6A NORTH END, LONDON, NW3 7HL

STRUCTURAL DESIGN PHILOSOPHY REPORT

Our ref: 6869
19th December 2013

R H Horwitz Associates
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CLIENT: **Cranbrook Basements Ltd**

Document Details:

Job No:	6869
Issue Date:	19th December 2013
Written By:	Daniel Claydon BEng(Hons), CEng, MIStructE
Reviewed By:	Richard Horwitz BSC (Hons), CEng, MIStruct E

CONTENTS

1.0 Introduction

At the request of Mr Dan Vickerstaff 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 6A North End, London NW3 7HL.

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 just off the A502 North End Way, North of Hampstead Tube Station.

The property is part of a small block of three properties around a central courtyard.

A Site Investigation report was commissioned by Cranbrook Basements and undertaken by Chelmer Site Investigations for one of the adjacent properties a copy of which is contained in Appendix A.

The Site Investigation consisted of a 5.7m deep borehole undertaken in front garden at ground floor level, of the adjacent property. The borehole indicated Made Ground to approximately 0.9m, overlain stiff clay to 3.8m, which in turn is overlain stiff dense, becoming medium dense silty Sands to close at 5.7m. Water seepage was noted at 5.4m

For the sake of the preliminary calculations and taking account of potential ground water within approximately 1m of the proposed formation level a SGBP of 150kN/m^2 will be assumed.

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 1mabove 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 positioned with two party walls to adjacent properties on perpendicular elevations. The property has two above ground floor levels, with vaulted ceilings to the first floor rooms.

Appendix B contains copies of Cranbrook Basements drawings indicating the existing floor layouts.

The existing property appears to be of traditional construction with a timber roof and timber upper floors supported on loadbearing masonry walls. It is assumed the ground floor slab is a 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 Cranbrook Basements drawings indicating the proposed floor plans, including the new lower ground floor plan.

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 under the properties courtyard, to the site boundaries. The layouts of the upper floors indicate that the changes include the addition of a new lightwell in the courtyard and amendments to the stairs, with new flight down to the lower ground floor level.

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 ground floor level.

It is proposed to retain the existing ground floor structure, which is assumed to be a 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 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 lower ground floor walls will be designed for hydrostatic forces in accordance with the requirements for BS 8100 2009.

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 ……

Reviewed

Richard Horwitz
BSc(Hons), CEng, MIStruct E ……..

APPENDIX A

SITE INVESTIGATION REPORT

A Factual Report on the

Site Investigation undertaken for

Cranbrook Basments

at

6a North End Road
Camden
London NW3

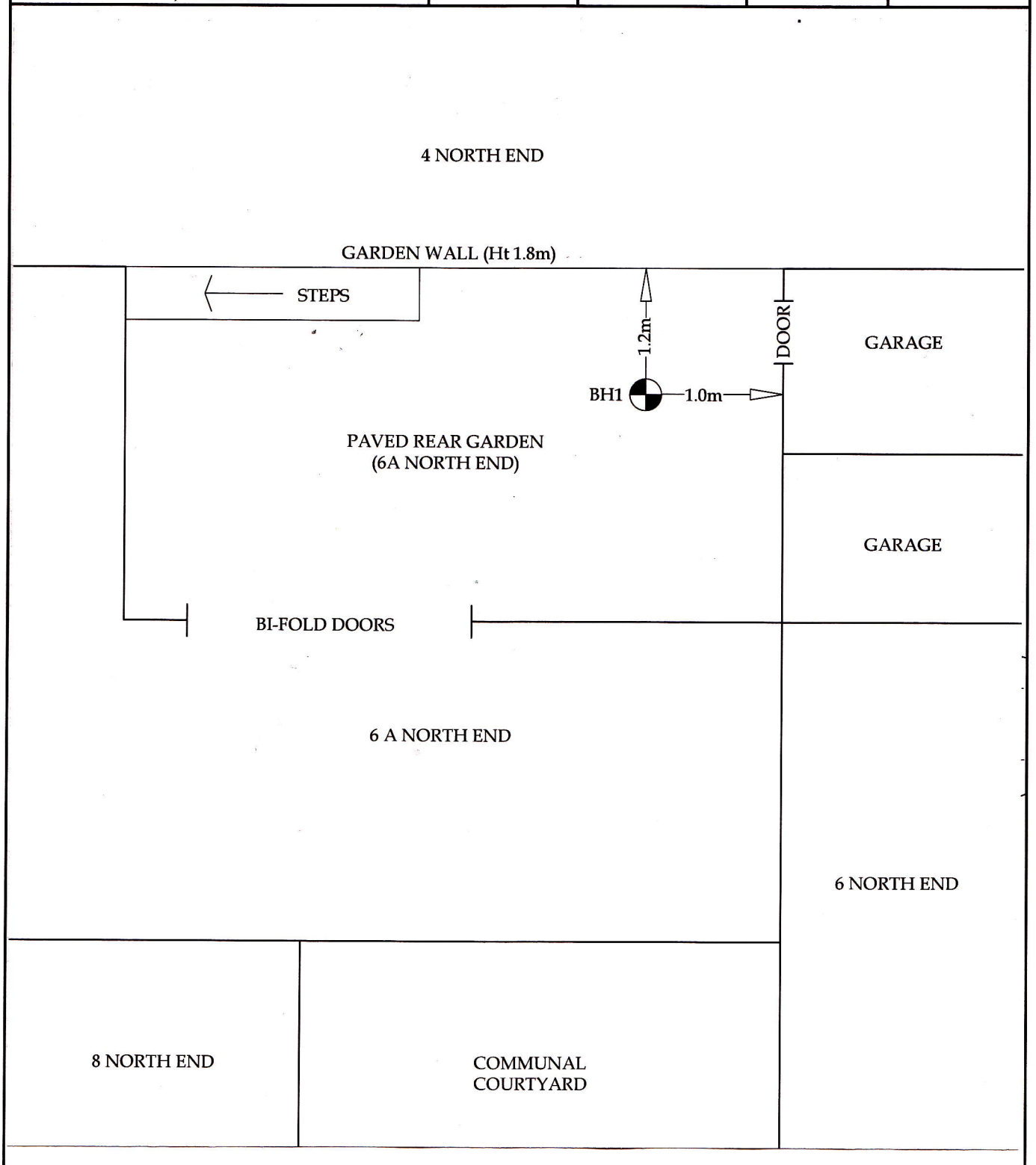
CSI Ref: 2997

Dated: 26th November 2013

Chelmer Site Investigation Laboratories Ltd. Unit 15 East Hanningfield Industrial Estate, Old Church Road, East Hanningfield, Essex CM3 8AB
Telephone: 01245 400930 Fax: 01245 400933 Email: info@siteinvestigations.co.uk Website: www.siteinvestigations.co.uk

Chelmer Site Investigations
Unit 15 East Hanningfield Industrial Estate
Old Church Road, East Hanningfield, Essex CM3 8AB
Telephone: 01245 400930 Fax: 01245 400933
Email: info@siteinvestigations.co.uk Website: www.siteinvestigations.co.uk

Client:	Cranbrook Basements	**Scale:** N.T.S.	**Sheet:** 1 of 1	**Date:** 26.11.13	
Location:	6a North End Road Camden, London NW3	**Job No:** 2997	**Weather:** Overcast	**Drawn by: JC**	**Checked by: ME**



Notes: RAISED FRONT GARDEN IS APPROX. 1.5m HIGHER THAN FOOTPATH LEVEL.

On site tree identification for guidance only. Not authenticated.

