SYMMETRYS
STRUCTURAL / CIVIL ENGINEERS

67 CHARLOTTE STREET SUMMARY OF PROPOSED STRUCTURAL SCHEME

67 Charlotte Street
London,
W1T 4PH

20304-SYM-XX-XX-RPT-S-0001
3rd March 2021 Rev. P2

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REVISION HISTORY

Revision	Description	Date	By	Checked
P1	Initial Issue	22/02/2021	TMD	TMD
P2	Reissued for Planning	03/03/2021	TMD	JE

CONTENTS

1.0 Introduction

Symmetrys have been instructed on behalf of the building owner, H Company 6 Limited, to undertake the structural engineering design of 67 Charlotte Street, W1T 4PH. This report highlights the existing condition of the structure and then goes on to summarise the proposed structural interventions and how these interface with the existing retained structure.

Symmetrys visited site on the following dates:

- 9th December 2020;
- 13th January 2021, and;
- 3rd February 2021.

2.0 Existing Site

2.1 67 Charlotte street is a five-storey terrace property with a single storey of basement. A single storey rear extension to the rear of the property covers the majority of the site.

2.2 The building appears to have been constructed around the 1900's.

2.3 The property was previously divided between a restaurant at ground floor and basement with apartments on the upper floors.

2.4 The property immediately adjoins the public footpath and there is a front lightwell that provides direct access to the basement along the front elevation.

2.5 The footpath is predominantly flat, as is the surrounding area.

2.6 Construction is traditional for a property of this age with solid masonry front and rear walls with solid masonry Party Walls along the two flank elevations. The front façade has is open at ground floor to create a shopfront and the façade above is supported on an existing timber beam at first floor level.

2.7 The rear façade has also been opened at ground floor level to connect to the historic rear extension and is likely supported on a similar beam to the front; although, this was not open for inspection at the time of our visits. There is a bay window of timber construction on the southern half of the rear elevation.

2.8 The roof to the main building is pitched with two ridges and a central valley. The roofs to the historic rear extensions are flat and on two different levels.

Figure 1 - Aerial view of site

Figure 2 - View of front facade

3.0 Observations

The following section of this report summarises the observations and provides commentary on the extent of degradation observed during the visual inspection.

3.1 Front Facade

The following defects were observed:

- Dropped front façade (Figure 3)
- Undermined pier to south façade (Figure 8);
- Existing L01 timber beam supporting 3 storeys of façade and existing mansard (Figure 9);
- Cracking throughout front façade masonry piers (Figure 4, Figure 5 and Figure 6);
- Poorly bonded brickwork internally at a number of locations (Figure 7);
- Front parapet poorly bonded brickwork (
-
- Figure 10);
- Cracking internally and externally along north party wall (Figure 4, Figure 5 and
-
- Figure 10);

Figure 3 - Front Facade - Note drop in brick coursing above centre window

Figure 4 - Cracking of L01 South Party Wall - Note undermined pier

Figure 5 - Cracking of L01 North Party Wall

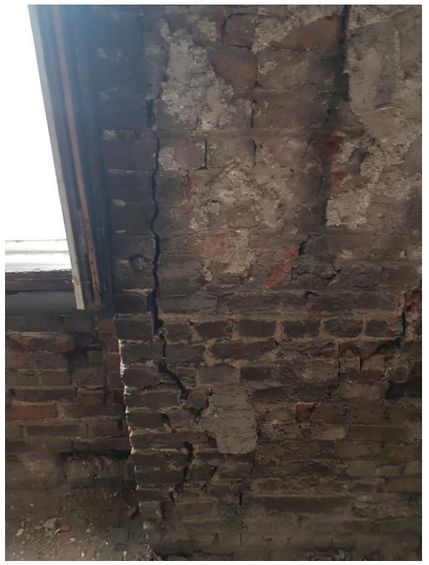


Figure 6 - Cracking of L01 centre pier

Figure 7 – Poor bonding of front façade brickwork at L01

Figure 8 – Undermined pier and timber beam at L01 South Party Wall

Figure 9 – L01 front façade timber beam from underside

Figure 10 - Front parapet poorly bonded brickwork potential past movement – also note cracking along Party Wall behind rain water pipe

Figure 11 – Summary of front facade defects

3.2 Rear façade

The following defects were observed:

- Bulging brickwork at L03 (Figure 12 and Figure 13);
- Dropped brickwork at L01 (Figure 14);
- Parapet leaning (Figure 15);
- Cracking of internal brickwork adjacent to bay windows (Figure 16).

