

CARMODY GROARKE

Power Hall and
Decarbonisation

Science and Industry
Museum

20 December 2022

3b Planning Permission & Listed Building Consent
Works to West Façade - Design Addendum

Contents

1. Introduction
2. Historic Context
3. Design Proposal



View of the proposed Power Hall concept

Introduction

This Design Addendum has been prepared by Carmody Groarke (Architects) on behalf of the Science and Industry Museum (SIM), Manchester, in collaboration with the design team:

Project Managers - Gardiner & Theobald LLP
Services Engineer – Max Fordham
Structural Engineer – Conisbee
Quantity Surveyor – Appleyard & Trew
Donald Insall Associates - Heritage Consultant

This document which covers proposed works to west façade of Power Hall has been prepared as an addendum to PP Ref. 131488/FO/2021 and LBC Ref. 131489/LO/2021 in relation to a new Power Hall and Decarbonisation project at the Science and Industry Museum (SIM), Manchester site.

As with the Planning Permission and Listed Building Consent the works outlined in this document support the following overall project aims:

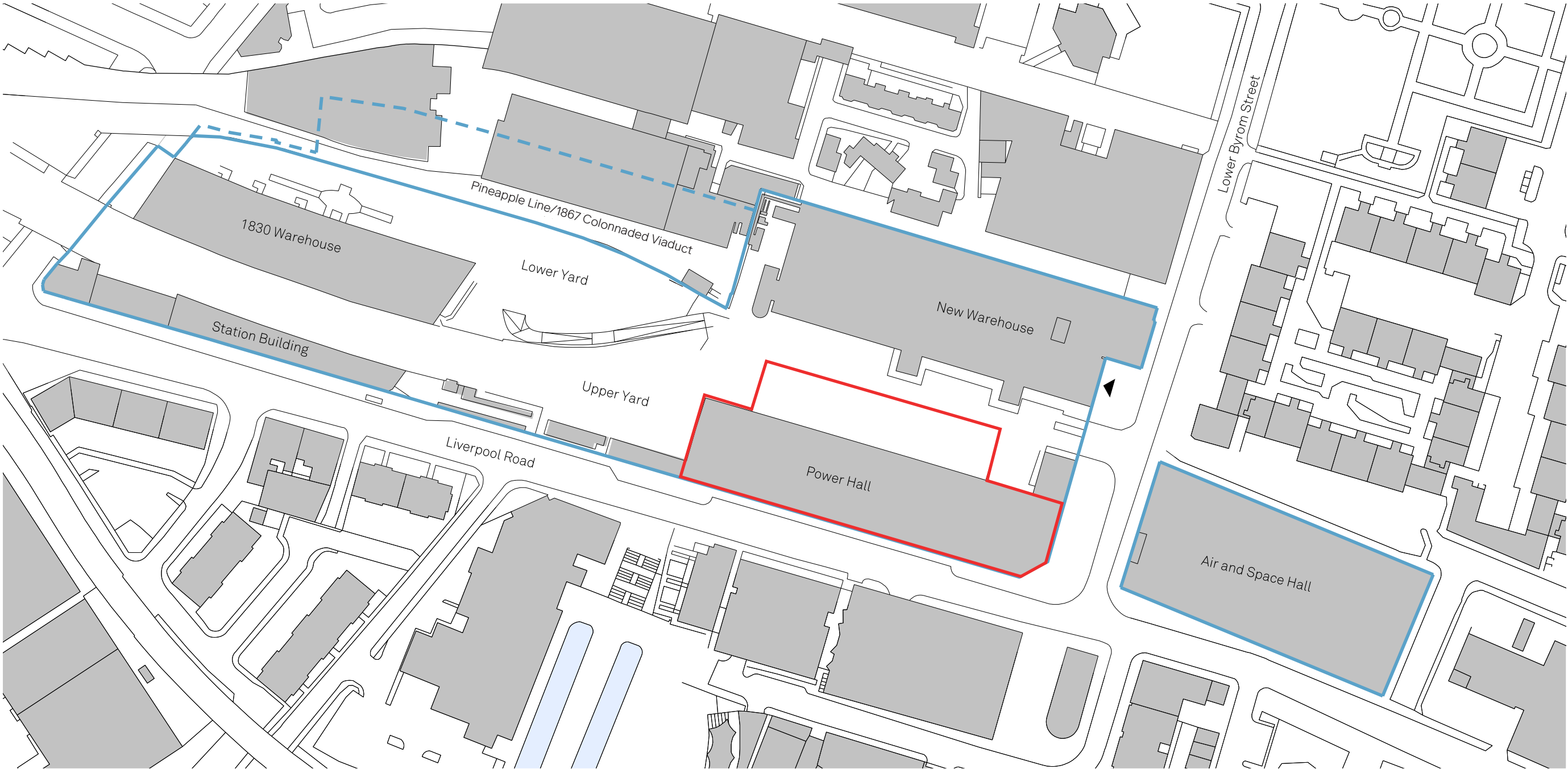
- Re-open the Power Hall, which was closed to the public for repair work in 2018;
- Create a new gallery design with a simple and clear circulation route in the Power Hall which is accessible for all;
- Reveal the historic structure of the Power Hall and carry out essential repairs to future-proof the building for years to come;
- Install new plant to the Power Hall which will allow recommissioning of some of the steam exhibits;
- Install site wide plant to reduce the museum's carbon footprint alongside significantly improving the thermal performance of Power Hall. Part of a journey towards net zero carbon for the Science and Industry Museum.

An appendix of key drawings is provided at the end of this document.



Context
The museum is located within the Castlefield Conservation Area, an area with a mixture of visitor attractions, offices and residential uses. A number of new developments are proposed around the Museum boundary, including a new arts complex and mixed use development.

The Science and Industry Museum is situated on the site of a former railway station – Liverpool Road Station – which opened as part of the Liverpool and Manchester Railway in September 1830. The railway yard eventually fell out of use in the 1970s, was purchased by Greater Manchester County Council in 1978 and became the Museum's home in 1983.



The Site

The site is formed by a complex of railway structures and buildings and is regarded by Historic England as one ‘of the most significant railway sites in the world’:

- Grade I listed 1830 Warehouse, the first railway warehouse in the world.
- Grade I listed 1830 Station building, the oldest surviving purpose-built railway passenger station.

- Grade II listed 1830 Viaduct, brick railway viaduct connecting the two buildings.
- Grade I listed, Station Master’s House,
- Grade II listed New Warehouse (Former Lower Byrom Street Warehouse).
- Grade II listed 1867 Colonnaded Viaduct (known as the Pineapple line), built in 1867

- Grade II listed Shipping Shed (known as the Power Hall), a transit shed added to the station in 1855.
- Grade II listed, Goods Office (New Warehouse).
- Grade II listed Air and Space Hall.

Key

-  SIM boundary
-  Planning Application boundary

The extent and scope of this addendum relates to works to the west façade of the Power Hall.

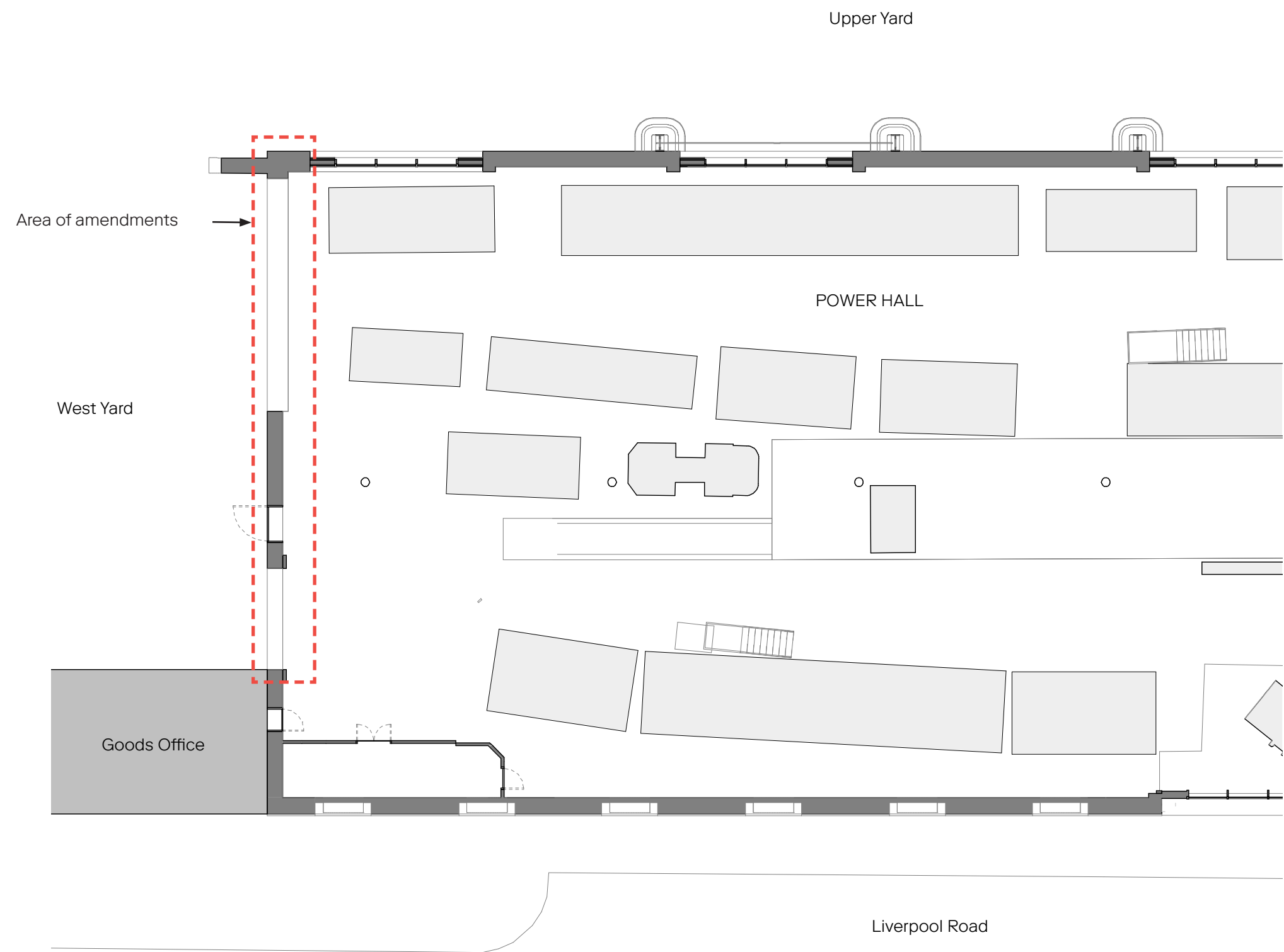
The west elevation historically provided access for goods carriages and road vehicles. Similar to the north elevation it is plain, with no decorative features.

The façade is configured with two large openings; the northernmost former rail opening (referred to in this document as the Large Railway Apertures) is double-width with bull-nosed jambs, a cast-iron lintel and a brick relieving arch. The north jamb is formed of stone blocks at the lower level, where a short buttress-fender abuts it. The south opening (referred to in this document as the Small Railway Aperture) is single-width, with the same bull-nosed jambs and a cast-iron lintel supporting the flat-headed opening with relieving arch. There are two small stone fenders protecting the jambs. Non-original metal concertina doors run on a metal rail (set internally) on both apertures and are surrounded by concrete footings. The concertina doors are not airtight, have very poor thermal performance and are not watertight.