Key:

Tree/Shrub | Borehole | Trial Pit | G Gully | Tree Stump | Rain Water/ Soil Pipe | MH Manhole

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Unit 15 East Hanningfield Industrial Estate
Old Church Road, East Hanningfield, Essex CM3 8AB
Telephone: 01245 400930 Fax: 01245 400933
Email: info@siteinvestigations.co.uk Website: www.siteinvestigations.co.uk

Client: Cranbrook Basements	**Scale:** N.T.S.	**Sheet No:** 1 of 1	**Weather:** Hand auger	**Date:** 26.11.13	
Site: 6a North End Road, London NW3	**Job No:** 2997	**Borehole No:** 1	**Boring method:** Hand auger		

Depth Mtrs.	Description of Strata	Thick-ness	Legend	Sample	Test Type	Test Result	Root Information	Depth to Water	Depth Mtrs
G.L.	TOPSOIL	0.3							
0.3	MADE GROUND: medium compact mid brown silty gravelly very sandy clay with numerous brick and concrete fragments.	0.6		D			Roots of live appearance to 5mmØ to 2.2m.		0.5
0.9	Stiff mid brown/orange silty very sandy CLAY.	2.3		D	V	78 82			1.0
				D					1.5
				D	V	88 92	Roots of live appearance to 1mmØ to 3.8m.		2.0
				D					2.5
				D	V	110 108			3.0
3.2	Stiff mid brown grey veined silty CLAY with partings of orange and brown silt and fine sand and crystals.	0.6		D					3.5
3.8	Stiff dense mid brown/orange silty fine SAND.	0.9		D	M	27 29 31 35	No roots observed below 3.8m.		4.0
				D					4.5
4.7	Stiff/medium dense to dense mid brown/ orange laminated CLAY SILT and fine SAND.	0.6		D	M	32 34 37 39			5.0
5.3	Medium dense mid brown slightly clayey very silty fine SAND.	0.4		D				*5.4*	5.5
5.7	Borehole ends at 5.7m Unable to extract samples below 5.5m.								

Drawn by: JC **Approved by:** ME

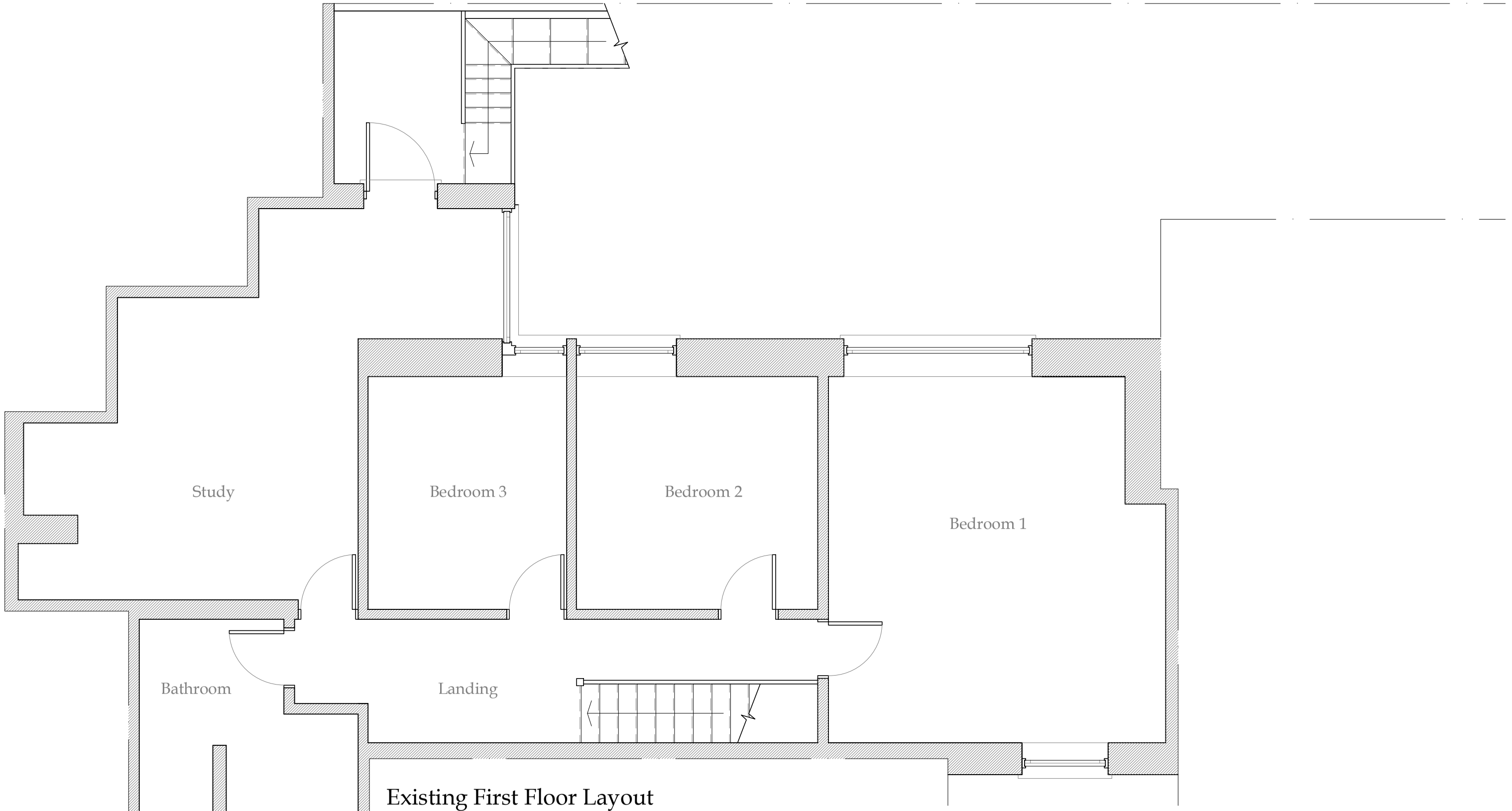
Remarks: *Water seepage at 5.4m.*
Borehole moist and collapsing on completion.

Key: T.D.T.D. Too Dense to Drive
D Small Disturbed Sample J Jar Sample
B Bulk Disturbed Sample V Pilcon Vane (kPa)
U Undisturbed Sample (U100) M Mackintosh Probe
W Water Sample N Standard Penetration Test Blow Count

APPENDIX B

CRANBROOK BASEMENT DRAWINGS

(EXISTING)



Existing First Floor Layout

0 METRES 5

SCALE

No.	Date	Amendment	Initials

Client :	Mr & Mrs Calcraft
Project :	6A North End London NW3 7HL
Drawing :	Existing First Floor Layout
Scale :	1:50 @ A3
Date :	15 Nov 13
Status :	PRELIMINARY
Dwg No :	2173-101
Rev :	-

