Hanover Retail

Listed Building Structural Report

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Rev	Description	Issued by	Checked	Date
P01	Original Issue	DS	DS	07/12/20
P02	Section 2.1.2 Amended	DS	DS	09/12/20
P03	Bay Window Removal Proposal Addedd	MA	DS	22/01/2021

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Table of contents

1.0 Introduction 1

2.0 Structural Alterations 2

2.1 Hanover Building 2

2.1.1 New Entrances 2

2.1.2 Current Entrance Alterations 3

2.1.3 Repair of lightwells 3

2.2 E-Block 4

2.2.1 New Entrances 4

2.2.2 New entrance staircase 4

2.2.3 Infill of existing slab voids 4

2.2.4 New Internal Staircase and Platform lift 5

2.2.5 Repair of existing lightwells 5

2.2.6 Repair/replacement of existing pavement support steelwork 6

3.0 Appendices 7

3.1 Appendix A Structural Modification GA's & Details 7

1.0 Introduction

The Hanover building is a grade II listed building in Manchester city centre. It was completed in 1907 and is the earliest surviving commercial warehouse built by the Co-operative Wholesale Society's (CWS) in-house architecture department.

It is forged from two buildings: E Block was built as a drapery warehouse and completed in 1904; and Hanover was added in 1909 to create offices and additional warehouse space. The red brick building with stone carved details is an outstanding example of Edwardian Baroque and was built using the most advanced construction techniques of its time.

The building has recently undergone a significant refurbishment that was completed in 2019, however works to the ground floor and basement areas in both Hanover and E-Block were completed as part of these works and this proposal seeks to amend the original proposals to refurbish these areas to provide usable retail spaces and/or office, financial or professional services.

It is proposed to facilitate these works through remedial and refurbishment work. Generally, these works will consist of the following:

- Repairs carried out to the lightwell structures surrounding the building
- Alterations to the existing structure to make internal and external spaces more useable
- Alterations to the façade to provide level access into the units from ground floor level

This report sets out the structural implications of these works on the existing structure, with respect to attaining listed building consent.

Due to the constraints provided by the building's age and listed status, we have explored structural options which will have the least impact on the existing structure, whilst still providing as much useable space as possible. The proposed structural works are based on assessments made during visual surveys and our assumptions based on experience with structures of similar age and construction. At the time of writing, surveys are ongoing and once completed, the findings will be used where possible to verify any assumptions and update the structural proposals and repair requirements as appropriate.

2.0 Structural Alterations

This section outlines the structural alterations that may be required to the existing building. This section should be read in conjunction with the appended Structural General Arrangement drawings and Typical Details drawings. Reference should also be made to the drawings produced by Sheppard Robson Architects (SR).

The design has been undertaken in such a way as to try and minimise the structural intervention required while improving the building's usability in order to bring it back into regular use in the appropriate spaces..

The majority of the structural elements are currently exposed in E-block but behind finishes in the Hanover section of the building, however information from the recent refurbishment has been used to develop the details in these areas.

Historical drawn information along with visual inspection of the structural elements that are exposed have allowed us to gain enough of an understanding of the building structure to develop a structural strategy for these alterations, however the exact details and measurements will need to be reviewed once the detail design is undertaken.

Generally, the structural form for the Hanover section is concrete floor slabs supported on reinforced concrete beams and columns. The structural form of E-block is generally filler joisted concrete floor slabs supported by steel beams and cast-iron columns within the internal floor spaces and load bearing masonry walls to the perimeter.

The structural modifications are described below and details of alteration along with a proposed method statement for undertaking the alteration (where appropriate) can be found in the appendices of this report.

2.1 Hanover Building

2.1.1 New Entrances

Two new entrances are being formed on the Corporation street elevation. The external floor level is much lower in these areas than the ground floor of the building and as such a section of floor at ground floor level needs to be removed to install a 'split' staircase to allow access to both the ground floor and basement unit.

To minimise structural intervention the staircases have been positioned between concrete beams to avoid major structural works. By positioning the staircases in this location, a trimmer beam can be installed between the existing beams and the floor slab can then be cut back to the existing and new beam lines.

A new beam will also be installed at the staircase half landing location to support the stairs and a new infill floor to create the level entrance from the external level to the half landing. The beam will be supported from the existing walls and there is a detail in the appendices of this report that shows how this will be done. This new floor will be created from composite metal decking.

The new staircase will be created from steel and will be supported from the new half landing beam and new trimmer beam. It will also be supported at basement level by directly fixing it to the basement slab. The platform lift in this location will be supported directly from the basement slab and will be fixed to it with a similar detail to that of the staircase.

Bay Window Removal

A small section of the façade under the existing windows will have to be removed to create the new entrance into the building. The existing façade comprises a bay window with two internal mullions supporting masonry and bay window above first floor. The structural proposal for removal of the bay window at ground floor level is to temporarily prop the masonry and the mullions above first floor level and install steelwork below the existing first floor slab supported of the concrete down stand beams. Removal of the existing facade after installation of the temporary props should be done carefully using hand tools only and reference should be made to the architects' drawings for details of this.