Figure 12 – Rear Facade – Note bulging brickwork at eave of bay window

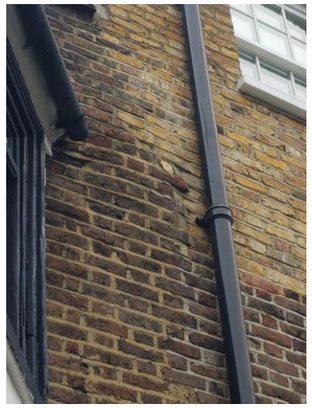


Figure 13 – Close up of bulging brickwork

Figure 14 – Rear Façade – L01 brickwork dropped above window

Figure 15 - Rear facade - L03 parapet leaning towards mansard

Figure 16 - Cracking of pier adjacent to L02 bay window

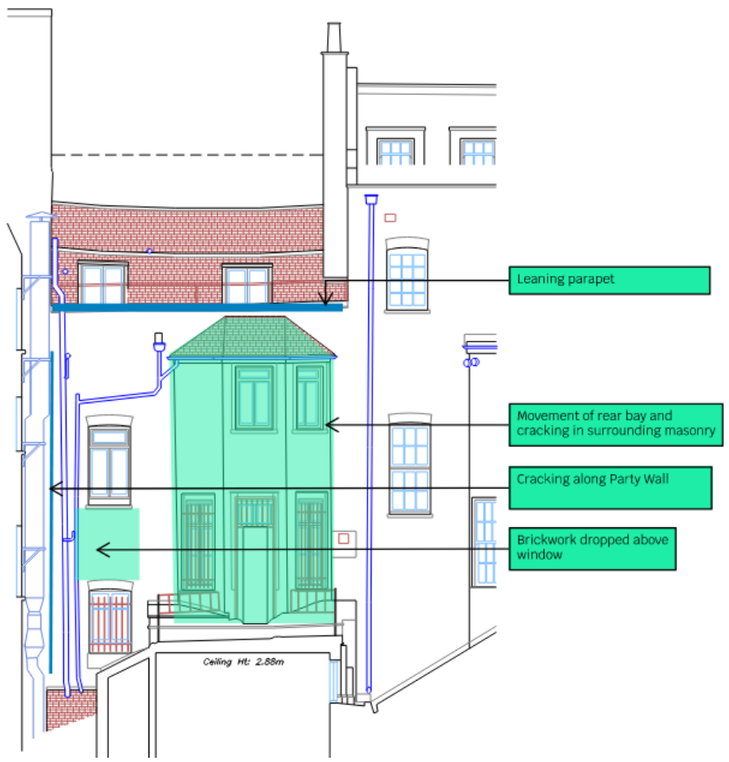


Figure 17 - Summary of rear facade defects

3.3 Internal floors

The following defects were observed:

- Dropped ground floor joists (Figure 18);
- Water-stained timber joists and rafters (Figure 18, Figure 19, Figure 20 and Figure 23);
- Joists with full loss of section at supports (Figure 20 and Figure 21);
- Bowing of internal floors (Figure 22);

Figure 18 – Ground floor joists dropped – note gap between floor boards and joists

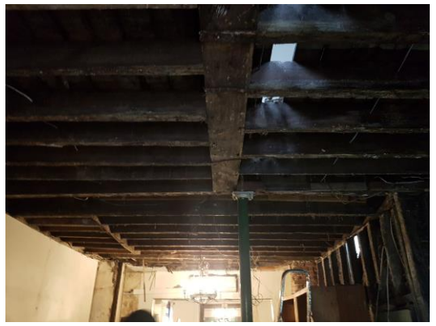


Figure 19 – First floor bressummer and joists from below

Figure 20 – L02 timber joist with full loss of section

Figure 21 – Close up L02 timber joist with full loss of section

Figure 22 – Third floor bressummer from underside – note visible bowing

Figure 23 – Water stained timber likely due to water ingress at roof level

3.4 Rear extensions

The following defects were observed:

- Water-stained timber joists and rafters (Figure 24 and Figure 26);
- Corroded steelwork and delamination at the supports (Figure 24 and Figure 27);

Figure 24 – Corroded beams at rear roof adjacent to Party Wall

Figure 25 – Temporary measures to prevent further water ingress at rear roof

Figure 26 – Rear building ground floor joists from below, note water staining

Figure 27 – Corroded beams at ground floor adjacent to Party Wall – note delamination of bottom flange

4.0 Conclusions

4.1 Structural defects have been observed throughout the building that are consistent with long-term water ingress. Water staining is present throughout, all observed steelwork shows signs of corrosion and in places water damage had resulted in significant loss of timber section. The front and rear facades show signs of movement and cracking at numerous locations and the bonding of the existing brickwork is in a poor condition. The existing timber beams that support the facades are liable to water damage and long-term deflection, these are considered as being the primary cause of the movement observed in the facades.

4.2 These defects have compromised the structural integrity of the building and require immediate intervention to stabilise the structure and prevent further movement. Further movement could result in defects worsening, damage to adjacent structures or potentially even collapse.

5.0 Proposed Structural Scheme

5.1 Strategic approach

An initial appraisal was undertaken to assess the viability of retaining the existing facades and undertaking insitu repairs in conjunction with the contractor and their temporary works engineer. To achieve this, a full system of needle props would have been required along the front elevation to relieve the existing timber beam of load such that new steelwork could be installed to support the existing façade.

The front façade would need to be transferred to temporary works and then back to new permanent structure. Even with robust design and careful sequencing, this would result in further movement of the facade. Given the poor bonding of the existing brickwork and numerous defects present, this approach was considered to increase the risk of potential collapse of the front façade which would present a safety concern to both the contractor and public. It was concluded that the approach that carried the lowest risk to the existing structure and surrounding buildings was to carefully deconstruction and rebuild the masonry from a new steel beam at first floor level to replace the existing timber beam.

