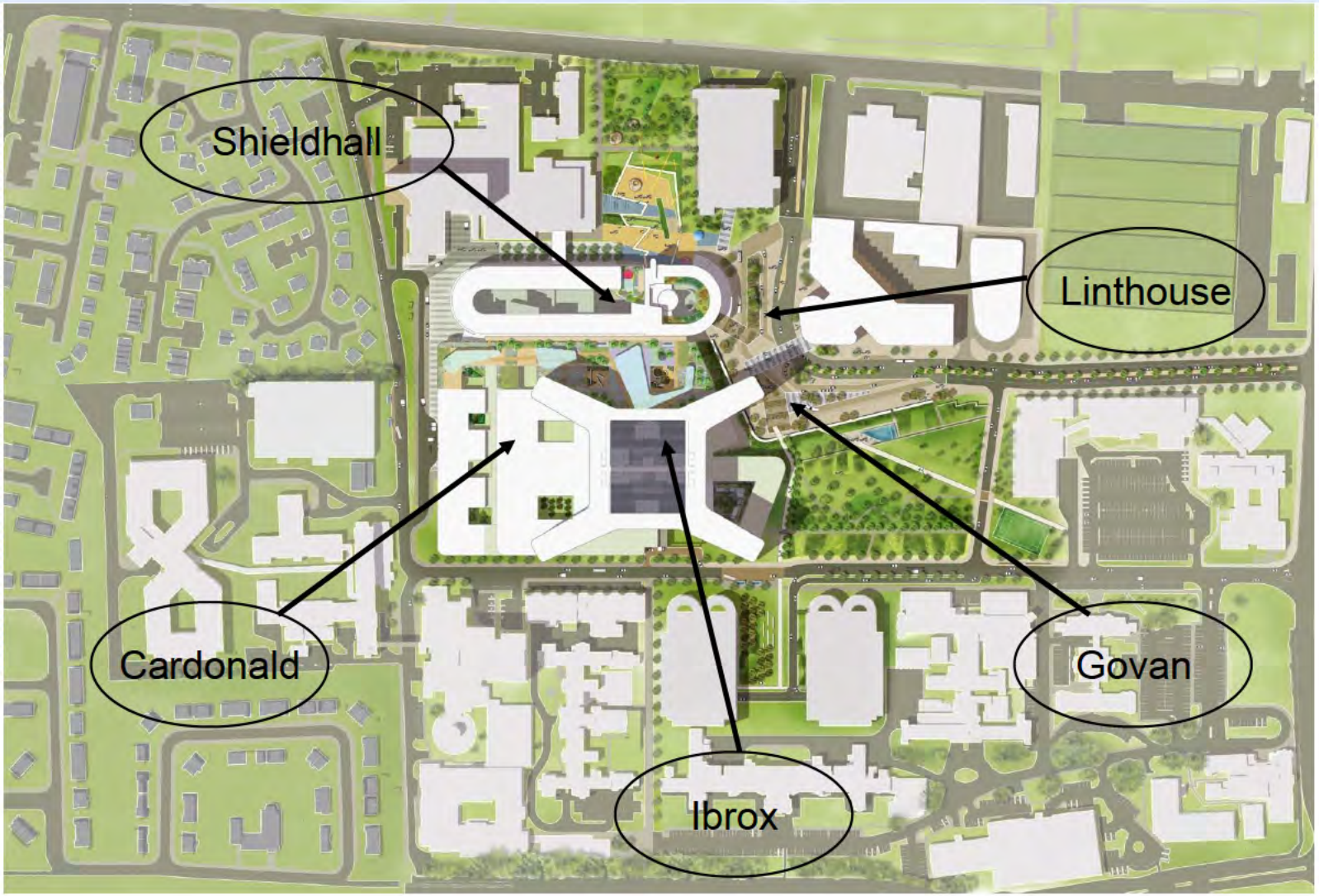
- Schools & Colleges
  - Awareness of Construction opportunities
  - Independent Learning Programmes

Community Benefits: Pre/Post Contract Award

What does NSGH Project mean to Glasgow?