2.1.2 Current Entrance Alterations

A section of the ground floor adjacent to the existing entrance is currently lower than the rest of the floor. The main ground floor level is access by a small flight of concrete stairs from the entrance landing at lower level. It is proposed that the existing entrance landing and stairs are removed and replace with a section of concrete floor at the same level as the rest of the ground floor space. This will not only allow this section of floor space to be used on the ground floor but will also remove the restricted headspace at basement level in this area and create visually a similar soffit appearance to the existing,

The alteration has been designed so that structural strengthening will not be required to keep structural interventions to a minimum. The new floor will be built into the existing perimeter walls and supported off the existing concrete slab/beams in the same location that the stairs are supported now. A small area of brickwork will need to be removed at ground floor level internally to allow the slab to be built-into the wall. The current door opening will not be filled in the door simply replaced with glazing to avoid further intervention.

2.1.3 Repair of lightwells

The current structure that supports the floor of the lightwells to the perimeter of the building is showing signs of corrosion and deterioration and need to be repaired. The steel beams that support the concrete floor needs to have the paint system tested to see whether it is lead paint before this is removed to

allow the corrosion from the beam to be removed by wire brush or other approved method. Once the corrosion has been removed the beam will be surveyed to ensure no remedial works are required before it is re-painted.

The concrete floor slab is showing signs of deterioration and the soffit should be cleaned with any corrosion/defects removed and a concrete repair mortar used to repair these areas. The entire soffit should then have a concrete protection coating applied to protect the concrete.

2.2 E-Block

2.2.1 New Entrances

There are three new entrances to be formed on Federation Street. Similar to Hanover, the external levels are lower than the ground floor level. Unlike Hanover, the level change is small and so internally it can be overcome with an internal ramp in two locations and the other location is virtually level and so requires no structural works. Where the two ramps are being provided the floor ground floor needs to be lowered locally to the external ground level. The ramps have been positioned and orientated so that they fit between the existing steel beams to minimise the area of modification and to prevent major structural alterations or the addition of extra structural members.

The structural works are to remove one bay of the ground floor slab between the existing beams and replace this with a new concrete floor at a lower level, supported off the existing beams. A detail of this along with a suggested method statement can be found in the appendices of this report.

2.2.2 New entrance staircase

Where the new entrance being created is level, a new staircase is being proposed to access the basement level. This will require the removal of a section of ground floor slab but as previously the orientation and location of the staircase has been selected to minimise the structural works required to facilitate it. The staircase is located within one structural bay and so the floor in this bay is to be removed between the existing steel beams in line with the details in the appendices of this report. This staircase will be formed in steel and connected to the existing steelwork at ground floor level.

At lower ground floor level, the staircase will connect to the slab directly above the steel beam below it. This beam may need strengthening to accommodate the extra load and a detail for this strengthening works is included within the appendices of this report. The requirement for strengthening this beam will be determined during the detailed design phase of the project and will be avoided where possible.

2.2.3 Infill of existing slab voids

There are a number of ground floor slab voids to the perimeter at the Hanover St and Balloon St elevations that need to be infilled. It is proposed to insert two new beams to support this section of

floor. The beams will either be built into the wall onto a padstone or connected to the existing steel beams dependent upon the support location. The new ground floor will be formed from composite metal decking. The beams will be installed before the new floor is installed.

2.2.4 New Internal Staircase and Platform lift

There is a requirement to install a new staircase and platform lift within the internal footprint of the building. Unlike the other staircases this does not fit with a structural bay and so has been positioned to only remove a section of 1 steel beam that is a secondary structural beam rather than a primary which means the structural works will be minimised.

The floor in the affected bays and the existing beam that is to be cut are to be propped. The beam can then be carefully cut to remove the section required. Two new beams will then be installed to trim the proposed opening and connected to the existing steel beams. The existing beams that support the new trimming steel may need strengthening with a similar detail to elsewhere and the requirement for this will be determined during the detailed design phase of the project. This requirement is shown on the drawings in the appendix of this report.

The staircase void will then be carefully cut out and the staircase installed, with the staircase supported by the newly installed beams at ground floor level. At lower ground floor level, the staircase will connect to the slab directly above the steel beam below it. This beam may need strengthening to accommodate the extra load and a detail for this strengthening works is included within the appendices of this report. The requirement for strengthening this beam will be determined during the detailed design phase of the project and will be avoided where possible.

The platform lift will be supported off the Lower ground floor slab and dependent upon the specification of this lift additional steel members may need to be installed below the lower ground floor slab to take the additional load from the lift.

2.2.5 Repair of existing lightwells

The current structure that supports the floor of the lightwells to the perimeter of the building is showing signs of corrosion and deterioration and need to be repaired. The steel beams that support the concrete floor needs to have the paint system tested to see whether it is lead paint before this is removed to allow the corrosion from the beam to be removed by wire brush or other approved method. Once the corrosion has been removed the beam will be surveyed to ensure no remedial works are required before it is re-painted.

The concrete floor slab is showing signs of deterioration and the soffit should be cleaned with any corrosion/defects removed and a concrete repair mortar used to repair these areas. The entire soffit should then have a concrete protection coating applied to protect the concrete.

2.2.6 Repair/replacement of existing pavement support steelwork

The current structure that supports the external pavement to the perimeter of the building is showing signs of corrosion and deterioration and need to be repaired/replaced. The steel beams that support the external pavement will need to be inspected for corrosion. Beams which are beyond repair will need to be replaced with a new steel beam with the correct corrosion protection specification applied.

