Construction Method Statement
22 Lansdowne Road
London
W11 3LL
Construction Method Statement
22 Lansdowne Road, London, W11 3LL

Client: Mr & Mrs Hoosenally

Document Details:

Project Number: 2167
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Written By: Robert Walker
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1.00 Introduction

1.01 This Method Statement has been provided for Mr & Mrs Hoosenally for works which are proposed at 22 Lansdowne Road, London, W11 3LL.

1.02 The works within this Method Statement refer to the following operations:
   • Construction of a single level basement below the building, extending into part of the front and rear gardens

1.03 This Method Statement is based upon the following architectural plans:
   • PL X 001 – Existing Basement and Lower Ground Floor Layout
   • S X001 – Existing Section
   • PL001 03 - Proposed Basement and Lower Ground Floor Layout
   • S001 03 – Proposed Section

1.04 The following engineering drawings have been relied upon in preparation of this Method Statement:
   • 6856-PS-01
   • 6856-PS-02

1.05 The structural and technical details have been produced for the project by R.H. Horwitz Associates, Chartered Structural Engineers.

1.06 The Site Investigation has been carried out by Chelmer Site Investigations who produced the following Report;
   • 22 Lansdowne Road- Site Investigation – Factual Report - 4040

2.00 Project Overview

2.01 The subject property is a semidetached house in the Norland Conservation area. Details include stucco fronted house is set over four floors.

2.02 The property is constructed over four storeys, comprising the following levels:
   • Lower Ground Floor
   • Ground Floor
   • First Floor
   • Second Floor

2.03 The property is of traditional construction:
- External walls - solid brick.
- Lower Ground floor concrete slab with finishes.
- Intermediate floors - suspended timber joists with floorboards.
- Roof - Pitched with traditional tiled roof over.

2.04 This document is part of a Planning Application relating to the proposed works submitted to the Royal Borough of Kensington & Chelsea (RBKC) council.

2.05 As part of the application made to RBKC Council a drawing is to be submitted highlighting the location of a skip and materials storage area on the Public Highway to the front of the subject property.

2.06 There are no obvious structural defects visible upon inspection. The property whilst aged is in generally good condition although as materials reach the end of their natural life-span refurbishment is required.

3.00 Site Investigation

3.01 Chelmer Site Investigations were commissioned to carry out a 6.0m rotary bore-hole investigation using a hand auger and GEO205 mechanical flight auger.

3.02 The site investigation took place on the 06/11/2013. The bore-hole was located at lower ground floor level within the lightwell to the front of the property. As identified within the factual report the bore-hole extended to a depth of 6.0m.

3.03 Topsoil was encountered to a depth of 0.15m overall.

3.04 Between 0.15m to 1.3m MADE GROUND: medium compact, dark brown, very silty clay, with gravel and brick fragments.

3.05 Between 1.3m to 2.7m Stiff, orange-brown, grey veined, silty CLAY, with partings of orange and brown, silt and fine sand and selenite crystals.

3.06 Becoming very stiff from 3.3m.

3.07 Borehole ends at 6.0m.

4.00 Trial Pit Investigation

4.01 Hand excavated trial pits are to be constructed at front and rear of the property.

5.00 Site Preparation & Enabling Works

5.01 An application will be made to RBKC Council for permission to site a builder's skip and hoarding to the front of the property.

5.02 The hoarding will have an overall height of 2.2m and be painted white.

5.03 Lights are to be fitted externally to the hoarding together with chevron high Reflectors so that it is clearly visible during the hours of darkness.
A metal skip container is to be located within the hoarding structure for temporary storage of waste material pending its removal and clearance from site.

Temporary water and electrical supply are to be provided for the duration of the construction period and will be retained in a safe condition within the hoarding zone.

Temporary access will be provided to the front elevation for the location of an electrical conveyor system for the purposes of the removal of excavated spoil which arises during the construction of the basement.

Install electrically operated 450mm wide conveyor to provide mechanised removal of spoil from the proposed basement zone.

Initially the conveyor is to be located at floor level and to incline not to exceed 40° to the appropriate discharge height. Discharge is to be directly located over metal waste container/skip.

Provide a proprietary 110 volt power supply to the conveyor complete with associated cut out fuse and the like.

Provide flexible tarpaulin protection to the discharge location on the proposed conveyor to limit any dust arising from the works.

As the works extends to a deeper section of the basement provide elongated conveyor sections suitably restrained to enable excavation works to continue.

6.00 Demolition & Fit Out

Break out existing lower ground floor slab using pneumatic equipment and remove from site.

Terminate any existing electrical or water supplies.

7.00 Datum Level Orientation

Establish baseline datum level relative to external ground level to front of the property – This is to be Origination Point.

Transfer Datum Level from Origination Point to subject property.

Establish datum transfer points to front and rear of subject property and record levels.

Datum Transfer points to be a minimum of 1.0m above existing ground floor level.
8.00 **Underpinning**

8.01 Excavate for underpin bases as indicated on Structural Engineering plans. Individual bases are not to exceed 1.0m in width and no adjacent sections are to be excavated simultaneously.

