63 ROSSLYN HILL NW8 5UQ

STRUCTURAL DESIGN PHILOSOPHY REPORT

Horwitz Associates
135-137 New London Road
Chelmsford
Essex
CM2 0QT
01245 809510

Report No: 7922.1
16 July 2020

CLIENT:	Cranbrook Basements Ltd

Document Details:

Job No:	7922.1
Issue Date:	20 February 2020
Written By:	Richard Horwitz BSc(Hons), CEng, MIStructE
Reviewed By:	Nikos Chasapis MSc(Hons), MScEng, BEng(Hons)

CONTENTS

1.0 Introduction

At the request of Mr David Kavanagh of Cranbrook Basements Ltd, Horwitz Associates have been instructed to produce a Structural Design Philosophy Report for the construction of a single storey basement at 63 Rosslyn Hill Hampstead NW8 5UQ.

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.

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.

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 south boundary of Rosslyn Hill Hampstead. Viewing the geological survey of Gt. Britain 1:50000 scale map indicates the underlying geology to be Claygate Members consisting Clay, Silt and Sand. No superficial deposits were recorded therefore it is likely these members would be encountered at shallow depths below Made Ground.

A Site Investigation report was commissioned by Cranbrook Basements and undertaken by Fastrack Ltd report ref: 20318 January 2020 (Appendix A).

A single borehole was sunk to a depth of 8.0m below ground level within the garden to the front of the property. The ground conditions encountered were top soil and Made Ground to a depth of 1.6m below ground level overlying Dark Brown/Grey Silty Clay, changing to Stiffer Grey Clay at a depth of 4.0m which was recorded to the termination level of 8.0m below ground. Shear Vane readings taken at 3.0m below ground were 110KPa, increasing to 120Kpa at 4.0m.

The anticipated formation level of the basement will be approximately 3.0m to 3.5m below the existing ground level to the front of the property, therefore for the purposes of design the lower value will be considered. This equates to an available safe ground bearing pressure of between 200 - 235Kn/m2.

For the purposes of the design for hydrostatic pressure, 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 below ground level, whichever is the worst condition, in accordance with BS8102 requirements.

This report will not provide comment on the local hydrology and the effect on the local ground water.

3.0 The Existing Property

The property is a semi-detached house over three floors, with access to the front via a flight of stairs to ground floor. There are also external stairs to access the existing lower ground floor level.

Appendix B contains copies of Cranbrook Basements Architects 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 the ground floor is likely to be timber construction over the existing lower ground floor level. The existing arrangement is such that there may be hidden beams within the depth of the ground and first floor structure.

Given the property's appearance and age it is likely that the existing foundations are shallow spread footings; this is to be verified before any of the works commence on site.

4.0 Proposed Works

Appendix B contains Cranbrook Basements architects drawing indicating the proposed floor plans, including the new below ground level and a building long section.

It can be seen from the plans and section that it is intended to provide a new basement/ lower ground floor extension under the property footprint accessed from the existing lower ground floor/basement level. The new basement/lower ground floor will extend to the property boundary on three sides.

Horwitz Associates have been advised that there is a basement on the party wall line with number 61 Rosslyn Hill, this will be taken into account in the design.

4.1 Design Principles

Appendix C contains a preliminary assessment of the building loads to be taken for the existing construction based on assessment of materials and span directions for traditional loadbearing masonry, timber suspended floors and hand pitched tiled roof.

The proposed layouts are such that the new basement level perimeter walls are to be formed using hit and miss sequence form of underpinning existing walls where required.

It is proposed to retain the existing lower ground floor, with the existing structure left in place; all areas of new ground floor slab are to be formed using a permanent formworks system on a steel frame support.

Where steel beams are to be used under the 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 basement extends to the property boundary the surcharge loads from the adjacent land is considered as set out below:

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.

The special foundations are 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.

Temporary works, where required, will be designed to suit the design loads and propping forces as found in the structural design calculations; typically propping forces to the underpin/retaining walls will be based on factors of safety of 1.5 for sliding and overturning in the temporary condition.

4.2 Ground Movement Assessments

With regards to the stability of the neighbouring structures, it is noted that the single level basement is likely to have a direct impact on the adjoining/adjacent properties only. Design of the new basement works is such that loading from the adjacent properties is assessed and included within the structural design where required. The design is undertaken to minimise vertical and lateral movement of the building over any adjacent properties. Works carried out in accordance with the design drawings and method statement typically result in movements that in turn result in damage no greater than BRE Category 1. Category 1 Fine Cracks – cracks that can be treated easily using normal decoration. However, there will always be some movement that cannot be avoided or predicated by pre-construction investigations that may result in more extensive damage. Where this does occur, typically it is no more onerous than BRE Category 2 – Cracks Easily Filled.

5.0 Design

Appendix D contains drawings for the proposed foundation/underpin arrangement, the Basement G.A.

6.0 Specifications

Appendix E contains a structural specification for the works.

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

Reviewed:
Nikos Chasapis
MSc(Hons), MSc(Eng), BEng(Hons) .....

APPENDIX A

Geotechnical Survey Report

Geotechnical Survey Report

FSI Ref:	20318
Issue Date:	January 2020
Risk Address:	63 Rosslyn Hill Camden London NW3 5UQ
Engineer:	David Kavanagh
Company:	Cranbrook Basement Design and Construction Ltd

Managing Director:	Martin Rush MSc FGS
Finance Director:	Louise Ayres BSc (Hons)
Geotechnical Compliance & Logistics Supervisor:	Perry Martin MCIHT
Laboratory Supervisor:	Jade McLellan
Assistant Geologists:	George Baron BSc (Hons) FGS Scott Parker BSc (Hons) FGS

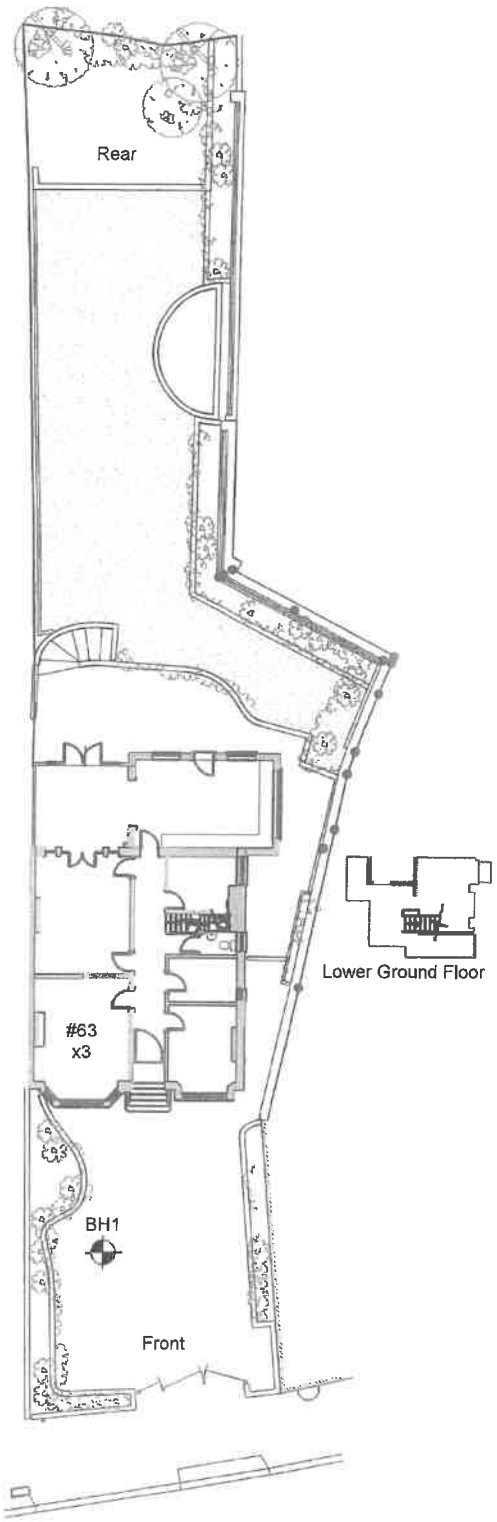
FASTRACK
Tyndales Farm, Southend Road, Woodham Mortimer, Maldon, Essex, CM9 6TQ
Telephone: 0844 3358908
Fax: 0844 3358907
Email:enquiries@fastrackgroup.co.uk
Web: www.fastrackgroup.co.uk

