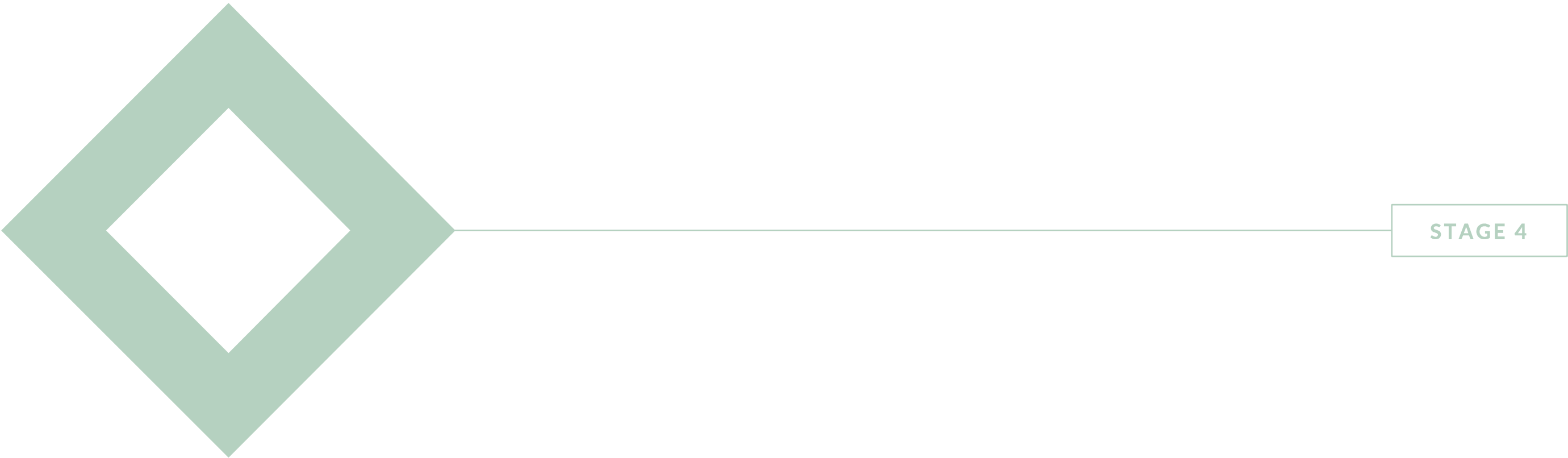


Withington CDC.
Withington.
Manchester University NHS Foundation Trust.

MEP ENGINEERING
STAGE 4 REPORT – EXTERNAL LINK CORRIDOR

REVISION P02 – 09 DECEMBER 2025



Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
P01	27/10/2025	RIBA Stage 4 issue	ES	SM	IH
P02	09/12/2025	Trust comments incorporated	ES	SM	IH

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1. Introduction.



This report has been prepared to record the detailed design proposals for the mechanical and electrical (M&E) engineering requirements for the Withington CDC External Link Corridor. The purpose of the report is to inform Manchester University NHS Foundation Trust and the design team of the proposed engineering design.

1.1 Project summary.

The Withington CDC External Link Corridor will be a new build lightweight canopied walkway to provide patient escorted access from the existing Withington Hospital site to the new CDC building hospital.

Below are detailed sections and plan drawing of Architectural design for the link corridor