8.02 The excavation sequence for underpins shall be in a 'hit and miss' sequence. All to the engineer's design.

8.03 Underpins are to be constructed in accordance with the 'hit and miss' sequence in order that opposite faces of underpins are aligned and allow introduction of lateral equilibrium bracing to prevent movement in temporary condition.

8.04 During the excavation phase ensure that the exposed face of the excavation is propped at all times in accordance with details TD 05 using metal trench sheets propped back to the central mound.

8.05 Fix reinforcement in advance of concreting to underpin base.

8.06 Pour concrete forming underpinning base to Engineer's details. Note the site foreman for Cranbook Basements is to inspect the formation prior to pouring of concrete.

8.07 Upon completion of reinforced concrete base provide temporary formwork to the vertical stem section and install reinforcement as detailed on the engineer's drawing.

8.08 Pour concrete to within vertical stem section to within 75mm of underside of the existing foundation.

8.09 Allow a minimum of 48 hours to lapse between construction of vertical stem section and installation of dry pack.

8.10 Clean the underside of the existing foundation in preparation for installation of dry pack.

8.11 Install 1:3 sharp sand and cement dry pack and thoroughly ram home to space between top of reinforced concrete underpinning stem and underside of existing foundation. The dry pack material is to be enhanced by the addition of Tecroc A Grout Dry Pack Expansive Chemical Additive.

8.12 As underpinning works progress introduce equilibrium bracing on an east-west axis through the basement core incorporating RMD Super Props. Super Props are to be surface fixed to the face of the underpinning in the manner indicated on drawing TD-11.

8.13 The remainder of the central spoil mound is to be retained for localised propping during the underpinning process.

8.14 Upon completion of the east-west underpin the entire process should be repeated for north-south underpins.

8
8.15 Following completion of underpinning work the remainder of the central spoil mound is to be excavated and removed from site.

8.16 Excavate for reinforced concrete basement slab ensuring that lateral bracing is maintained at all times between opposite faces of underpin stems utilising RMD Super Props.

8.17 Fix reinforcement as specified on Engineer's drawings.

8.18 Pour concrete forming basement floor slab in permanent condition.

9.00 Structural Steelwork

9.01 During construction of reinforced concrete sections introduce structural steel framework throughout the basement level in accordance with structural engineer's details.

9.02 Column sections are to be installed over locally thickened slab areas.

9.03 All structural connection details, splices and base plates are to be in accordance with requirements of the Structural Engineer's Drawings.

9.04 When installing proposed steelwork under existing masonry wall, the following sequence applies-
- Position vertical props either side of existing foundation at 1m centres
- Remove sections of existing foundation at 1m centres and install 25mm thick metal spreader plates bearing onto props each side
- Once complete remainder of existing foundation can be removed
- Install new beam (refer to section 9.00 below for details)
- Dry pack 25mm voids above steelwork between spreader plates
- Remove vertical props

10.00 Corbel Brick Foundation

10.01 Upon completion of concrete underpinning and dry packing the existing corbel brick foundation is to be carefully removed.

10.02 Using a small hand held pneumatic breaker carefully remove the existing projected brickwork corbel so that it is finished flush with the face of the projecting underpinning.

10.03 Take care to ensure that no excessive force is used during the removal of the brick corbel and in circumstances where the existing masonry may be in poor condition use small hand held hammer and steel chisels for brickwork cutting back.
11.00 Below Ground Drainage

11.01 Prior to the construction of basement floor slab install foul water drainage runs and drained cavity drainage points using 100mm diameter uPVC pipework installed in accordance with the manufacturer's instructions.

11.02 In the agreed location install 1No. Delta Dual V3 Sump and pump system to serve the drained cavity membrane.

11.03 In the agreed position install 1No. Delta Foul V3 Retrofit Sump to serve the foul water drainage installation.

11.04 Both sumps are to be installed in accordance with the manufacturer's recommendations.

12.00 Basement Floor Slab

12.01 Excavate Basement Floor Slab to levels indicated on Structural Engineers Plans.

12.02 Compact base and install reinforcement ensuring adequate concrete cover is achieved.

12.03 Install Concrete Basement Slab.

12.04 Allow 48 Hours for initial concrete cure and remove lateral props.

13.00 De-watering – Construction Phase

13.01 Based upon information contained within the factual Site Investigation Report it is unlikely that significant quantities of water will be encountered during the excavation phase.

13.02 In the event that ground water is encountered during the course of excavation a localised excavated sump of size 1m x 1m x 1m is to be formed at a level lower than the progressive base of the excavation that is being carried out.

13.03 A timber perforated plywood shell is to be constructed to support the perimeter of the temporary working sump and placed within the excavated zone.

13.04 Any ground water that is present will naturally pour within the sump area and that point a 50mm diameter Semi Trash Water pump unit is to be introduced with a 50mm discharge hose.