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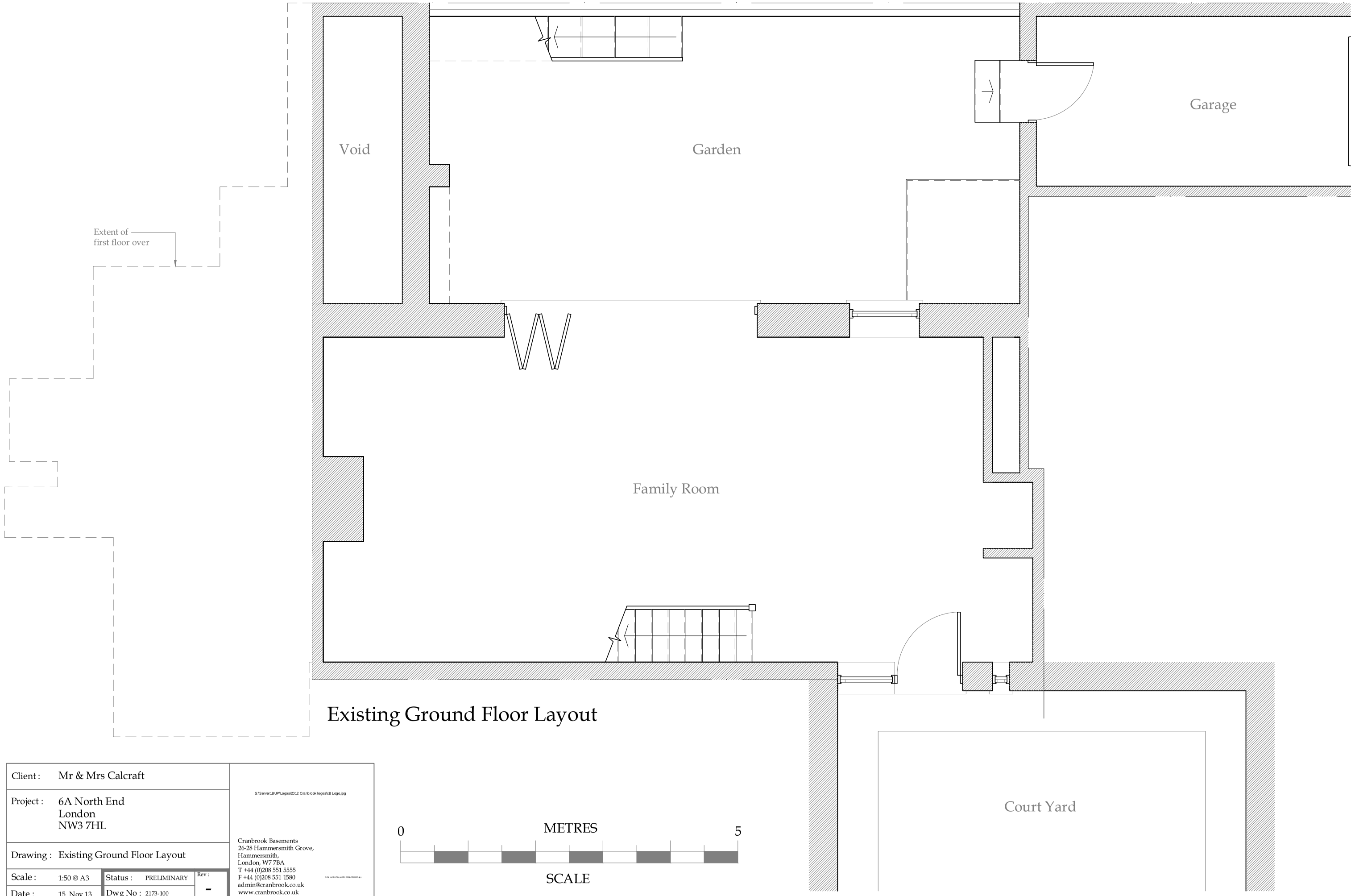

Existing Ground Floor Layout

Client :	Mr & Mrs Calcraft
Project :	6A North End London NW3 7HL
Drawing :	Existing Ground Floor Layout
Scale :	1:50 @ A3
Status :	PRELIMINARY
Rev :	-
Date :	15 Nov 13
Dwg No :	2173-100

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0 METRES 5

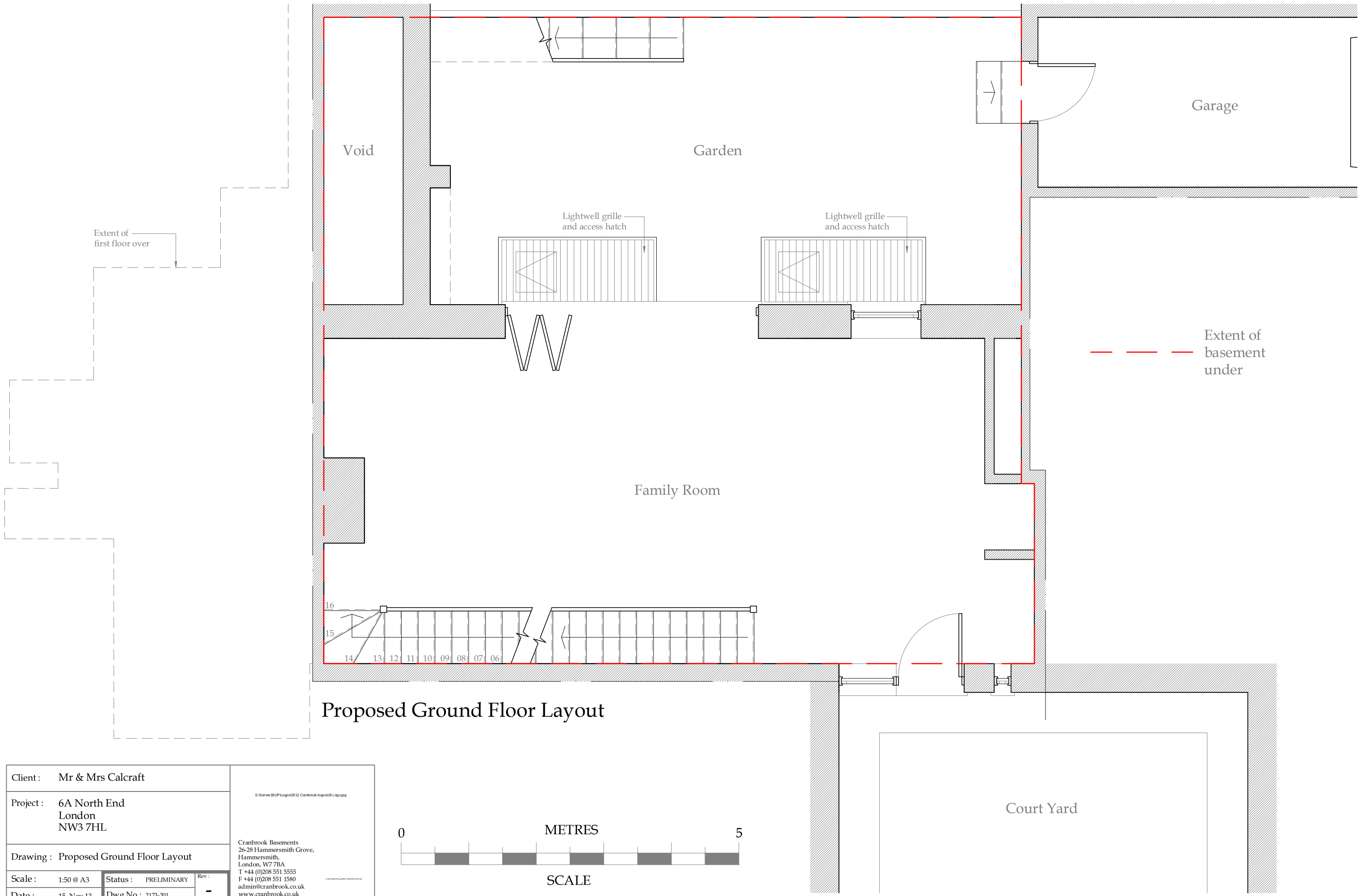
SCALE

No.	Date	Amendment	Initials

APPENDIX C

CRANBROOK BASEMENT DRAWINGS

(PROPOSED)



Proposed Ground Floor Layout

Client :	Mr & Mrs Calcraft
Project :	6A North End London NW3 7HL
Drawing :	Proposed Ground Floor Layout
Scale : 1:50 @ A3	Status : PRELIMINARY — Rev : -
Date : 15 Nov 13	Dwg No : 2173-201