The rear façade is largely comprised of the timber bay, due to the movement that has occurred around this and the water ingress, the timber needs to be replaced. The remaining masonry defects extend down to below the first floor and historic repairs are apparent; however, they have not addressed the movement that has occurred. Given the failed historic repairs, these areas require the deconstruction and reconstruction of the affected areas.

5.2 Temporary works

Interim temporary propping has been installed on site to mitigate further movement prior to the contractor taking possession of site. The contractor will be installing a scaffold and temporary works to facilitate the permanent works and safeguard the existing structure as well as the buildings adjacent. The full details of the temporary works scheme are still in development by the contractor at the time of writing.

5.3 Permanent works

The below provides a summary of the main works, for a full description of the proposed structural works drawings can be found in Appendix A.

5.4 The proposed scheme is to replace any water damaged elements of timber, bressummer beams are to be replaced with steelwork and joists replaced with comparable new joists. Beams will be supported on new padstones to better distribute stresses within the walls and protect the existing brickwork.

5.5 The front and rear façades are to be rebuilt from a sound point below their lowermost defect.

5.5.1 Front façade

The existing timber beam at first floor level is the likely cause of the movement and this is to be replaced with a new steel beam. The façade will therefore be carefully deconstructed and reconstructed, reusing existing brickwork where possible.

5.5.2 Rear façade

The masonry has dropped above the half landing window opening between ground and first floor. The façade will therefore be carefully deconstructed and reconstructed, reusing existing brickwork where possible.

5.6 Roof

The roof is to be temporarily supported by temporary beams until the façade is rebuilt and support reinstated.

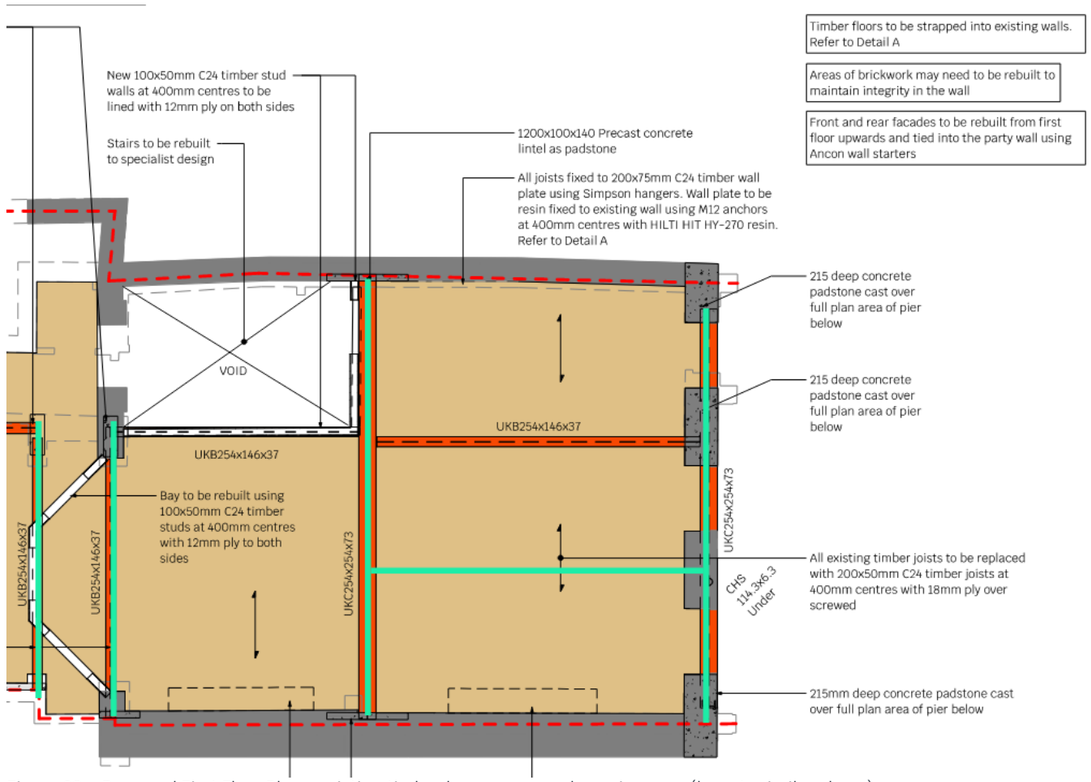


Figure 28 – Proposed First Floor Plan - existing timber bressummers shown in green (layouts similar above)

5.7 Summary of proposals

The existing facades and internal structure have suffered significant degradation due to water ingress, undermining of structures and general degradation over time. Due to the level of movement, debonding of brickwork and removal of section of sections it has been concluded that temporarily supporting the facades presents an additional risk of collapse. The proposal is therefore to carefully deconstruct and rebuild masonry wherever possible and to provide new support structures to prevent future movements.

APPENDIX A
STRUCTURAL DRAWINGS

1.0 General Notes

1.1. Do not scale from these drawings. use only the dimensions shown.
1.2. All structural drawings are to be read in conjunction with the Architects and Service Engineers details, drawings and specifications.
1.3 All proprietary products are to be used in strict accordance with the manufacturers' recommendations and details.
1.4 The contractor is responsible for establishing and checking the setting out of gridlines, levels and datums. Any discrepancies between the structural drawings and with other design consultants should immediately be brought to the attention of all relevant parties.
1.5 The information shown on Symmetrys drawings relating to the existing structure is based on limited exploratory works, the contractor is to check and notify any discrepancies.
1.6 Waterproofing and DPM requirements to architects and/or specialist's details and specification.