13.05 For works located adjacent to excavation level sump the hose is to be routed to the nearest adjacent manhole for discharge.

13.06 Following the de-watering of the excavated zone concrete is to be poured and the process is to be repeated in the next work zone.
14.00 Water Management – Post Construction

14.01 Water penetration within the reinforced concrete basement structure is to be designed to meet the requirements of BS 8102 Table 2 Grade 3 for habitable basements. This is to be achieved via a drained cavity membrane.

14.02 Install Delta membrane in MS20 To all basement floor surfaces.

14.03 Install Delta Membranes MS500 to all basement wall surfaces.

15.00 Padstone & Spreader Plate Installation

15.01 Where indicated on the Engineer’s Drawings structural steel bearings or padstones are to be introduced to the party wall.

15.02 In the position indicated carefully drill sequential holes to create a honeycomb effect within the existing brickwork.

15.03 Using hand held hammer and steel chisel carefully remove the honeycomb brickwork to create a recessed pocket suitable for installation of padstone/steel spreader.

15.04 Install padstone/steel spreader over a thin bed of 1:1 sharp sand levelling compound in preparation to receive steel beam.

15.05 Following installation of the steel beam carry out brickwork making good to surround steel work and to close up the pocket formed to within the party wall for the padstone/steel bearing plate.

16.00 Installation of Steel Beams

16.01 In locations identified on structural Engineers drawings prepare for Steel Beam Installation.

16.02 Provide 102 x 102 Steel needles through masonry wall at 500mm centres.

16.03 Install adjustable steel props to both sides of the wall below each needle.

16.04 In the event that masonry is loose then additional strong boy wide platform props are to be introduced to aid stability.

16.05 Clean underside of masonry to receive steel beam.

16.06 Install steel beam tight to underside of masonry and resting on padstones.

16.07 Point any small gaps that may remain with Tecroc Expansive Grout to ensure a tight fit between beam and supported structure.

16.08 Make good to beam ends where penetrating the end bearing.
17.00 **Fireplace & Chimney Flu**

17.01 Prior to demolition works provide soft blocking to adjoining owners chimney flue to avoid loose chimney debris falling onto fireplace.

17.02 Provide and install hardboard covering to fireplace opening secured with low tack adhesive tape

17.03 Upon completion of construction works remove soft blocking to chimney flues and hardboard fireplace enclosure.

18.00 **Working Hours**

18.01 Works that are associated with the Party Wall Act shall be carried out as permitted by planning consent namely 8.00am – 6pm Monday to Friday and 8am – 1pm on Saturday.
Appendix (i)

Architectural Plans
THIS DRAWING IS THE COPYRIGHT OF CRANBROOK BASEMENTS. It shall not be in any way used or reproduced without their prior written consent. All dimensions are to be checked on site or in the workshop prior to commencing any work. Work only to figured dimensions. Any discrepancies are to be reported to the Architect.

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London W11 3LL

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admin@cranbrook.co.uk
www.cranbrook.co.uk

<2167-201>
Appendix (ii)

Engineering Plans
THE CONTRACTOR IS TO DESIGN & PROVIDE ALL NECESSARY TEMPORARY WORKS, PROPPING AND SHORING. THIS IS TO INCLUDE ALL NEEDLING AND PROPPING TO SUPPORT THE EXISTING WALLS AND FOUNDATIONS (WHICH MAY BE FRAGILE AND LOOSE) AND LATERAL SUPPORT TO ALL WALL AND UNDERPINNING SECTIONS UNTIL THE ENTIRE WORKS HAVE BEEN COMPLETE. THE SEQUENCE OF UNDERPINNING IS TO BE AGREED IN WRITING BETWEEN ENGINEER AND CONTRACTOR.

ALL WATERPROOFING AND DAMP PROOFING IS TO BE BY OTHERS. ANY DETAILS SHOWN ON THIS DRAWING ARE PURELY INDICATIVE.

NOTE:
A. ALL WOODEN GRADE CHECKS ON THE DRAWING ARE NOT TO SCALE.
B. PERMISSIBLE ALLOWABLE SAFE GROUND BEARING PRESSURE IS 175 kN/M SQ.
C. SCALE 1:50.
Appendix (iii)

Structural Calculations
Our ref: 6856
April 2015

R H Horwitz Associates
135-137 New London Road
Chelmsford
Essex
CM2 0QT
01245 809 510
CLIENT: Cranbrook Basements Ltd

Document Details:

Job No: 6856

Issue Date: 17th April 2015

Written By: Daniel Claydon
BEng(Hons), CEng, MIStructE

Reviewed By: Richard Horwitz
BSc (Hons), CEng, MIStruct E
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2.0 Site and Geology
3.0 The Existing Property
4.0 Proposed Works
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6.0 Specifications

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Appendix E Design Principle drawings
Appendix F Specification
1.0 Introduction

At the request of Mr Robert Walker of Cranbrook Basements Ltd, R H Horwitz Associates have been appointed to produce a Structural Design Philosophy Report for the construction of a single storey basement under the existing structure at 22 Lansdowne Road, London W11 3LL.