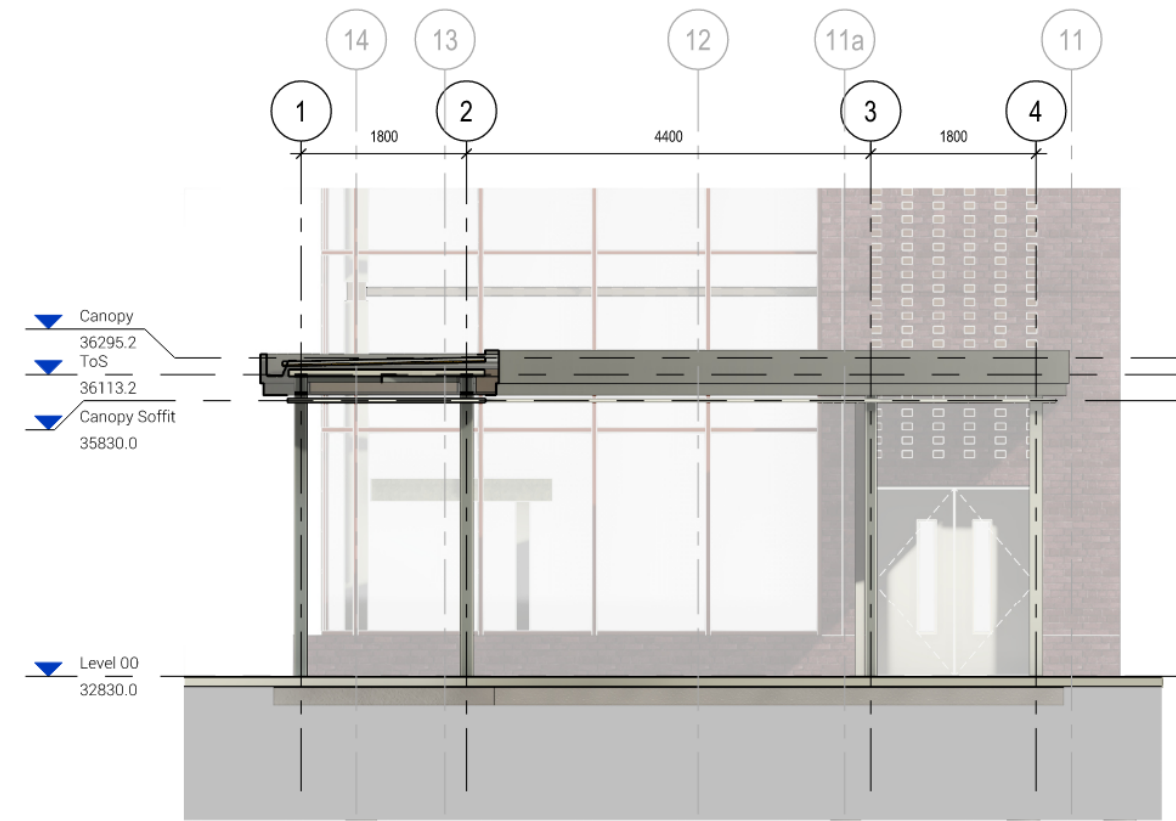
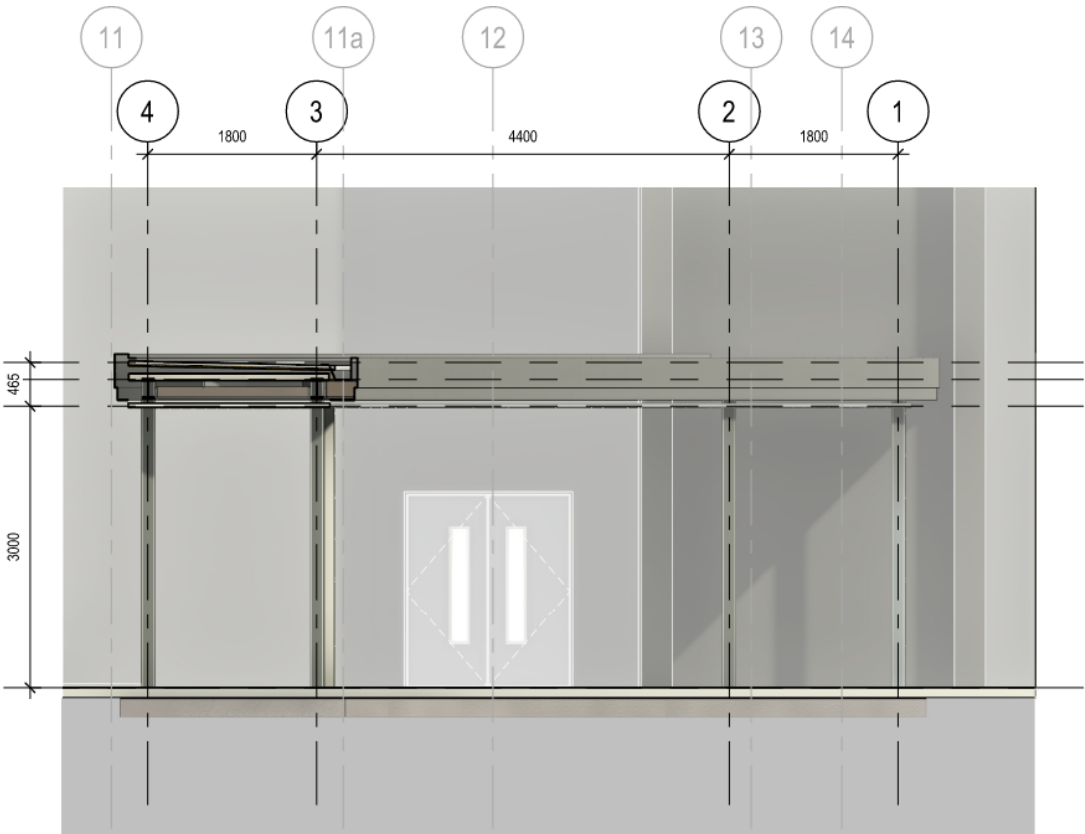
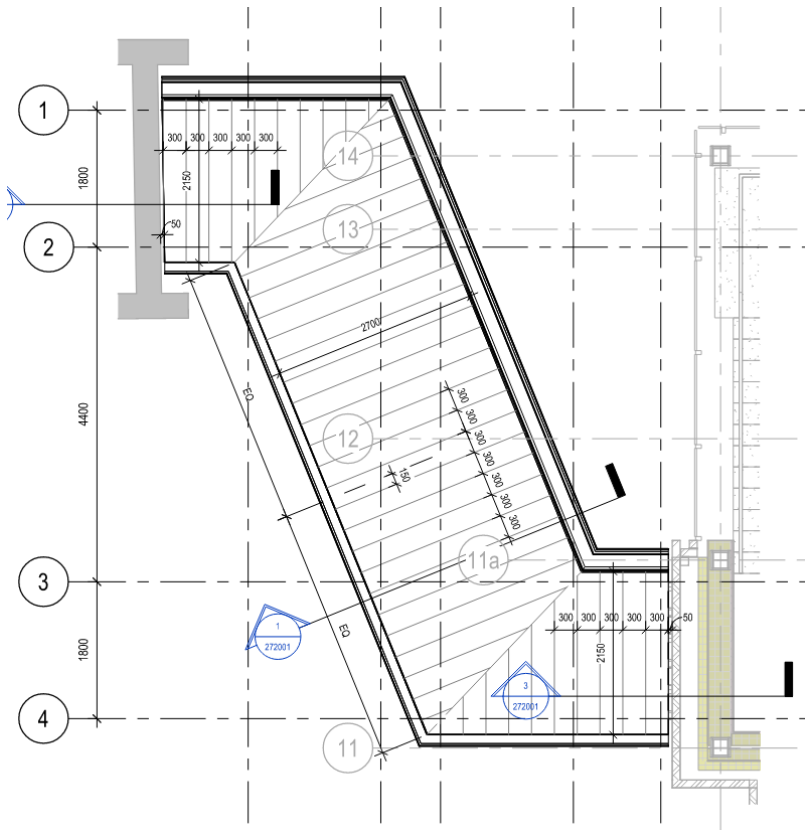


Figure 1 - Architectural sections and plan

1.2 Site location and analysis.

1.2.1 Geographical location

The location for the new link corridor is within the existing Withington Hospital site as detailed below;



Figure 2 - Site Location

1.2.2 Site constraints

There are a number of site-specific constraints that have been identified, which will require consideration in the continued development of the scheme and the respective MEP concepts. The constraints include:

- There is a large number of existing underground LV and HV service routes within the proposed footprint and surrounding areas which will require detailed coordination with architectural and structural design.
- There is existing and proposed underground drainage routes within the proposed footprint and surrounding areas which will require detailed coordination with architectural and structural design. Underground drainage works is not part of HL scope of works, however it is prudent to highlight this coordination issue which will need to be undertaken by others.
- As part of the new CDC construction works there is a number of new underground electrical LV services which are to be routed within the proposed footprint of the new link corridor. As part of the coordination works it is essential that these routes are considered within the design strategy.
- Interface into the existing live Hospital building.