Suggested method statement for removal and replacement of existing beam

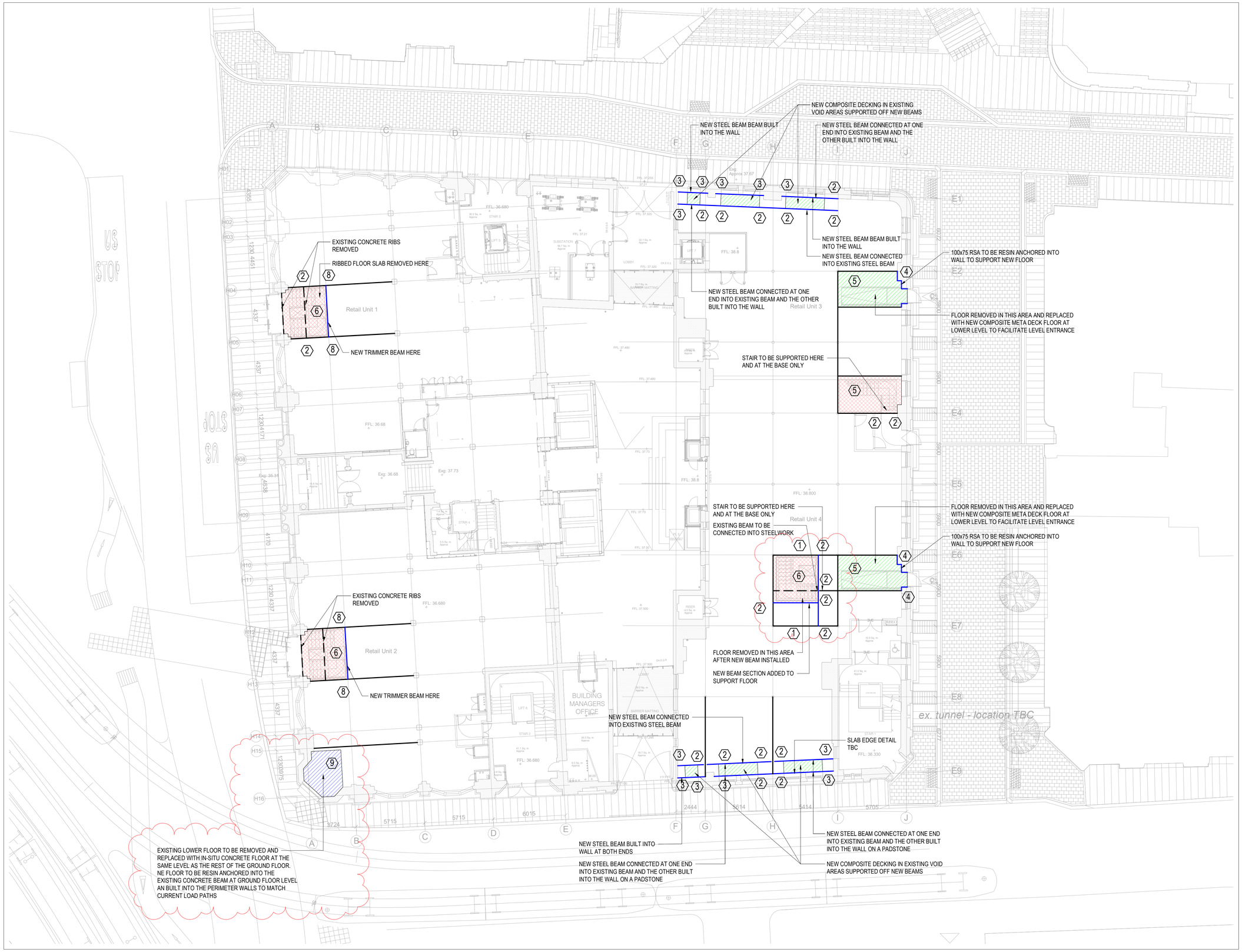
1. Temporarily prop existing pavement
2. Remove existing beam
3. Replace with new steel beam
4. Pack gap between new steel beam and existing pavement
5. Remove temporary props

Beams which can be repaired will need to have the paint system tested to see whether it is lead paint before this is removed to allow the corrosion from the beam to be removed by wire brush or other approved method. Once the corrosion has been removed the beam will be surveyed to ensure no remedial works are required before it is re-painted.

3.0 Appendices

3.1 Appendix A Structural Modification GA's & Details

Appendix A Structural Modification GA's & Details



PROPOSED GROUND FLOOR

SCALE: 1 : 150

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
4. FOR GENERAL NOTES REFER TO DRAWING.

KEY:

- DENOTES PROPOSED STEELWORK
- DENOTES EXISTING BEAM
- DENOTES NEW 150mm THICK INSITU COMPOSITE DECK FLOORING
- DENOTES EXISTING FLOOR SLAB TO BE REMOVED
- XX REFER TO CORRESPONDING DETAIL NUMBER ON 077487-CUR-XX-ZZ-DR-S-21010 FOR DETAILS

Rev:	Description:	Date:	By:	Chkd:
P02	REVISED AS CLOUDED	09.12.20	GM	DS
P01	STAGE 3 ISSUE	04.12.20	GM	DS