R H Horwitz Associates, Consulting Engineers, was formed in 1995 by Richard Horwitz after having spent five years as an Associate Director with Miller Osborne & Partners.

Our expertise and experience cover a full spectrum of civil and structural engineering within the building industry. The practice works on projects of all sizes, working with developers, contractors and other building professionals forming multi discipline teams to deliver optimum designs and construction solutions.

R H Horwitz Associates are members of the Association of Consulting Engineers and Richard Horwitz, a Chartered Engineer, is a Member of the Institute of Structural Engineers and a Fellow of the Association of Consulting Engineers.

R H Horwitz Associates have undertaken structural design services on a number of similar and much larger basement projects for Cranbrook Basements Ltd and a number of other specialist contractors and developers.
2.0 Site and Geology

The site is located to the north of Holland Park Tube station, west of Ladbroke Grove and has a Park to the rear.

The property is a semi-detached townhouse sharing a party wall with No20, with a fully detached two storey house, No 22A adjacent to the other flank. The property has gardens to the front and rear.

A Site Investigation report was commissioned by Cranbrook Basements and undertaken by Chelmer Site Investigations on the 6\textsuperscript{th} November 2013. Appendix A contains a copy of report ref FACT/4040

The Site Investigation consisted of a 6.0m deep borehole undertaken in front garden at ground level, which falls between the ground floor and lower ground floor levels internally. The borehole indicates Made Ground to approximately 1.3m, overlain stiff clay becoming very stiff clay at 3.3m. It is noted that the borehole was dry upon completion.

For the sake of the preliminary calculations a SGBP of 150kN/m\textsuperscript{2} will be taken for the clays.
For the sake of the design calculations an allowance for ground water will be made based on basement design guidance with the worst case level being assumed at 0.75 times the retained depth or at 1m above formation level, depending on the depth of the basement and in accordance with the requirements of BS8102:2009.

This report will not provide comment on the local hydrology and the effect on the local ground water.
3.0 **The Existing Property**

The existing property is semi-detached, with three above ground levels and a lower ground floor level accessed via a stair from the front of the property. The rear garden is terraced and accessed from lower ground floor level. It should be noted that there is an existing wine cellar, accessed from the lower ground floor level to the front of the property.

Appendix B contains copies of Architectural drawings indicating the existing floor layouts and an existing long section.

The existing property appears to be of traditional construction with a timber roof, timber upper floors and a timber ground floor supported from load bearing masonry walls. The lower ground floor is assumed to be ground bearing slab throughout.

No exploratory works have been undertaken but given the type, size and age of the structure it is envisaged that the load bearing walls are supported on brick corbel strip foundations.
4.0 Proposed Works

Appendix C contains Architectural drawings indicating the proposed floor plans, including the new basement plan and a long section.

It can be seen from the plans and section that it is intended to provide a new basement level under the entire of the existing footprint of the property, extending towards the front and rear boundaries of the property.

The layouts of the upper floors indicate that the changes are to the stairs only, with the addition of a new flight down to the new basement.

4.1 Design Principles

Appendix D contains details of loadings to be taken for the existing and proposed structure in the structural design calculations.

The proposed layouts are such that there are no load bearing elements to be removed at lower ground floor level.

It is proposed to retain the existing lower ground floor structure, which is assumed to be ground bearing concrete slab, this is to be retained, using a system of steel beams supporting precast concrete lintels which in turn are to support the existing slab.
Where steel beams are to be used under lower ground floor level to support load bearing walls over the steel beams are to be designed in accordance with the relevant British Standards with characteristic dead and live load deflections limited to span/500, to minimise the risk of cracking to the existing wall.

Where the proposed lower ground floor extends to the property boundary the surcharge loads from the adjacent land is considered as set out below:

- Gardens - A UDL of 2.5kw/m²
- Highway/Footpath - A UDL of 10kw/m²
- A point load of 40kN applied over 0.3 x 0.3m and acting 0.6m from the boundary is considered.

As previously noted the basement walls will be designed for hydrostatic forces in accordance with the requirements for BS 8100 2009.

The new basement areas under the front and rear gardens are to be constructed in a “cut and cover” sequence with the roof slab constructed as an insitu RC slab built of permanent formwork, supported on steel beams.

It is proposed to provide a special foundation under the existing Party walls. The foundation thickness will match that of the wall over and the reinforced concrete section will be designed to support the loadbearing walls over and retain the adjacent earth.
The special foundation is designed for two load cases, the first a temporary case prior to the installation of dry packing over the new foundation to the underside of the existing and allows for lateral loads only. The second permanent case upon completion of the pin allows for both vertical and lateral loads.

The bases sizes for the special foundations are calculated for the permanent condition with propping loads indicated, if required, for the temporary condition. The propping forces allow for factors of safety against overturning and sliding at 2.0 and 1.5 respectively.