2.0 Foundations

2.1 The contractor is responsible for ground water control on site.
2.2 All excavations are to be kept free from water until below ground works are complete. suitable mitigation measures to ensure watercourses are not polluted with silt laden water should be implemented.
2.3 The contractor is to be responsible for ensuring that excavations and associated operations do not compromise the integrity of adjacent structures and to ensure the stability of all excavations.

3.0 Demolition

3.1 Suitable care should be taken during demolition to ensure the retained structure is not damaged.

4.0 Masonry

4.1 All new load bearing masonry walls to be built in 15N/mm compressive strength brick and grade iii mortar

5.0 Concrete

5.1 Ground beams, underpinning and slabs – min grade c32/40
5.2 Cover to ground beams -75mm all sides
5.3 Cover to slabs
50mm Bottom and sides
35mm Top

6.0 Steelwork

6.1 All steelwork to be grade s335jo
6.2 Design of all steel-to-steel connections by fabricator.
6.3 All steelwork in the external walls to be galvanised (125 microns)
6.4 The fabricator to conduct a survey/site visit prior to any fabrication to obtain site accurate dimensions in order to ensure correct fit.
6.5 Ends of all steel beams that bear onto masonry walls to be grouted into the wall

7.0 Fire Protection

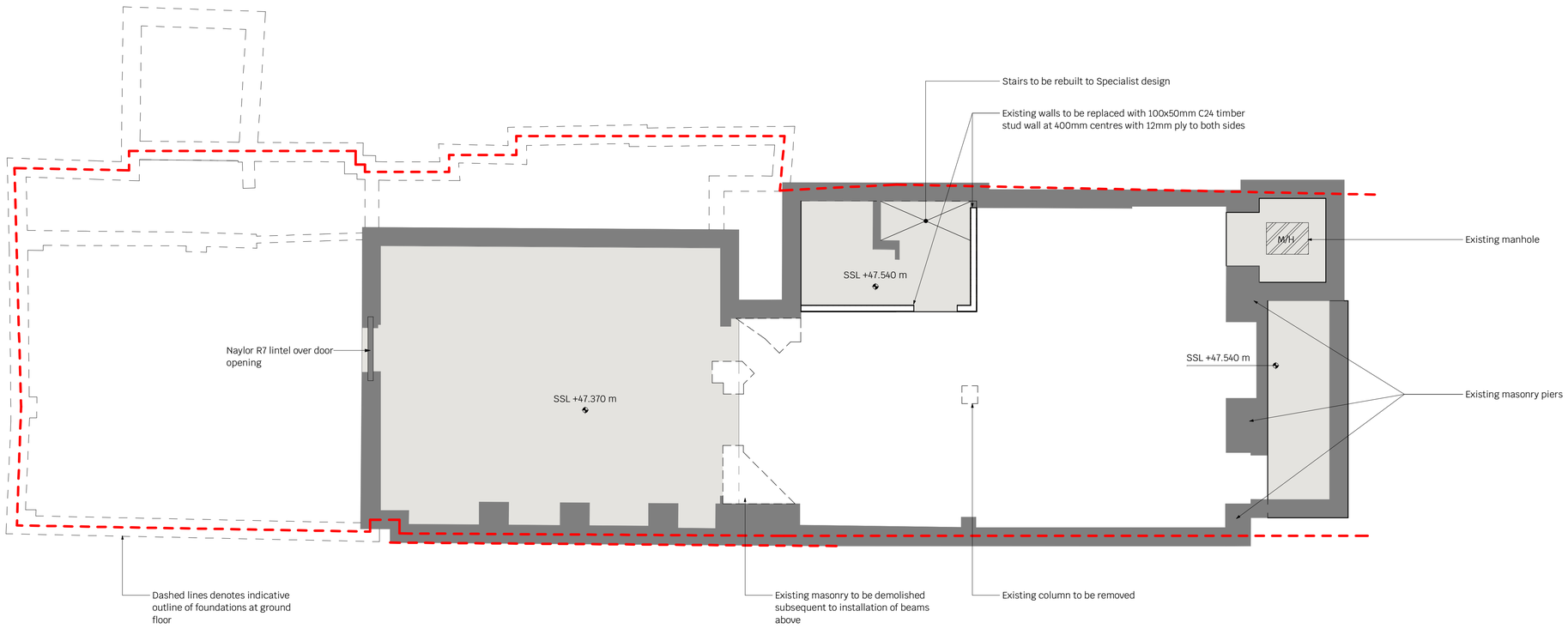
7.1 Refer to the Architect's drawings and specifications for all fire protection details

8.0 Structural Timber

8.1 All structural timber to be C24

9.0 Staircase fabricator

9.1 staircase design and the production of construction drawings by staircase fabricator in accordance with the architect's intent.