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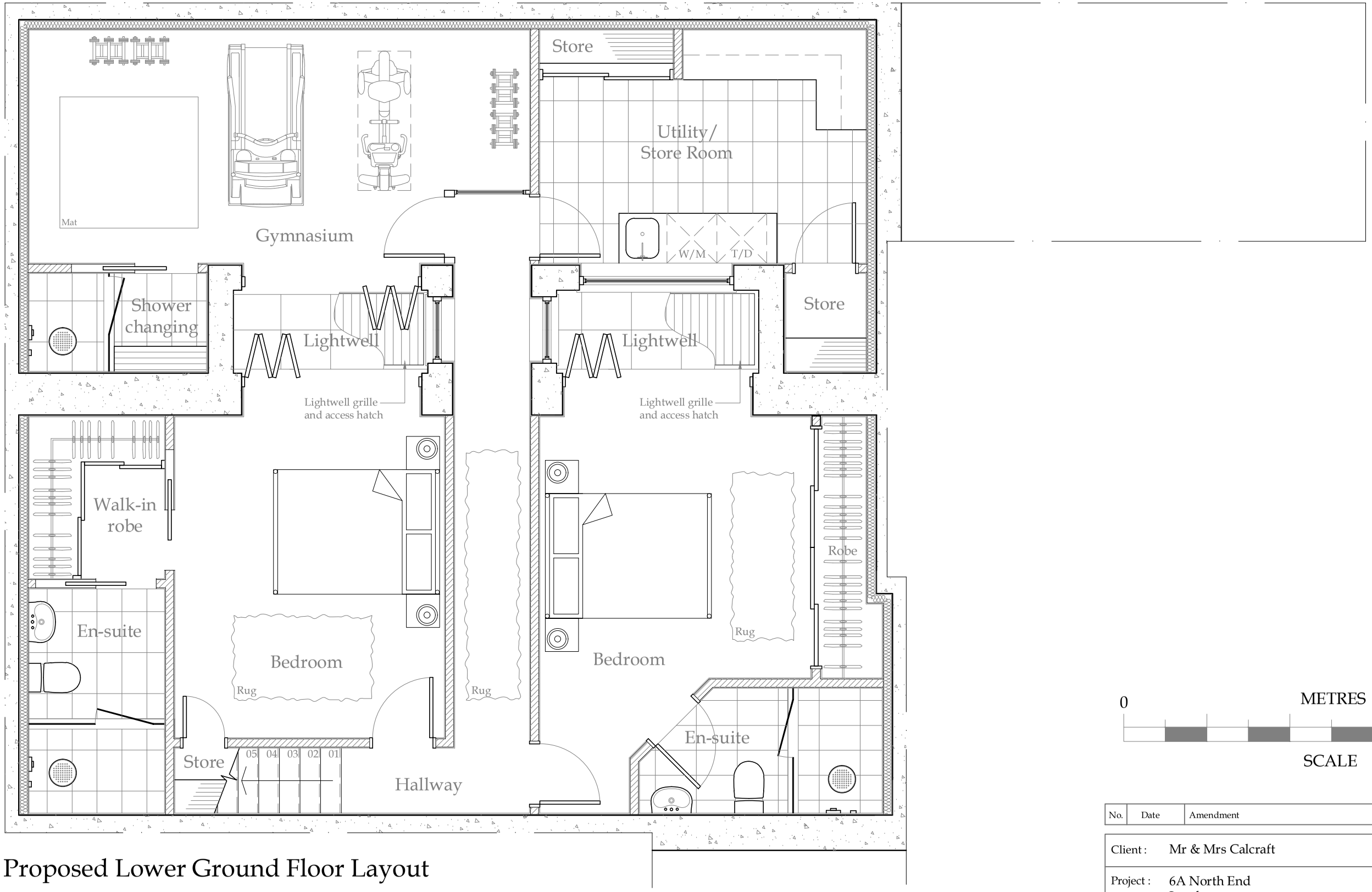
0 METRES 5

SCALE

No.	Date	Amendment	Initials



Proposed Lower Ground Floor Layout

0 METRES 5

SCALE

No.	Date	Amendment	Initials

Client : Mr & Mrs Calcraft

Project : 6A North End
London
NW3 7HL

Drawing : Proposed Lower Ground Floor Layout

Scale : 1:50 @ A3

Date : 15 Nov 13

Status : PRELIMINARY

Dwg No : 2173-200

Rev : -

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APPENDIX D

DESIGN LOADS

R·H·H

R · H · HORWITZ ASSOCIATES
Civil & Structural Engineering Consultants

Sheet No. 10/01
Job No. 6869
Engineer DC
Date DEC 13

6A NORTH END

These sheets are loadings for the structural calculations

ROOF :- (PITCHED - EXISTING)

Dead loads :-

Tiles / Felt / Battens	-	0.8 kn/m²
Rafters / Trusses	-	0.2 kn/m²
ceiling & Services	-	0.3 kn/m²
		1.3 kn/m²

Live loads :- Maintenance Access only 0.6 kn/m²

Wind = 1.9 kn/m² Wind = 2.8 kn/m²

UPPER FLOORS :-

Dead loads :-

Boards	-	0.3 kn/m²
Joists	-	0.2 kn/m²
Ceiling & Ser	-	0.3 kn/m²
		0.8 kn/m²

Live loads :-

Residential		1.5 kn/m²
Partitions	-	0.5 kn/m²
		2.0 kn/m²

GROUND FLOOR (Ex. conc)

Dead loads :-

Screed	1.8 kn/m²
150mm slab	- 3.6 kn/m²
Support	- 1.0 kn/m²
ceiling & Serv	- 0.3 kn/m²
	6.7 kn/m²

Live loads - Residential - 1.5 kn/m²

Wind = 8.2 kn/m² Wind = 11.5 kn/m²

R·H·H
R · H · HORWITZ ASSOCIATES
Civil & Structural Engineering Consultants

Sheet No. 10/02
Job No. 6869
Engineer DC
Date DEC 13.

GROUND FLOOR :- (EXTERNAL)

Dead loads :-

Finishes	-	1.2kN/m²
Soil	-	18kN/m³
200mm slab	-	4.8kN/m²
Ceiling & Ser	-	0.3kN/m²
		24.3kN/m²

Live loads :- 3.0kN/m² say

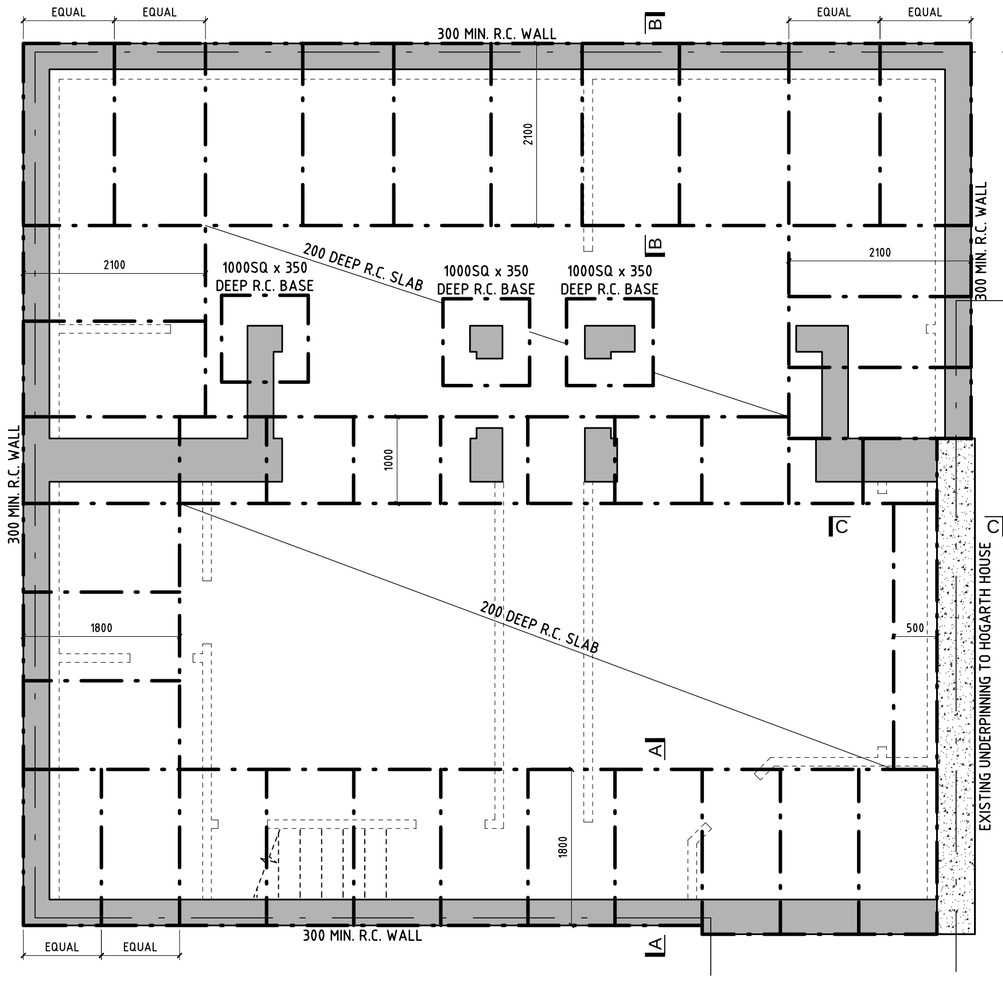
Wss = 27.3kN/m² Wus = 38.8kN/m²

WALL LOADS :-

100mm	Block	- 0.1 x 18 x 2.8 x 1.4	=	7.0kN/m	(5.0kN/m)
215mm	Masonry	- 0.215 x 22 x 2.8 x 1.4	=	18.5kN/m	(13.2kN/m)
330mm	Masonry	- 0.33 x 22 x 2.8 x 1.4	=	28.5kN/m.	(20.3kN/m)
440mm	Masonry	- 0.44 x 22 x 2.8 x 1.4	=	37.9kN/m.	(27.1kN/m)