5.0 Design

Appendix E contains drawings for the proposed foundation/underpin arrangement; the lower ground floor G.A.

6.0 Specifications

Appendix F contains a structural specification for the works.

Daniel Claydon
B Eng(Hons), CEng, MIstruct E

Richard Horwitz
BSc(Hons), CEng, MIstruct E
APPENDIX A

SITE INVESTIGATION REPORT
Factual Report

Client: Cranbrook Basements
Site: 22 Lansdowne Road
Notting Hill
London W11

CSI Ref: FACT/4040

Dated: 6th November 2013
Notes:

On site tree identification for guidance only. Not authenticated.

Key:

- Tree/Shrub
- Borehole
- Trial Pit
- Gully
- Tree Stump
- Rain Water/Soil Pipe
- Manhole
**Remarks:**

Description of Strata

<table>
<thead>
<tr>
<th>Depth Mtrs.</th>
<th>Thickness</th>
<th>Strata Description</th>
</tr>
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<tbody>
<tr>
<td>0.15</td>
<td>0.15</td>
<td>TOPSOIL</td>
</tr>
<tr>
<td>1.3</td>
<td>1.15</td>
<td>MADE GROUND: medium compact, dark brown, very silty clay, with gravel and brick fragments.</td>
</tr>
<tr>
<td>1.3</td>
<td>2.7</td>
<td>Stiff, orange-brown, grey veined, silty CLAY, with partings of orange and brown, silt and fine sand and selenite crystals.</td>
</tr>
<tr>
<td>1.3</td>
<td></td>
<td>.....becoming very stiff from 3.3m.</td>
</tr>
<tr>
<td>6.0</td>
<td></td>
<td>Borehole ends at 6.0m</td>
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</tbody>
</table>

Borehole dry and open on completion. Standpipe installed to 6.0m.
REPORT NOTES

Equipment Used

Hand tools, Mechanical Concrete Breaker and Spade, Hand Augers, 100mm/150mm diameter Mechanical Flight Auger Rig, GEO205 Flight Auger Rig, Window Sampling Rig, and Large or Limited Access Shell & Auger Rig upon request and/or access permitting.

On Site Tests

By Pilcon Shear-Vane Tester (Kn/m²) in clay soils, and/or Mackintosh Probe in granular soils or made ground and/or upon request Continuous Dynamic Probe Testing and Standard Penetration Testing.

Note:

Details reported in trial-pits and boreholes relate to positions investigated only as instructed by the client or engineer on the date shown.

We are therefore unable to accept any responsibility for changes in soil conditions not investigated i.e. variations due to climate, season, vegetation and varying ground water levels.

Full terms and conditions are available upon request.
APPENDIX B

CRANBROOK BASEMENT DRAWINGS

(EXISTING)
APPENDIX C

CRANBROOK BASEMENT DRAWINGS

(PROPOSED)
Proposed Lower Ground Floor Layout

Proposed Basement Floor Layout

Client: Mr & Hoosenally
Project: 22 Lansdowne Road
London
W11 3LL

Drawing: Proposed Basement and Lower Ground Floor Layout

Scale: 1:100 @ A3
Date: 20 Apr 15

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APPENDIX D

DESIGN LOADS
LOADINGS:

These loadings are to be used throughout the structural calculations.

**Roof:** (Existing Pitched)

- **Dead loads:**
  - Tile / Felt / Battens: 0.8 kN/m^2
  - Roof / Trusses: 0.2 kN/m^2
  - Insulation: 0.1 kN/m^2
  - Ceiling & Scr: 0.3 kN/m^2
  - Total: 1.4 kN/m^2

- **Live loads:**
  - Membrane Access only: 0.6 kN/m^2

  \[ \text{W}_d = 2.0 \text{kN/m}^2 \quad \text{W}_l = 2.9 \text{kN/m}^2 \]

**Walls:**

- **Dead loads:**
  - Finish: 0.1 kN/m^2
  - Posts: 0.2 kN/m^2
  - Beams: 0.2 kN/m^2
  - Ceiling & Scr: 0.3 kN/m^2
  - Total: 0.8 kN/m^2

- **Live loads:**
  - Residential: 1.5 kN/m^2
  - Partitions: 0.5 kN/m^2

  \[ \text{W}_d = 2.5 \text{kN/m}^2 \quad \text{W}_l = 4.3 \text{kN/m}^2 \]

**Walls:**

- 330 Masonry: \( 0.35 \times 22 \times 2.0 \times 1.4 = 3.0 \text{ kN/m} \) (21.6 kN/m)
- 215 Masonry: \( 0.75 \times 22 \times 2.5 \times 1.4 = 2.6 \text{ kN/m} \) (15.4 kN/m)
- 100 Masonry: \( 0.1 \times 22 \times 2.8 \times 1.4 = 8.6 \text{ kN/m} \) (6.2 kN/m)
- 100 Block: \( 0.1 \times 18 \times 2.8 \times 1.4 = 7.1 \text{ kN/m} \) (5.0 kN/m)
- 100 Stud: \( (0.25 \times 2 + 0.2 + 0.1) \times 2.8 \times 1.4 = 8.1 \text{ kN/m} \) (2.2 kN/m)
APPENDIX E