1.3 The project team.

The project team is as follows:

Role	Name
Client	BAM and Manchester University NHS Foundation Trust

Role	Name
Architect	DAY Architectural
Project Manager	Trust PM with support from a seconded PM
MEP Engineer	Hoare Lea
Structural Engineer	CCS Consulting

Table 1 - The project team

1.4 Hoare Lea’s role and responsibilities.

BAM has appointed Hoare Lea to undertake mechanical and electrical duties to RIBA Stage 4. The MEP design items include:

- Underground Mechanical and Electrical services
- Lighting
- Security systems
- Fire alarm
- Lightning protection

1.5 Basis of the design.

The proposed engineering designs have been based on the following information;

- Stage 2 MEP design concepts
- Manchester University NHS Foundation Trust revised brief, received 01/10/2025
- DAY Architectural drawings and model, received 14/10/2025
- CCS Structural drawings, model and report, received 17/10/2025
- Current Withington CDC design information

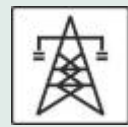
This report should also be considered as a document for approval and form an agreed basis on which the next stage of design and construction will be progressed.

1.5.1 Design reports

This report should be read in conjunction with the Architectural and Structural reports.

This report should also be read in conjunction with the Withington CDC MEP Engineering Specification 22182-HLE-WCH006-XX-SP-U-00001. Works carried out in relation to the link corridor are to be in compliance with the requirements detailed within the MEP Engineering Specification.

2. Utility infrastructure.



This section of the report provides an overview of the existing and future statutory infrastructure for the scheme.

This section provides a summary of the utility investigations undertaken to date and the strategies developed to accommodate the Link Corridor into the existing utility infrastructure.

It is proposed that the new link corridor will be serviced via the new M&E services installed within the CDC.

New services located within the existing Withington Hospital are to be provided and installed by the Trust from the existing Hospital systems and installations.

2.1 Diversions, and disconnections.

Throughout the area of the proposed link corridor footprint (and immediate surrounding areas) there are a number of existing and proposed underground MEP services, this includes the following:

- Existing HV cable route
- Existing LV cable routes
- Existing underground drainage
- New LV essential and non-essential cable routes
- New external lighting and power cable routes
- New Fibre cable routes
- New underground drainage

The screenshot below details the current below ground services which are existing and/or will be installed within the area;

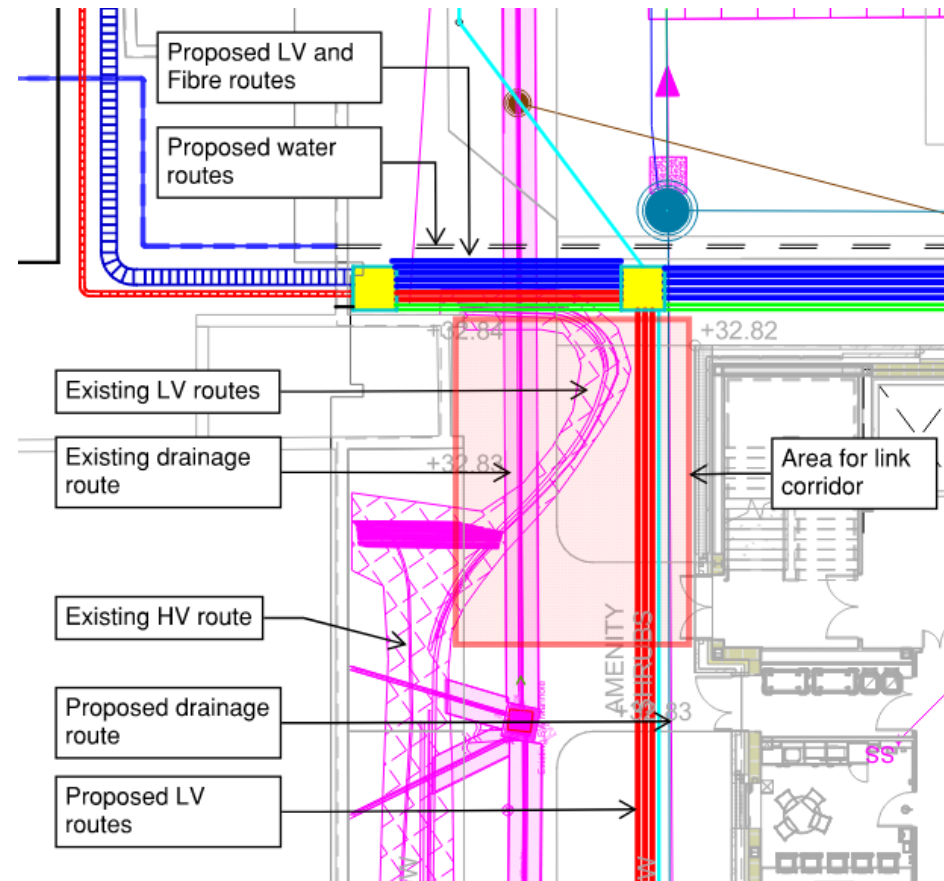


Figure 3 existing underground services

The existing LV cable route is known to route at a shallow depth in the order of 200mm below ground level in the area of the proposed external corridor link. The intention is to simplify the bending radius and straighten the existing LV cable routes to create additional depth within the area of the external corridor link. In addition, there is an intention to review all the LV cable routes and create an appropriate depth for the entire cable route.

It is proposed that the existing LV cables are to be excavated and rerouted as shown indicatively on drawing 22182-HLE-WCH006-00-DR-N-90101 (screenshot below).