There is a modern fully glazed single door set between these two main openings which was installed as part of the conversion to a museum in the 1980s.

Agreement for the removal and demolition of the metal concertina doors, and the replacement of the fully glazed single door set was consented via planning application, 131488/FO/2021 - Reinstatement of Power Hall roof, installation of new windows and doors and stripping of external services and removal of railway doors.

The proposal as outlined in the following pages details the proposed infill assembly for the apertures and a revised strategy for the modern glazed door. The proposals respond to feedback received from Manchester City Council following a pre-application meeting on 29.09.22.



Plan illustrating the area of west façade



View of the Shipping Shed in 1978
(Historic England)



The Power Hall in 1978
(MMU Visual Resources Centre)



View of the Shipping Shed during restoration, 1981
(SIM)

Historic Depot Doors

The images above show the 20th century doors of the Power Hall whilst it was still in use as a goods depot in the 1970s.

The doors were either inwards opening double doors or sliding doors depending on their locations. They were constructed with a simple timber frame with cross-bracing and clad with vertical timber.

As shown in the top right-hand photo the doors to the south and on Lower Byrom Street had high level openings for illumination and ventilation with hit and miss timber panels below. The doors in the north elevation were solid cross-braced plank and rail doors.

West Façade

It is understood that apertures on the west façade would not originally have had any pivoting doors, however a historic steel and timber beam at high level internally suggests that at some point there was a sliding mechanism.

During restoration work in the 1980s a set of simple timber framed doors were installed, these appear to have been quickly replaced by the metal concertina sliding system seen today.



The west façade in 1973 without the modern fully glazed single door set

Reinstating Historic Proportions

Alongside the installation of the metal concertina doors, restoration work to the west façade in the 1980s included the installation of fully glazed single door set and masonry arch between the two railway door apertures, acting as a fire escape.

The proposed works forming part of this addendum includes infilling the non original door opening, removing the surrounding non original brickwork (including the relieving arch) and making good to match the surrounding historic brickwork. As outlined in Donald Insall's Heritage Impact Assessment Addendum this would result in a direct heritage benefit by restoring the original appearance of this elevation.



The west façade prior to construction work with modern fully glazed single door set



Liverpool Road typical window



North Yard typical window

Window Families

The existing apertures to the building differ on each elevation:

- The large square apertures on Liverpool Road
- The arched apertures to the Upper Yard

The window design as consented under application 3b (PP Ref. 131488/FO/2021 and LBC Ref. 131489/LO/2021) creates a relationship between these elevations though a family of windows and doors characterised by centrally located fixed glazing with vertical timber clad surrounds.

Reference to the historic doors

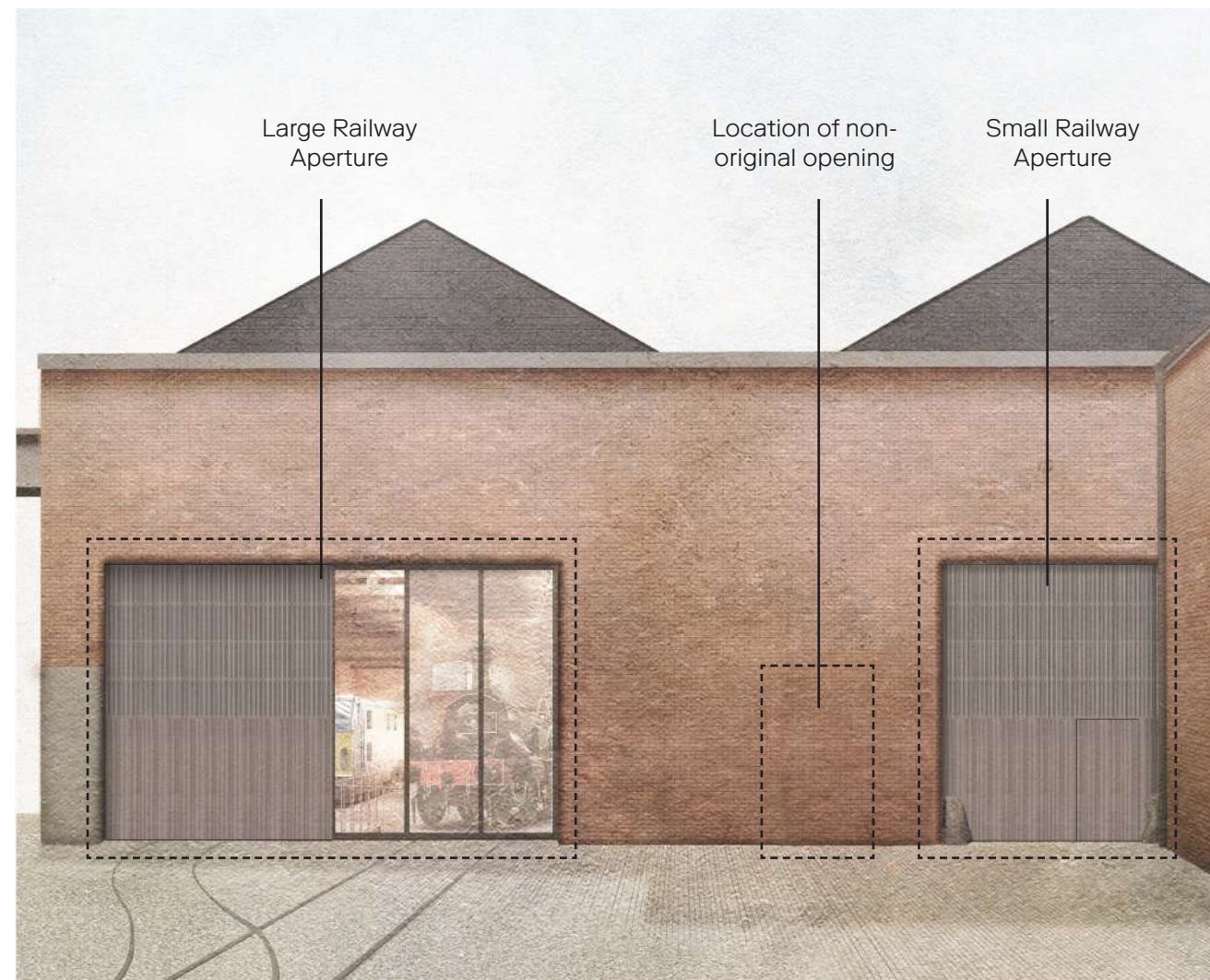
The new windows and doors reference the historic apertures, both in material and arrangement. The new surrounds are clad in vertical slatted timber internally and externally. These timber panels read in a similar way to the historic timber sliding doors, partially opened up to reveal views in and out of the building.



Lower Byrom Street window



North Yard main entrance



Option 01 - Asymmetrical composition



Option 02 - Symmetrical composition

Pre-Planning Application

The non-original metal concertina doors which were installed as part of the 1980s works require replacement. They are very poor quality - both thermally and visually and they are not watertight. In the pre-application meeting 29.09.22 two options were discussed. In option 01, as illustrated above, there is an asymmetrical composition which comprises a slatted timber clad panel and glazed curtain wall system to the Large Railway Aperture. Option 02, as illustrated to the right is a symmetrical composition, comprising a slatted timber cladding and centrally located glazed curtain wall system. In both instances, the proposals for the Small Railway Aperture, with integrated fire escape jib door, is to be fully clad with timber slats.

The non-original fully-glazed single door set and non-original relieving arch is proposed to be removed. The subsequent opening is proposed to be in-filled with a high quality reinstatement of original brickwork.

Pre Application Feedback

The design team received feedback from Manchester City Council on the design options above. The feedback stated:

- The proposal 'appears acceptable subject to high quality reinstatement of original brickwork'.
- Fire escape door – 'needs to be ensured the jib door is as drawn'

on the submitted visual with simple clean lines, there should be no exposed ironmongery, M&E or emergency lighting etc'.

- Glazing proportions – 'our preference is asymmetrical but no strong opposition to either option'.



Proposed design for west façade

Final Proposal

Following the pre-application discussions there have been further investigations into the verticality of the existing brickwork, the existing threshold/rails and input from the museum in terms of their operational requirements.

The final proposed resolution for the west façade is illustrated on the left. As per the options presented to Manchester City Council as part of the pre-application presentation, the proposal still comprises a timber and glazed infill panel to the Large Railway Aperture, a timber infill panel with integrated fire escape door to the Small Railway Aperture, and, the removal of the modern single door set.

The proposals for this façade have been designed to relate to the already consented window and door assemblies on the Upper Yard, Liverpool Road and Lover Byrom Street elevations, referencing the historic timber doors.

Large Railway Aperture

Following detailed design coordination, two centrally located glazing panels flanked by timber clad panels are proposed for the Large Railway Aperture. This follows the principles of option 02 on the previous page. There are several advantages to this approach, namely:

- The centralised glazing panels reference the architectural language of the already consented window and doors assemblies elsewhere in the building;
- The brick reveals either side of the aperture are not vertically aligned. An abutment in timber, as opposed to the metal frame of a window glazing system, eliminates the need for a large mastic joint at the interface with the brick reveal;
- The position of the proposed central glazed panels, which sits inboard of the existing railway tracks. allows for a more robust, watertight base junction detail to be achieved without interrupting the tracks;
- Visitors to the Museum benefit from an unobstructed 'long' view in and out of Power Hall, improving the visual connection between the museum interior and the Upper / West Yard.

Small Railway Aperture

The Small Railway Aperture to the south of the elevation will be fully clad with vertical timber boarding to match the installations as already consented. The assembly will include a jib fire escape door.

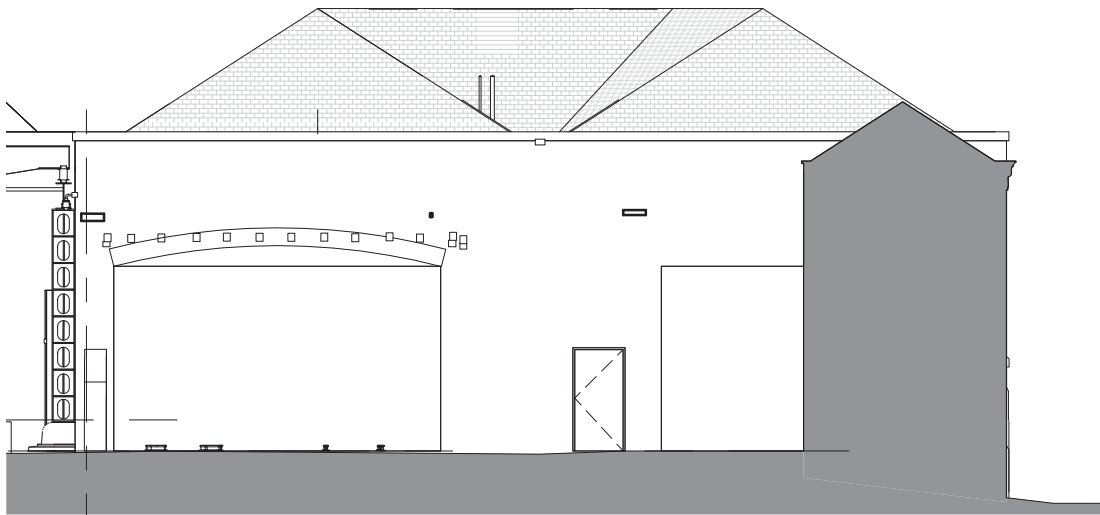
Fire Exit Door
As per the pre-application proposal the non-original single door set and non-original masonry relieving arch will be removed to reinstate a solid masonry wall between the two railway door apertures, returning to the historic composition of the west façade. The masonry infill will be carried out in accordance with the quality of materials and standard of workmanship as per the previously submitted methodology.