Appendix No: 1
FSI Ref: 20318

SITE PLAN

Property Address: 63 Rosslyn Hill, Camden, London NW3 5UQ

Survey date: 17/12/2019 **Operative:** SE1



Scale:	Drawn by:	Key:							
NTS	GB	Trial Pit	Manholes	Rain Water Pipe	Surface Water Gully	Shrub	Tree (Conifer)	Tree (Deciduous)	
		Borehole		Soil & Vent Pipe	Foul Water Gully				

FASTRACK

Fastrack Site Investigations Ltd
Unit 9, Tyndales Farm
Southend Road
Maldon CM9 6TQ

Borehole Log

Borehole No.
BH1
Sheet 1 of 1

Project Name:	63 Rosslyn Hill	Project No. 20318	Site Date: 17/12/2019
Location:	Camden, London NW3 5UQ		
Client:	Cranbrook Basement Design and Construction Ltd		

Hole Type: BH
Scale: 1:45
Logged By: SE1

Water Strikes	Sample and In Situ Testing			Depth (m)	Legend	Stratum Description
	Depth (m)	Type	Results			
				0.07		Block PAVING
				0.17		Sand FILL
						Dark Brown Silty Clayey MADE GROUND containing Brick and Gravel
				0.70		Mid Brown Silty Sandy Clayey MADE GROUND containing Brick and Gravel
	1.00	D	V (kPa) = 64 V (kPa) = 70			
				1.60		Dark Brown/Grey Silty CLAY
	2.00	D	V (kPa) = 94 V (kPa) = 98			
	3.00	D	V (kPa) = 108 V (kPa) = 110			
	4.00	D	V (kPa) = 120 V (kPa) = 122			
	5.00	D	V (kPa) = 128 V (kPa) = 132			
				5.40		Grey CLAY
	6.00	D	V (kPa) = 140			
	7.00	D	V (kPa) = 140			
	8.00	D	V (kPa) = 140	8.00		End of Borehole at 8.000m

1 2 3 4 5 6 7 8 9

Key: D - Disturbed Sample V - Insitu Vane Test MP - Mackintosh Probe Test

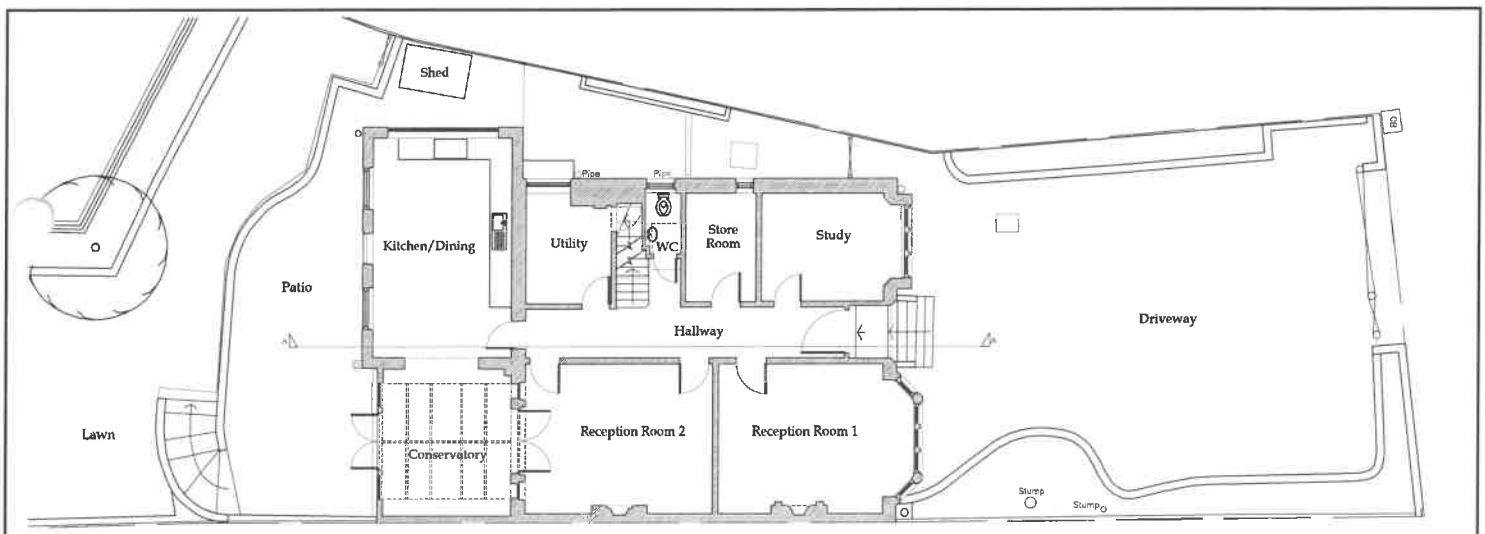
Remarks: Borehole closed at 8.00m.

AGS

APPENDIX B

Cranbrook Basements Architects Drawings

(Existing & Proposed)



Existing Ground Floor Layout

Existing Basement Floor Layout

0 METRES 5

SCALE

No.	Date	Amendment	Initials

Client : Simon Lawson

Project : 63 Rosslyn Hill
London
NW3 5UQ

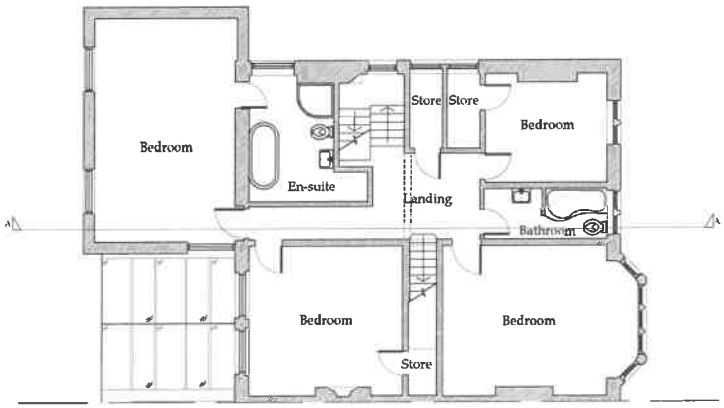
Drawing : Existing Basement & Ground Floor Layouts