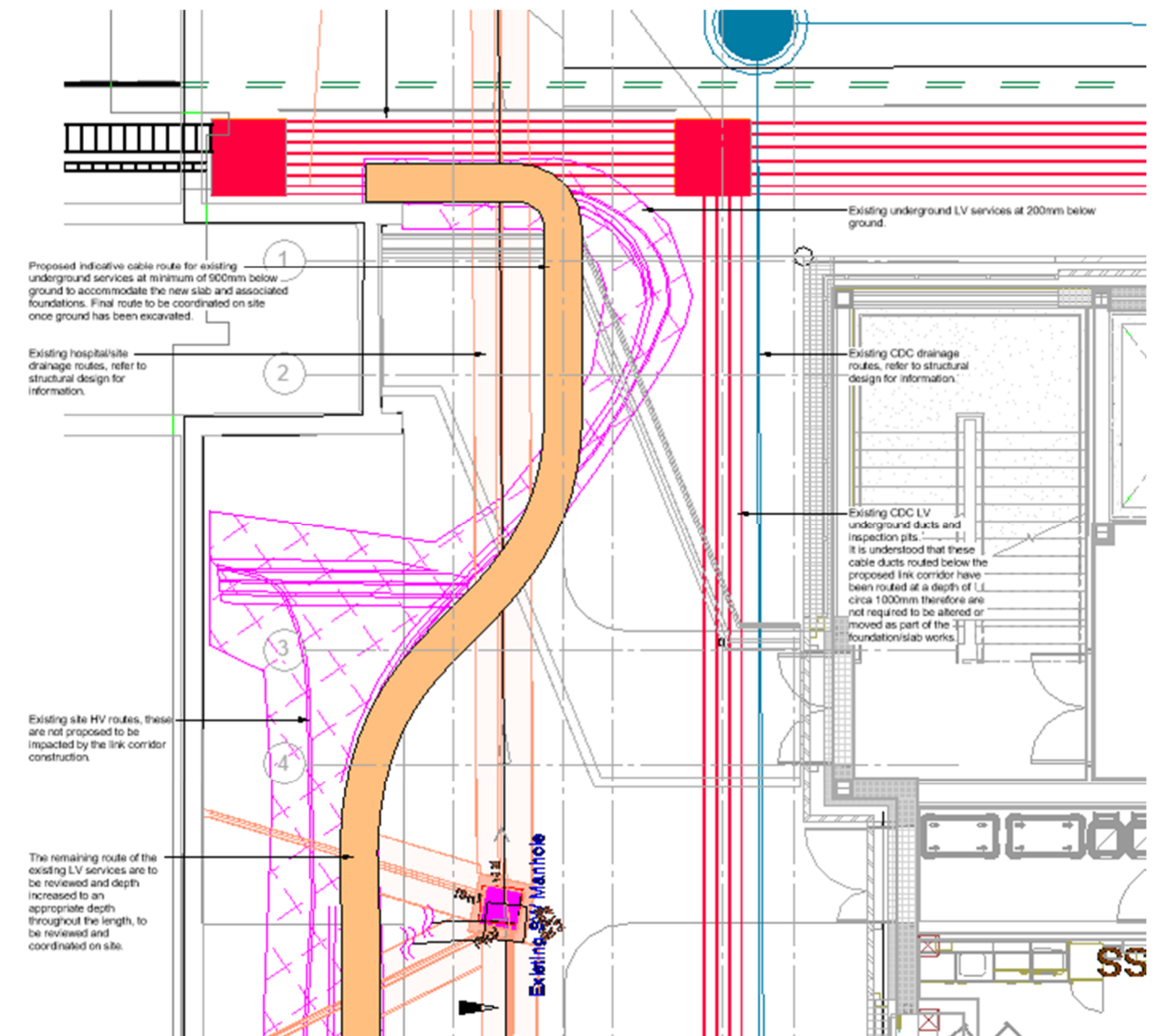


Figure 4 proposed underground services

Existing LV cables are to be re-routed at a minimum depth of 900mm below ground as indicated by the Structural Report in order to accommodate and coordinate with the new link corridor slab and associated foundations.

For the remaining route of the LV cables the intention is for these cables to be also be routed at a lower depth to create a more consistent and appropriate installation depth. This is to be reviewed and coordinated on site with the Contractors groundworks team.

Final proposed route for the existing LV cables is to be fully coordinated and determined on site by the Contractors groundworks team in order to appropriately align with the other underground services and new link corridor construction.

RISK ITEMS

It is anticipated that there is sufficient length available on the existing cables in order to increase the depth of the cables, however if this is found to not be the case once the cables have been exposed there is a potential requirement for the services to be provided with a concrete encasement where routed under the external corridor link, this is to be reviewed and coordinated with the Contractors ground work team and Structural Engineer at the Construction phase.

In order to appropriately carry out the required works to the existing LV cables there may be a requirement to isolate the electrical supplies for the duration of the works.

The new below ground electrical services associated with the new CDC building are to be installed within a series of below ground ducts which have currently been installed at circa 1000mm within the link corridor area. Therefore these routes are not expected to be impacted by the proposed construction.

At this stage the Architectural and Structural designs have taken into account the existing underground services and coordinated to minimise the extent of any diversions or disconnections.

All below ground services works to be in compliance with the requirements of Withington CDC MEP Engineering Specification 22182-HLE-WCH006-XX-SP-U-00001.

3. Mechanical engineering systems.

There are no requirements for any mechanical services.

4. Electrical Engineering Systems.

4.1 Low-voltage distribution and transmission systems.



The purpose of this section is to set out the proposals for low voltage distribution within the *building*, and the levels of proposed resilience the arrangements offer.

4.1.1 Low voltage distribution

See section 2 for diversions and disconnections.

4.2 Small power systems.



The purpose of this section is to set out the provisions that will be made in relation to small power in the general areas as well as non-clinical areas of the hospital.

4.2.1 General small power

General small power will be provided to comply with use requirements with fixed equipment fed via local, suitably rated isolators or fused connection units, as appropriate including power supply for new access control provision on door set into the existing hospital building from the external link corridor to be supplied from an existing local distribution board that supplies the associated internal corridor. This may also include power for associated fire alarm interface for the access control.

Provide a new switched fused connection unit within the existing hospital staircore to supply the new access control equipment and associated controller.

Provide a new unswitched fused connection unit within the existing hospital staircore to supply new fire alarm interface unit associated with the access control.

Supply new power supplies from existing spare ways on local distribution boards within the existing hospital. Circuit designation to be provided by the Trust.

New power supplies including all associated cabling, MCB's and containment are to be provided and installed by the Trust.

Single core LSZH cabling to be utilized enclosed within galvanised steel conduits and trunking.

RCD protection to be provided as required by BS7671.

All small power works to be in compliance with the requirements of Withington CDC MEP Engineering Specification 22182-HLE-WCH006-XX-SP-U-00001.

