

**STRUCTURAL CALCULATIONS FOR BUILDING REGULATIONS
AND CONSTRUCTION PURPOSES**

SGM STRUCTURAL DESIGN

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Project No: 2025 / 036

**Project: 31 Towngate
Marsden
HD7 6DD**

Title: Wall Removal

Date: 15 July 2025

Client: Matthew Arrowsmith

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CALCULATION SHEET

Project Number 2025/036
 Sheet Number 01
 Date 15/07/2025

Project: 31 Towngate, Marsden, HD7 6DD	Prepared by KB
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Sub Section Introduction & Loadings

Introduction

The proposed development comprises a wall removal in an existing dwelling.

SGM Structural Design have been commissioned to only design a steel beam to support the structure over.

Structural calculations to be read in conjunction with drawings by the Project Architect and copied to the Builder, Client and Principal Designer (see below).

Loadings

Plan Load in
kN/m²

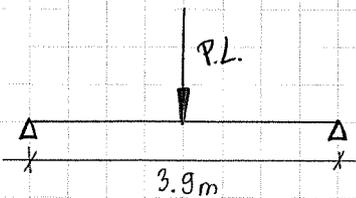
<u>Floor</u>	<u>Dead</u>		
		Finishes on chipboard on joists under drawn with plaster board and skim	0.85
	<u>Imposed</u>	Domestic loading to BS6399-1:1996	1.50

General Notes

1. Foundation design is outside the scope of the Engineers brief. It remains the responsibility of the Local Authority Building Control Officer to inspect and approve the excavated formation and assess the adequacy of the ground to sustain applied pressure. If any doubt exists regarding the adequacy of the ground to sustain the loads then the Engineer must be informed to carry out an inspection. Where any new construction increases loading on existing footings it is recommended that trial holes be excavated and an inspection be made by Building Control.
2. Masonry design is outside the scope of the Engineers brief. Install movement joints as required by Architect.
3. Any temporary propping of existing structure required prior to installation of new support elements remains the responsibility of the General Builder. If the builder is in any doubt regarding the form of temporary propping or applied loads the Engineer must be informed prior to removal of load-bearing elements.
4. Calculations / Drawings must be forwarded to the 'Principal Designer' as referred to in CDM Regulations 2015. The role of 'Principal Designer' is outside the scope of the Engineers brief. As you may or may not be aware CDM Regulations have changed in 2015. As a 'Designer', it is our legal requirement to draw your attention to your duties as a 'client' (if you have employed more than one contractor). Please review important information regarding your duties on www.hse.gov.uk/construction/cdm/2015/domestic-clients.htm.

Project 31 TOWNGATE	Prepared by KB
Sub section STEEL BEAM DESIGN	Checked by

BEAM DESIGN



LOADINGS:

$$- P.L., P_L = 0.85 \times (1.8 \times 3.4) = 5.2 \text{ kN}$$

$$I_L = 1.50 \times (1.8 \times 3.4) = 9.2 \text{ kN}$$

$$\text{CHAR} = 5.2 + 9.2 = 14.4 \text{ kN}$$

$$\text{ULT} = 5.2 \times 1.4 + 9.2 \times 1.6 = 22.0 \text{ kN}$$

$$\text{APPL. B.M.} = \frac{22.0 \times 3.9}{4} = 21.5 \text{ kNm}$$

* TRY 152 x 152 x 23 UC

$$L_e = (1.2 \times 3.9) + (2 \times 0.15) = 5.0 \text{ m} \Rightarrow M_b = 27.5 \text{ kNm} > \text{APPL. B.M.} \Rightarrow \text{OK}$$

$$\text{APPL. } \delta = \frac{14.4 \times 3900^3}{48 \times 205 \times 1250 \times 10^4} = 6.9 \text{ mm} < \frac{\text{SPAN}}{360} = 10.8 \text{ mm} \Rightarrow \text{OK}$$

* ALTERNATIVELY TRY 203 x 133 x 25 UB

$$L_e = (1.2 \times 3.9) + (2 \times 0.2) = 5.1 \text{ m} \Rightarrow M_b = 28.5 \text{ kNm} > \text{APPL. B.M.} \Rightarrow \text{OK}$$

$$\text{APPL. } \delta = \frac{14.4 \times 3900^3}{48 \times 205 \times 2340 \times 10^4} = 3.7 \text{ mm} < \frac{\text{SPAN}}{360} = 10.8 \text{ mm} \Rightarrow \text{OK}$$