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Status: STAGE 3

Project: HANNOVER RETAIL PROJECT

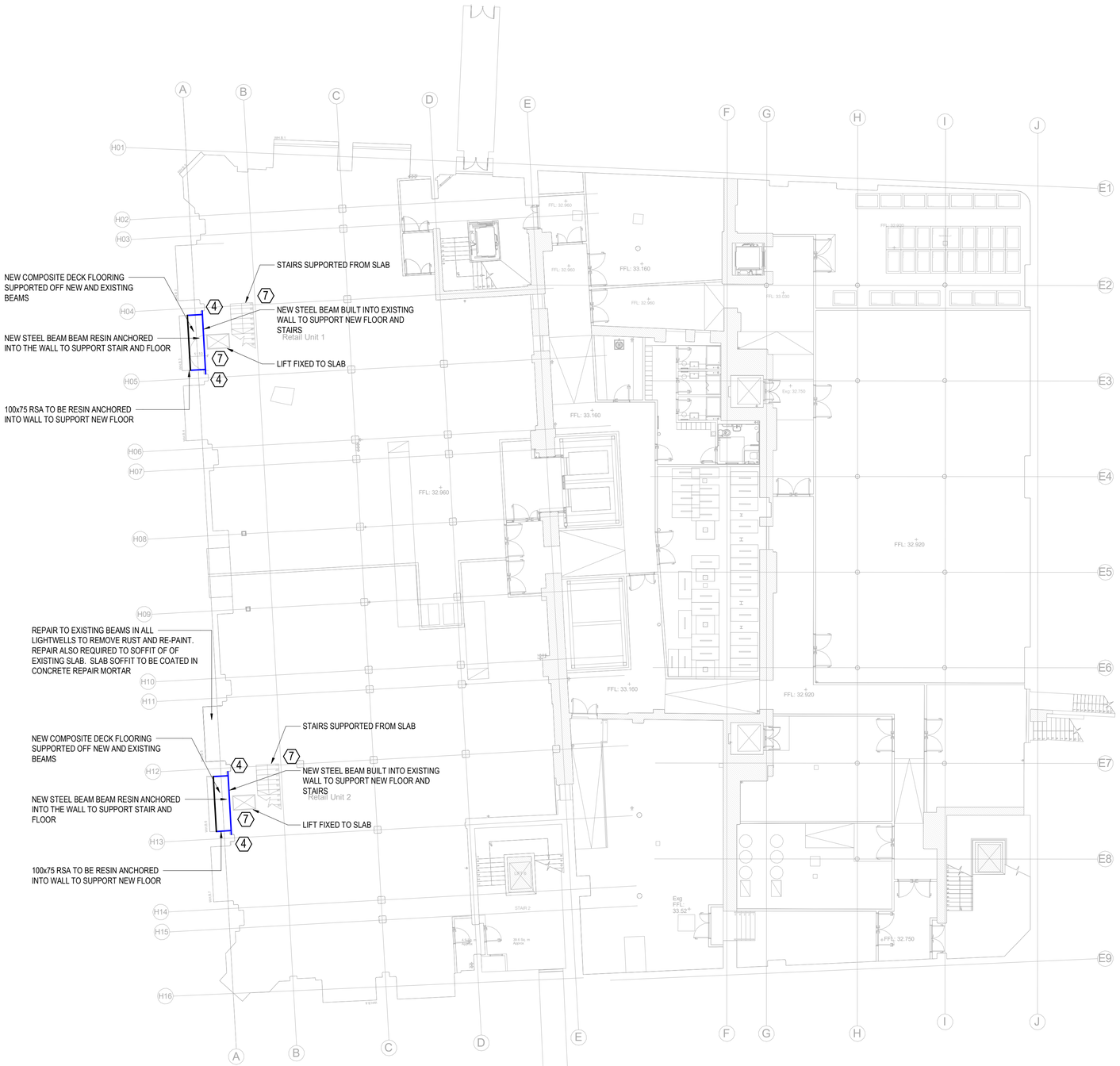
Drg Title: PROPOSED GROUND FLOOR GENERAL ARRANGEMENT

Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	DEC 20	GM	DS	DS

Scale: As indicated

Project No:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:
077487 -	CUR -	XX -	00 -	DR -	S -	20002 -	P02

Model Name:XXXXXX-CUR-ZZ-XX-M3-S-00001



BASEMENT GENERAL ARRANGMENT

SCALE: 1 : 150

GENERAL NOTES:

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Status: STAGE 3

Project: HANNOVER RETAIL PROJECT

Drg Title: PROPOSED BASEMENT GENERAL ARRANGEMENT

Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	DEC 20	GM	DS	DS

Scale: As indicated

Project No:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:
077487 -	CUR -	XX -	B1 -	DR -	S -	16001 -	P01

Model Name:XXXXXX-CUR-ZZ-XX-M3-S-00001



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KEY:

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- DENOTES EXISTING BEAM
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- DENOTES EXISTING FLOOR SLAB TO BE REMOVED
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Rev:	Description:	Date:	By:	Chkd:
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Status: STAGE 3

Project: HANNOVER RETAIL PROJECT

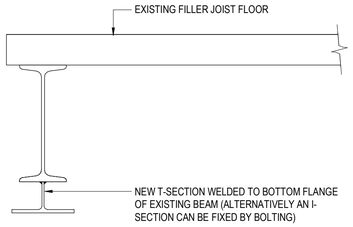
Drg Title: PROPOSED LOWER GROUND FLOOR GENERAL ARRANGEMENT

Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	DEC 20	GM	DS	DS

Scale: As indicated

Project No:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:
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Model Name:XXXXXX-CUR-ZZ-XX-M3-S-00001