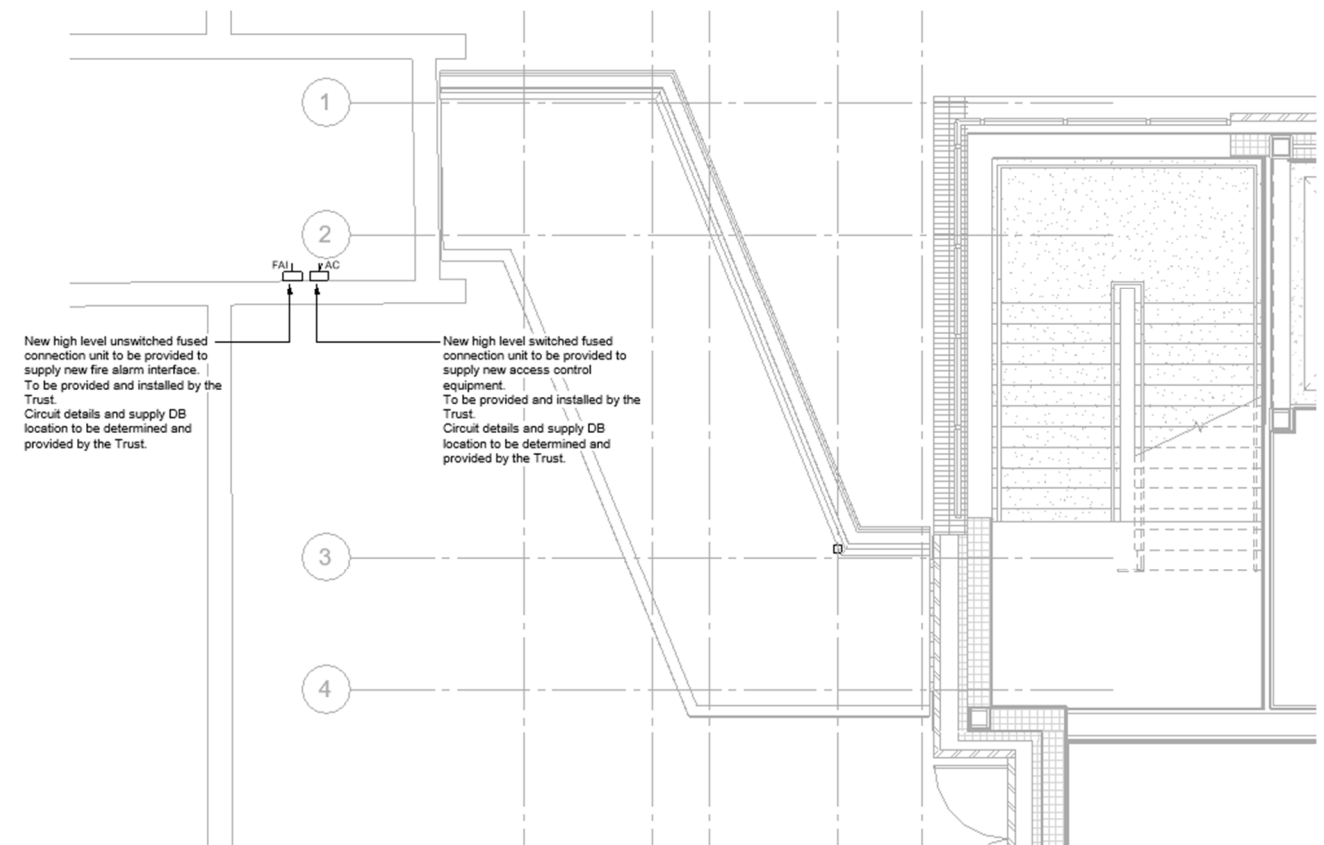


Figure 5 Small Power Layout

4.3 Lighting.



In healthcare settings it is important that patients, staff, carers and visitors have access to natural light. Exposure to daylight is well known for the health benefits it brings to patients and the general public at large. Artificial lighting will be provided to satisfy functional, aesthetic and energy requirements. The integration of the lighting with the interior design concept is vital to deliver a quality environment.

4.3.1 Emergency lighting

Whilst the CDC External lighting scheme includes external emergency lighting, it is proposed that additional emergency lighting is provided integral to the new luminaires within the canopy. This is to ensure that sufficient emergency lighting is provided on the walkway of the canopy.

The new luminaires are to be connection into the new CDC emergency lighting testing and monitoring system.

4.3.2 External lighting

The external link corridor, will be illuminated by use of energy efficient luminaires, in principle to be flush mounted and integrated into the architectural finishes, to achieve the required illumination levels.

This will provide external lighting for safety and security purposes. Consideration will be given to light pollution, vandalism, security and energy efficiency, in selecting suitable luminaires.

Design lighting level of 50lux, with reference to Table 9 of British Standard Light and lighting – lighting of work places Part 2: Outdoor work places BS EN 12464-2:2024, based on an enhanced level for building entrance with canopy.

The current external lighting design for the new CDC is to be retained as per current design.

4.3.2.1 External lighting control

The new external canopy luminaires will be controlled with Day lighting sensor control and 24 hour / 7 day timeclock. The timer settings within the controls are to be set to operate from dusk until dawn inline with the new CDC external lighting. Final settings of timers to be reviewed and agreed on site with the Trust.

In addition to the proposed photocell and timeclock arrangement the new canopy lighting is to be provided with a manual override on/off function. This will be provided in the form of 2No. 1 gang 2 way switches located within each staircore. This is to provide the function of turning on the luminaires out of the controlled hours when/if needed.

All lighting and emergency lighting works to be in compliance with the requirements of Withington CDC MEP Engineering Specification 22182-HLE-WCH006-XX-SP-U-00001.