DESIGN PRINCIPLE DRAWINGS
THE CONTRACTOR IS TO DESIGN & PROVIDE ALL NECESSARY TEMPORARY WORKS, PROPPING AND SHORING. THIS IS TO INCLUDE ALL NEEDLING AND PROPPING TO SUPPORT THE EXISTING WALLS AND FOUNDATIONS (WHICH MAY BE FRAGILE AND LOOSE) AND LATERAL SUPPORT TO ALL WALL AND UNDERPINNING SECTIONS UNTIL THE ENTIRE WORKS HAVE BEEN COMPLETE.

SEQUENCE OF UNDERPINNING IS TO BE AGREED IN WRITING BETWEEN ENGINEER AND CONTRACTOR.

ALL WATERPROOFING AND DAMPPROOFING IS TO BE BY OTHERS. ANY DETAILS SHOWN ON THIS DRAWING ARE PURELY INDICATIVE.

ALL DETAILS PRELIMINARY.

DESIGN ASSUMES ALLOWABLE SAFE GROUND BEARING PRESSURE OF 175 kN/M².

BASEMENT FLOOR PLAN
SHOWING LOWER GROUND FLOOR / ROOF OVER
[Scale 1:50]

BASEMENT FLOOR PLAN
SHOWING UNDERPINNING & FOUNDATIONS
[Scale 1:50]
APPENDIX F

SPECIFICATION
SPECIFICATION

FOR WORKS

1.0 DEMOLITION

1.1 Scope

The areas to be demolished are shown on the drawings. The Contractor shall make good, at his own expense, any areas demolished beyond the limits shown on the drawings.

1.2 Demolition

All demolition work shall be carried out strictly in accordance with BS 6187 2011. Before commencement of work the demolition Contractor shall submit details of his insurance cover. In particular, cover shall be obtained for claims arising out of any act, neglect or omission by the building owner, as well as providing for all contractual liability.

If it is necessary to erect temporary hoardings, etc., the Contractor shall obtain all necessary licences, give all notices and pay all dues in connection therewith.

1.3 Temporary Works

The Contractor shall be responsible for the stability of the existing building on the site and any adjoining sites and he shall take all necessary precautions to safeguard this stability. Any temporary shoring, propping or strutting inserted to ensure this stability shall comply with the relevant British Standards.

Any scaffolding erected shall comply with BS EN 12811 and BS 5975 2008.

Any metal props and struts required shall comply with BS 4074 2000.

Any temporary shoring, propping or strutting shall be provided with an adequate foundation.
2.0 EXCAVATIONS

2.1 General

Excavation for the various parts of the works shall be carried out to the widths, lengths and depths indicated on the drawings or as directed by the Engineer on site.

Materials arising from the excavations shall be removed from the site.

Any excavations taken out below the depth required for construction of the works shall be replaced at the Contractor's own expense with approved and properly compacted materials as directed by the Engineer on site.

2.2 Planking and Strutting

Where excavations are taken out with vertical sides the Contractor shall, if necessary, provide all shoring, planking and strutting for supporting the sides of excavations at his own expense. The Contractor shall be responsible for the stability of earth works and shall take all necessary precautions to safeguard this stability.

2.3 Temporary Drainage

All excavations shall, as far as is reasonably possible, be kept free of water during the progress of the works and the Contractor shall provide, at his own expense, all temporary drains, sumps and pumping machinery that may be needed for this purpose.

2.4 Formation of Works

No concrete shall be poured until the ground formation for it has been inspected by the Building Control Officer.

The Contractor shall notify the Local Authority when approvals are required.

The formation of all excavations shall be trimmed and levelled 75mm above the formation level shown on the drawings prior to approval of the Engineer. In the case of mass concrete footings a further 75mm shall be taken out and the whole base poured immediately. In the case of reinforced concrete bases a further 125mm shall be taken out and the formation sealed with a 50mm layer of blinding concrete 1:8 laid as dry as is practicable.
2.4 **Formation of Works (cont’d)**

If the exposed formation is not satisfactory for the loading required, the Contractor shall execute such extra works as may be necessary to achieve a firm foundation as directed by the Engineer on site.

Should the material forming the bottom of any excavation, whilst sound at the time of excavation, become soft or deteriorated due to percolation of water or unsatisfactory protection during the progress of the works, the Contractor shall, at his own expense, remove such softened or loose material and replace it with approved material as directed by the Engineer on site.

The top surface of all blinding concrete under reinforced concrete work shall be such that the tolerance from the true level is +0, -20mm.

All existing construction and obstructions in the way of the proposed new foundations shall be reported to the Engineer. They shall then be removed or otherwise as directed by the Engineer.
3.0 UNDERPINNING

WORKMANSHIP: The work shall be carried out in accordance with the Engineer’s drawings and instructions and to the approval of the Architect and the Building Control Officer.