1 Basement Plan
1 : 50

Notes

1. **This drawing is to be read in conjunction with all relevant architects & engineers drawings and specifications**
2. **Do not scale from this drawing**

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Sub Contractor/Specialist Design Elements

1. All temporary works
2. All reinforcement drawings and bar bending schedules
3. Design of all steelwork connections. the fabricator is to submit their calculations to building approval
4. Design of all tanking/waterproofing
5. Steel fabrication drawings
6. All stairs by others to support 5kN/m^2 imposed load

Rev	Date	Drwn	Chkd	Amendments
T2	22.02.21	SDR	TMD	For Tender
T1	05.02.21	NF	TMD	For Tender

Drawing status: Stage 3

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Job Title
67 Charlotte Street
W1T 4PH
London

Drawing Title
Basement Plan

Project	Company	Zones	Level	Type	Role	Number
20304	SYM	ZZ	B1	DR	S	0990

Scale: 1 : 50 @ A1
Date: JAN 2021
Drawn by: NF
Checked: TMD
Revision : T2

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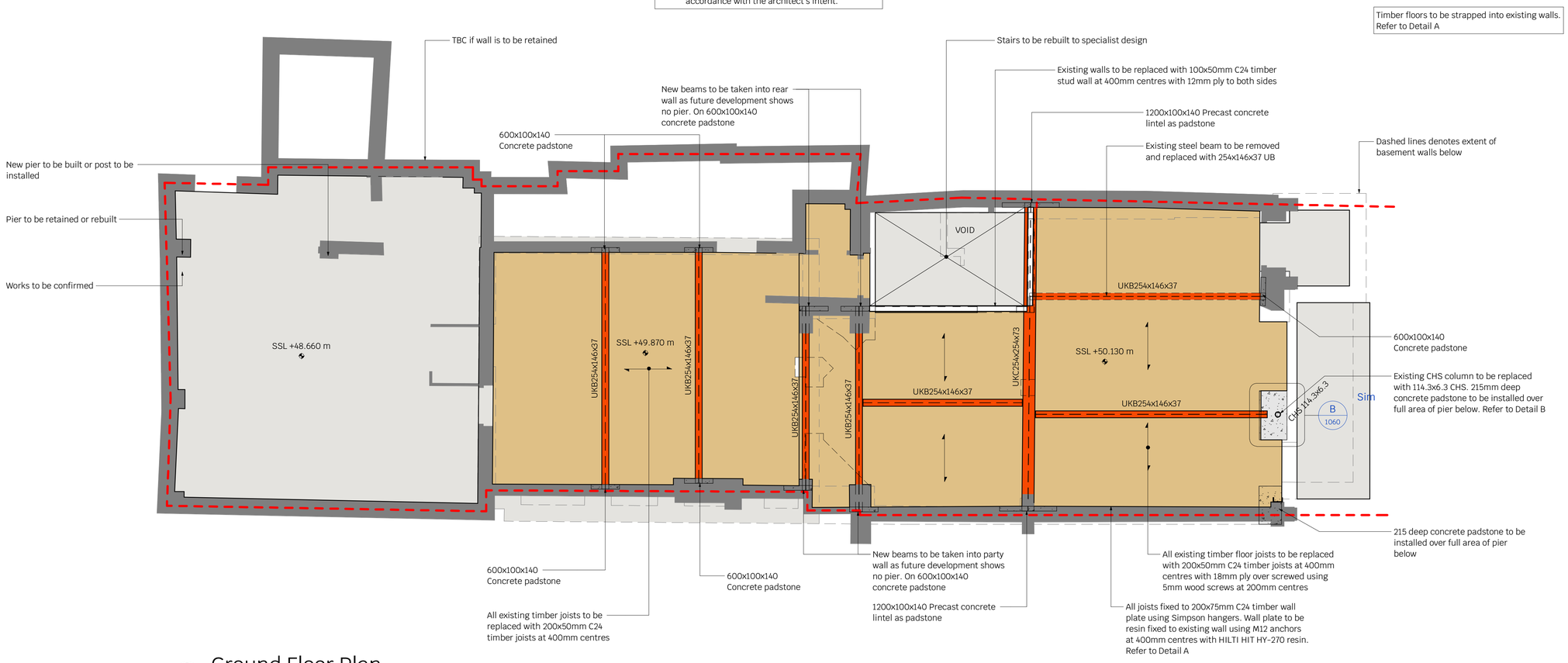

1 Ground Floor Plan
1 : 50

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5. Steel fabrication drawings
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Job Title
67 Charlotte Street
W1T 4PH
London