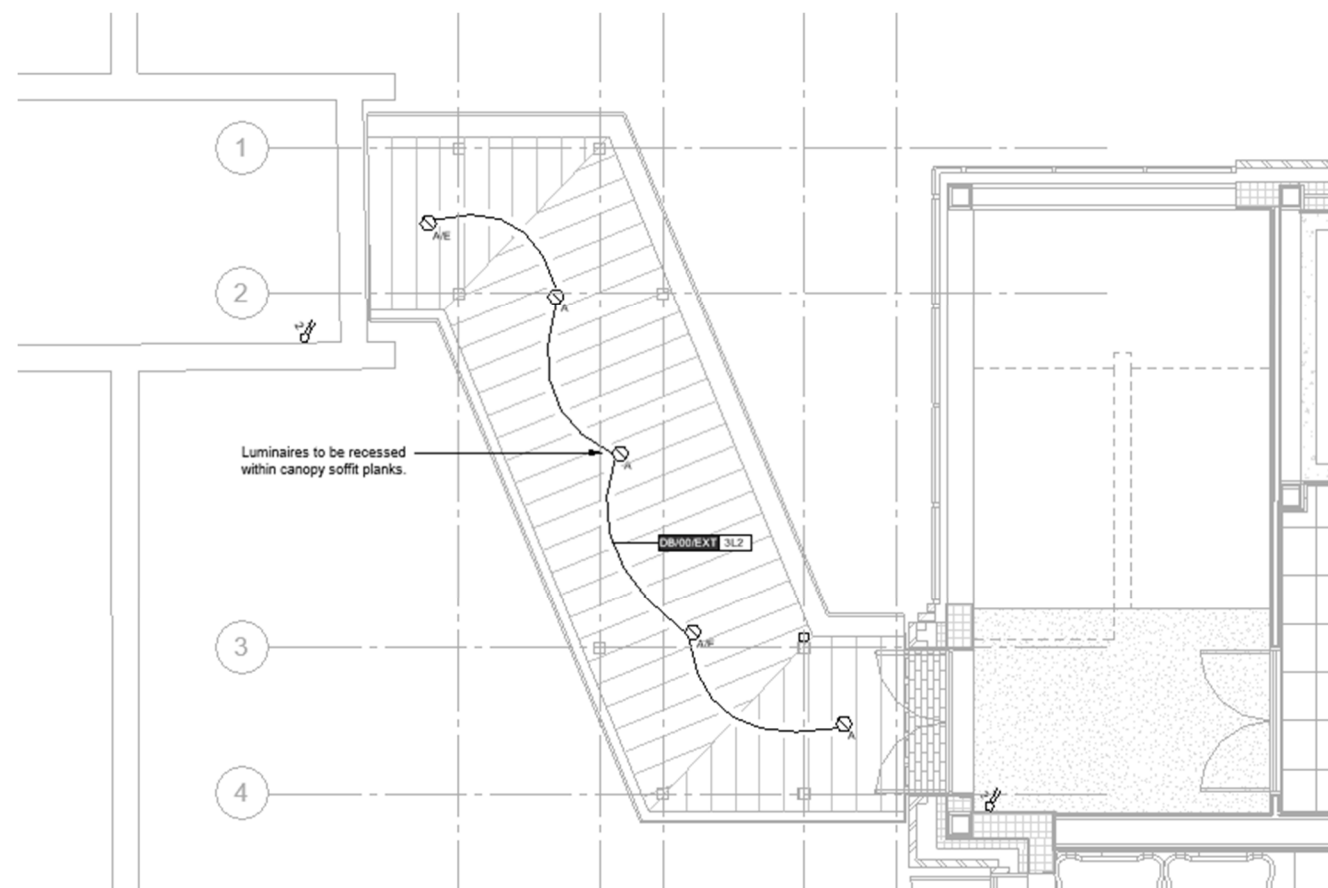


Figure 6 Lighting Layout

4.4 Security systems.



The approach taken to security for External Link Corridor is to create a safe and secure environment for patients, staff, visitors and goods that will allow all users of the hospital to undertake their legitimate daily functions without impediment.

The approach to security for the External Link Corridor is to create a safe and secure environment for patients, staff, visitors and goods that will allow all users of the hospital to undertake their legitimate daily functions without impediment. The principles of 'Secured by Design' will be adopted to achieve a high quality installation standard across all aspects of the design, by the integration of the following systems:

- Surveillance cameras (CCTV)
- Access control

4.4.1 Surveillance camera system

The CDC Surveillance camera system includes for a CCTV camera located above the door to the CDC building at the interface with the proposed external link corridor. This CCTV camera to be mounted to ensure it does not clash with the external link corridor structure and also provides appropriate coverage of the area.

At this stage it has been advised by the MFT Security team that there is no need for additional CCTV cameras. It is to be ensured that the new CCTV cameras associated with the CDC building are to be appropriately coordinated to ensure sufficient coverage.

4.4.2 Access control

The existing building access control system will be extended to provide;

- Proximity card reader access and exit from the existing hospital building from the external link corridor. It is currently intended that this door is to be provided with swipe access for both entry and exit.
- The current design for the CDC building is for the north staircore access door to be provided with swipe entry, this is to be retained. The current strategy includes for push to exit arrangement to exit out from the CDC building, this is to be retained. Final requirements to be reviewed and agreed with the Trust

All works associated with the new access control provision at the existing hospital staircore is to be provided and installed by the Trust.

Out of normal hours, and at the end of visiting times, external access into the hospital will be controlled. All external public access doors will be locked by means of electronic locks. Security staff will control these locks. Security staff using the surveillance system will monitor visitor access after external doors are locked, and access will be granted at specific locations only. Staff will be able to gain access using their proximity card, at specific entrances.

In the event of a fire alarm, only the local secure doors will release. This will be configured to local department requirements, as determined in the cause and effect strategy.

The access control system will comply with the requirements of the BS EN 50133-1.

The access control system will use a local area network (LAN) IP-based system, which is flexible and adaptable, as described in this section. The system will use an open protocol, in line with principles that enhance the facilities and flexibility of the system.

The access control system for this door will be provided with reader, door contacts, 'request to exit' button, emergency break glass unit, magnetic locks, local controller, and wiring, will be functionally independent, to allow the system to be fully tested and demonstrated at the individual door location. The controller and/or reader will use standard TCP/IP protocol, to allow LAN based communication for configuration and monitoring using software and active network equipment.

All access control and security works to be in compliance with the requirements of Withington CDC MEP Engineering Specification 22182-HLE-WCH006-XX-SP-U-00001.