Any other sequence of operations or method of working proposed by the Contractor is to be submitted to the Architect and copied to the Engineer and agreed in writing a minimum of 14 days before work is to be commenced on site.

CONTRACTORS RESPONSIBILITIES: The Contractor shall be responsible for the safety of the underpinned structure and provide all necessary shoring, strutting and bracing to ensure its safety and stability at all times.

SERVICES: The Contractor is also to carry out a survey of the property and adjacent area to establish to location of obstructions such as service runs or drains. Any obstruction found is to be brought to the attention of the Architect/Engineer. The Contractor is to allow for any temporary support to the services or obstructions during the underpinning.

CONSTRUCTION SEQUENCE: The underpinning is to be undertaken in short sections not exceeding 1.2 metres in length. The underpinning is to be undertaken on a ‘hit and miss’ sequence as shown on the drawings or otherwise agreed in writing by the Engineer.

No adjacent pin is to be excavated until a minimum 48 hours after the adjacent pin has been cast and dry pack has been installed.

The Contractor is to provide drawings marked up to show the proposed sequence of underpinning a minimum of 14 days before work is commenced.

EXCAVATIONS: Excavation shall be to the depth and width shown on the drawings. However, where tree roots are encountered new underpins are to extend 600mm below the last trace of any root activity. The sides of the excavation shall be adequately shored and propped to prevent subsidence or slip of the soil. Soil faces behind the pin and at the formation level shall be undisturbed.

Any soil faces behind the underpinning that require to be retained shall be by precast concrete poling boarding. The boards are to have holes to enable the void behind the boards to be grouted up. The poling boards are to be measured as left in.

INSPECTIONS: All excavations are to be inspected by the Engineer and/or the Building Control Officer. Minimum notice of 24 hours is to be given when excavations are ready for inspection.
PREPARATION: The sides of the completed pin are to be thoroughly cleaned and scabbled to the satisfaction of the Engineer.

The soffit of the existing footings is to be levelled off and cleaned of all loose or detrimental material.

No projecting partitions of the existing footings are to be trimmed except as shown on the drawings or directed by the Engineer.

The Contractor must provide shear keys.

Allow for 150 deep x 100 wide shear keys across width of scabbled interfaces at 1m maximum vertical centres. Minimum 2 per face. Form in timber or polystyrene.

ANTI-HEAVE PRECAUTIONS: Before carrying out concreting introduce anti-heave precautions in the form of Claymaster as directed by the Engineer to the faces of the excavation.

PLACING CONCRETE: The concrete for the underpinning is to be mass concrete and poured continuously to 75mm below the soffit of the existing footing. The concrete is to be fully compacted using a mechanical vibrator.

The top 75mm of the pin is to be filled to the full depth and width of the void with a well rammed C35 concrete using 5mm-10mm coarse aggregate and Conbex 100’ expanding admixture by Messrs Fosroc UK Ltd in accordance with their instructions. The filling of this void is to be undertaken 24 hours after the mass concrete has been poured.

CONCRETE GRADE: On works where a full specification has not been provided, a FND2 mix should be used. This has characteristic 28 day strength of 35N/mm² and is suitable for Class 2 sulphate soils.

OVER-EXCAVATION: Except where noted otherwise on the drawings, areas of over-excavation are to be backfilled with a granular material and compacted in 225mm layers to provide a stable sub-base compatible with the final finishes.

SPOIL: The Contractor will include in his prices for the removal of all spoil arising from the works which is not suitable for backfilling purposes.

RECORDS: A full record of each section underpinned is to be kept on site and readily available for inspection by the Engineer or Building Control Officer.

GUARANTEE: The Contractor is to provide a 10 year insurance backed guarantee for the underpinning works.
4.0 PLAIN & REINFORCED CONCRETE WORK

4.1 Scope

This specification applies to the materials and workmanship in plain and reinforced concrete work to beams, columns, foundations, slab, staircases, walls and similar work, the extent of which is shown on the drawings.

4.2 Materials

Aggregates - fine and course aggregate shall be obtained from natural sources and shall comply with BS EN 12620 2012.

Cement shall be Ordinary Portland Cement complying with BS EN 197-1 2011.

Water used for any purpose shall be from an approved public supply.

Reinforcement - mild steel bars shall be plain round, hot rolled bars complying with BS 4449. High tensile bars shall be rolled steel bars of square or rolled ribbed indented section, which have been twisted cold, complying with BS 4461. Hot rolled bars shall have a yield stress of 420 N/mm² complying with BS 4449. Welded fabrics, twisted square bar fabric or expanded metal shall comply with BS 4483.

4.3 Concrete Mixes

Concrete mixes to be used are noted on the drawings. The proportions of aggregate and cement shall be measured by weigh batching.

Ready-mix concrete may be used in accordance with BS EN 206 with the Engineer’s prior approval.

The mix proportions and minimum strength requirements shall comply with BS 8110 and BS 8500 as stated on drawings.