Scale : 1:100 @ A3 | Status : PLANNING | Rev

Date : 22 Jan 20 | Dwg No : 2313-100.1

Cranbrook®
Basement design & construction

Cranbrook Basements
2b-2f Hammersmith Grove,
Hammersmith,
London, W7 7HA
T +44 (0)208 753 2555
F +44 (0)208 551 1560
admin@cranbrook.co.uk
www.cranbrook.co.uk



Existing & Proposed First Floor Layout

0 METRES 5

SCALE

No.	Date	Amendment	Initials

Client :	Simon Lawson
Project :	65 Rosslyn Hill London NW3 5UQ
Drawing :	Existing & Proposed First Floor Layout
Scale :	1:100 @ A3
Status :	PLANNING
Rev :	
Date :	22 Jan 20
Dwg No :	2913-101.1

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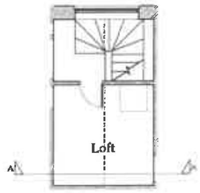
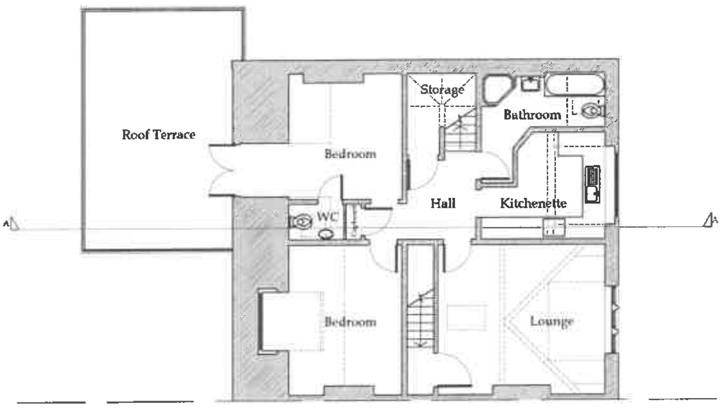
Basement design & construction

Cranbrook Basements
2a-2d Hammersmith Grove,
Hammersmith,
London, W6 7HA
T +44 (0)208 551 5555
F +44 (0)208 551 1560
adam@cranbrook.co.uk
www.cranbrook.co.uk



Existing & Proposed Loft Layout



Existing & Proposed Second Floor Layout

0 METRES 5

SCALE

No.	Date	Amendment	Initials

Client :	Simon Lawson
Project :	63 Rosslyn Hill London NW3 5UQ
Drawing :	Existing & Proposed Second & Loft Floor Layouts
Scale :	1:100 @ A3
Status :	PLANNING
Date :	22 Jan 20
Dwg No :	2313-102.1

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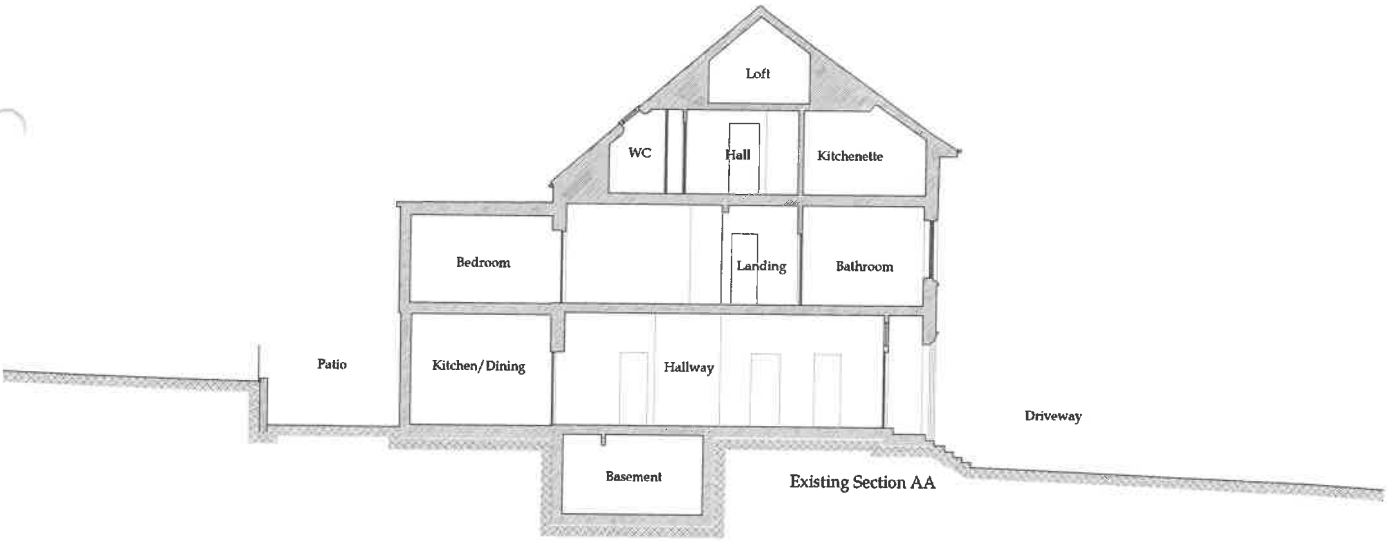
Basement design & construction

Cranbrook Basements
26-28 Hammersmith Grove,
Hammersmith,
London, W7 7BA
T +44 (0)208 553 5555
F +44 (0)208 551 1580
admin@cranbrook.co.uk
www.cranbrook.co.uk



Existing Section AA

0 METRES 5

SCALE

No.	Date	Amendment	Initials

Client : Simon Lawson

Project : 63 Rosslyn Hill
London
NW3 5UQ

Drawing : Existing Section AA

Scale : 1:100 @ A3 | Status : PLANNING | Rev :

Date : 22 Jan 20 | Dwg No : 2313-103.1

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Basement design & construction

Cranbrook Basements
76-78 Hammersmith Grove,
Hammersmith,
London, W6 7HA
T +44 (0)208 581 5555
F +44 (0)208 581 5560
admin@cranbrooke.co.uk
www.cranbrooke.co.uk

61 Rosslyn Hill

63 Rosslyn Hill

Existing & Proposed Front Elevation

0 METRES 5

SCALE

No.	Date	Amendment	Initials

Client :	Simon Lawson
Project :	63 Rosslyn Hill London NW3 5UQ
Drawing :	Existing & Proposed Front Elevation
Scale :	1:100 @ A3
Status :	PLANNING
Rev :	
Date :	22 Jan 20
Dwg No :	2513-104.1

Cranbrook

Basement design & construction

Cranbrook Basements
26-28 Hammersmith Grove
Hammersmith,
London, W6 7HA
T +44 (0)208 741 9555
F +44 (0)208 553 1580
schmidt@cranbrook.co.uk
www.cranbrook.co.uk

Existing & Proposed Side Elevation

63 Rosslyn Hill

61 Rosslyn Hill

Existing & Proposed Rear Elevation

0 METRES 5

SCALE

No.	Date	Amendment	Initials

Client :	Simon Lawson
Project :	63 Rosslyn Hill London NW3 5UQ
Drawing :	Existing & Proposed Side and Rear Elevations
Scale :	1:100 @ A3
Status :	PLANNING
Date :	22 Jan 20
Dwg No :	2319-105.1