APPENDIX E

DESIGN PRINCIPLE DRAWINGS



NOTE:
DRAINAGE GULLY TO BE PROVIDED IN LIGHT WELL & ALSO WITHIN THE DWELLING CONNECTED TO A PUMP FOR DISCHARGE TO GROUND LEVEL IN ACCORDANCE WITH ARCHITECTS & SPECIALISTS DETAILS

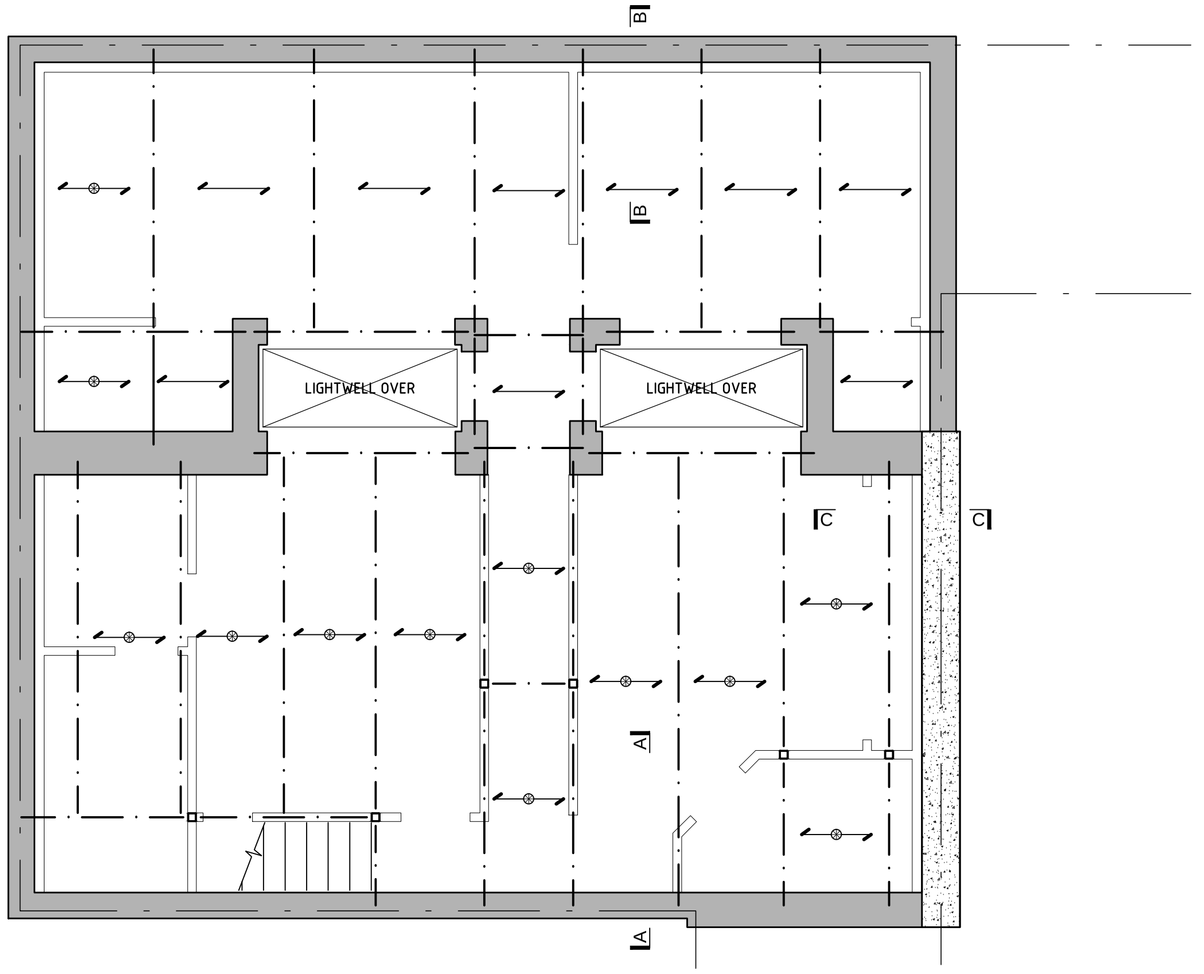
THE CONTRACTOR IS TO DESIGN & PROVIDE ALL NECESSARY TEMPORARY WORKS, PROPPINGAND SHORING THIS IS TO INCLUDE ALL NEEDLING AND PROPPING TO SUPPORT THE EXISTING WALLS AND FOUNDATIONS (WHICH MAY BE FRAGILE AND LOOSE) AND LATERAL SUPPORT TO ALL WALL AND UNDERPINNING SECTIONS UNTIL THE ENTIRE WORKS HAVE BEEN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

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

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

ALL DETAILS PRELIMINARY
DESIGN ASSUMES ALLOWABLE SAFEGROUND BEARING PRESSURE OF 175 kN/M SQ

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



DENOTES SPAN 200 RC SLAB ON HOLORIB PERMANENT FORMWORK OR SIMILAR APPROVED

DENOTES SPAN LINTEL SUPPORTS TO ASSUMED EXISTING LOWER GROUND FLOOR CONCRETE SLAB.

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

UNDERPINNING NOTES:-

A. ALL REINFORCED CONCRETE CAST ON THE GROUND TO BE PLACED ON 50mm C20 CONCRETE BLINDING

B. FOUNDATIONS HAVE BEEN DESIGNED ASSUMING A SAFE GROUND BEARING PRESSURE OF 125kN/m2. THE BEARING STRATA TO BE APPROVED BY THE LOCAL AUTHORITY BUILDING INSPECTOR BEFORE LAYING ANY BLINDING OR CASTING OF FOUNDATIONS. ANY ADDITIONAL EXCAVATION DUE TO SOFT SPOTS ETC TO BE DUG OUT AND BACKFILLED USING C20 CONCRETE MIX. IN THE EVENT OF ANY EXTENSIVE ADDITIONAL EXCAVATION BEING REQUIRED THE ENGINEER MUST BE INFORMED FRESH INSTRUCTIONS OBTAINED IF REQUIRED.

C. CONCRETE:
UNDERPINNING (BASES & WALLS) TO BE GRADE C35 IN ACCORDANCE WITH BS 8110. AN APPROVED RAPID HARDENING AGENT TO BE ADDED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS AND SPECIFICATIONS. SLAB TO BE GRADE C35 IN ACCORDANCE WITH BS8110.

D. ALL CONCRETE AGAINST BLINDED OR EARTH SURFACES IS TO BE CLASS DS-2 ACEC AC-2 IN ACCORDANCE WITH SPECIAL DIGEST 1 OF BRE GUIDANCE (CONCRETE IN AGGRESSIVE GROUND Part 1 - Assessing the aggressive chemical environment, Special Digest 1, 2001.