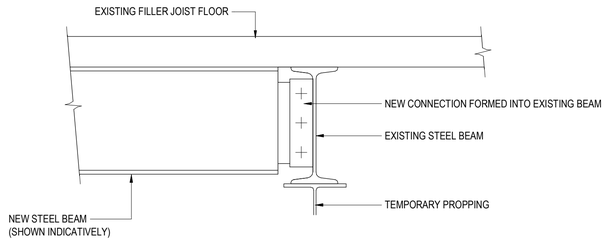


DETAIL 01
TYPICAL STRENGTHENING DETAIL TO EXISTING BEAMS

(NTS)

DETAIL 01
SUGGESTED METHOD STATEMENT

1. PREPARE STEEL SURFACE FOR BOLTING OR WELDING AS NECESSARY.
2. WELD NEW T-SECTION OR BOLT NEW PFC TO UNDERSIDE OF EXISTING BEAM.
3. PROVIDE CORROSION PROTECTION TO NEW STEELWORK.

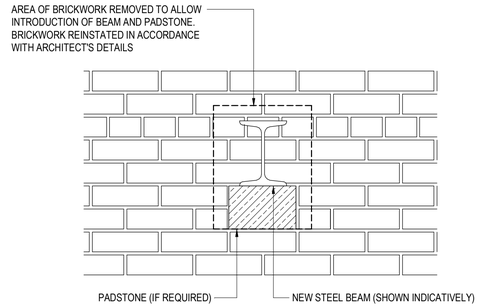


DETAIL 02
NEW BEAMS CONNECTED TO EXISTING STRUCTURE

(NTS)

DETAIL 02
SUGGESTED METHOD STATEMENT

1. PROVIDE TEMPORARY PROPPING AS NECESSARY.
2. WELD FIN PLATE(S) TO EXISTING STEEL MEMBER.
3. PROVIDE CORROSION PROTECTION TO NEW FIN PLATE.
4. OFFER UP NEW STEEL BEAM AND CONNECT TO FIN PLATE.
5. REMOVE TEMPORARY PROPPING.

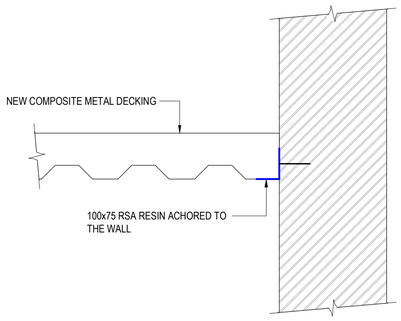


DETAIL 03
NEW BEAM BEARING ONTO EXISTING MASONRY WALL

(NTS)

DETAIL 03
SUGGESTED METHOD STATEMENT

1. CAREFULLY REMOVE BRICKWORK AS REQUIRED TO INTRODUCE THE BEAM AND PADSTONE (IF REQUIRED) BY MEANS OF HAND TOOLS OR RECIPROCATING TOOLS.
2. INTRODUCE PADSTONE IF REQUIRED (TBC ON CASE-BY-CASE BASIS BY STRUCTURAL ENGINEER).
3. INTRODUCE STEEL BEAM, BEAM TO HAVE CORROSION PROTECTION PRE-APPLIED.
4. REINSTATE REMOVED BRICKS AROUND NEW STEEL BEAM.

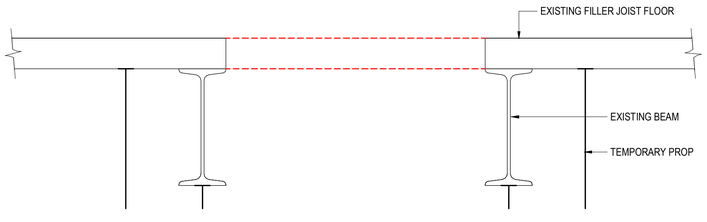


DETAIL 04
TYPICAL FLOOR INFILL FLOOR ADJACENT TO EXISTING MASONRY WALL

(NTS)

DETAIL 04
SUGGESTED METHOD STATEMENT

1. CAREFULLY REMOVE ANY FINISHES OR FIXTURES TO ADJACENT WALLS AS NECESSARY. IN ACCORDANCE WITH THE ARCHITECTS DOCUMENTATION.
2. DRILL HOLES FOR FIXINGS.
3. INTRODUCE ANGLE AN FIX TO EXISTING WALL.
4. INTRODUCE NEW COMPOSITE METAL DECKING AND POUR CONCRETE.
5. FIX FLOOR COVERINGS AND FINISHES IN ACCORDANCE WITH THE ARCHITECTS DOCUMENTATION.

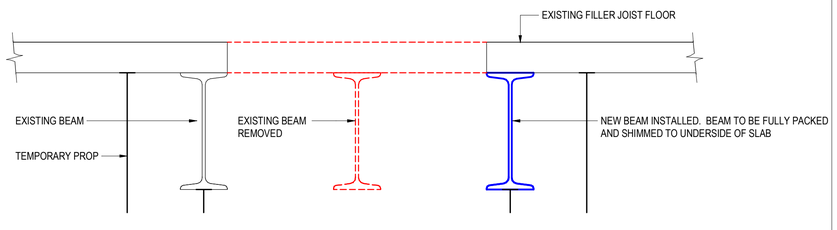


DETAIL 05
TYPICAL FLOOR REMOVAL DETAIL

(NTS)