All reinforced concrete work, unless otherwise specified, shall be compacted by means of poker vibrators.
4.4 Workmanship

Workmanship shall be in accordance with BS 8110 as stated on the drawings.

All concrete shall be properly cured for a minimum of seven days. The method of curing shall be agreed with the Engineer prior to the commencement of the work.

The interval between adding water to the dry mix and final placing shall not exceed thirty minutes and thereafter the concrete shall not be disturbed.

The method of working in cold weather shall be as set out in BS 8500 and Concrete Society Publication CS164-Good Concrete Guide 8 and is to be agreed with the Engineer prior to the commencement of the work.

The Contractor shall be responsible for the strength and stability of all temporary formwork and its supports. All formwork shall be constructed to prevent any losses of grout or mortar from the concrete. Adequate openings and removable panels shall be provided in shuttering for inspection and cleaning, etc. Connections shall be so constructed to permit easy removal of the shuttering.

All faces of shuttering and moulds in contact with wet concrete shall be treated with mould oil or other coating to the Engineer's approval.

The timing of the removal of formwork shall be entirely the Contractor's responsibility and forms shall not be struck until the concrete reaches a strength of at least twice the stress to which the concrete may be subjected at the time of striking. All formwork shall be removed without shock or vibration that would damage the concrete construction.

The surface finish to the concrete shall be as specified by the Inspecting Officer.

Concrete test cubes shall be made as directed by the Engineer and shall conform to BS 1881. The location of the concrete under test shall be clearly stated on the Test Certificate.

Reinforcement shall be free from pitting, loose rust, mill scale, paint, oil, grease, adhering earth, ice or any harmful matter that may impair the bond between the concrete and the reinforcement.

All reinforcement shall be bent in accordance with BS 4466. All reinforcement shall be placed and maintained in the position shown on the drawings with plastic chairs or similar.
4.5 Concrete in Cold Weather

No concrete shall be mixed or placed whilst the temperature is below $2^\circ C$ on a rising thermometer or below $4^\circ C$ on a falling thermometer, or freezing temperatures are forecast in the next 24 hours, but in any event, the following should be noted:-

1. No part of fresh concrete, at the time of placing, should have a temperature of less than $5^\circ C$.
2. All surfaces with which the fresh concrete will come into contact, including those of formwork, reinforcement and hardened concrete, should be free of snow, ice and frost.
3. Regardless of the air temperature at the time of placing, the temperature of the concrete should at no point fall below $5^\circ C$, nor should the water curing be applied until the concrete in the structural element reaches a strength of $5N/m^2$.
4. Any concrete damaged by frost shall immediately be removed and the member re-constructed at the Contractor’s own cost.
5. The Contractor shall provide an accurate maximum and minimum thermometer and hang in an approved position in the works and keep accurate daily record of these maximum and minimum temperatures for inspection by the Engineer.
6. Concrete may be preheated in the mixer by heating the mixing water to not more than $40^\circ C$.
7. The use of calcium chloride or any other chemicals to accelerate hardening will not be allowed.
5.0  STRUCTURAL STEEL WORK

5.1  Scope

This specification applies to the supply of materials and workmanship in connection with the fabrication, delivery to site and erection of structural steelwork consisting of beams, stanchions, connections, including all necessary fittings, bolts and welding, the extent of which is shown on the drawings.

The Contractor shall visit the site and carry out a survey to check the spans, section sizes and setting out of the existing steelwork and structural arrangement.

5.2  Materials

Mild steel shall comply with BS EN 10025 2004 Grade 5275 for quality and BS 4-1 with regard to form.

High tensile steel shall comply with BS 1775 for quality and BS 4 Part 2 with regard to form.

Steel tubes shall comply with BS 1775 for quality and BS 4 Part 2 with regard to form.

Cold formed steel sections formed from plate, sheet or strip steel 6mm thick and under shall comply with P.D. 4064 Addendum No 1 to BS 449.

Black bolts and nuts shall comply with BS 916 and BS 1769.

High strength friction grip bolts shall comply with BS 4395 and BS 4604.

The term 'weld', 'welds' and 'welding' shall refer to work done by electric metal arc welding and shall comply with BS EN 1011-2 2001. The Contractor shall provide certified evidence that every welding operative has passed tests as required by BS 5950 and specified in BS 2645.
5.3 Workmanship

Workmanship shall be of a first class standard and the design, fabrication and form of details shall be in accordance with BS 5950 and to the approval of the Engineer.

Cleaning of all surfaces to be painted shall be carried out in accordance with the requirements of BS ISO 27831.

All steelwork, unless otherwise agreed, shall be painted with one coat of zinc phosphate to 75 micron DFT.

The size of the steel members are shown on the Engineer's drawings and must not be varied without his approval.

5.4 Connections

The connections are to be of bolted or welded construction and of adequate strength to sustain the various loads indicated on the drawings and all details shall be sent to the Engineer for his examination before any work is put in hand.