Drawing Title
Ground Floor Plan

Project	Company	Zones	Level	Type	Role	Number
20304	SYM	ZZ	00	DR	S	1000

Scale: 1 : 50 @ A1
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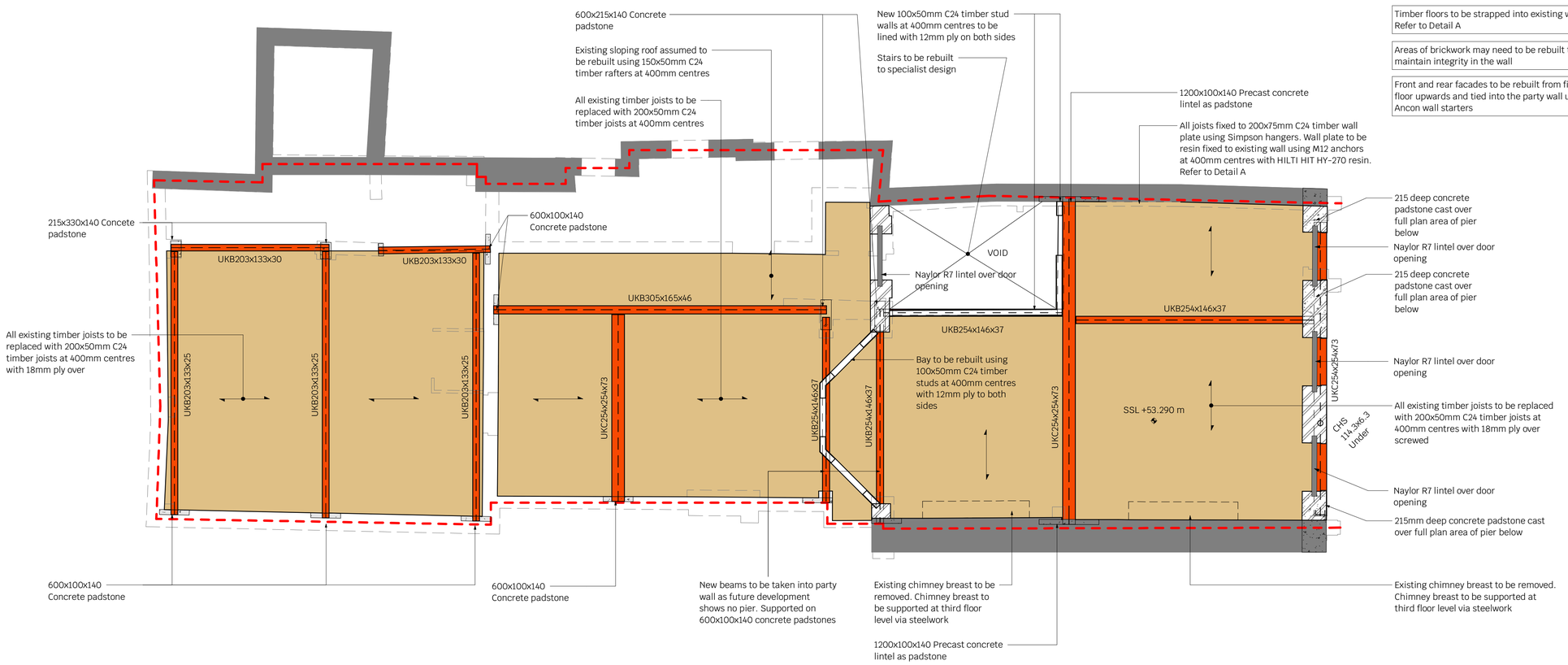

Timber floors to be strapped into existing walls. Refer to Detail A

Areas of brickwork may need to be rebuilt to maintain integrity in the wall

Front and rear facades to be rebuilt from first floor upwards and tied into the party wall using Ancon wall starters

1 First Floor Plan
1 : 50

Notes

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Job Title
67 Charlotte Street
W1T 4PH
London

Drawing Title
First Floor Plan

Project	Company	Zones	Level	Type	Role	Number
20304	SYM	ZZ	01	DR	S	1010

Scale: 1 : 50 @ A1
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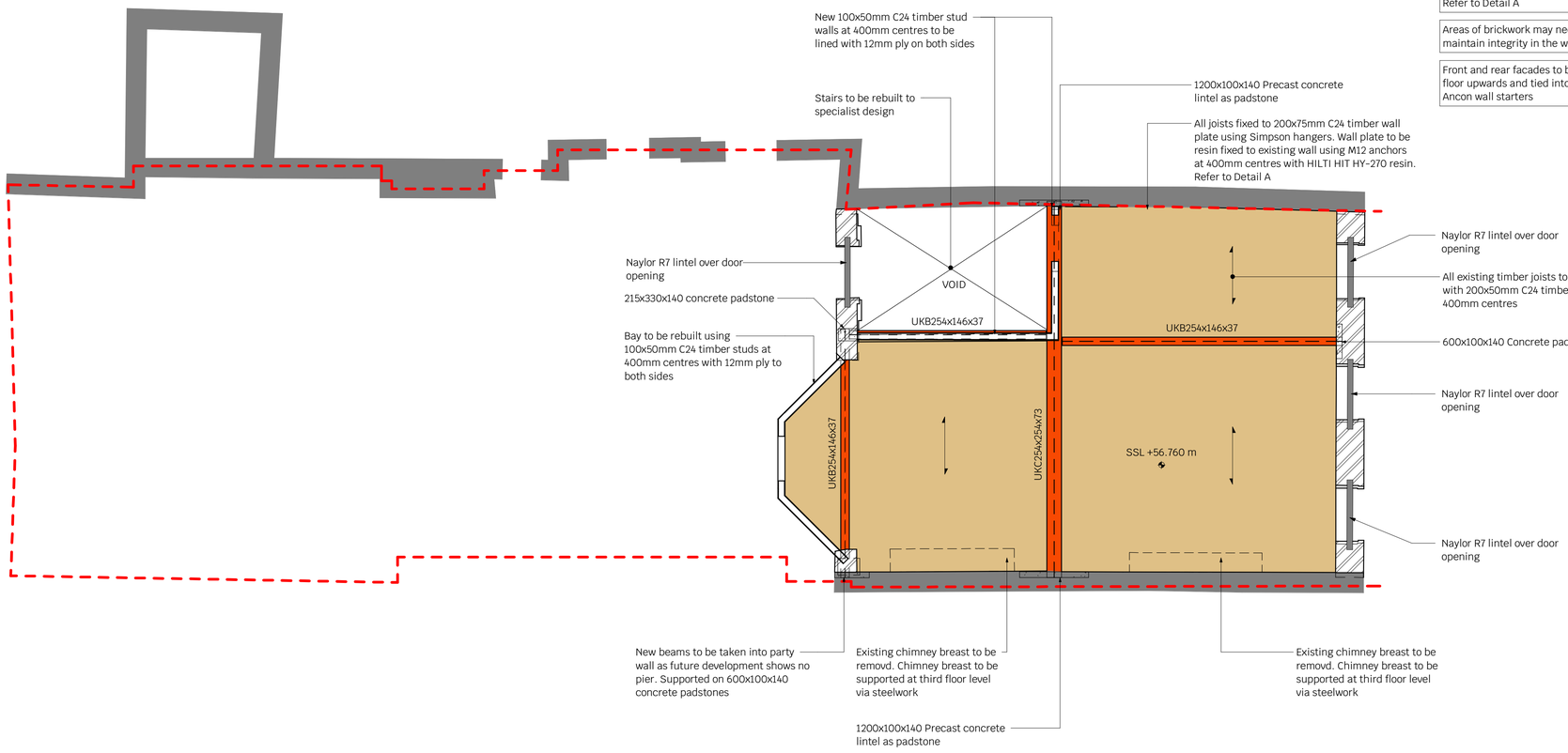