The new fire exit door within the timber infill to the small railway door aperture will be detailed as per the consented fire exit door on Lower Byrom Street. The door will have limited visible ironmongery with the exception of an antique brushed brass/bronze cylinder pull, hinges and a discretely located access control card/fob reader which is required to meet the museum's security and insurance policies.

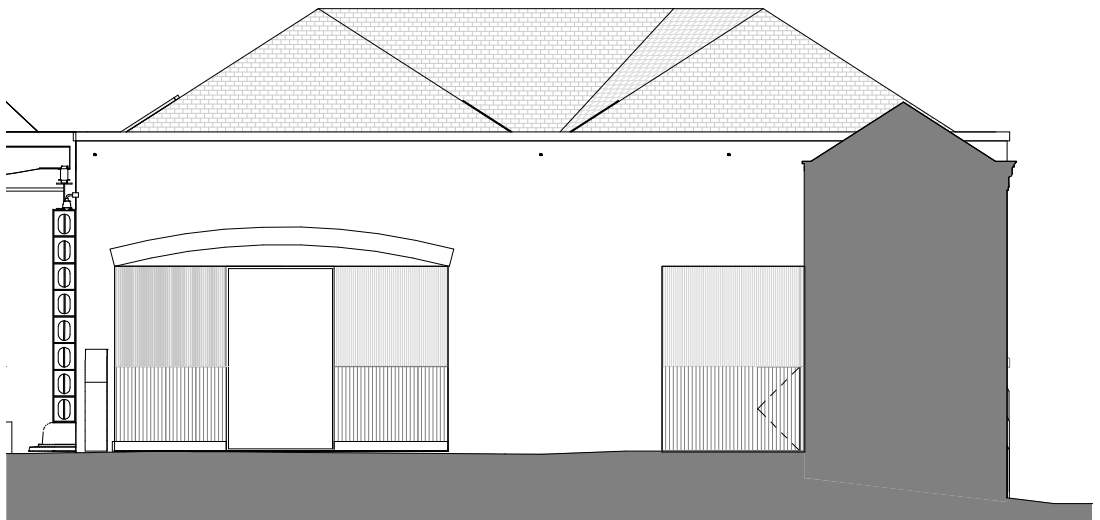
Due to the adjacent location of an existing emergency light above the adjacent exit from the Good Office, no new emergency lighting is required at this new exit door.



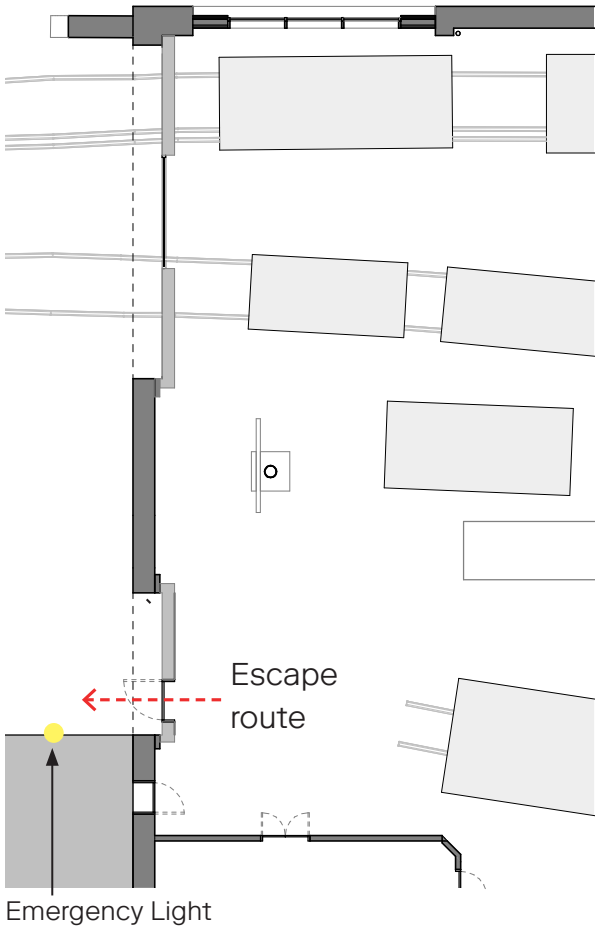
Non-original modern glazed single door set, and existing fire escape

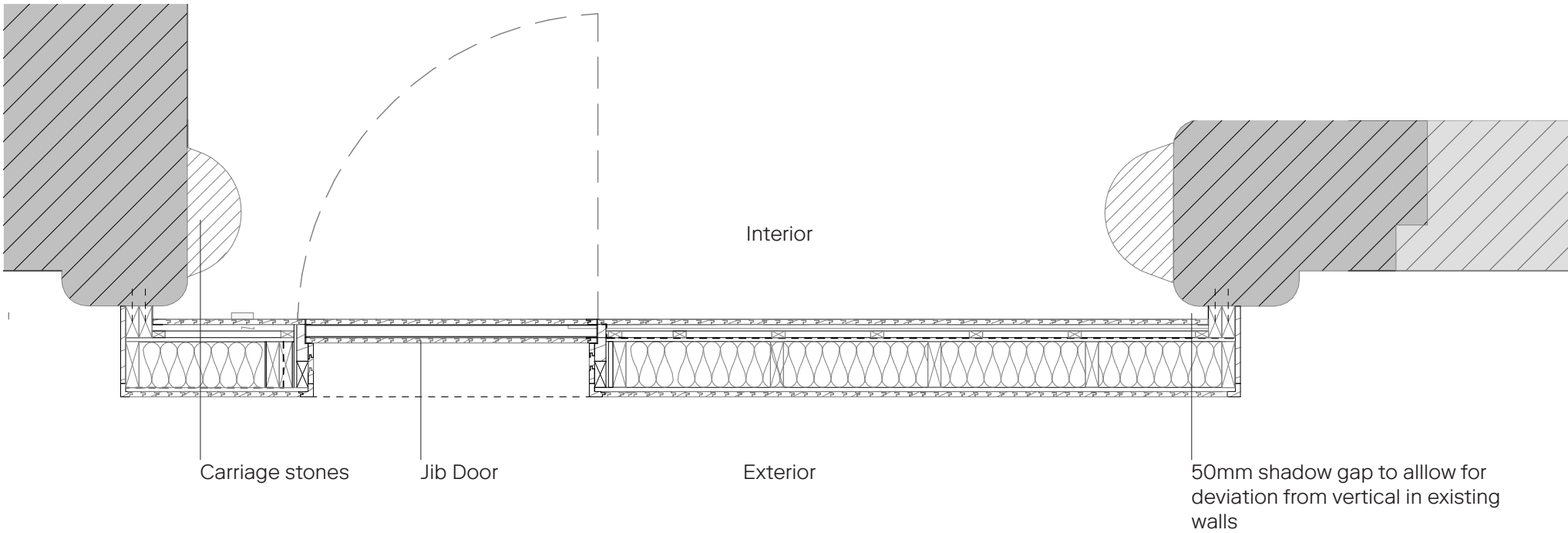


Existing west façade elevation



Proposed design for west façade elevation





Final Proposal

The construction of the proposed infill for the Small Railway Aperture has been designed to sit approximately 50mm back from the inside face of the brick piers. This is to avoid the construction clashing with the corbelled brickwork to either side of the opening and two full stone fenders (carriage stones) protecting the jam.

The location of the Large Railway Aperture aperture infill has been designed to follow the same principle and therefore also sits approximately 50mm back from the inside face of the brick piers.



Corbelled brickwork at the top of the opening of the small aperture

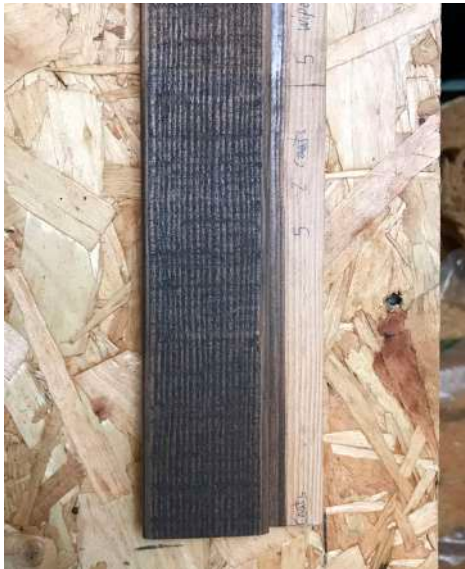


Corbelled brickwork at the base of the small aperture and carriage stone



Full carriage stone within the depth of the reveal

Vertical timber boarding with dark stained finish:



As per the works to existing apertures already consented under PP Ref. 131488/FO/2021 and LBC Ref. 131489/LO/2021 the vertical timber boarding will be a quarter-sawn slow-grown Canadian Douglas Fir which is treated Natural Oil Woodstain by OSMO in Quartz Grey.

Detailed information on the choice of timber, durability and protection from weathering and ageing was issued to Manchester City Council in CG document 321_SK080922_Douglas Fir_Weathering & Ageing - Expectations & Mitigation.

Material Palette

The material palette for works to west façade are designed to match works to existing apertures already consented under PP Ref. 131488/FO/2021 and LBC Ref. 131489/LO/2021.

Power coated metal curtain walling system system profile:



The profile, dimensions and finish of the picture window curtain walling system to the Large Railway Aperture will match the windows already consented under PP Ref. 131488/FO/2021 and LBC Ref. 131489/LO/2021.

Power coated metal curtain walling system:



The power coated finish to the curtain walling system will match the finish already consented under PP Ref. 131488/FO/2021 and LBC Ref. 131489/LO/2021. This is a durable power coating to specification Tiger Drylac 29/80081 LL / C Iron Glimmer Effect P7. The same finish will be applied to the metal plinth plates beneath the windows.