$$\text{BEAM END R.} = \frac{22.0}{2} = 11.0 \text{ kN (MIN.)}$$

$$\text{(ULT) } R = 22 + 11 = 33.0 \text{ kN (MAX.)}$$

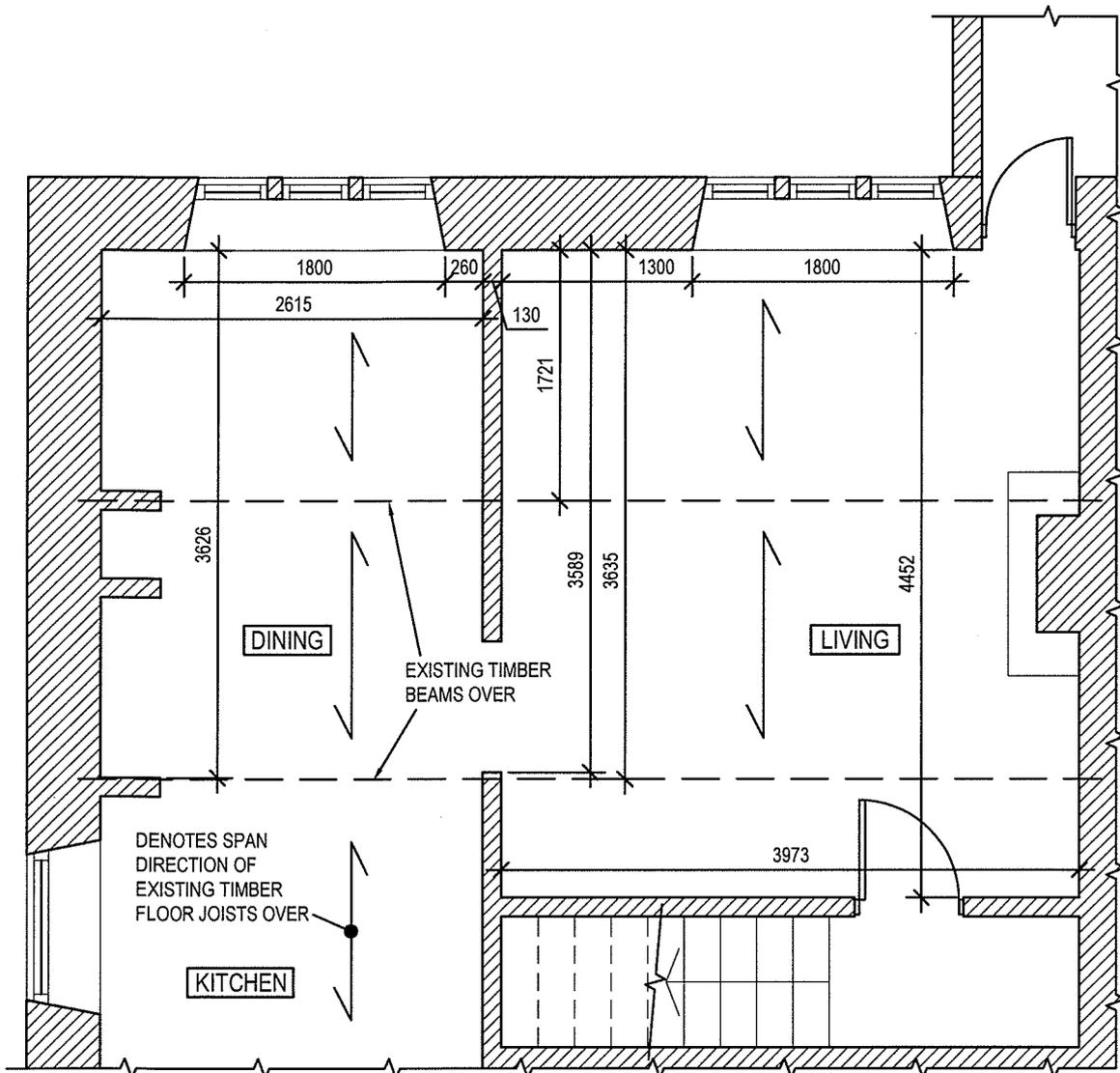
PROVIDE 152 x 152 x 23 UC

OR 203 x 133 x 25 UB

APPENDIX A

DRAWINGS





**EXISTING GROUND FLOOR PLAN
SHOWING STRUCTURE OVER**

SCALE 1:50

ALL DIMENSIONS APPROXIMATE

Revision	Date	By	Chk

SGM STRUCTURAL DESIGN

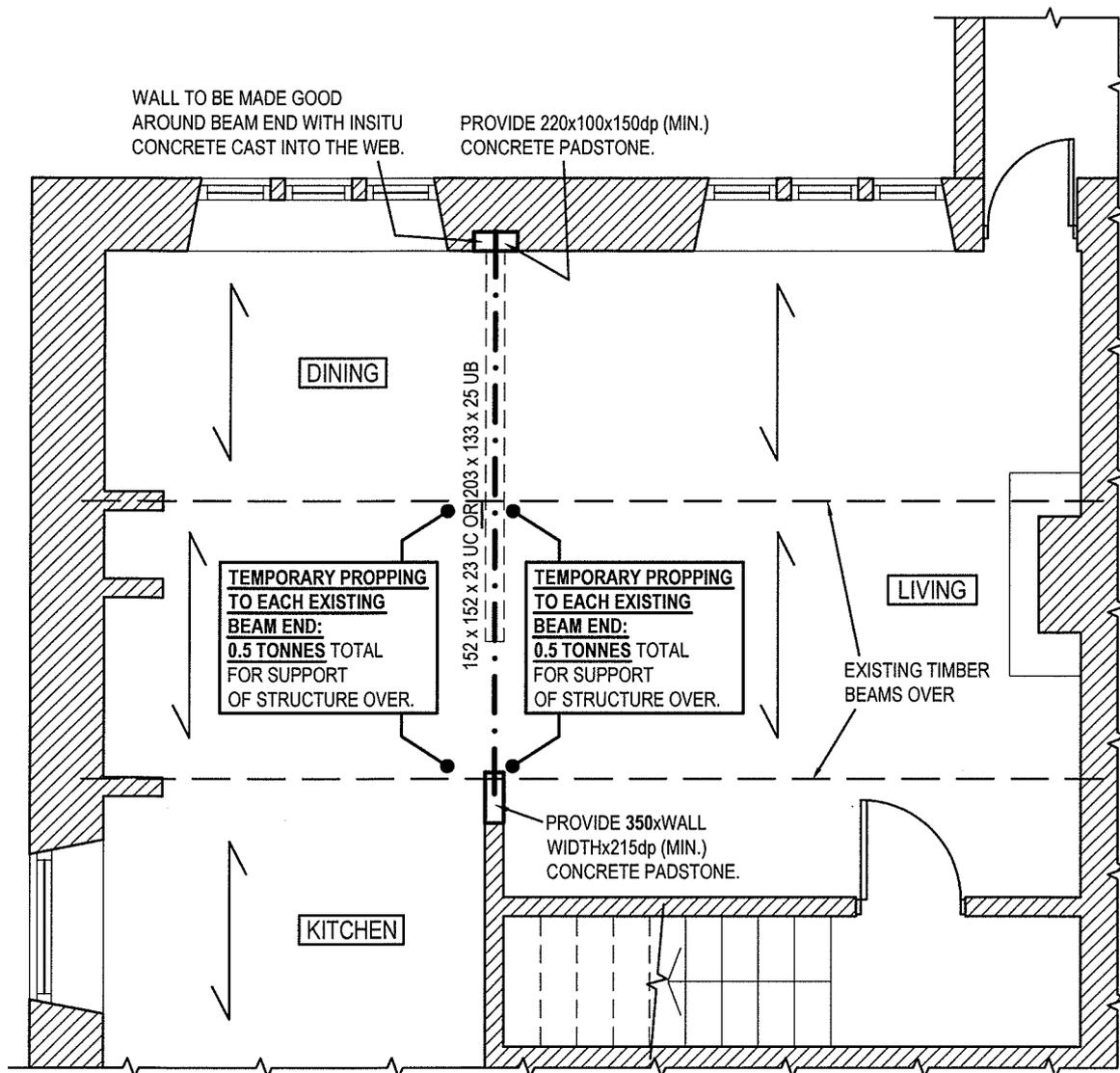
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PROJECT
**31 TOWNGATE
MARSDEN, HD7 6DD**

TITLE
**EXISTING GROUND FLOOR PLAN
SHOWING STRUCTURE OVER**

Project No. 2025 / 036	Drawing No. SK01	Revision -
Date Drawn 15 / 07 / 25	Drawn By KB	Checked By CD

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**PROPOSED GROUND FLOOR PLAN
SHOWING STRUCTURE OVER**

SCALE 1:50

NOTE:

ALL SETTING-OUT AND RELATIVE LEVELS etc. TO BE CONFIRMED BY ARCHITECT / BUILDER.

Revision	Date	By	Chk

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PROJECT
**31 TOWNGATE
MARSDEN, HD7 6DD**

TITLE
**PROPOSED GROUND FLOOR PLAN
SHOWING STRUCTURE OVER**

Project No. 2025 / 036	Drawing No. SK02	Revision -
Date Drawn 15 / 07 / 25	Drawn By KB	Checked By CD

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NOTES

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL NECESSARY ENGINEERS DRAWINGS AND THE STRUCTURAL CALCULATIONS.