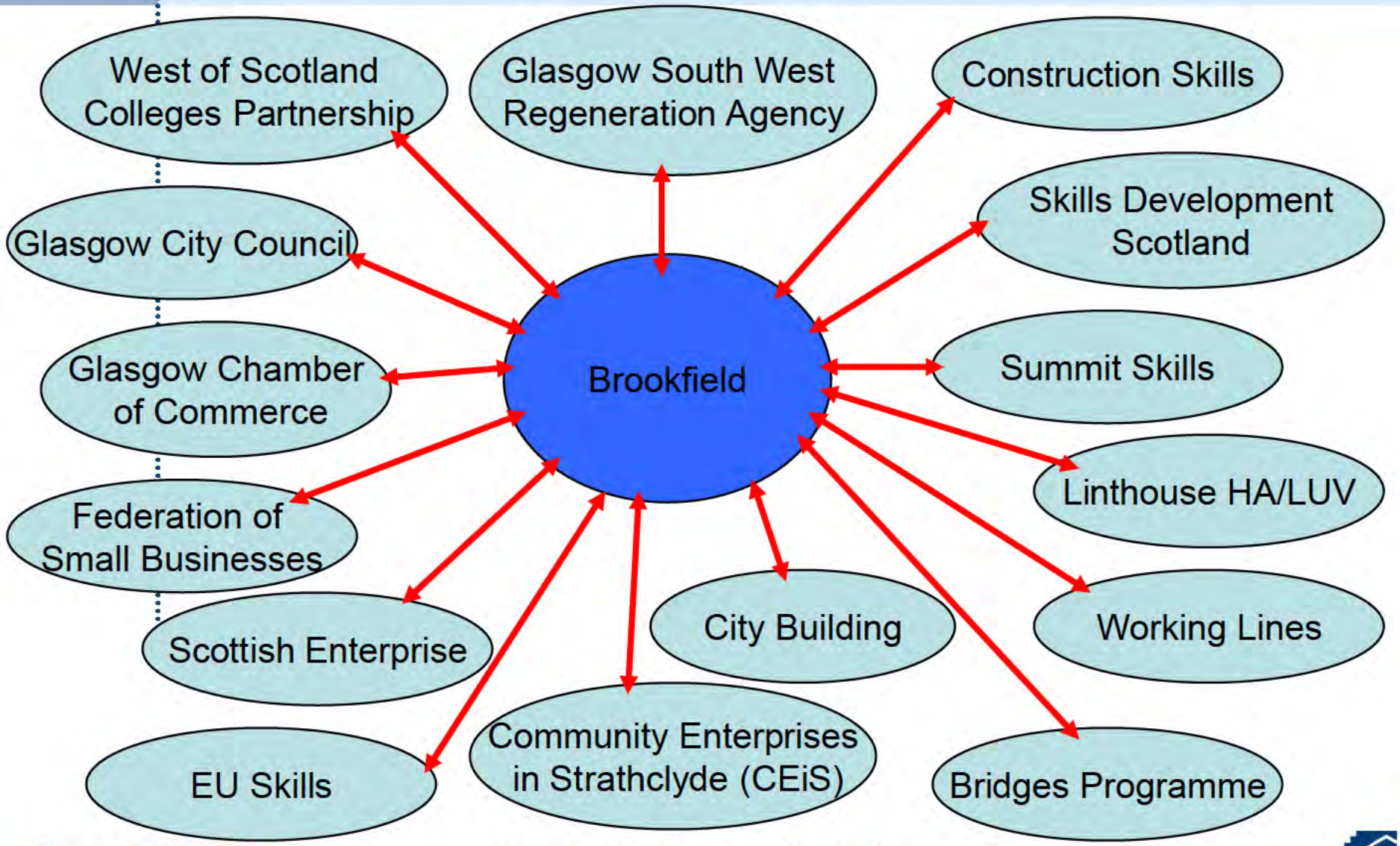
- Major Opportunity/Big Impact
- Recognition of traditional values
- Understanding/Appreciation of Location
- Breaking down the barriers
- A Journey for all/work ready/sustainable employment
- Collaborative approach
- Lasting Legacy