Access control panel:



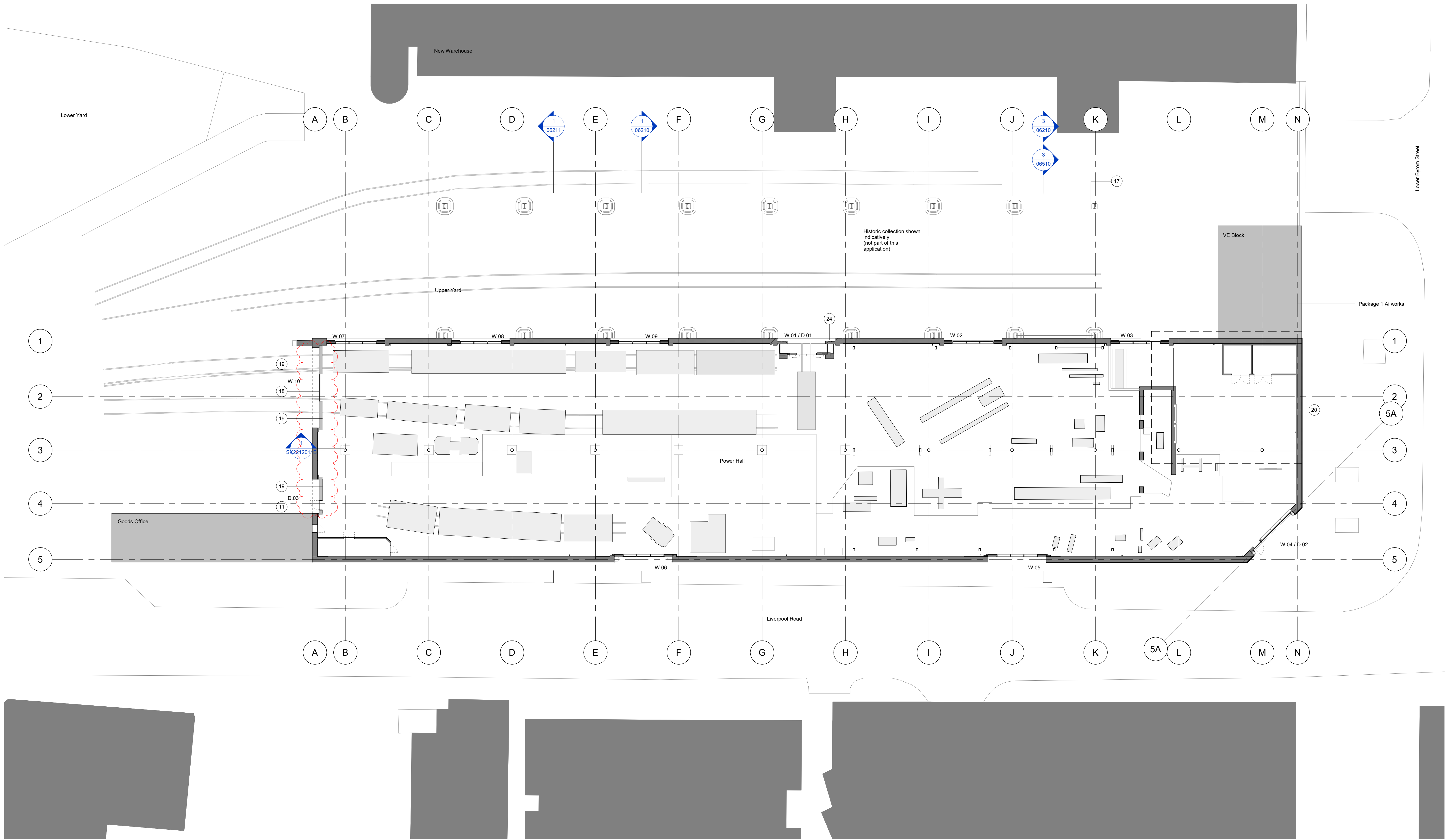
The new fire exit door within the timber infill to the Small Railway Aperture will act as the first point of entry for Museum staff. The door therefore requires an access control system. A discrete access control card/fob reader, such as the 95.5mmx95.5mm Salto XS4 2.0 Wall Reader in Black (or similar) will be installed.

Ironmongery:



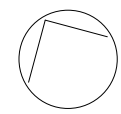
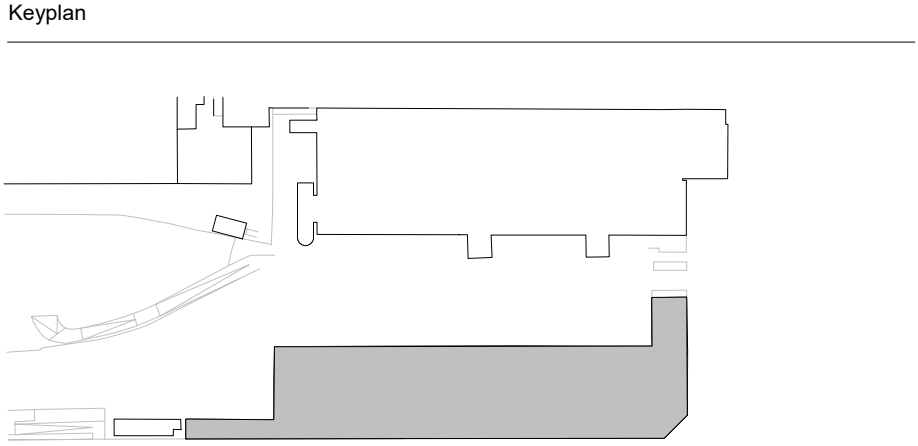
As the first point of entry for Museum staff, the new fire exit door within the timber infill to the Small Railway Aperture will require a cylinder dead lock with thumb pull on the outside face such as the Croft Euro Cylinder Pull, DBMA Bronze (or similar).

Appendices



Revision	Description	Drawn/Checked	Date
PL 1	Issue for Planning	JY	20.08.2021
PL 2	Issue for Planning	CM	20.12.2022

Key	
	Existing
01. Salvaged / reclaimed slate roof finish	17. Existing gantry
02. Lead work	18. Double glazed curtain walling
03. Roof ridge tile	19. Vertical timber weatherboarding
04. Building services/ pipe work	20. Existing blind windows
05. Patent glazing roof lights	21. Existing window glazed door
06. New roof build up	22. Existing shutter doors
07. Roof light support	23. Robust metal cladding panel
08. Stained OSB sheathing board	24. Metal framed sliding door
09. Existing purlin	25. Existing modern platform with balustrade
10. Existing rafter	26. Existing lighting
11. New door	27. New lighting
12. Membrane lined insulated metal gutter	28. New glazed door
13. Fitch beam	
14. Existing brick parapet	
15. Existing stone and brick cornice	
16. Existing timber truss/ structure	



0 2 4 10m

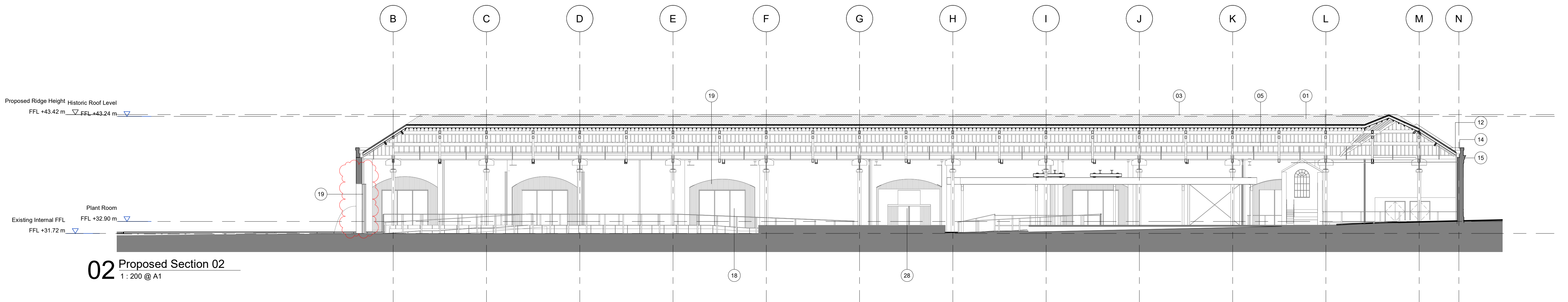
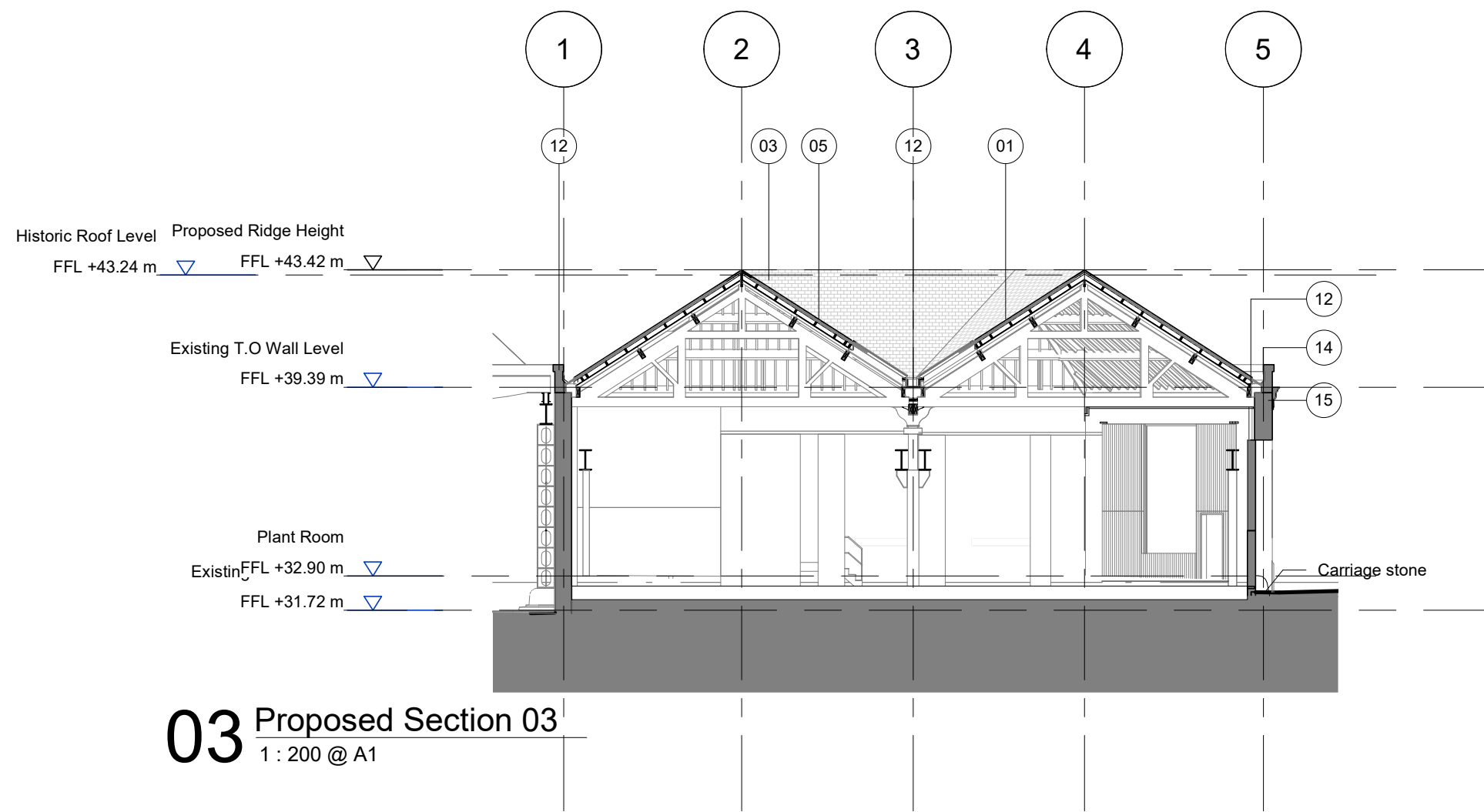
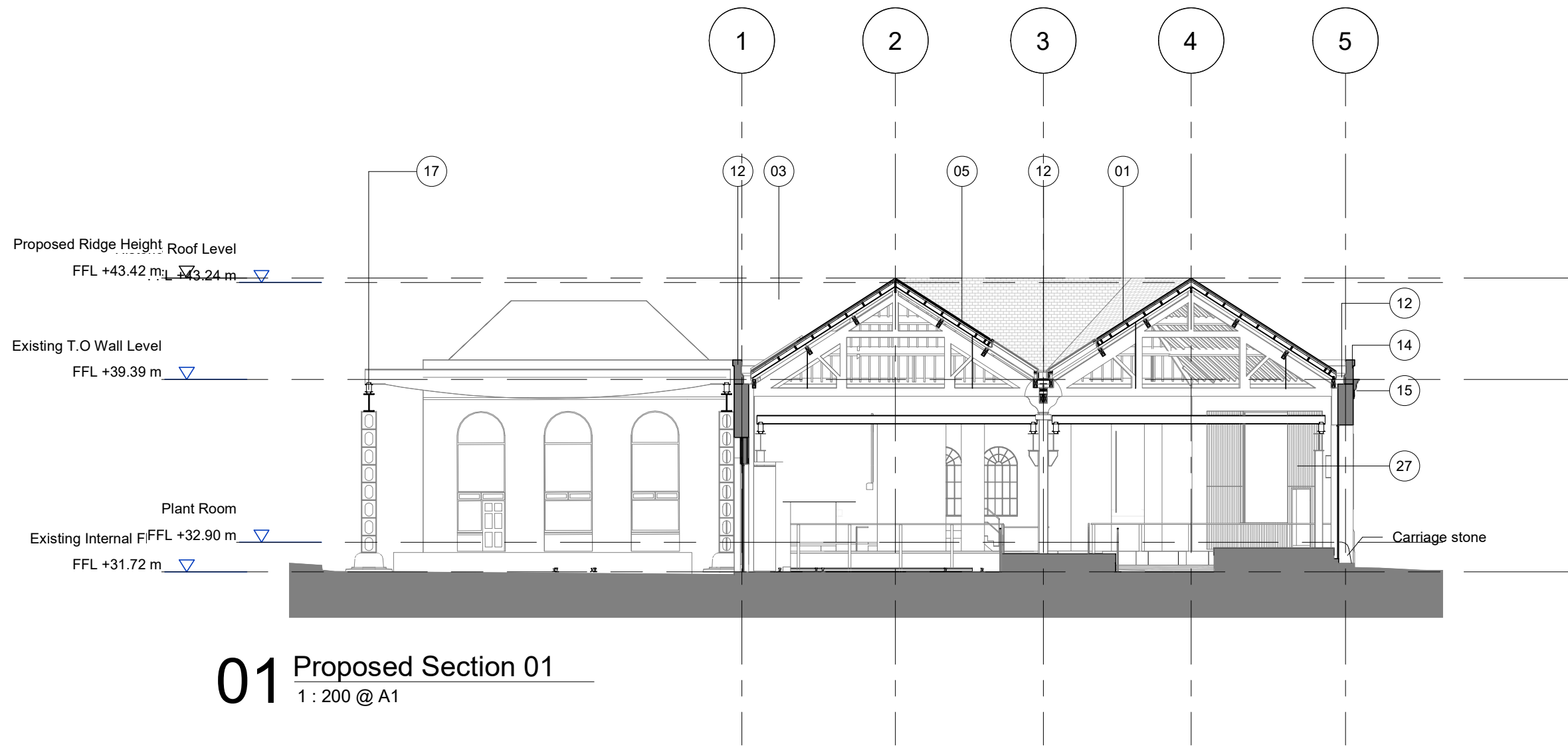
Drawings are based on survey information provided and subject to changes to accommodate existing building structure and services installation. We have noted discrepancies in the survey information and clarification required following further site investigations by the contractor on site. Do not scale from drawing. Errors to be reported immediately to the Architect. All dimensions must be verified on site. To be read in conjunction with all relevant Architects', Services and Structural Engineers' drawings.