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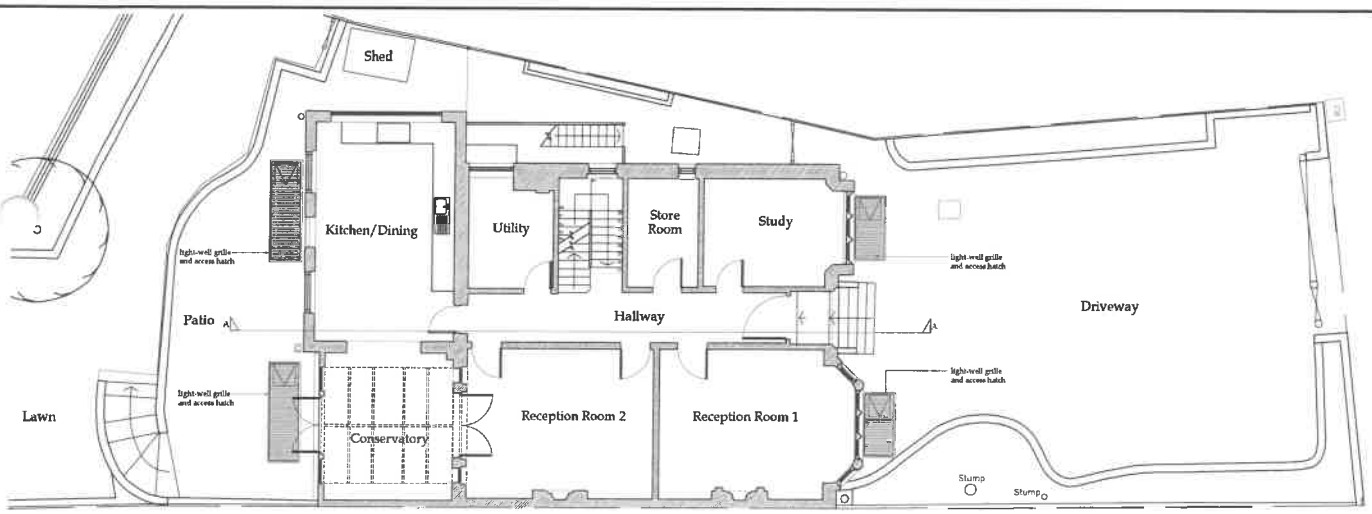
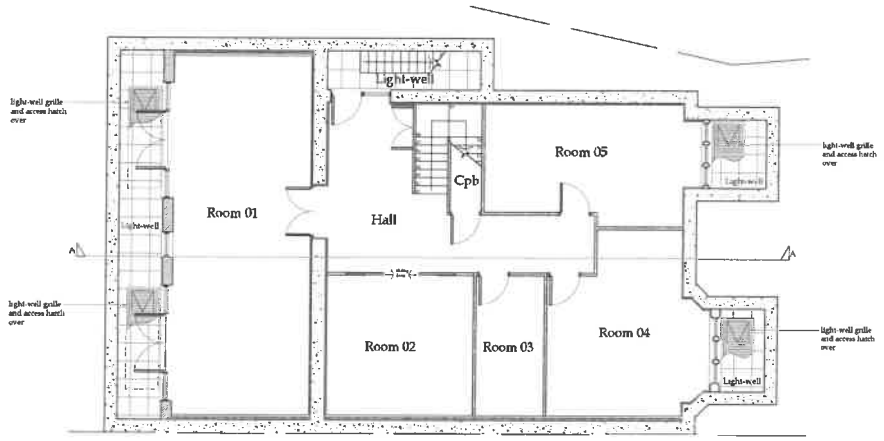
Basement design & construction

Cranbrook Basements
2a-2b Hammersmith Grove,
Hammersmith,
London, W6 7HA
T +44 (0)208 563 5595
F +44 (0)208 811 1560
admin@cranbrook.co.uk
www.cranbrook.co.uk



Proposed Ground Floor Layout



Proposed Basement Floor Layout

0 METRES 5

SCALE

No.	Date	Amendment	Initials

Client :	Simon Lawson		
Project :	63 Rosslyn Hill London NW3 5UQ		
Drawing :	Proposed Basement & Ground Floor Layouts		
Scale :	1:100 @ A3	Status : PLANNING	Rev
Date :	20 Jan 20	Dwg No : 2313-200.1	

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Cranbrook Basements
26-28 Hammersmith Grove
Hammersmith
London, W6 7BA
T +44 (0)208 503 3535
F +44 (0)208 503 1580
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www.cranbrook.co.uk

Proposed Section AA

0 METRES 5

SCALE

No.	Date	Amendment	Initials

Client : Simon Lawson

Project : 63 Rosslyn Hill
London
NW3 5UQ

Drawing : Proposed Section AA

Scale : 1:100 @ A3 | Status : PLANNING | Rev

Date : 20 Jan 20 | Dwg No : 2313-201.1

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26-28 Hammersmith Grove
Hammersmith,
London, W6 7BA
T +44 (0)208 551 5505
F +44 (0)208 551 5560
admin@cranbrook.co.uk
www.cranbrook.co.uk

APPENDIX C

Preliminary Design Calculations

HORWITZ ASSOCIATES
Civil & Structural Consulting Engineers

Sheet No. PRELIMINARY/1
Job No. 7922
Engineer ZH
Date Feb 2020

Appendix C.

63 ROSSLYN HILL.

It is proposed to construct a new basement beneath the existing ground floor at 63 Rosslyn Hill.

The following loadings are to be allowed in assessment of the building loads to be supported on the basement and new construction

Roof (pitched) rafters	DL + LL	= 1.8 kN/m²
Ceilings where accessible	DL + LL	= 0.7 kN/m²
Loft	DL + LL	= 2.5 kN/m²
Upper floors	DL + LL	= 3.0 kN/m²
suspended timber ground floors	DL + LL	= 2.5 kN/m²
Walls 215mm	DL	4.8 kN/m²
330mm	DL	6.9 kN/m².
SOLID GROUND FLOORS	DL + LL	7.3 kN/m²

Contd.

HORWITZ ASSOCIATES
Civil & Structural Consulting Engineers

Sheet No. Preliminary/2A
Job No. 7922
Engineer RH
Date Feb 2020

Foundations.

Preliminary Calculations for the proposed construction of Reinforced Concrete Retaining Walls and Basement Slabs will adopt SGBP ≤ 150KPa.

ϕ = 21°.
γ = ~~18~~ 20.

Design of Walls to be prepared using Concrete Centre Spread Sheets.
Two load cases to be considered temporary and permanent condition subject to Contractor proposals

The following calculations are for example only and full analysis and design will be prepare at RIBA Stage 4 and 5.

APPENDIX C

HORWITZ ASSOCIATES
Civil & Structural Consulting Engineers

63 ROSEMYN HILL.

Sheet No. WL1
Job No. 7922
Engineer RH
Date FEB 2010

WALL LOADS SEE LOADING SHEET LIF ABOVE 2ND FLOOR.