Community Benefits: Local area



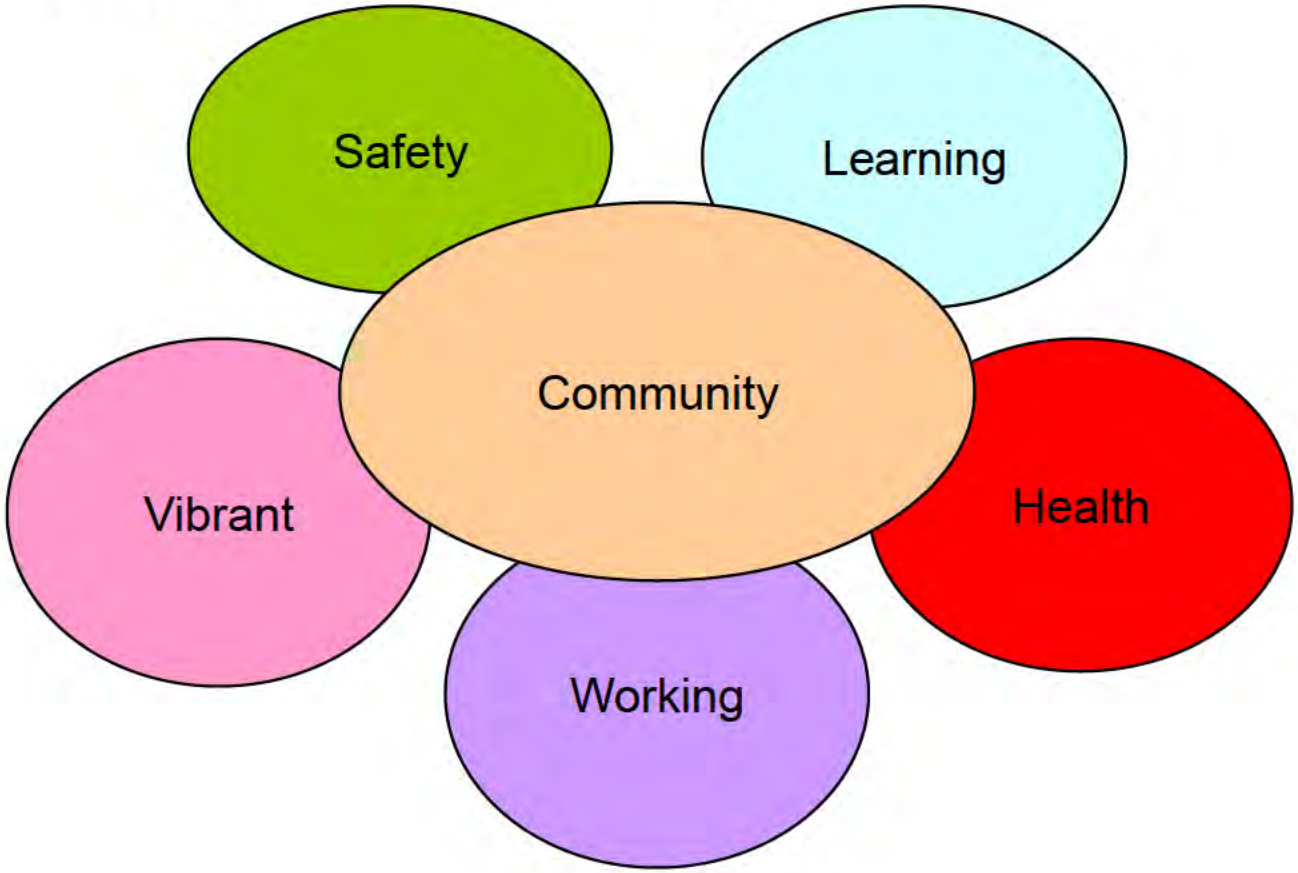
NHS Greater Glasgow and Clyde

Community Benefits: Who we've met so far.



Understanding the Community "themes"