DETAIL 05
SUGGESTED METHOD STATEMENT

1. PROVIDE TEMPORARY PROPPING AS NECESSARY.
2. CAREFULLY CUT OUT SLAB AT FANGE END.
3. REMOVE TEMPORARY PROPS.

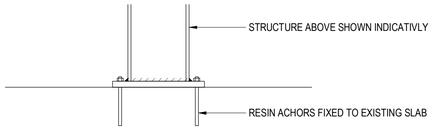


DETAIL 06
TYPICAL BEAM & FLOOR REMOVAL DETAIL

(NTS)

DETAIL 06
SUGGESTED METHOD STATEMENT

1. PROVIDE TEMPORARY PROPPING AS NECESSARY TO ENTIRE BAY FLOOR AND BEAMS.
2. CAREFULLY CUT THE EXISTING BEAM AT APPROPRIATE LOCATION AND REMOVE.
3. INSTALL NEW BEAMS.
4. REMOVE PROPS UNDER AREA OF SLAB TO BE CUT OUT.
5. CAREFULLY CUT OUT SLAB AT FLANGE EDGE.
6. REMOVE REMAINING TEMPORARY PROPS.

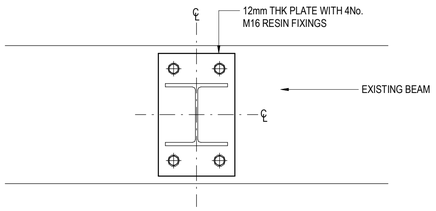


DETAIL 07
NEW STRUCTURE ONTO EXISTING BEAM

(NTS)

DETAIL 07
SUGGESTED METHOD STATEMENT

1. DRILL HOLES FOR FIXINGS
2. INTRODUCE BASEPLATE SUPPORTING STRUCTURE ABOVE
3. FIX STRUCTURE TO THE FLOOR WITH RESIN ANCHORS

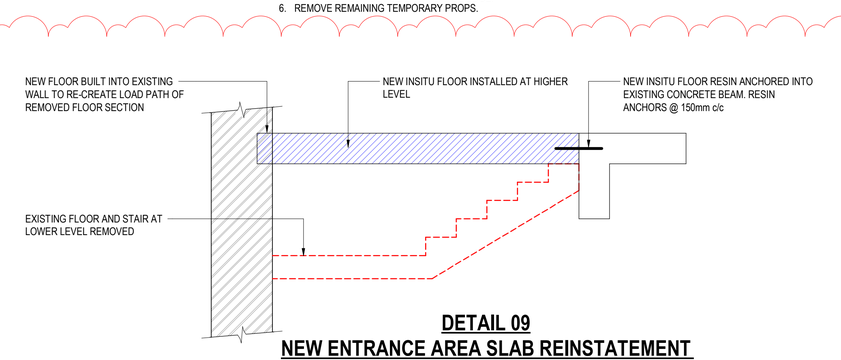


DETAIL 08
TYPICAL STEEL BEAM TO EXISTING BEAM CONNECTION DETAIL

(NTS)

DETAIL 08
SUGGESTED METHOD STATEMENT

1. SCAN EXISTING BEAM TO LOCATE EXISTING REBAR
2. DESIGN FIXIING TO POSITION RESIN ANCHORS TO AVOID REBAR
3. DRILL HOLES FOR FIXINGS
4. INTRODUCE ENDPLATE, PROPPING THE BEAM IF NECESSARY
5. FIX STRUCTURE TO THE BEAM WITH RESIN ANCHORS
6. FULLY PACK AND SHIM BEAM TO SOFFIT
7. REMOVE PROPPING



DETAIL 09
NEW ENTRANCE AREA SLAB REINSTATEMENT DETAIL

(NTS)

DETAIL 08
SUGGESTED METHOD STATEMENT

1. DRILL A SMALL PILOT HOLE TO ESTABLISH WALL BUILD-UP
2. PROP EXISTING BEAM, FLOOR AND STAIRS WHERE NECESSARY
3. PROVIDE PROTECTION TO EXISTING STRUCTURE
4. CAREFULLY REMOVE THE SLAB AND STAIRS BY CUTTING THE SLAB AND STAIRS AT THE EDGE OF THE WALL/BEAM,
5. CAREFULLY REMOVE BRICKWORK AS REQUIRED TO INTRODUCE THE SLAB BY MEANS OF HAND TOOLS OR SIMILAR APPROVED TECHNIQUE
6. PUT UP FORMWORK AND PROP AS NECESSARY, AVOIDING TAKING SUPPORT FROM EXISTING WALLS
7. INTRODUCE RESIN ANCHORS INTO EXISTING BEAM/SLAB
8. LAY REINFORCEMENT FOR NEW SLAB
9. CAST THE NEW CONCRETE SLAB
10. LET CONCRETE CURE
11. REMOVE PROPPING AND FORMWORK

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
4. SIZES AND ARRANGEMENT OF ALL EXISTING STRUCTURAL ELEMENTS ARE TO BE DETERMINED.
5. ALL DETAILS SHOWN ARE INDICATIVE ONLY. TO ILLUSTRATE THE PRINCIPLES OF THE PROPOSED ARRANGEMENT.
6. ALL DETAILS ARE SUBJECT TO MODIFICATION TO SUIT THE ARRANGEMENTS AND PARTICULAR CIRCUMSTANCES ENCOUNTERED ON SITE.