1ST FLOOR WALLS SEE SHEET REF. GK1/B

WA. 1ST – ROOF
ROOF – 1.8 x 2 = 3.6
WALL ABOVE 2ND – 5 x 1.3 = 6.5
2ND FLOOL – 3.0 x 2.7 = 8.1
WALL 1ST – 2ND – 5.0 x 3 x .7 = 10.5
28.7kN/m

WB. GABLE + STACKS 1 & 2
GABLE WALL 2ND – ROOF – 14.0
WALL 1ST – 2ND 5.0 x 3 = 15.0
29 KN/m + STACKS 1 & 2
+

WC
ROOF 1.8 x 1.4 = 1.6
2ND 3.0 x 1.4 = 4.8
TERRACE ROOF 7.0 x 1.1 = 14.7
WALL 5.0 x 3 = 15.0
37.0 KN/m

HORWITZ ASSOCIATES
Civil & Structural Consulting Engineers

WALL 'D'

WALL 2ND - ROOF 13.5 x 1/2 = 6.8
2ND FLOOR 3.0 x 2.2 = 6.6
ROOF 1.8 x 2.3 = 4.2
WALL 1ST - 2ND 5.0 x 3 x .7 = 10.5
28.1 KN/m

PW 1/2 LOADS + STAIRS 3 & 4

ROOF PLA 20/3 = 10.0 KN/m
GABLE 2ND - ROOF = 14.0 KN/m
2ND FLOOR 3.0 x 1.0 = 3.0 KN
WALL 1ST - 2ND 5.0 x 3 = 15.0
42KN/m + STAIRS 3 & 4

WE

2ND - 3.0 x 2.40 = 7.20
WALL 1ST - 2ND 1.5 x 3 = 4.50
ALLOW FOR STAIR - 2.0 x .5 x 4 = 4.00
15.7 KN

WF

2ND FLR WALL 13.5/2 = 6.8
2ND 3.0 x 2.6 = 7.8
WALL 3.0 x 1.5 = 4.5
19.1 KN/m

CONT'D

HORWITZ ASSOCIATES
Civil & Structural Consulting Engineers

WG. 'A5' WF 19.1 KN/m

WH. ALLOW FOR:-

FLR 'ROOF'	20 ÷ 4	= 5.0 KN/m
WALL ABOVE	1.5 × 3	= 4.5
NOTIONAL FLOOR	3.0 ÷ 1.5	= 4.1
		13.6 KN/m

WI.

TERRACE	7.0 × 1.0	= 7.0
WALL	5.0 × 4.5	= 22.5
CONSERVATIVE ROOF	0.9 × 2	= 1.8
		31.3 KN/m

WJ.

TERRACE	7.0 × 2.1	= 14.7
WALL	5.0 ÷ 3 × 7	= 10.5
		25.2 KN/m

PIER A & PIER B

SECOND FLOOR	3.0 × 7.5 × 1.65	= 12.4
BEAM SUPPORTS GABLE WALL / ROOF	LOW	= 40.5
PIER CUT OFF	LOW	= 14.0

} 67 KN CAN 70 KN

Cont'd

HORWITZ ASSOCIATES
Civil & Structural Consulting Engineers

Sheet No. WL 4
Job No. 7022
Engineer RH
Date FEB 2020

WALL LOADS

GROUND - FIRST FLOOR

SEE SHEET REF FOR NOTATION

WB. GABLE + STACKS 1 & 2.

WB 1ST - ROOF = 29.00

WB G - 1ST 7.2×3 = 21.60

NOTIONAL 1ST FLOOR = 3.0

53.6 > ADOPT 55 KN/m

WC.

WC 1ST - ROOF = 37.0

WC GRD - 1ST 7.2×3 = 21.6

FIRST FLOOR 3.0 × 3.5 = 10.50

69.1 KN/m

WD.

WALL OVER 1ST. ROOF - 28.1

WALL GRD - 1ST 7.2 × 3 × .7 = 15.12

FLOOR 1ST 3.0 × 1.3 = 6.4

CONCRETE WALL 0.9 × 2.1 × 1.9 = 1.20 / 3.0

31.82

CONT'D

WE ALLOW FOR

WE 1ST - 2ND = 15.7
WE GRD - 1ST = 4.50
FIRST 3.0 x 5 = 15.0
WALL F 10.1 x 1.8 = 15.2
50.2 kN/m

WF 1ST FLOOR ONLY

WG.

WG - 1ST - 2ND = 10.1
GRD - 1ST WALL 1.5 x 3 = 4.5
FIRST FLOOR 3.0 x 3.5 = 10.5
34.1 kN/m

WH.

WH: 1ST - 2ND = 14.0
FIRST 3.0 x 1.0 = 3.0
WALL G - H = 4.5
21.5 kN/m

CONTD.

HORWITZ ASSOCIATES
Civil & Structural Consulting Engineers

Sheet No. WLC
Job No. 7422
Engineer RMH
Date FEB 2020

WJ.

WJ over - 31.30
Wall C20-1M allow 7.5 nominal
38.8 Say 40 kN/m

WJ.
WJ over = 25.2
Allow 1ST = 3 x 2.1 = 6.6
Wall C-1M 5.0 x 3 x 1.8 = 12.0
43.8 kN/m Say 44 kN/m

WX & WY
Wall over = 13.5
Wall = 4.5
1ST 3x2.1 = 6.3
24.3 kN/m

PIERS. 'C' & 'D'
PIER C.
1ST FLR - 3 x 2.1 x 5/2 = 15.75
WALL WA OVER 28.7 x 5/2 = 71.75
Sund Wt. = 20.0
107.5 Say 110 kN Cont

PIER 'D'

1ST FLR = 15.75

WALL $10.7 \times \frac{2.5}{2}$ = 34.90

SLAB + WT = 20.0

72KN.

PIERS E & F.

PIER E

PIER A ABOVE = 70.0

FIRST FLOOR $3.0 \times 2.1 \times 2.8$ = 17.6

PIER SELF WT = 20.0

108 KN SAY 110 KN

PIER F.

PIER B ABOVE = 70

1ST $3 \times 1.5 \times 1.4$ = 10.5

SELF WT = 20.0

100.5 SAY 110 KN

HORWITZ ASSOCIATES
Civil & Structural Consulting Engineers

Sheet No. WLB
Job No. T922
Engineer RM
Date FEB 2020

Stack 1 & 2.

Stack 1.