E. UNDERPINNING TO BE CARRIED OUT IN 1200mm MAXIMUM LENGTHS

F. ANY BACKFILLING BEHIND RETAINING WALLS TO BE CARRIED OUT USING C20 CONCRETE MIX.

G. CONCRETE COVER UNLESS NOTED 35mm. BLINDED SURFACES TO BE 40mm. EARTH FACES 75mm.

H. THE UNDERSIDE OF THE EXISTING WALL OR FOUNDATION SHALL BE TRIMMED AND CLEANED OF ALL MUD & DEBRIS BEFORE DRY PACKING. THE DRY PACK SHALL BE A 1:3 MIX AND WELL RAMMED IN HORIZONTAL LAYERS NOT EXCEEDING 75mm THICKNESS. DRY PACKING SHALL BE LEFT 24 HOURS BEFORE EXCAVATIONS ARE COMMENCED ON ADJACENT UNDERPINS.

I. AFTER EXCAVATING ADJACENT PREVIOUSLY CAST BASES, CLEAN AND SCABBLE EXISTING SURFACE OF CONCRETE.

J. ALLOW 48 HOURS MINIMUM BEFORE DRY-PACKING OVER WALLS.

K. SEQUENCE OF UNDERPINNING WORKS TO BE AGREED ON SITE WITH ENGINEER PRIOR TO COMMENCEMENT OF WORKS.

L. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL NECESSARY DE-WATERING OF EXCAVATIONS DURING THE EXECUTION OF THE WORKS.

SUPERSTRUCTURE NOTES:-

1. STEELWORK TO BE MILD STEEL GRADE 43 IN ACCORDANCE WITH BS 4360 FOR QUALITY AND BS 5950 FOR DESIGN, DETAIL AND WORKMANSHIP.
2. ALL STEELWORK IS TO BE CLEANED TO SWEDISH 2½ SA AND PRIMED WITH MINIMUM 75 MICRON DFT. WORKS APPLIED APPROVED PRIMER.
3. ALL BEAM TO BEAM CONNECTIONS SHALL BE 12mm WELDED END PLATES (6mm FPFW) 4 No. M20 (8.8) BOLTS. OR SIMILAR APPROVED.
4. FIRE PROTECTION TO ALL STEELWORK TO BE IN ACCORDANCE WITH ARCHITECTS DETAILS
5. PADSTONES TO BE C50 GRADE CONCRETE WITH A MAX. 10mm AGGREGATE SIZE OR SOLID CLASS 'A' ENGINEERING BRICKWORK IF SPECIFIED.
6. ALL NEW STRUCTURAL TIMBER TO BE GRADE C24 TO BS 5268 AND ALL ENDS TREATED ETC TREATED WITH AN APPROVED TIMBER PRESERVATIVE
7. 30x5 GMS STRAPS TO BE PROVIDED AT 1.25m CENTRES TO ALL FLOORS TO COMPLY WITH PART A3 DISPROPORTIONATE COLLAPSE SECTION 5c. FOR CLASS 2A BUILDINGS.
8. BRICKWORK TO BE CONSTRUCTED IN CLASS 'A' SOLID ENGINEERING BRICKWORK WITH A MINIMUM CRUSHING STRENGTH OF 35 N/mm2. BLOCKWORK TO HAVE A MINIMUM CRUSHING STRENGTH OF 3.5 N/mm2.
9. ALL UNLESS NOTED OTHERWISE
10. ALL MASONRY SHALL BE LAID IN CLASS (iii) MORTAR EXCEPT BELOW DPC CLASS (i).
11. ANY CUTTING AWAY OF EXISTING BRICKWORK TO BE CARRIED OUT CAREFULLY TO REDUCE DAMAGE TO SURROUNDING AREAS TO A MINIMUM.
12. THE CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF THE EXISTING STRUCTURE AND ADJOINING PROPERTIES DURING EXECUTION OF THE WORKS AND MUST TAKE ALL NECESSARY PRECAUTIONS TO SAFEGUARD THIS STABILITY.

GENERAL NOTES:-

1. THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND SPECIALIST DRAWINGS WHICH MUST BE REFERRED TO FOR VERIFICATION OF LEVELS AND SETTING OUT.
2. ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE
3. DO NOT SCALE THIS DRAWING
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE GROUND INVESTIGATION REPORTS.
5. THE MAIN CONTRACTOR SHALL BE RESPONSIBLE FOR EXECUTING ALL NECESSARY TEMPORARY WORKS INCLUDING DESIGN WHICH SHALL BE CARRIED OUT BY A SUITABLY QUALIFIED ENGINEER WITH ADEQUATE INSURANCES FOR UNDERTAKING SUCH WORKS. THE MAIN CONTRACTOR SHALL PROVIDE ALL NECESSARY INSURANCE COVER FOR HIS WORKS AND IS TO PROVIDE TO NECESSARY PARTIES FULL METHOD STATEMENTS FOR EXECUTION OF ALL WORKS.
6. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE STABILITY OF THE EXISTING BUILDING AND ADJOINING PROPERTY TOGETHER WITH EXCAVATIONS AND EARTHWORKS AND MUST TAKE ALL NECESSARY PRECAUTIONS TO SAFEGUARD THIS THROUGHOUT EXECUTION OF THE WORKS.
7. ADEQUATE SHORING SHALL BE INSTALLED DURING THE WORKS TO ENSURE THE STABILITY OF THE STRUCTURES. SUCH SHORING SHALL BE ADEQUATELY FOUNDED
8. ANY DEVIATION FROM THE DETAILS SHOWN MUST BE NOTIFIED TO THE ENGINEER BY THE CONTRACTOR IN WRITING BEFORE BEING CARRIED OUT.
9. THE LOCAL AUTHORITY's BUILDING INSPECTOR AND THE ENGINEER ARE TO BE INFORMED BY THE CONTRACTOR IN WRITING AT LEAST 48 HOURS PRIOR TO THE WORKS STARTING ON SITE. THEIR AGREEMENT MUST BE OBTAINED BEFORE WORK CAN COMMENCE.
10. THE CONTRACTOR MUST MAINTAIN ANY EXISTING SERVICES REQUIRED TO THE ADJOINING PROPERTY AS NECESSARY.
11. THE CAVITY DRAIN TO WALLS AND SLAB TO BE IN ACCORDANCE WITH ARCHITECTS AND SPECIALISTS DETAILS INCLUDING DRAINAGE AND PUMPS. ALL TO SPECIALISTS DESIGN AND DETAILS.
12. A FULL CONDITIONAL AND PHOTOGRAPHIC SURVEY IS TO BE UNDERTAKEN TO THE PROPERTY AND ADJACENT PROPERTIES PRIOR TO THE COMMENCEMENT OF ANY WORKS.
13. THE CONTRACTOR IS TO DESIGN,SPECIFY AND PROVIDE ALL NECESSARY TEMPORARY WORKS INCLUDING THE PROPPING AND NEEDLING OF ALL EXISTING WALLS AND FOUNDATIONS ((CONTRACTOR TO NOTE THAT THE EXISTING FOUNDATIONS MAY BE FRAGILE, LOOSE AND BECOME HAZARDOUS - SUITABLE MEASURES AND SAFE WORKING PRACTICES ARE TO BE EMPLOYED) THE CONTRACTOR IS TO PROVIDE ALL LATERAL PROPPING OF THE UNDERPIN SECTIONS TO SUPPORT THE RETAINED SOIL BEHIND,STRUCTURES ABOVE AND ADJACENT AND THE PUBLIC FOOTPATH AND HIGHWAY.
14. ALL UNDERPINNING WALL STEMS AND BASE SECTIONS ARE TO BE DOWELLED TOGETHER WITH H12 BARS AT 150 CENTRES (LENGTH OF BARS 600MM)
15. TRIAL PITS ARE TO BE DUG PRIOR TO THE COMMENCEMENT OF THE MAIN WORKS TO EXPOSE THE EXISTING FOUNDATIONS AND ANY POSSIBLE HISTORIC UNDERPINNING WHICH MAY EXIST - THE DESIGN AND DETAILS OF THE PROPOSED UNDERPINNING MAY NEED TO BE REVISED TO SUIT AND SHOULD BE REPORTED IN WRITING TO THE ENGINEER PRIOR TO ANY MODIFICATION BEING AGREED.
16. REFER TO ARCHITECTS SPECIFICATION FOR ALL DAMP PROOFING DETAILS INCLUDING DPC, DPM'S & BASEMENT WATER PROOFING.
17. ALL WORKMANSHIP & MATERIALS USED IN RESPECT OF THE WORKS SHALL BE IN ACCORDANCE WITH THE CURRENT BRITISH STANDARDS AND CODES OF PRACTICE WHERE RELEVANT TO THIS PROJECT.