Rev:	Description:	Date:	By:	Chkd:
P02	REVISED AS CLOUDED	09.12.20	GM	DS
P01	STAGE 3 ISSUE	04.12.20	GM	DS

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Status: STAGE 3

Project: HANNOVER RETAIL PROJECT

Drg Title: DETAIL SHEET 1

Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	DEC 20	GM	DS	DS

Scale: 1 : 10

Project No:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:
077487 -	CUR -	XX -	ZZ -	DR -	S -	21010 -	P02

Model Name:XXXXXX-CUR-ZZ-XX-M3-S-00001

LEGEND

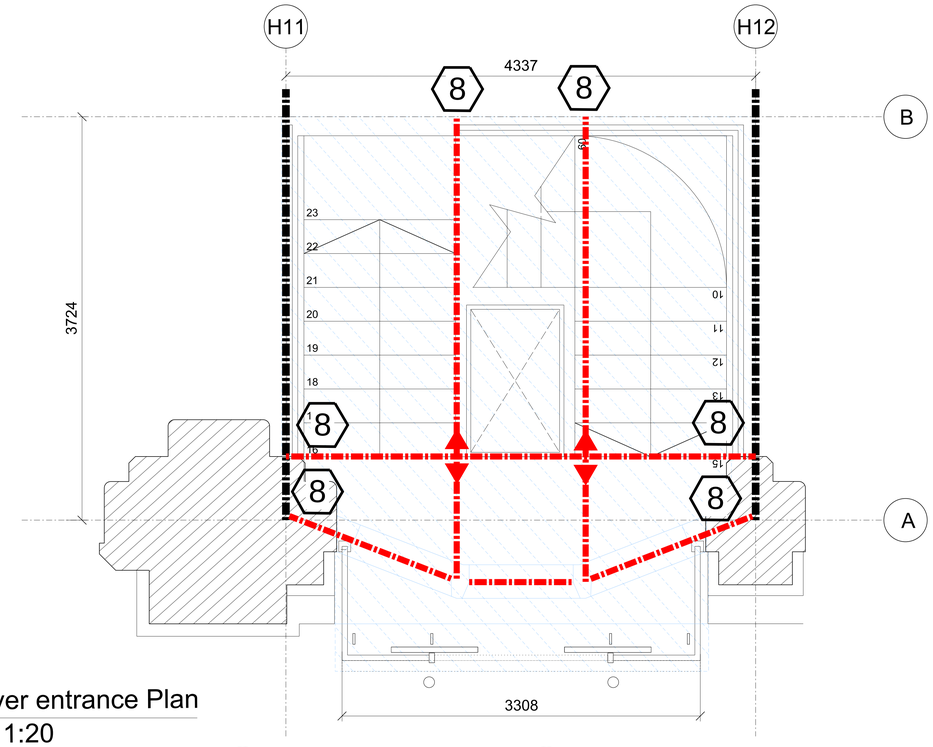
DENOTES EXISTING PRIMARY CONCRETE DOWNSTAND BEAMS

DENOTES NEW STEEL BEAM

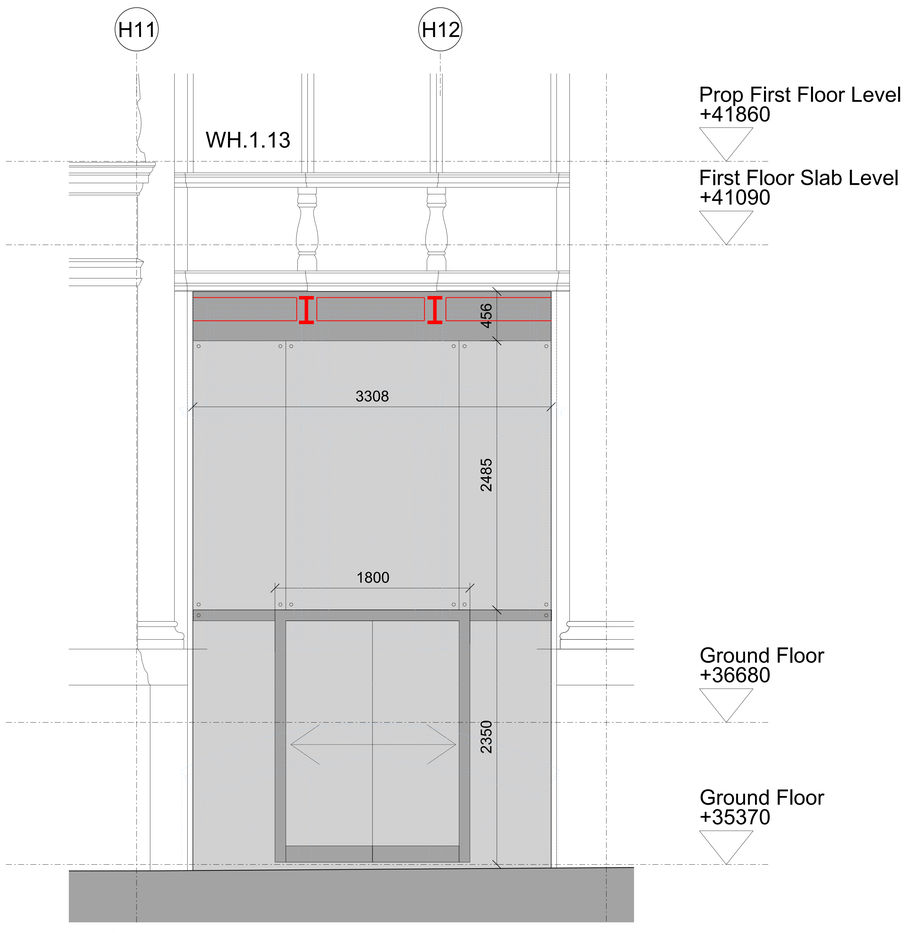
DENOTES MOMENT CONNECTION

SUGGESTED METHOD STATEMENT

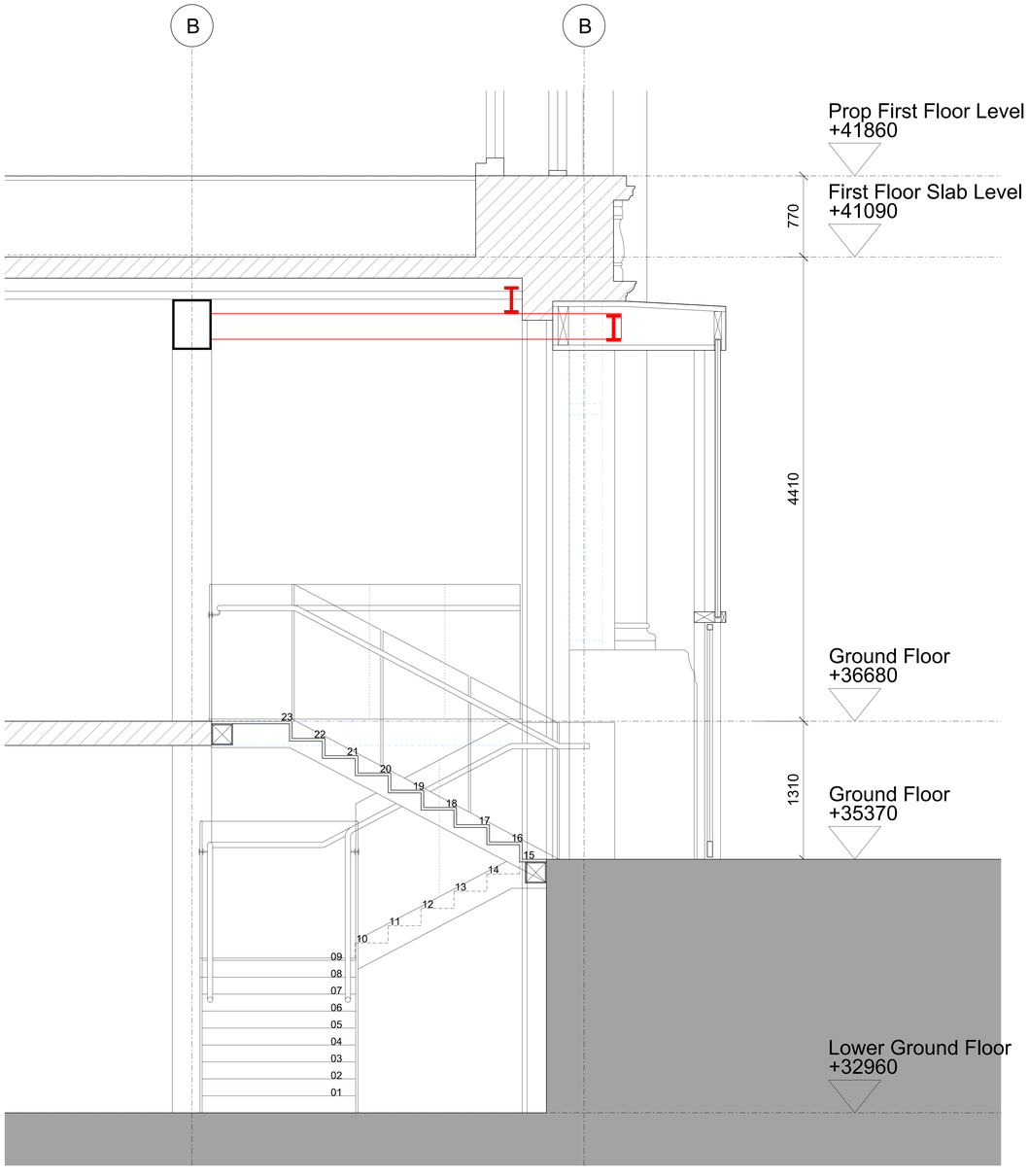
1. TEMPORARILY PROP EXISTING MULLIONS AND MASONRY ABOVE FIRST FLOOR.
2. INSTALL NEW STEELWORK AND CONNECT TO EXISTING CONCRETE FRAME.
3. REMOVE TEMPORARY PROPS
4. INSTALL NEW DTAIR, PLATFORM LIFT AND NEW ENTRANCE FASCADE



Hanover entrance Plan
Scale 1:20



Hanover entrance elevation
Scale 1:20



Hanover entrance section
Scale 1:20

P01	ISSUED FOR INOFRMATION	MA	22.01.21

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Project:
HANOVER RETAIL

Sketch/Drawing Title:
NEW ENTRANCE BAY WINDOW REMOVAL PROPOSAL

Sketch/Drawing No:
077487-CUR-XX-ZZ-DR-S-20010

Date:	Initials:	Rev:
22.01.2021	M.A	P01

Filename:P:\Projects\8700_ptr\4700\CAD\dwf\X4_trans_umm\4700-24-4ft.dgn
Plotted:21/01/2021

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