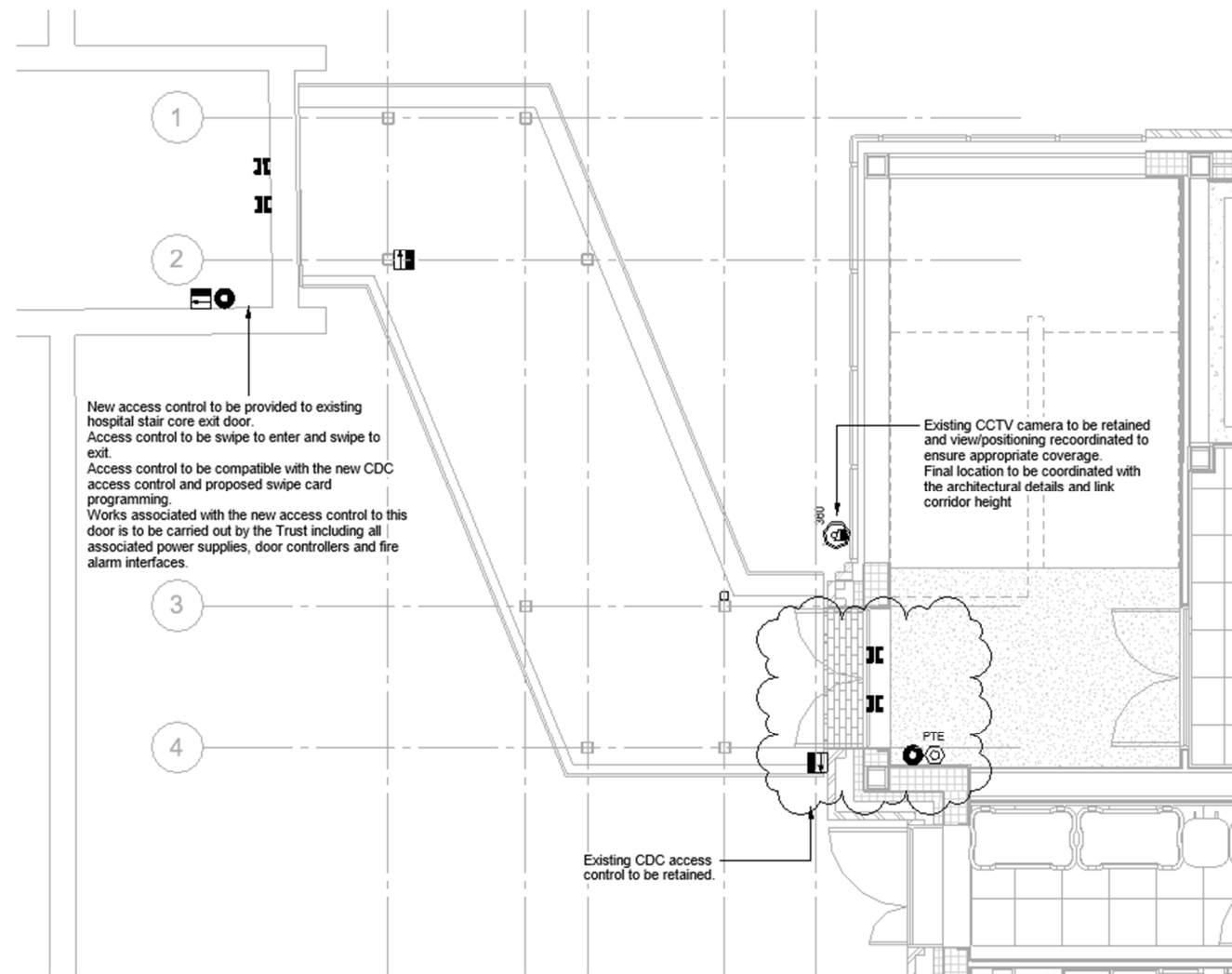


Figure 7 Access Control and Security Layout

4.5 Lightning protection.



The purpose of this section is to set out the lightning protection systems, which are provided to reduce risk of damage and injury caused by lightning strikes.

4.5.1 Lightning protection strategy

It is understood that the existing hospital building is circa 12m in height.

The new CDC building is proposed to be circa 11m in height.

The new external canopy is detailed at circa 3.6m in height.

The new canopy is proposed to be a completely standalone structure which will have no physical structural connections with the existing hospital and new CDC building.

Due to the heights of the existing building and proposed CDC building, utilising the rolling sphere method (20m radius) for lightning protection coverage it is anticipated that additional lightning protection coverage for the link corridor canopy will not be required. The canopy lightning protection would be provided by the adjacent building coverage.

However, this is to be fully reviewed and assessed by a Lightning Protection Specialist to verify that Lightning Protection is not required.

An allowance is to be provided for appointing a Lightning Protection Specialist to carry out the appropriate assessment of the Lightning Protection provision.