Rev.	Description.	Date.

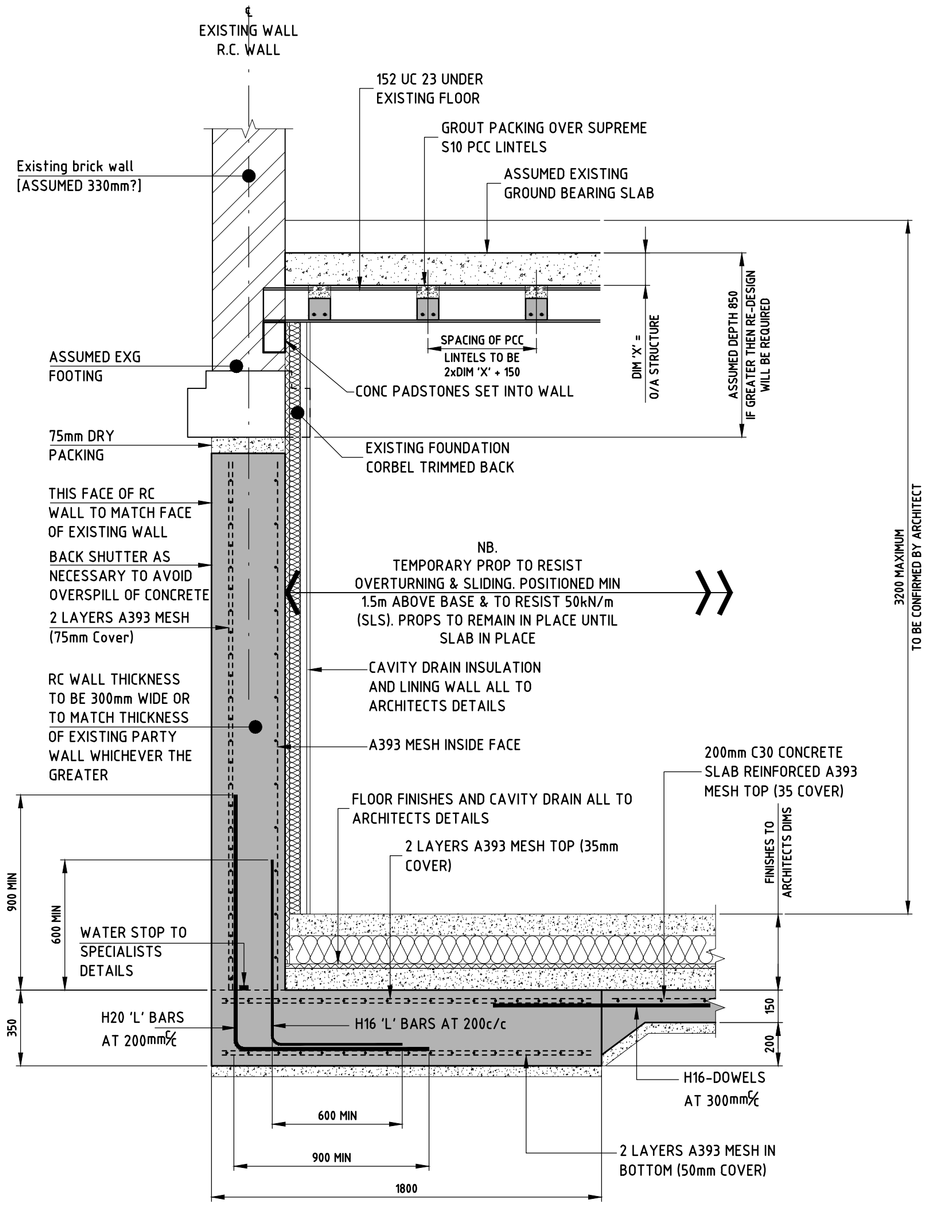
Cranbrook Basements

R-H-HORWITZ ASSOCIATES
Civil & Structural Engineering Consultants
Tel: 01245 809010
Email: RHH@Horwitz.co.uk

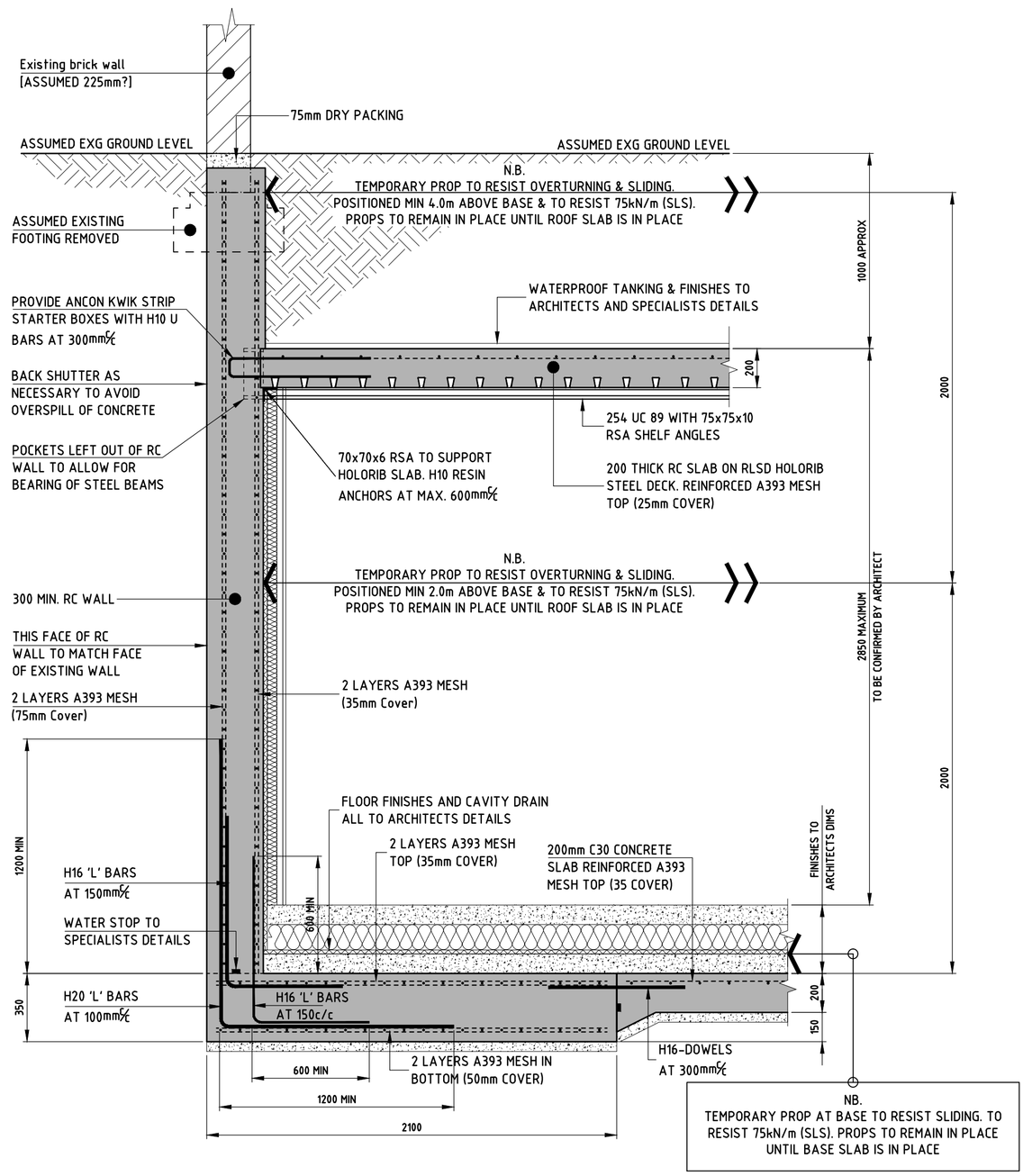
PROPOSED BASEMENT AT No. 6A NORTH END, LONDON, NW3 7HL