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1 : 50

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Job Title
67 Charlotte Street
W1T 4PH
London

Drawing Title
Second Floor Plan

Project	Company	Zones	Level	Type	Role	Number
20304	SYM	ZZ	02	DR	S	1020

Scale: 1 : 50 @ A1
Date: JAN 2021
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50mm Bottom and sides
35mm Top

6.0 Steelwork

6.1 All steelwork to be grade S355JO
6.2 Design of all steel-to-steel connections by fabricator.
6.3 All steelwork in the external walls to be galvanised (125 microns)
6.4 The fabricator to conduct a survey/site visit prior to any fabrication to obtain site accurate dimensions in order to ensure correct fit.
6.5 Ends of all steel beams that bear onto masonry walls to be grouted into the wall

7.0 Fire Protection

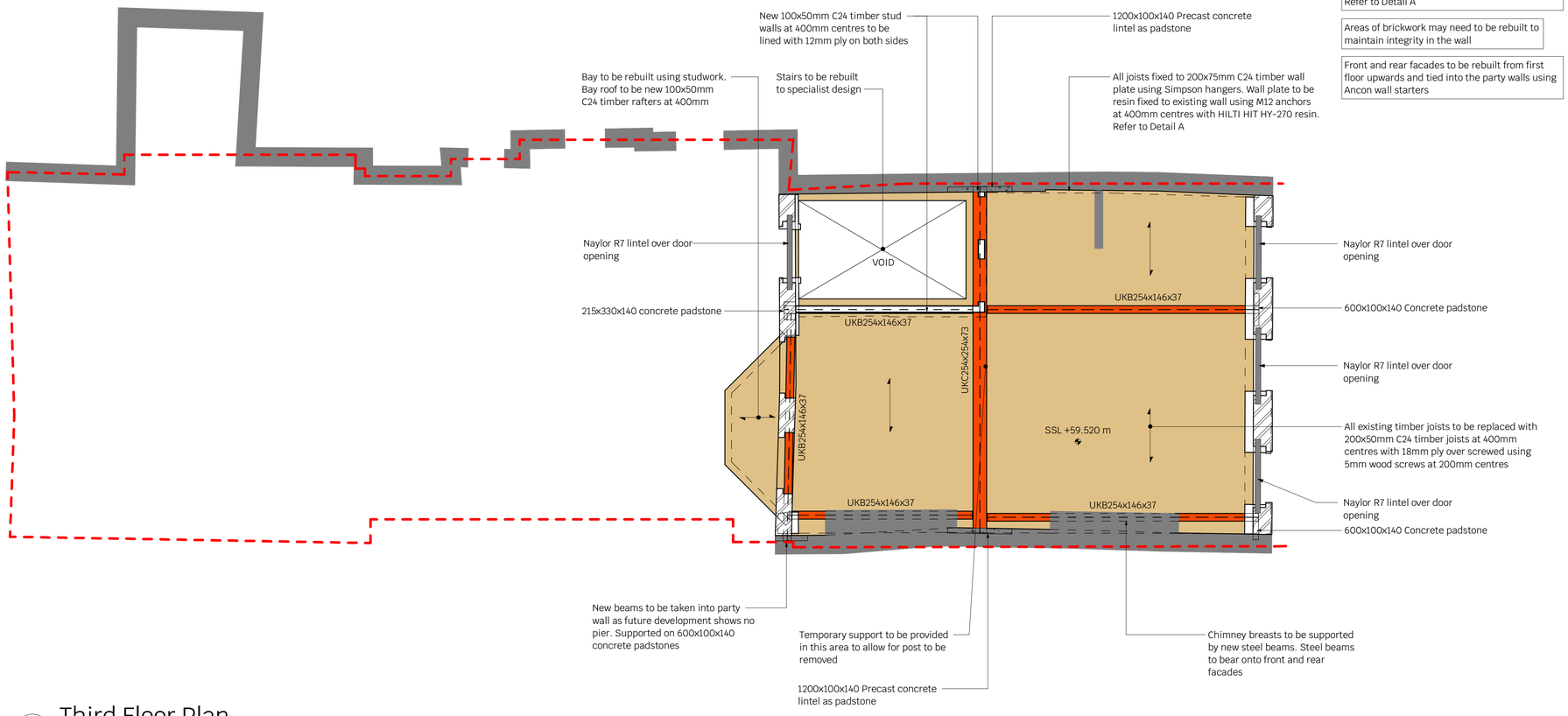
7.1 Refer to the Architect's drawings and specifications for all fire protection details