2ND - ROOF = 80

1ST - 2ND $3 \times 1.25 \times 1.9 \times 17 \times 20 = 47.3$

GRD - 1ST ALLOWANCE 47.3

175 KN

Stack 2

2ND - ROOF = 60

GRD - 2ND $2 \times 3 \times 1.9 \times 1.6 \times 17 \times 20 = 45$

105 KN SAY 110KN

HORWITZ ASSOCIATES

Civil & Structural Consulting Engineers

Sheet No. BL/1
Job No. 7922
Engineer RMH
Date FEB 2020

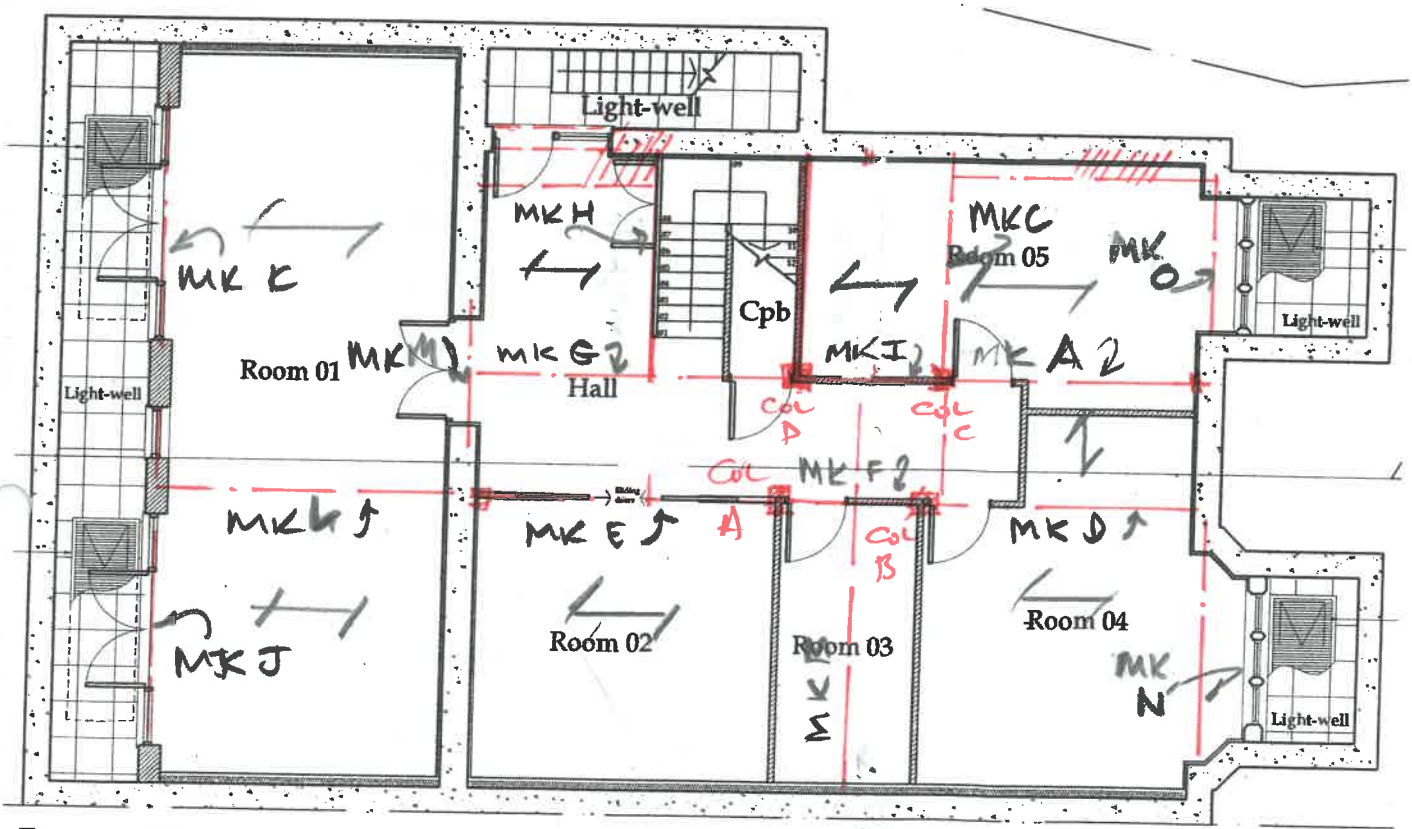
BASEMENT LOADINGS

APPLIED TO TOP OF BASEMENT WALLS

Layout.

ALL LOADS ARE (DL+LL) SERVICE LOADS

NOTATION PLAN (BEAMS AT U/S GRD FLOOR)



Proposed Basement Floor Layout

PARTY WALL AS-BUILT.

GROUND FLOOR BEAMS

HORWITZ ASSOCIATES
Civil & Structural Consulting Engineers

Sheet No. BL2
Job No. 7922
Engineer RM
Date FEB 2020

BASEMENT LOADINGS

BEAM LOADINGS

BEAM MK A. (3.6m)

UDL = WH = 21.50
GRD FLR 3 x 1.5 = 4.5
SW + = .5
26.50 KN/m R TN = 47.7 kN.

BEAM MK B. (3.75m)

UDL - WE = 50.2
GRD FLOOR = 15.0
SW + = .5
65.7 KN/m R TN = 33 KN.

BEAM MK C. (3.125m)

UDL. WY = 24.3
GRD FLOOR. = 8.7
SW + = .50
33.50 kN/m R TN = 52.5 kN

BEAM MK D. (4.0m)

UDL : WH 21.5
GRD FLOOR : 3.75
SW + = .5.
25.75 KN/m. R TN = 52 kN

Cont'd

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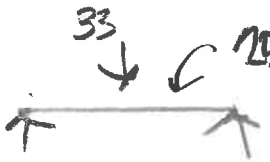
BEAM MK E (4.2)

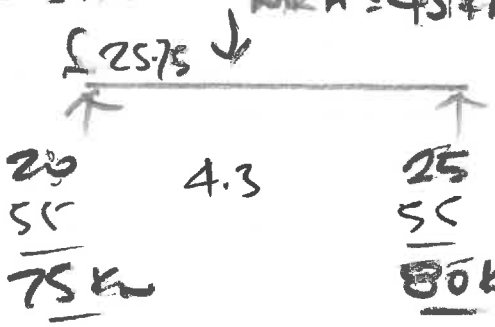
UDL = WH = 21.50
GRD floor = 3.75
Self wt = .50
25.75 kN/m R = 54 kN

BEAM MK F.



= 44 kN

BEAM MK G (4.3 m)



BEAM MK H (3.2)

UDL = WX = 21.3
bm floor = 3 x 1.2 = 3.6
Self = .4
25.3 kN R = 45 kN

BEAM MK I. (2.1 -)

UDL + As G = 25.75 ∴ R = 27 kN

CONTD...

Beam mk J. (3.6)

Allow 3.0 - 2.4 = 7.2
0.9 × 3.8 = 3.4
11kN / Say 20kN/m
R = 36kN

Beam mk K. (3.60)

UDL WJ = 44 kN
Grd floor 3 × 2.2 = 6.6
Say 7.4
51.0kN/m
Rtn - 87 kN

Beam mk L (3.8)

UDL = WJ 31.3
Grd flr 2.2 × 3 = 6.6
Say 7.4
38kN/m Rtn = 71kN

Beam MK M (1.6)

PL = MK G = 80kN
UDL: WC 37 = 37kN/m Rtn = 70kN

Beam MK N & O.

Nominal Ln Allow = 10 × 1.5 = 15kN Rtn.
Grd floor only

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Job No. 7922
Engineer DH
Date FEB 2022

COLUMN LOADS INTO BASEMENT LOW LEVEL.

COLUMN REF. 'A'

MK E 54 KN
MK F 44 KN
} 98 KN SAY 100 KN.

COLUMN REF 'B'

MK F 44 KN
MK B 33 KN
} 77 KN SAY 80 KN

COLUMN REF C

MK A - 48 KN
MK C - 53 KN
MK I - 27 KN
} 128 KN SAY 130 KN

COLUMN REF D (WORST CASE)