An appreciation of the community themes

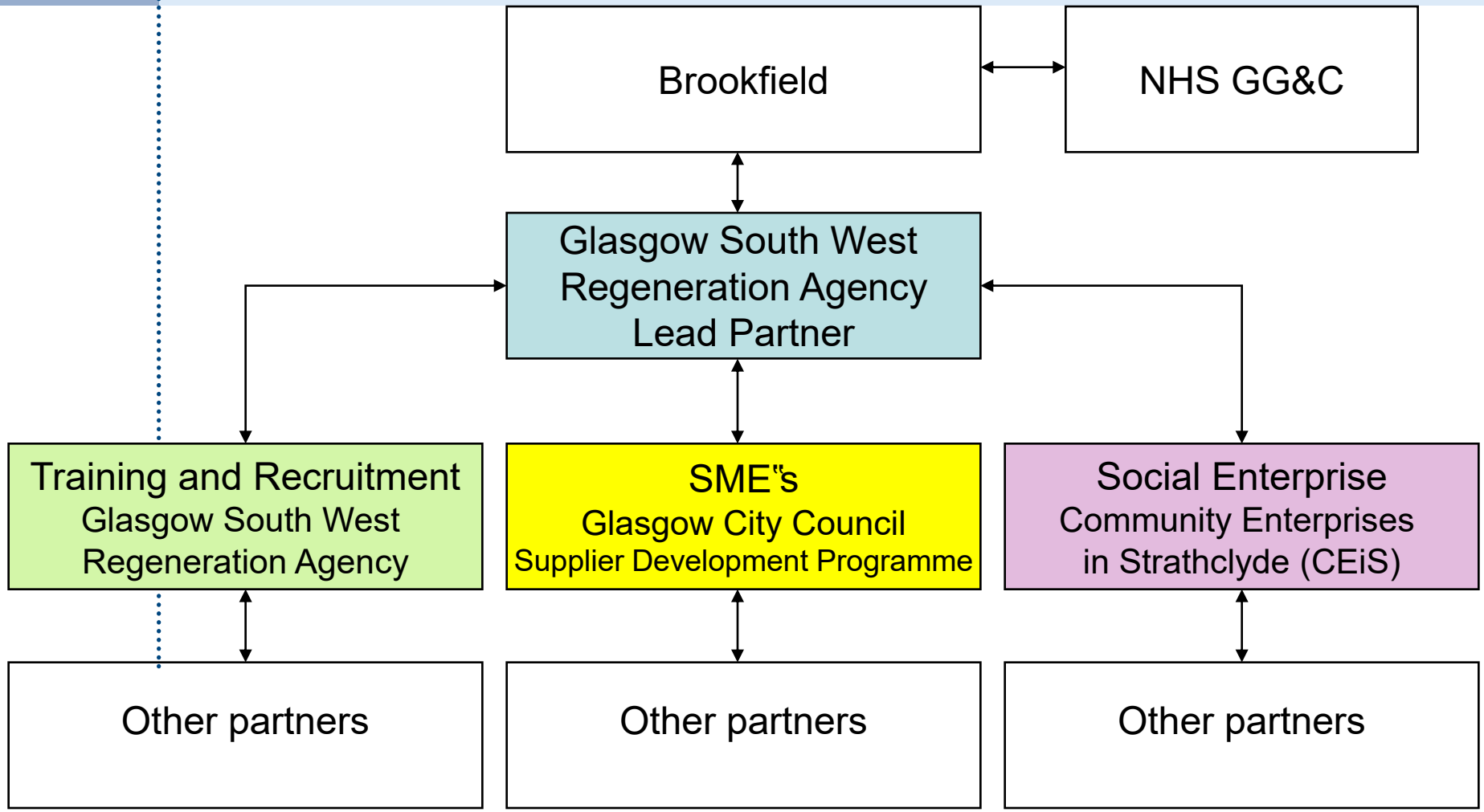


Community Benefits: Strategy

A robust, comprehensive community benefits strategy

- Partnership Agreement with key agencies
- Lead Partner Single point of contact
- Partner Biographies/Obligations
- On site/close proximity training & recruitment centre
- Project Website
- Utilise funding with no cost to the Board
- Lessons learnt (Govan/Pollock Initiatives)

Community Benefits: Proposed Partnership Structure



Community Benefit: Strategy

- Regular liaison/progress meetings
- Collaborative approach with all partners
- Monitoring
- Feedback

Community Benefit: Strategy

How do we ensure “buy in” from our supply chain?

- Supply Chain with contractual obligations to deliver on their agreed promises (Direct)

- Supply Chain (Indirect) awareness and obligations to deliver

- Actively work with Supply Chain and Lead Partner to ensure obligations are delivered upon

Community Benefit: Training and Recruitment

- Mercury Engineering
  - New Entrant Apprentice
    - Qualified tradesman
      - Hospital FM Employee

= Sustainable Employment

Astins Institute

Community Benefits: Strategy- SME/SE

How do we break down the barriers for SME/SE involvement?

- Identify packages eg catering, welfare, couriers, printing, painting & decorating

- Up-skilling of SME's; develop confidence to grow in a safe and controlled manner through training

- Providing SE's with opportunity to develop

- Meet the Buyer events; eg
    - South Glasgow Business Club;
    - Chamber of Commerce Events

- Marketing (Sunny Govan Radio)

Community Benefits : KPI"s

KPI"s set by the NHS GG&C Board

•Targeted Recruitment and Training
- Target 10% of total labour on project delivered by “New Entrants”
- Training and upskilling existing employees
- Regular monitoring
- Case studies
- Stakeholder Evaluation

Community Benefits: SME"s/SE KPI"s

SME's/Social Enterprise

- SME/Social Enterprise development
  - Provide access to opportunities for SME"s
  - Engage with Social Enterprises/demonstrate successful collaboration

- Access to over 2,500 business ready local SME companies through the Partnership Agreement

Community Benefits: SMART KPI"S

- Specific
- Measurable
- Achievable
- Realistic
- Timely

Community Benefits: Summary

- Single Point of Contact
- Partner team
- Robust strategy
- SMART's
- Lasting Legacy

Community Benefits: Summary

Collectively we have a real chance to make a lasting difference to:

- Individuals;
- Businesses; and
- Glasgow

Community Benefits: It's about People

NHS Greater Glasgow and Clyde

Summary

- Commitment
- Culture
- Attention to detail
- Value
- Team Work