8.0 Structural Timber

8.1 All structural timber to be C24

9.0 Staircase fabricator

9.1 staircase design and the production of construction drawings by staircase fabricator in accordance with the architect's intent.



1 Third Floor Plan
1 : 50

Notes

1. **This drawing is to be read in conjunction with all relevant architects & engineers drawings and specifications**
2. **Do not scale from this drawing**

The contractor shall be responsible for the design, installation and sequencing of all temporary works and must ensure that the stability of the structure is not compromised during the works

Sub Contractor/Specialist Design Elements

1. All temporary works
2. All reinforcement drawings and bar bending schedules
3. Design of all steelwork connections. the fabricator is to submit their calculations to building approval
4. Design of all tanking/waterproofing
5. Steel fabrication drawings
6. All stairs by others to support 5kN/m^2 imposed load

Rev	Date	Drwn	Chkd	Amendments
T2	22.02.21	SDR	TMD	For Tender
T1	05.02.21	NF	TMD	For Tender

Drawing status: Stage 3

SYMMETRYS
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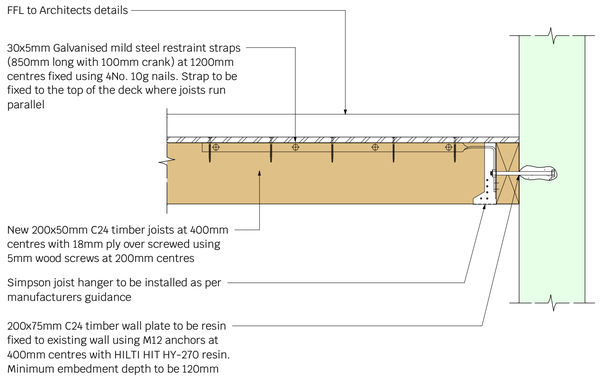
Job Title
67 Charlotte Street
W1T 4PH
London

Drawing Title
Third Floor Plan

Project	Company	Zones	Level	Type	Role	Number
20304	SYM	ZZ	03	DR	S	1030

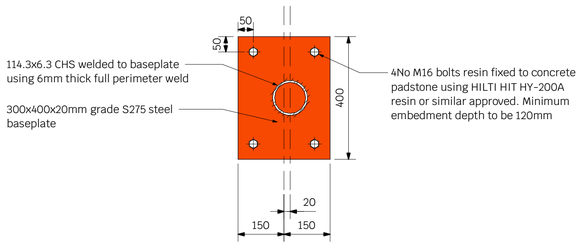
Scale: 1 : 50 @ A1
Date: JAN 2021
Drawn by: NF
Checked: TMD
Revision : T2

Company No. 5873122 VAT Registration No. 894 2993 61
Registered In England And Wales



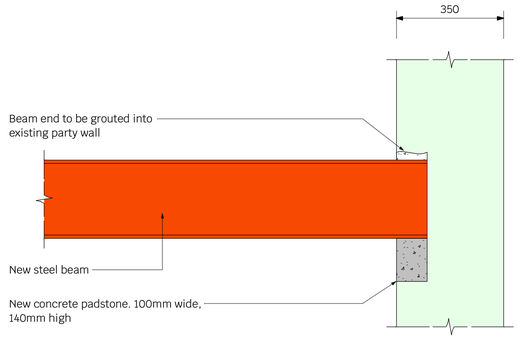
A Wall Strap Detail

1 : 10



B CHS Baseplate Detail

1 : 10



C Beam to Party Wall Detail

1 : 10

Notes

1. **This drawing is to be read in conjunction with all relevant architects & engineers drawings and specifications**
2. **Do not scale from this drawing**

Rev	Date	Drwn	Chkd	Amendments
T2	22.02.21	SDR	TMD	For Tender

Drawing status: Stage 3

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Job Title

67 Charlotte Street
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London

Drawing Title

Typical Detail Sheet 1

Project	Company	Zones	Level	Type	Role	Number
20304	SYM	ZZ	XX	DR	S	1060

Scale: **1 : 10 @ A1**
Date: **FEB 2021**
Drawn by: **NF**
Checked: **TMD**
Revision : **T2**

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