MK G - 80 KN
MK H - 45 KN
MK I - 27 KN
} 152 SAY 155 KN

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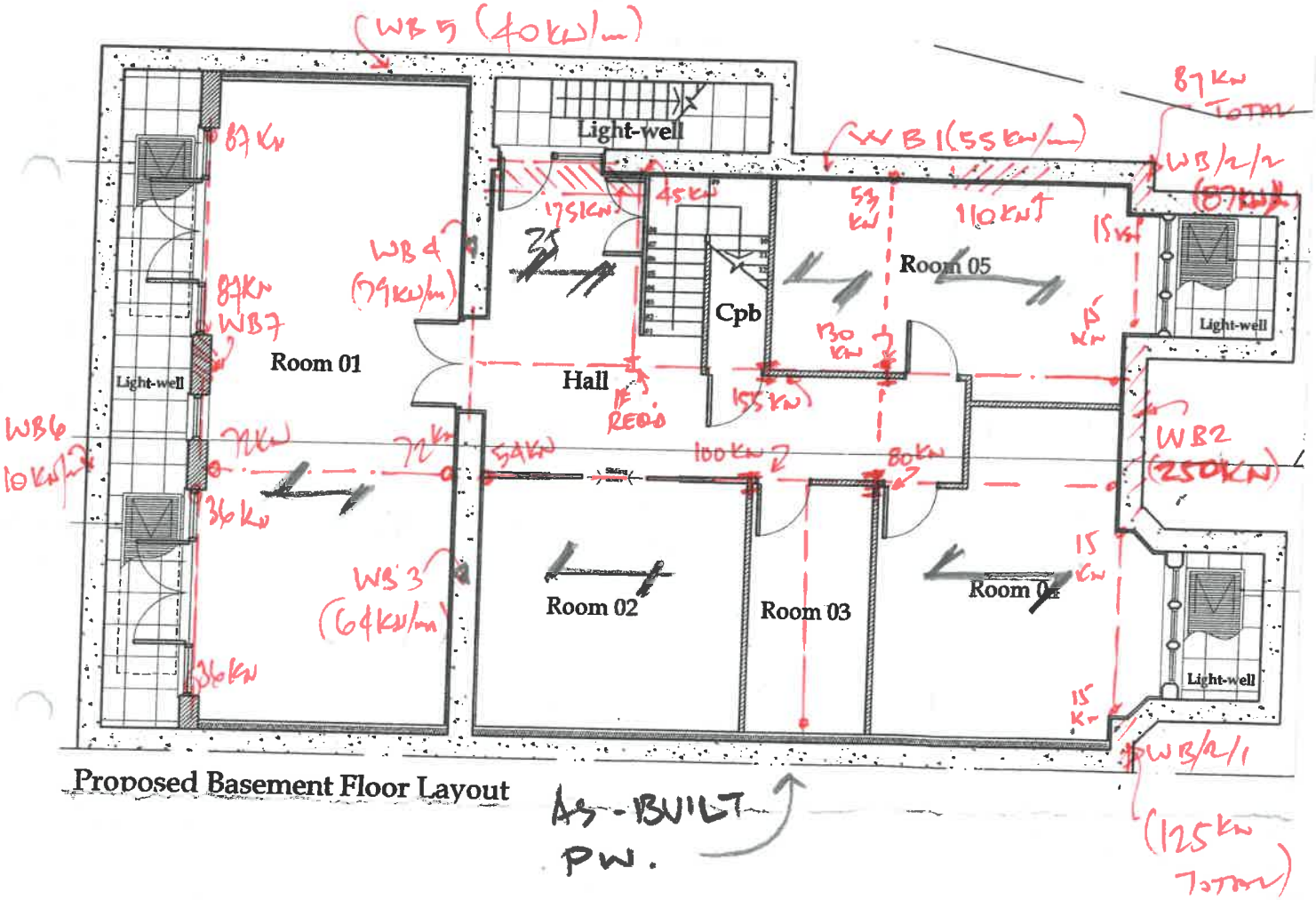
Sheet No. BL 50
Job No. 7922
Engineer RH
Date FEB 2020

PRELIMINARY DESIGN LOADS ALLIED TO BASEMENT EXCL CUT.



WB1 - 55 KN/m + PLi

WB 2 - 250 KN TOTAL.

WB 3 - 64 KN/m

WB 4 - 79 KN/m

WB 5 - 40 KN/m

WB 6 - 10 KN/m

WB 7 - 87 KN.

WB 2/2/1 - 125 KN TOTAL

WB 2/2/2 - 87 KN TOTAL

HORWITZ ASSOCIATES
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Sheet No. EL 7
Job No. 7922
Engineer R
Date FEB 2020

LOADS TO TOP OF BASEMENT WALL

WB1.

WB.. 55kN/mrt WL4.

STACK 2. 110KN. SAT WL8

STACK 1 175KN SAT WL8

WB2

PIER C & E - 110+110 = 220kN

MK O 15 KN
MK N 15 KN
30 kN

250 KN ALONG TOP OF WALL

WB/2/1

PIER F 110kN
MK O 15 kN
125 kN

WB/2/2

PIER D 72 kN
MK N 15
87 kN

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WB 3.

WD. - 51.32 kN/m

GEO Fill - 3 x 4.2 = 12.60

63.92 kN/m

Say 64 kN/m

WB 4

WC - 69.1 kN/m

GEO Fill - 3 x 3.3 = 9.9

79 kN/m

WB 5

WI - 40 kN/m

WB 6

Normal 7.0 kN/m² x 1.0 = 7 Say 10 kN/m

WB 7 As WJ 43.8 kN/m

+ GEO FILL 9.2

53 kN/m

Project	63 Rosslyn Hill - Hampstead	The **Concrete** Centre		
Client	Cranbrook Basements	Made by: RH	Date:	Page:
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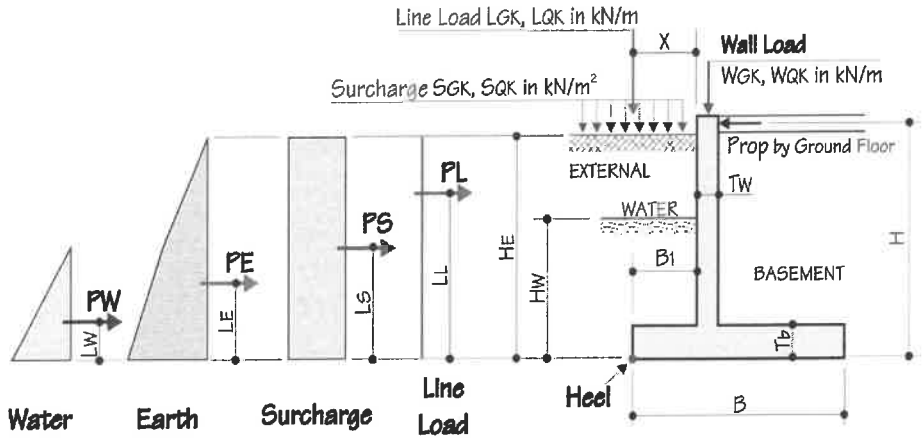
Basement wall design to BS8110:2005

Originated from 'RCC61 Basement Wall.xls' v4.0

IDEALISED STRUCTURE and FORCE DIAGRAMS

DESIGN STATUS : VALID



DIMENSION (mm)

H =	3500	B =	1800	Tw =	300
Hw =	3500	Bl =	0	Tb =	350
He =	0				

Wall Geometry

MATERIAL PROPERTIES — steel class: A

fcu =	35	N/mm²	γm = 1.50	concrete
fy =	500	N/mm²	γm = 1.15	steel
Cover to tension reinforcement (co) =			40	mm
Max. allowable design surface crack width (W) =			0.3	mm (0.2 or 0.3 mm only)
Concrete density =			24.0	kN/m3