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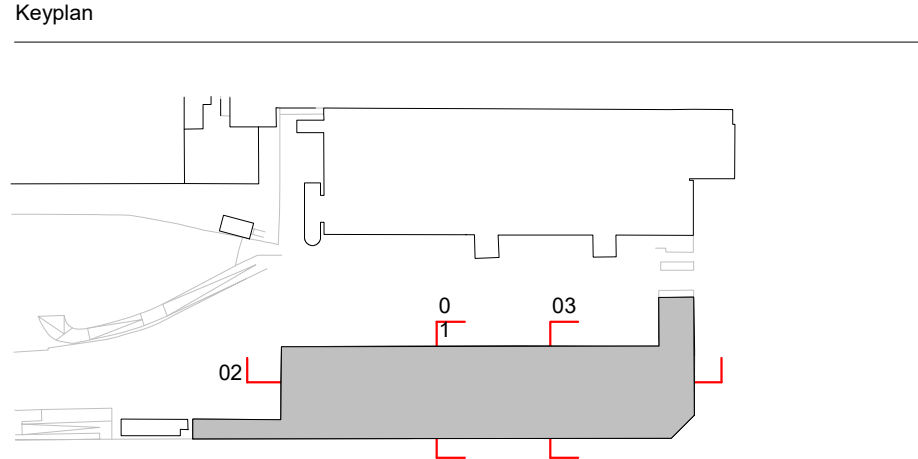
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Date		Issue	
20.12.2022		PL 2	
Project Name	Power Hall & Decarbonisation	Scale/Format	1 : 200 @ A1
Client	SIM	Drawn/Checked	CM/ RS
Project number	PHL	Approved	RS
		CAD Reference	



Note: Historic collection not shown for clarity (not part of this application)

Revision	Description	Drawn/Checked	Date
PL 1	Issue for Planning	JY	20.08.2021
PL 2	Issue for Planning	JY	20.10.2021

Key	
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01. Salvaged / reclaimed slate roof finish	17. Existing gantry
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13. Flitch beam	
14. Existing brick parapet	
15. Existing stone and brick cornice	
16. Existing timber truss/ structure	



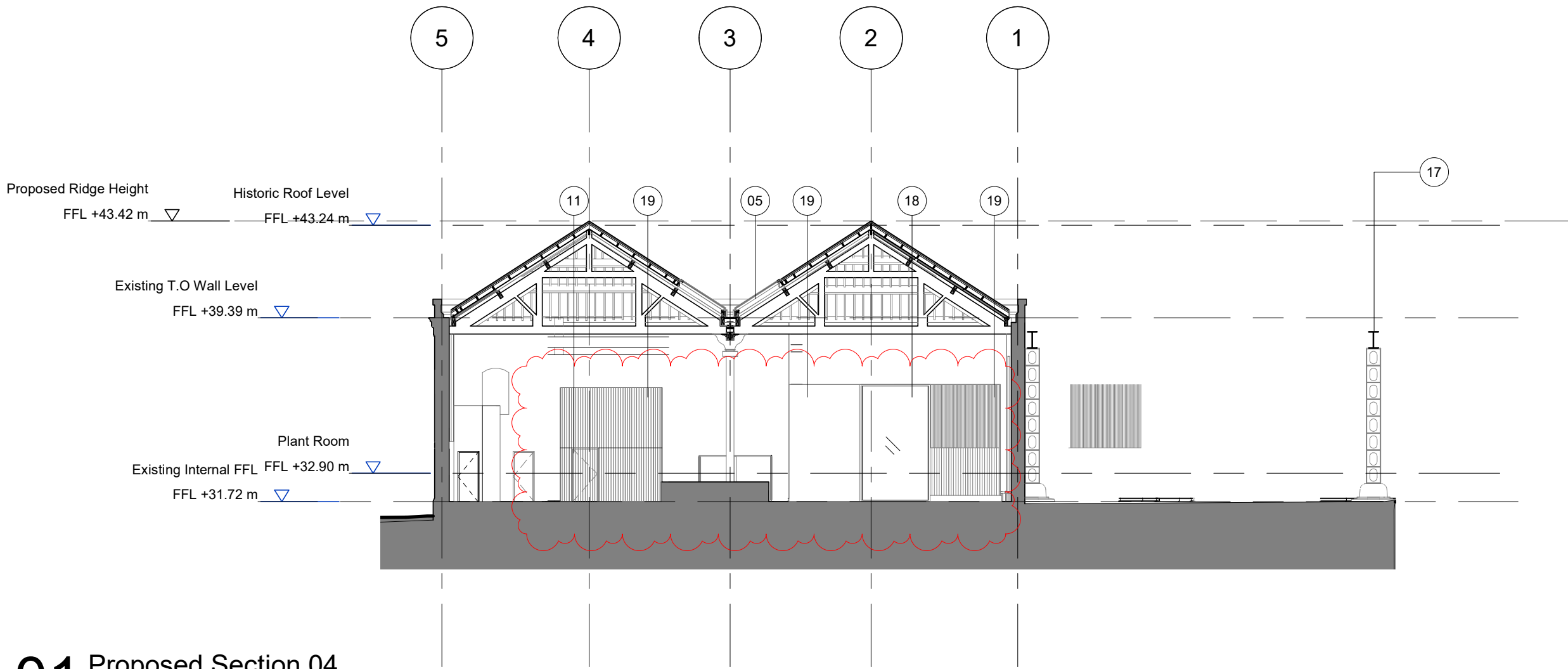
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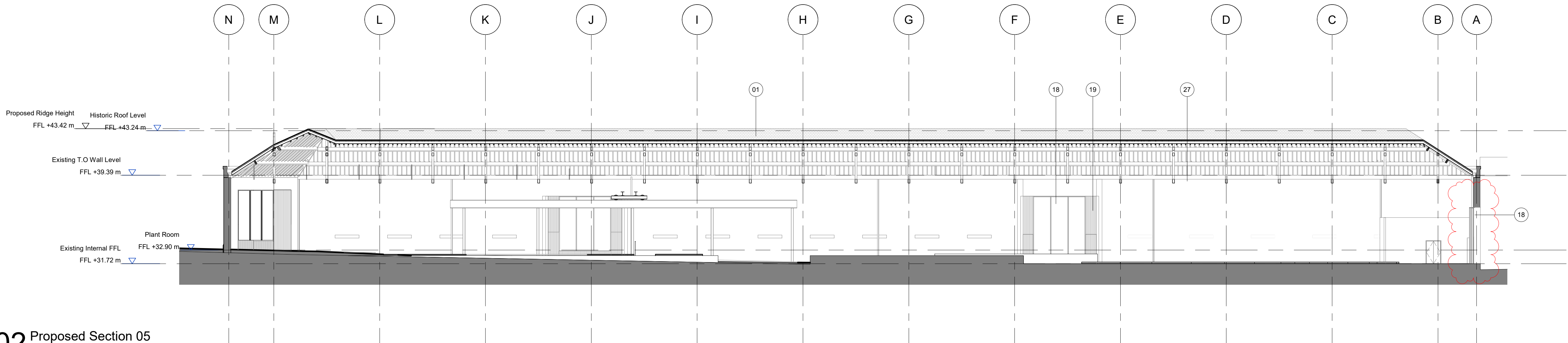
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Drawing Name		Drawing Number	
Proposed Sections 01 - 03		PHL-CGA-00-XX-DR-A-06210	
Date		Issue	
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Project Name	Power Hall & Decarbonisation	Scale/Format	1 : 200 @ A1
Client	SIM	Drawn/Checked	CM/ RS
Project number	PHL	Approved	RS
		CAD Reference	