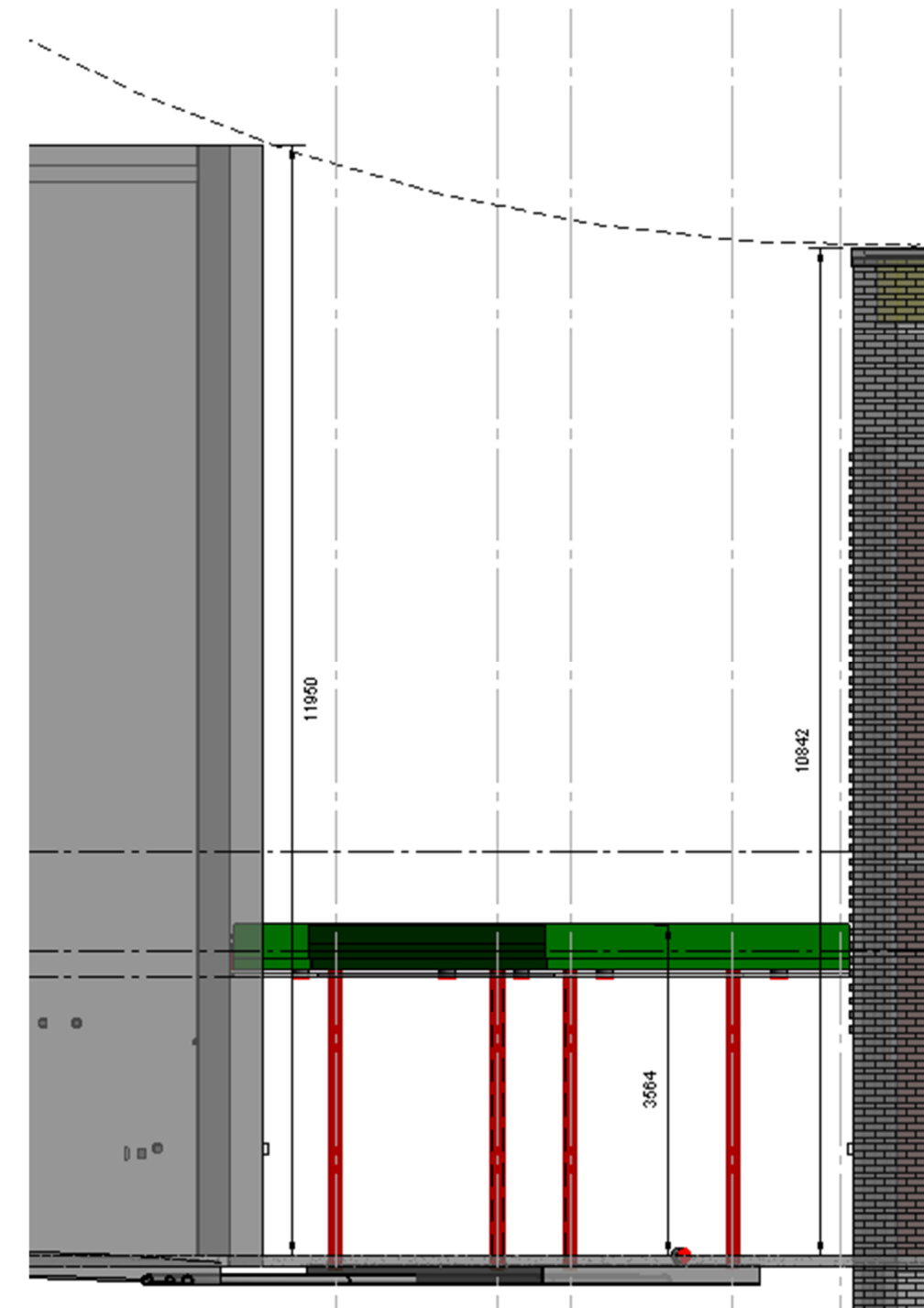


Figure 8 Building heights

5. Design standards and numerical design criteria.



This section contains information on the reference documentation, and numerical design criteria that Hoare Lea have used to develop the concept referenced within, and also the basis on which the design will be taken forward into the next stage of design development. The content of this section is based upon previous similar experience and industry best practice.

5.1 Reference documentation.

The proposed design criteria for the mechanical and electrical engineering systems will be in accordance with the following:

Health Technical Memorandum 05-02: Firecode. Guidance in support of functional provisions (Fire safety in the design of healthcare premises)

Firecode – fire safety in the NHS. Health Technical Memorandum 05-03: Operational provisions

Health Technical Memorandum 06-01: Electrical services supply and distribution

Health Technical Memorandum 06-02: Electrical safety guidance for low voltage systems

The requirements of Building Control (including Fire Officer)

Local Authority rules and regulations

Health and Safety Executive (HSE) Guidance

Construction Design and Management (CDM) Regulations

Statutory undertakings regulations

All current CIBSE Guides, Application Manuals, Commissioning Codes and Codes of Practice

BSRIA Guides

BS 5588 Fire precautions in the design, construction and use of buildings

BS 6266 Fire protection for electronic equipment installations

BS 7671 Electrical wiring regulations

The SLL Code for Lighting

BCO Guide to Lighting

BS 5266 Emergency lighting. Code of practice for the emergency escape lighting of premises

BS EN 1838 Lighting applications. Emergency lighting

BS 5839-1&6 Fire detection and fire alarm systems for buildings

BS 9999 Code of practice for fire safety in the design, management and use of buildings.

BS EN 62305 Lightning protection systems

BS 7430 Code of practice for protective earthing of electrical installations

BS EN 81 Safety rules for the construction and installation of lifts

Glossary.

ACB	Air circuit breaker
AGSS	Anaesthetic gas scavenging system
AGV	Automatic guided vehicle
AMR	Automatic meter reading
ASHP	Air-source heat pump
ATS	Automatic transfer switch
AVSU	Area valve service unit
BBU	Battery backup unit
BESS	Battery energy storage system
CAFM	Computer aided facilities management
CEM	Contract energy management
CNH	Core network hub
CSU	Clinical station unit
CT	Current transformer
DALI	Digital addressable lighting interface
DAS	Distributed antenna systems
DSR	Demand side response
DX	Direct expansion
EBB	Equipotential bonding bar
EBS	Emergency bed service
EPO	Emergency power off
ESCo	Energy supply company
ESN	Emergency services network
EVC	Electrical vehicle charging
GDN	Gas distribution network
GSHP	Ground source heat pump
GSM	Global system for mobile communications
HFC	Hydrofluorocarbon
iBMS	Intelligent building management system
IGT	Independent gas transporter
IPS	Isolated power supply
IPTV	Internet protocol television
IRS	Integrated reception system
LAN	Local area network
LEMP	Lightning electromagnetic impulse
LSZH	Low smoke zero halogen
MA4	Medical air - 4 bar

MCCB	Moulded case circuit breaker
MER	Main equipment room
MMC	Modern methods of construction
MRL	Machine room-less
NACOSS	National Approval Council for Security Systems
PES	Primary electrical supply
PICV	Pressure independent control valve
PME	Protective multiple earthing
PoE	Power over ethernet
PSTN	Public service telephone network
PTS	Pneumatic tube system
PTZ	Pan tilt zoom
RAID	Redundant array of independent discs
RCBO	Residual-current circuit breaker with overcurrent protection
RCD	Residual current device
RMU	Ring main unit
SA7	Surgical air – 7 bar
SER	Secondary equipment room
SPS	Secondary power supply
SVP	Soil vent pipe
TCP/IP	Transmission control protocol/Internet protocol
TN-C	Earth neutral – combined
TN-C-S	Earth neutral – combined – separate
TNS	Earth neutral – separate
TVSS	Transient voltage surge suppressor
UCV	Ultra-clean ventilation
UPS	Uninterruptable power supply
VAC	Medical vacuum
VAV	Variable air volume
VCD	Volume control damper
VoIP	Voice over internet protocol
VLAN	Virtual local area network
VRF	Variable refrigerant flow
WAN	Wide area network



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