2. ALL CRITICAL & KEY DIMENSIONS ARE TO BE TAKEN ON SITE BEFORE WORK COMMENCES.
ALL SETTING-OUT AND RELATIVE LEVELS etc. ARE TO BE ASCERTAINED BY BUILDER / FABRICATOR ON SITE PRIOR TO COMMENCEMENT OF WORK. DO NOT SCALE FROM THIS DRAWING. SETTING-OUT & LEVELS REMAIN THE RESPONSIBILITY OF THE BUILDER / FABRICATOR AND NOT 'SGM STRUCTURAL DESIGN'.

3. ALL NECESSARY WALLS AND FLOORS TO BE CAREFULLY NEEDED AND PROPPED PRIOR TO DEMOLITION OF ANY SUPPORTING ELEMENTS. PROPS SHOULD **ONLY** BE TAKEN OFF STRUCTURAL ELEMENTS CAPABLE OF TAKING THE PROP LOADINGS. INSTALLATION OF TEMPORARY CONCRETE PADS BELOW GROUND FLOOR JOISTS MAY BE REQUIRED, SPREADER BOARDS MAY NOT BE SUFFICIENT DEPENDING ON JOIST SIZE AND SPAN DIRECTION. INSTALLATION OF BACK-PROPS TO CELLAR AREAS MAY BE REQUIRED. FULL PROPPING SYSTEM TO BE DESIGNED BY CONTRACTOR AS PART OF THE TEMPORARY WORKS SCHEME TO CATER FOR THE APPLIED LOADINGS SHOWN ON SGM STRUCTURAL DESIGN DRAWINGS OR OTHERWISE CALCULABLE FOR LOADINGS GIVEN OR A SITE INSPECTION. CONTRACTORS DESIGN PROPOSALS TO BE ISSUED TO ENGINEER FOR COMMENT 7 DAYS PRIOR TO INSTALLATION.

4. WALLS AND FLOORS TO BE PACKED TIGHT OFF SUPPORTING BEAM TOP FLANGE USING BLUE SLATES OR STEEL SHIMS AND SEMI-DRY NON SHRINK MORTAR.

5. STEEL BEAMS TO BE GRADE S275 AND TO BE THOROUGHLY CLEANED BEFORE PAINTING WITH PRIMER TO A MINIMUM THICKNESS OF 75 MICRONS.

6. ALL STEELWORK MUST BE ADEQUATELY CERTIFIED WITH ALL CORRECT AND UP TO DATE C.E. MARKING AND ALL IN ACCORDANCE WITH EXECUTION CLASS 2 TO BS EN 1090 AS A MINIMUM REQUIREMENT.

7. ALL PRECAST CONCRETE LINTELS AND STEEL BEAMS WITH BEARING ONTO MASONRY ARE TO HAVE A MINIMUM BEARING OF 150mm.

8. FACES OF ALL NEW OPENINGS TO BE MADE GOOD IN ENGINEERING CLASS B BRICKWORK, TIED TO EXTERNAL WALLS AND/OR BLOCK BONDED TO EXISTING MASONRY AS NOTED.

9. ALL PADSTONES TO BE MINIMUM GRADE C35 CONCRETE CAST INSITU WITH THE TOP TROWELLED SMOOTH. STEEL SHIMS, 150mm x 100mm x VARYING THICKNESSES, ARE TO BE PLACED MID-WAY ALONG THE LENGTH OF THE PADSTONE WITH THE BEAM BEARING A MINIMUM OF 100mm ONTO THE SHIMS. ALTERNATIVELY USE CUT DOWN PRECAST CONCRETE LINTELS BEDDED ON MORTAR. WALL TO BE MADE GOOD AROUND BEAM END WITH INSITU CONCRETE CAST INTO THE WEB.

10. FIRE PROTECTION TO THE STEELWORK (REQUIREMENT TO BE CONFIRMED BY LOCAL BUILDING CONTROL OFFICER) TO BE A MINIMUM OF TWO LAYERS OF 12.5mm PLASTERBOARD, OR GYPROC FIRELINE BOARD PLUS ONE LAYER OF 12.5mm PLASTERBOARD.

Revision	Date	By	Chk

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PROJECT
**31 TOWNGATE
MARSDEN, HD7 6DD**

TITLE
CONSTRUCTION NOTES

Project No. 2025 / 036	Drawing No. SK03	Revision -
Date Drawn 15 / 07 / 25	Drawn By KB	Checked By CD

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