01 Proposed Section 04
1 : 200 @ A1

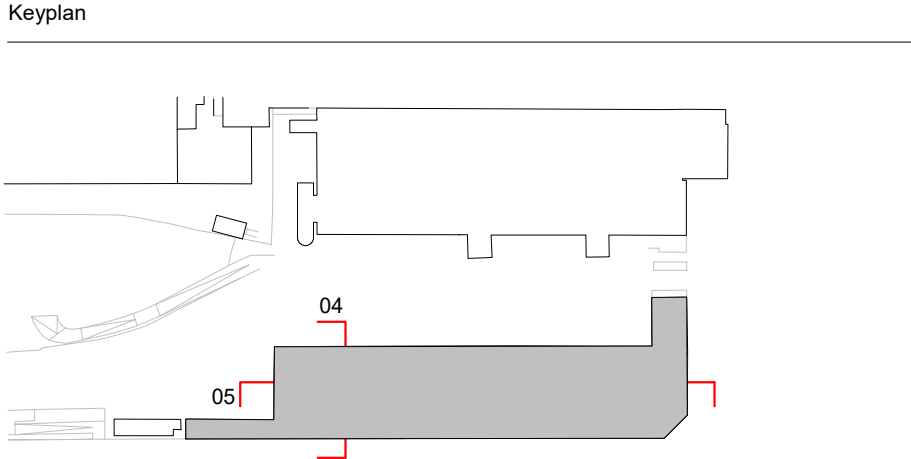


02 Proposed Section 05
1 : 200 @ A1

Note: Historic collection
not shown for clarity
(not part of this
application)

Revision	Description	Drawn/Checked	Date
PL 1	Issue for Planning	JY	20.08.2021
PL 2	Issue for Planning	JY	20.10.2021

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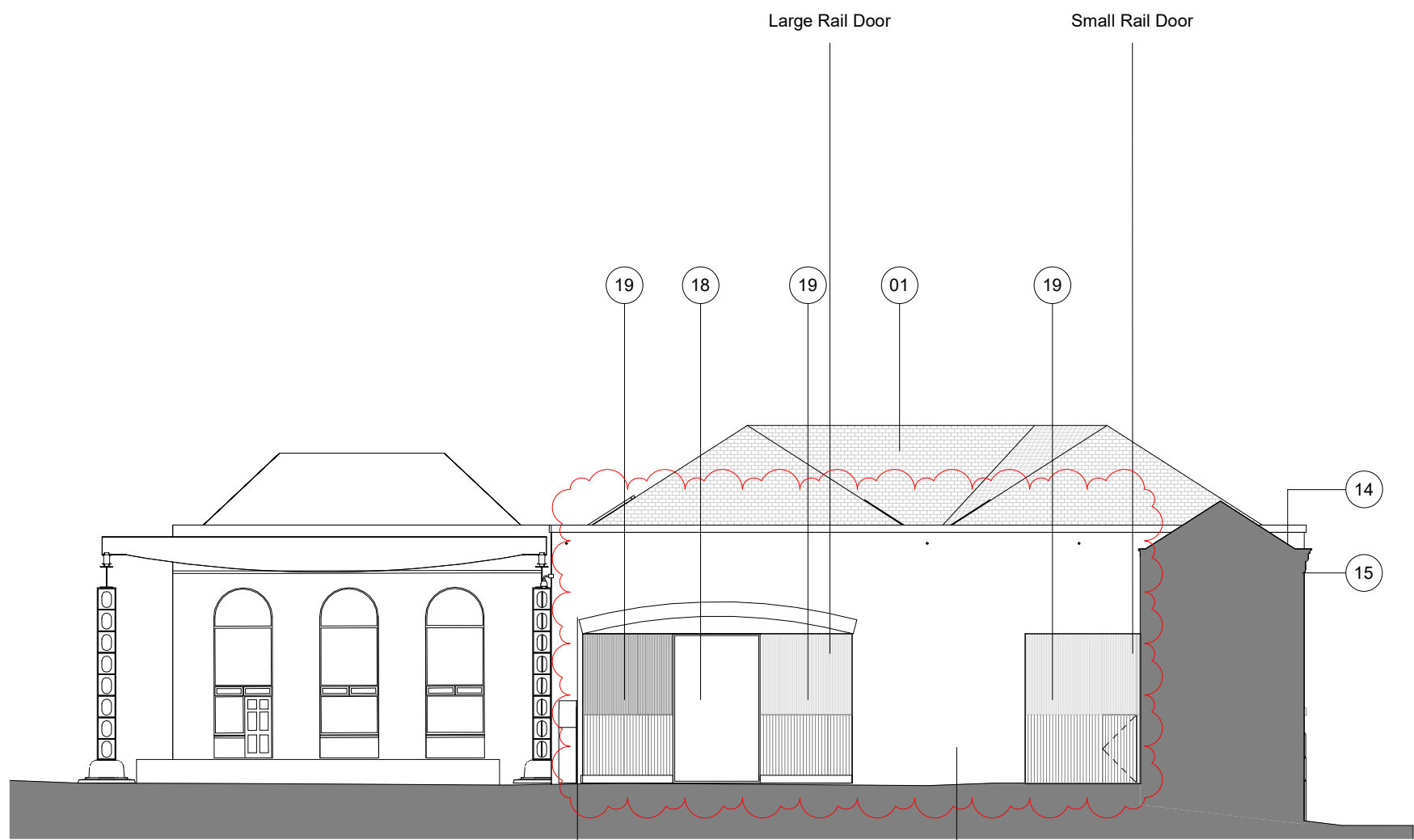
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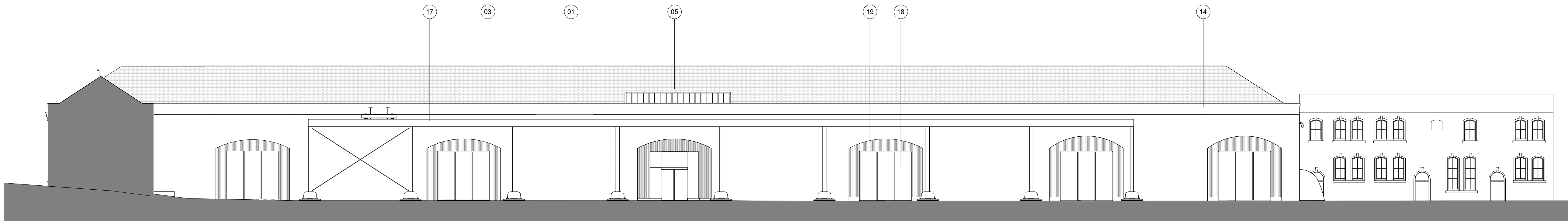
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Drawing Name		Drawing Number	
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Date		Issue	
20.12.2022		PL 3	
Project Name	Power Hall & Decarbonisation	Scale/Format	1 : 200 @ A1
Client	SIM	Drawn/Checked	CM/ RS
Project number	PHL	Approved	RS
		CAD Reference	



01 Proposed West Elevation
1 : 200 @ A1



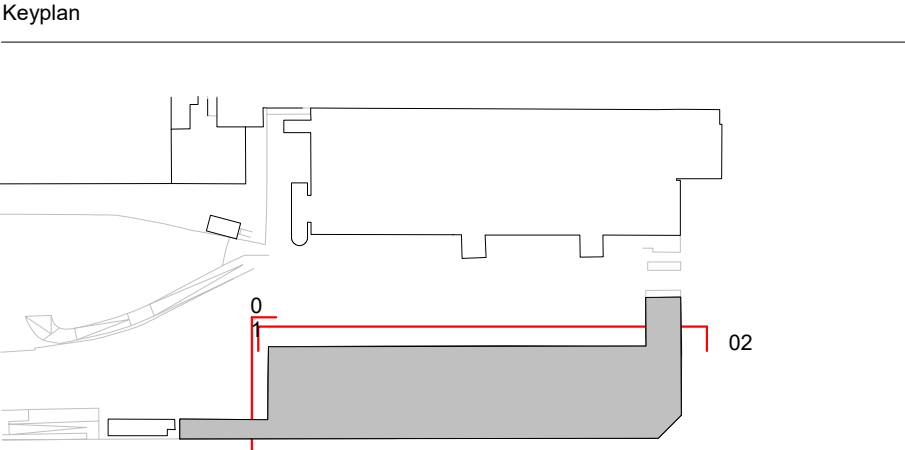
02 Proposed North Elevation
1 : 200 @ A1

Notes

New external lighting to be developed as part of package 4.

Revision	Description	Drawn/Checked	Date
PL 1	Issue for Planning	JY	20.08.2021
PL 2	Issue for Planning	JY	20.10.2021