PROPOSESD UNDERPINNING : BASEMENT STRUCTURAL DETAILS

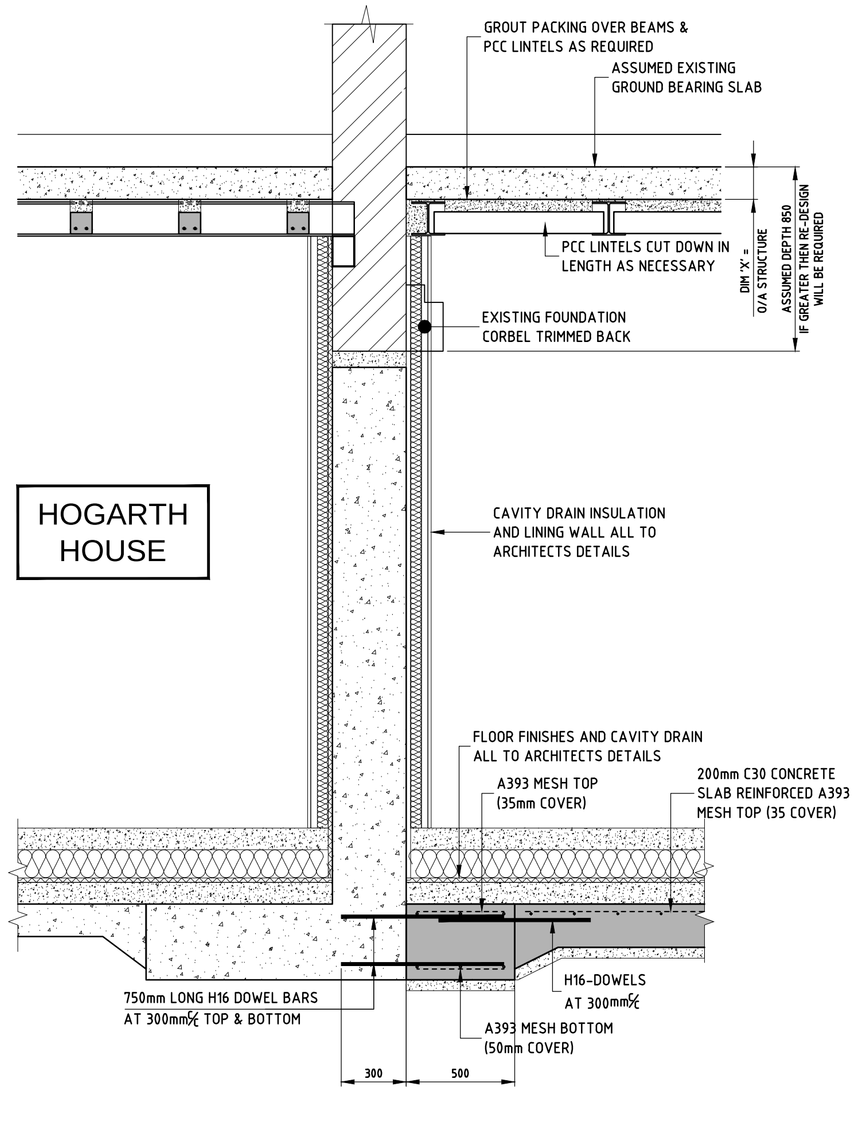
Scale AS SHOWN AT A1		Date DECEMBER 2013	
Engineer D.C.		Drawn A.E.	Checked
Client CRANBROOK BASEMENTS		DRG No. 6869-PS-01	REV. -



SECTION A - A (Party Wall)
[Scale 1:20]



SECTION B - B (Boundary Wall)
[Scale 1:20]



SECTION C - C (Party Wall)
[Scale 1:20]

FOR UNDERPINNING & GENERAL NOTES, SEE DRAWING 6869-PS-01.

Rev.	Description.	Date.

Cranbrook Basements

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PROPOSED BASEMENT AT
No. 6A NORTH END, LONDON, NW3 7HL

PROPOSESD UNDERPINNING : BASEMENT SECTIONS

Scale AS SHOWN AT A1	Date DECEMBER 2013	
Engineer D.C.	Drawn A.E.	Checked
Client CRANBROOK BASEMENTS	DRG No. 6869-PS-02	REV. -

APPENDIX F

SPECIFICATION

6A NORTH END, LONDON, NW3 7HL

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 wish 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 2^0C on a rising thermometer or below 4^0C 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 5^0C.
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 5^0C, nor should the water curing be applied until the concrete in the structural element reaches a strength of 5N/m².
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 40^0C.
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.

6.0 SHORING TO FORM OPENINGS

6.1 Scope

The scope of the work comprises the erection of internal shoring to support the structure whilst new openings are formed or existing openings are extended, the extent of which is indicated on the drawings.

Details of the existing work have been assumed. These are to be checked on site by the Main Contractor and any discrepancies reported to the Engineer so that adjustments may be made to the structural scheme if necessary.

6.2 Materials

All structural timber used to form the temporary shoring shall comply in all respects with BS 5268 and BS 4978, the grade of timber to be used shall be as specified on the drawings.

Any metal props and struts required shall comply with BS 4074. The type of prop shall be as specified on the drawings.

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

Any shoring, propping or strutting shall be provided with an adequate foundation to the approval of the Engineer.

7.3 Sequence of Operation

Before any openings are formed by removal of brickwork, the internal shoring, as shown on the drawings, shall be in position and shall be to the satisfaction of the Engineer.

The Contractor shall, at all times, allow access to the Engineer to inspect the works.

Notwithstanding the work specified to be carried out, the Contractor shall carry out the work in such a manner as to safeguard the structure from further structural damage.

The Contractor shall regularly inspect all shoring to ensure that it is maintained in a rigid condition and also regularly inspect the structure for any movement whatsoever. Should any movement be noted before, during or after the execution of the works described in this specification, he shall notify the Engineer immediately and shall also place in position any props, needles and shores he may consider necessary.

6.3 Sequence of Operation cont'd

The Contractor shall provide all necessary scaffolds, screens, platforms, etc., to protect the adjoining properties and public from damage or falling objects during the execution of the works.

The shoring shall be constructed with props, needles, braces, wedges, etc., as shown on the drawings or in accordance with any written instructions which may be issued by the Engineer.

The whole shall be placed in position with the minimum of shock to the existing structure and shall, in every way, be to the satisfaction of the Engineer. The location of the seating for members shall be inspected by the Contractor to ensure that the existing brickwork is sound. In no case shall a shoring member be placed against lathe and plaster work. In such locations the lathe and plaster shall be cut away to expose the brickwork or main structural frame. The Contractor shall provide all necessary timber packs, folding wedges, etc., as may be instructed by the Engineer. All braces shall be properly mitred, bolted or spiked as instructed by the Engineer and the whole of the shoring maintained in a rigid condition.

On completion of the shoring the openings of the required size shall be formed. All brickwork shall be removed by hand, brick by brick, with the minimum of shock on the existing structures. Under no circumstances shall mechanical appliances be used for this work without prior approval of the Engineer in writing.

The brickwork reveals shall be reinstated in accordance with the drawings. The padstones shall be positioned to the levels shown on the drawing. The new steel supports shall be erected and shall be pinned up solid using semi-dry 1:1.1/2:3 mix having a minimum cube crushing strength of 25:5 N/mm² at 28 days using a maximum aggregate size of 10mm well rammed into position using a club hammer and caulking tool. None of the shoring shown on the drawing shall be removed until the dry packing has achieved its full strength.

During the removal of the shoring, the Contractor shall ensure that it is taken down with the minimum of shock and that all props are released slowly to ensure that all displaced members are securely bedded down to their new seating.