Key	
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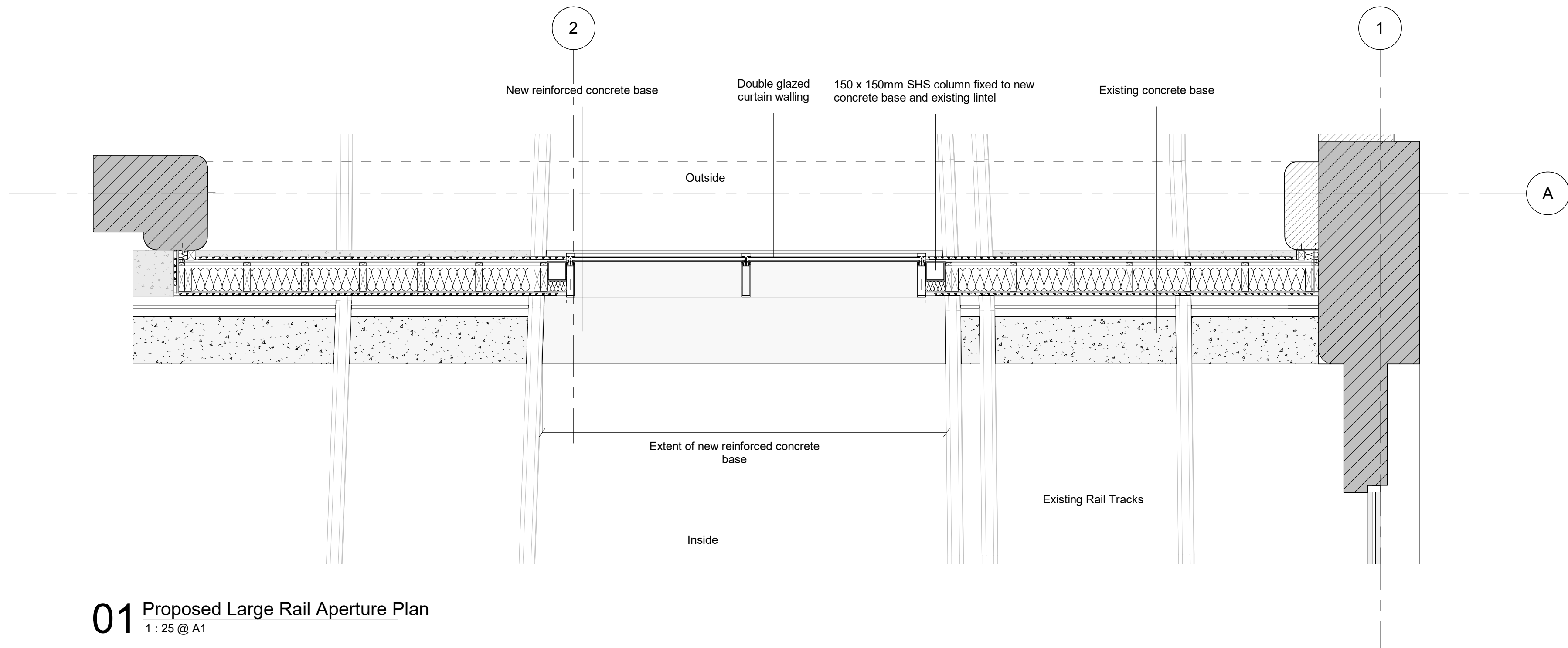
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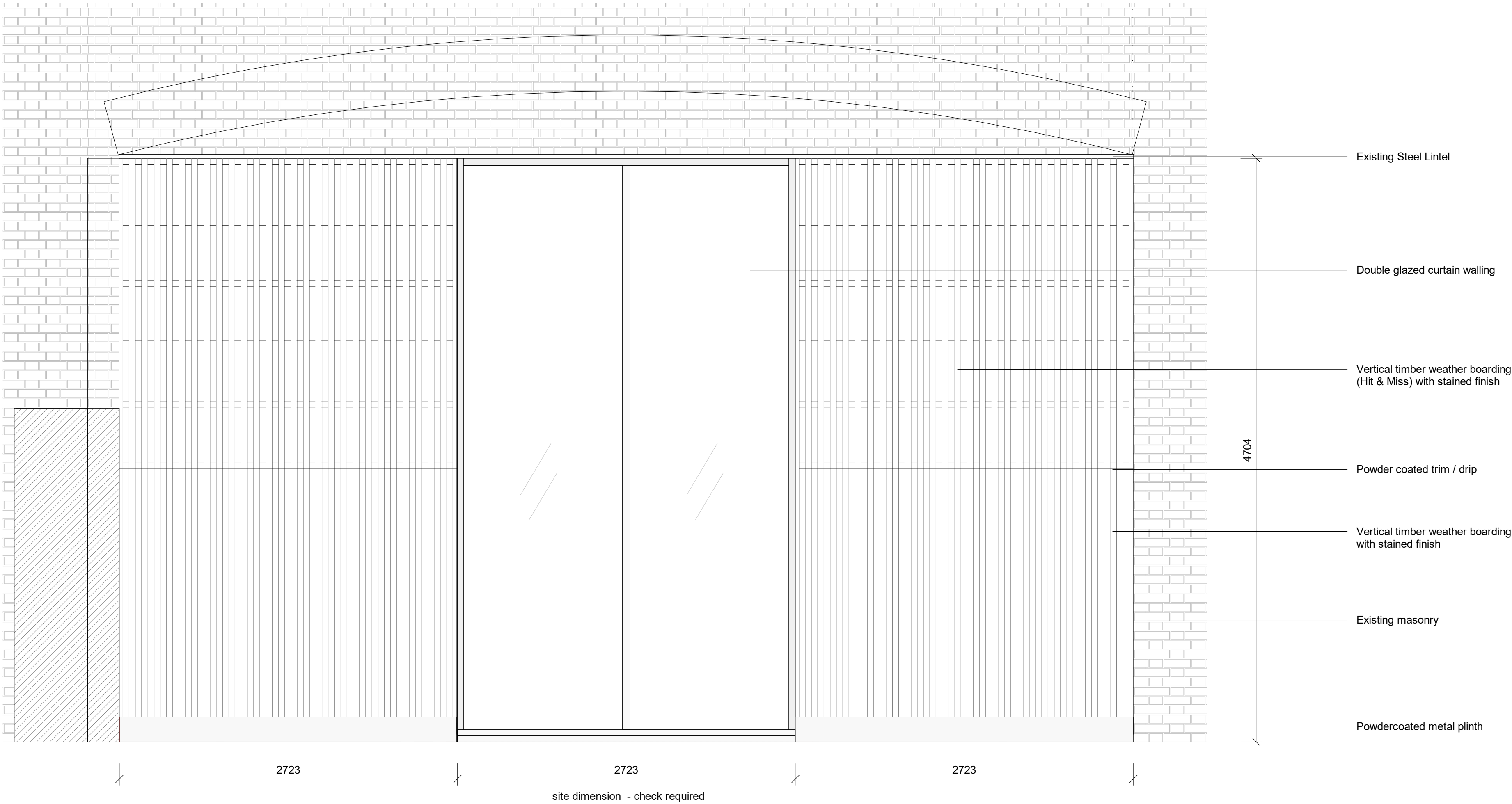
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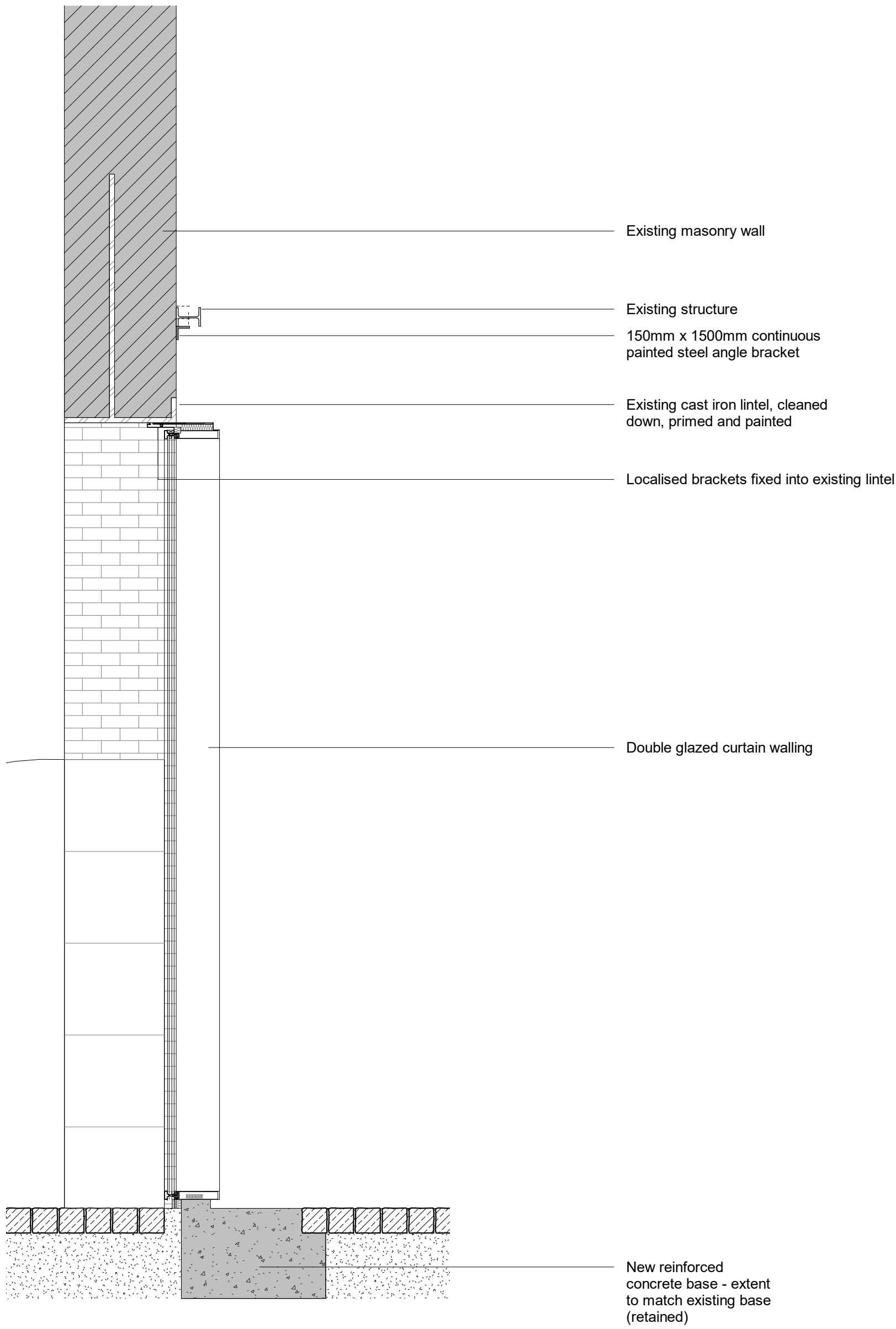
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Date		Issue	
20.12.2022		PL 3	
Project Name	Power Hall & Decarbonisation	Scale/Format	1 : 200 @ A1
Client	SIM	Drawn/Checked	CBol / JY
Project number	PHL	Approved	RS
		CAD Reference	



01 Proposed Large Rail Aperture Plan
1 : 25 @ A1



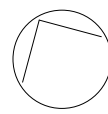
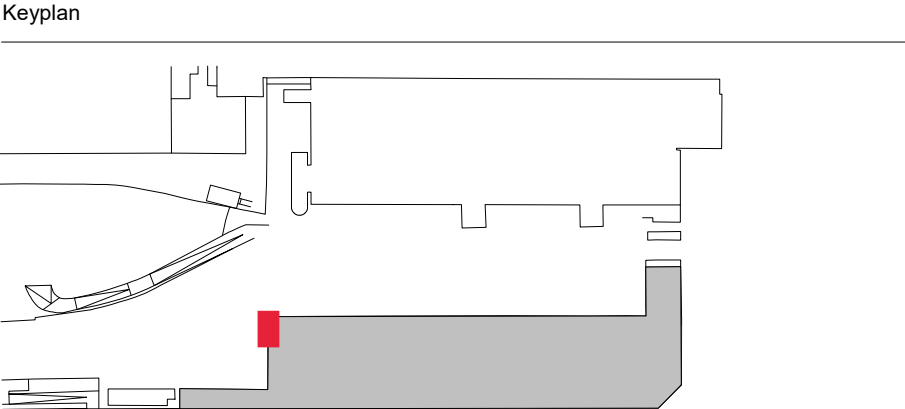
02 Proposed Large Rail Aperture Elevation
1 : 25 @ A1



03 West gable railway door section proposed
1 : 25 @ A1

Revision	Description	Drawn/Checked	Date
PL1	Planning	CM	20.12.22

Key
Existing



0 0.02 0.04 0.1

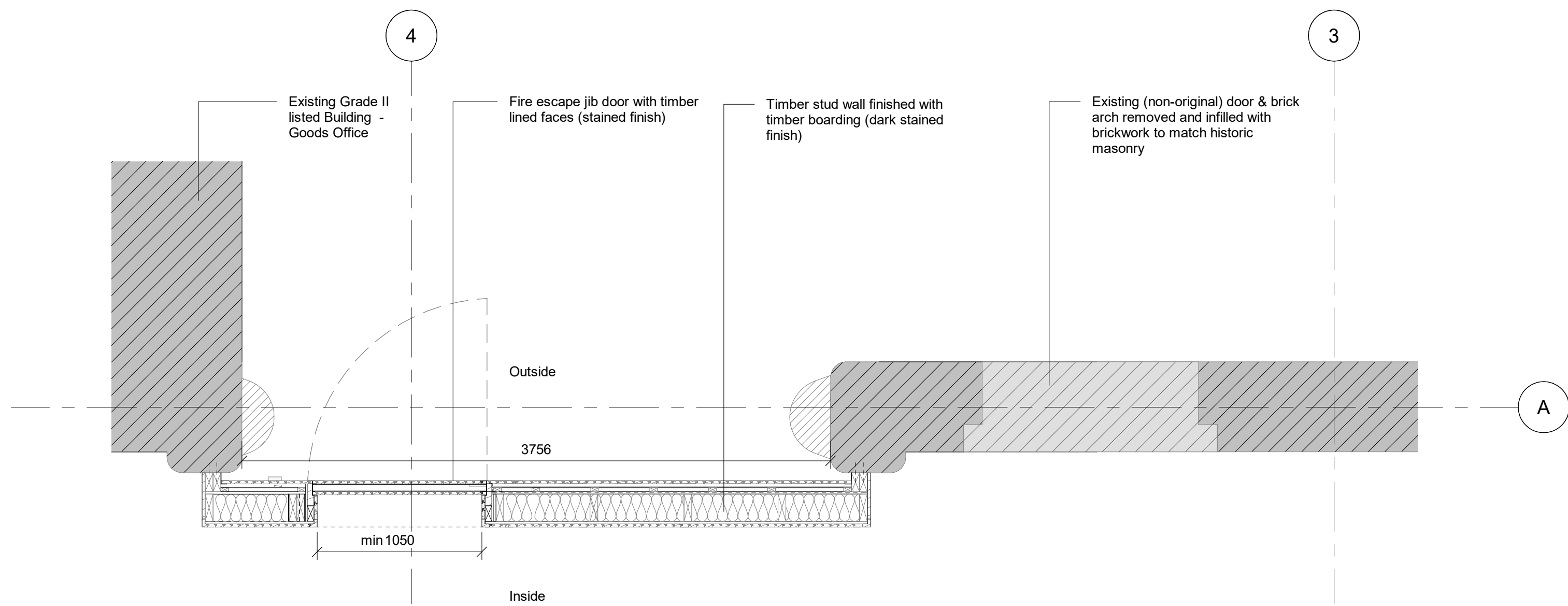
Drawings are based on survey information provided and subject to changes to accommodate existing building structure and services installation. We have noted discrepancies in the survey information and clarification required following further site investigations by the contractor on site. Do not scale from drawing. Errors to be reported immediately to the Architect. All dimensions must be verified on site. To be read in conjunction with all relevant Architects', Services and Structural Engineers' drawings.

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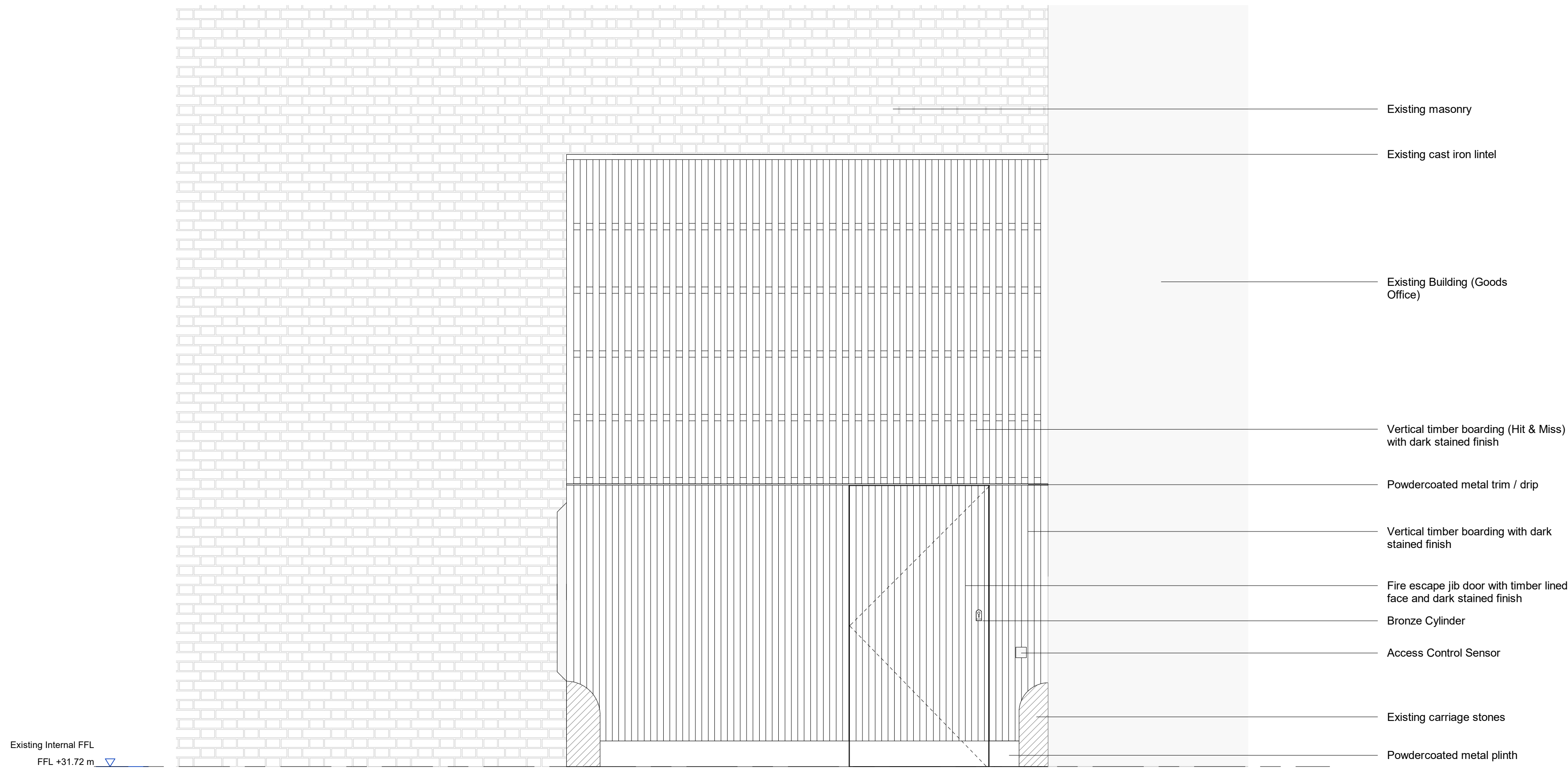
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Drawing Name		Drawing Number	
Proposed Large Rail Aperture		PHL-CGA-00-XX-DR-A-31535	
Date		Issue	
20.12.22		PL1	
Project Name	Power Hall & Decarbonisation	Scale/Format	1 : 25 @ A1
Client	SIM	Drawn/Checked	CM/ RS
Project number	PHL	Approved	Approver
		CAD Reference	



02 Proposed Small Railway Aperture_Plan
1 : 25 @ A1

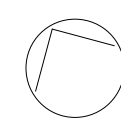
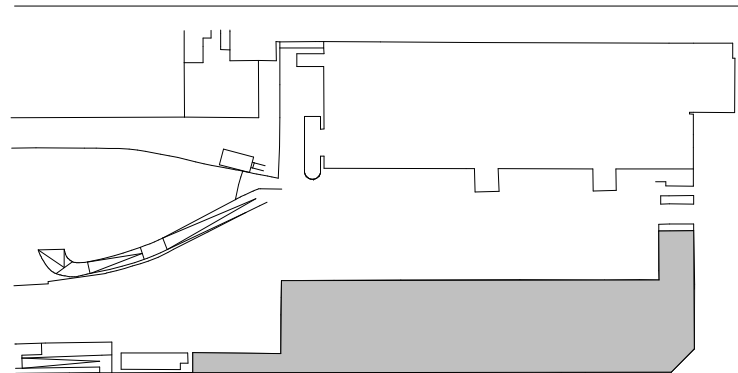


01 Proposed Small Railway Aperture_Elevation
1 : 25 @ A1

Revision	Description	Drawn/Checked	Date
PL1	Planning	CM	20.12.22

Key
Existing

Keyplan



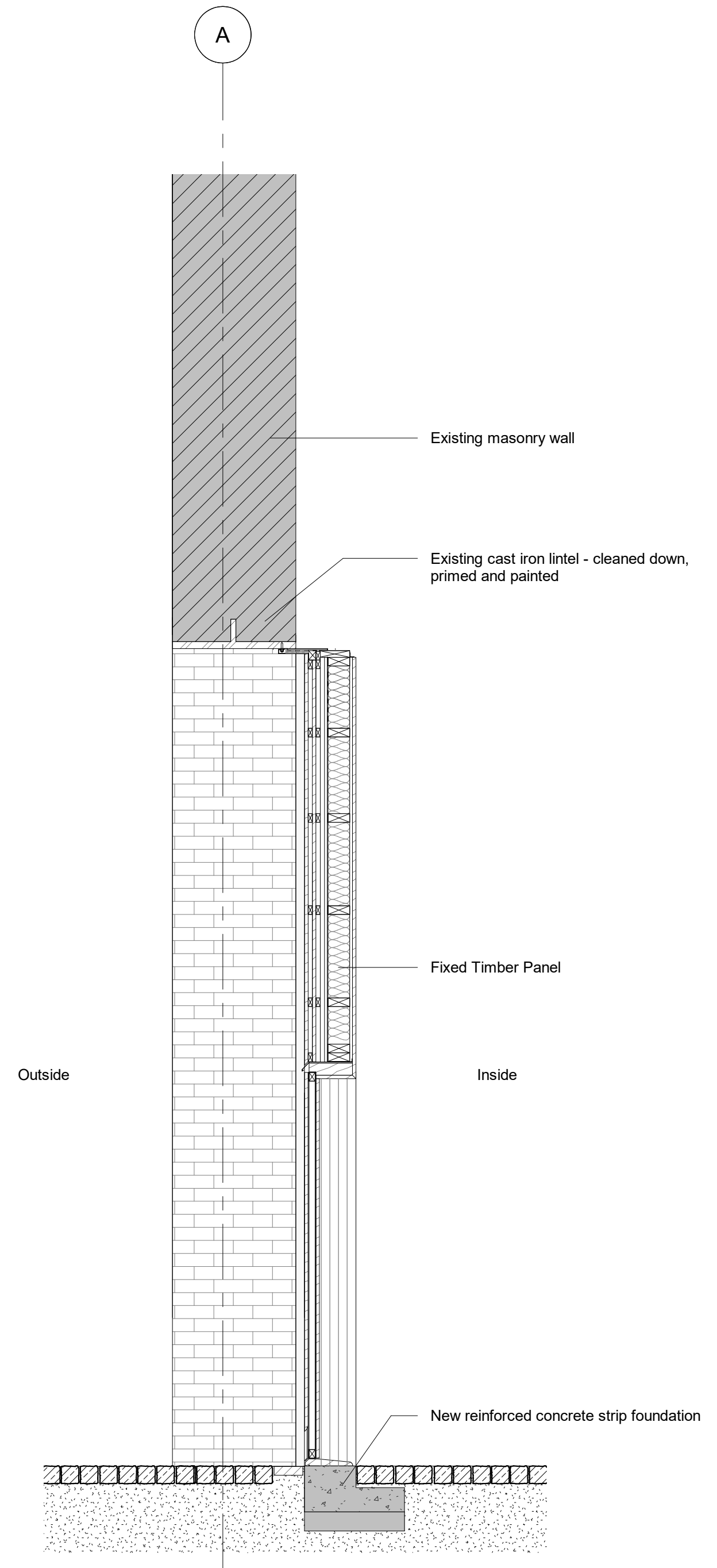
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03 Proposed Small Railway Aperture_Section
1 : 25 @ A1

Drawing Name		Drawing Number	
Proposed Small Rail Aperture		PHL-CGA-00-XX-DR-A-31540	
Date		Issue	
20.12.22		PL1	
Project Name	Power Hall & Decarbonisation	Scale/Format	1 : 25 @ A1
Client	SIM	Drawn/Checked	CM/ RS
Project number	PHL	Approved	RS
		CAD Reference	