SOIL PROPERTIES

Design angle of int'l friction of retained mat'l (Ø) =	21	degree	
Design cohesion of retained mat'l (C) =	0	kN/m2	(Only granular backfill considered, ie "C" = 0)
Density of retained mat'l (q) =	20	kN/m3	
Submerged Density of retained mat'l (qs) =	13.33	kN/m3	(default=2/3 of q), only apply when Hw >0
Design angle of int'l friction of base mat'l (Øb) =	21	degree	= 13.33
Design cohesion of base mat'l (Cb) =	2	kN/m2	ASSUMPTIONS
Density of base mat'l (qb) =	20	kN/m3	a) Wall friction is zero
Allowable gross ground bearing pressure (GBP) =	200	kN/m2	b) Minimum active earth pressure = 0.25qH
LOADINGS (unfactored)			c) Granular backfill
Surcharge load -- live (SQK) =	5	kN/m2	h) Design not intended for walls over 3.5 m high
Surcharge load -- dead (SGK) =	10	kN/m2	i)Does **not** include check for temp or shrinkage
Line load -- live (LQK) =	0	kN/m	
Line load -- dead (LGK) =	0	kN/m	
Distance of line load from wall (X) =	0	mm	
Wall load -- live (WQK) =	13.4	kN/m	
Wall load – Dead (WGK) =	76.4	kN/m	

LATERAL FORCES

Ko =	0.64	default Ko = (1-SIN Ø) 0.64
Kac =	1.60	= $2Ko^{0.5}$

Force (kN)		Lever arm (m)		γ_f	Ultimate Force (kN)
PE =	0.00	LE =	0.000	1.40	0.00
PS(GK) =	0.00	LS =	0.00	1.40	0.00
PS(QK) =	0.00	LS =	0.00	1.60	0.00
PL(GK) =	0.00	LL =	0.00	1.40	0.00
PL(QK) =	0.00	LL =	0.00	1.60	0.00
PW =	61.25	LW =	1.17	1.40	85.75
Total	61.25				85.75

Project	63 Rosslyn Hill - Hampstead	The Concrete Centre		
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	Originated from 'RCC61 Basement Wall.xls' v4.0 © 2006 TCC			

EXTERNAL STABILITY

STABILITY CHECK : OK

ANALYSIS - Assumptions & Notes

1) Wall idealised as a propped cantilever (i.e. pinned at top and fixed at base)
2) Wall is braced.
3) Maximum slenderness of wall is limited to 15, i.e [0.9*(He-Tb/2)/Tw < 15]
4) Maximum Ultimate axial load on wall is limited to 0.1fcu times the wall cross-sectional area
5) Design Span (Effective wall height) = He - (Tb/2)
6) -ve moment is hogging (i.e. tension at external face of wall)
   +ve moment is sagging (i.e. tension at internal face of wall)
7) " Wall MT. " is maximum +ve moment on the wall.
8) Estimated lateral deflections are used for checking the **PΔ** effect .

UNFACTORED LOADS AND FORCES

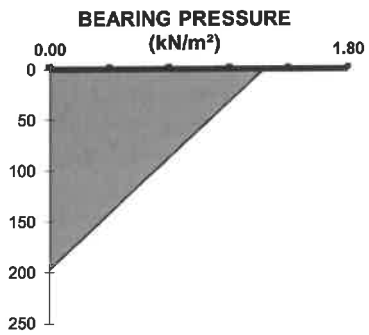
Lateral Force	Force (kN)	Lever arm to base (m)	Base MT. (kNm)	Wall MT. (kNm)	Reaction at Base (kN)	Reaction at Top (kN)	Estimated Elastic Deflection Δ (mm)
PE =	0.00	0.00	0.00	0.00	0.00	0.00	0.0
PS(GK) =	0.00	0.00	0.00	0.00	0.00	0.00	0.0
PS(QK) =	0.00	0.00	0.00	0.00	0.00	0.00	0.0
PL(GK) =	0.00	0.00	0.00	0.00	0.00	0.00	0.0
PL(QK) =	0.00	0.00	0.00	0.00	0.00	0.00	0.0
PW =	55.28	1.11	-24.51	10.96	44.22	11.06	0.3
Total	55.28		-24.51	10.96	44.22	11.06	0.3

GROUND BEARING FAILURE

LOAD CASE: Wall Load **MAX**
Surcharge **MAX**

Taking moments about centre of base (anticlockwise "+")

Vertical FORCES (kN)		Lever arm (m	Moment (kNm)
Wall load =	89.8	0.75	67.3499991
Wall (sw) =	22.68	0.75	17.01
Base =	15.12	0.00	0.00
Earth =	0.00	0.90	0.00
Water =	0.00	0.90	0.00
Surcharge =	0.00	0.90	0.00
Line load =	0.00	0.90	0.00
Σ V =	127.60		Σ Mv = 84.36



MOMENT due to LATERAL FORCES, Mo = -24.51 kNm

RESULTANT MOMENT, M = Mv + Mo = 59.85 kNm

ECCENTRICITY FROM BASE CENTRE, M / V = 0.47 m

MAXIMUM GROSS BEARING PRESSURE = 197.40 kN/m² < 200 OK

SLIDING AT BASE (using overall factor of safety instead of partial safety fa F.O.S = 1.50

SUM of LATERAL FORCES, **P** = 44.22 kN

BASE FRICTION, F_b = - (**V** TANØb + B.Cb) = -52.58 kN

Factor of Safety, F_b / P = 1.19 < 1.50 FAIL .. but

therefore, LATERAL RESISTANCE to be provided by BASEMENT SLAB = 13.75 kN

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Basement wall design to BS8110:2005

Originated from 'RCC61 Basement Wall.xls' v4.0

STRUCTURAL DESIGNS (ultimate)

DESIGN CHECKS : OK

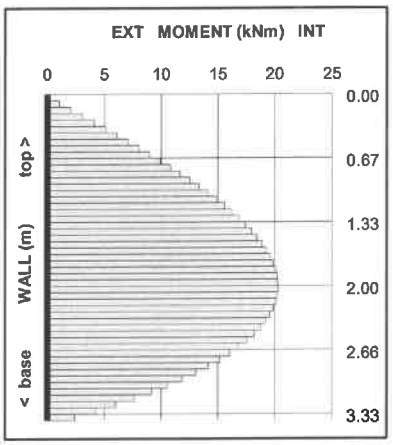
WALL (per metre length) — BS8110 reference

AXIAL LOAD CAPACITY (Limited to 0.1fcu) = 1050.00 kN > 128.4 OK 3.4.4.1

Lateral Force	Force (kN)	γ_f	Ultimate Force (kN)	Ult. Moment at base (kNm)	Ult. Shear at base (kN)	Ult. Shear at top (kN)
PE =	0.00	1.40	0.00	0.00	0.00	0.00
PS(GK) =	0.00	1.40	0.00	0.00	0.00	0.00
PS(QK) =	0.00	1.60	0.00	0.00	0.00	0.00
PL(GK) =	0.00	1.40	0.00	0.00	0.00	0.00
PL(QK) =	0.00	1.60	0.00	0.00	0.00	0.00
PW =	55.28	1.40	77.39	-34.31	61.91	15.48
Total	55.28		77.39	-34.31	61.91	15.48

Design Bending Moments

On INTERNAL face due to lateral forces, M_{int} =	20.28	kNm
On EXTERNAL face due to lateral forces, M_{ext} =	-34.31	kNm
Eccentricity of Axial Loads =	125	mm
LATERAL DEFLECTION " Δ " =	0.3	mm
Due to eccentricity of axial loads, M_{ecc} =	16.1	kNm
Due to PΔ effect, M_p =	0.04	kNm
Total Mmt on INTERNAL face (M_{int}+0.5M_{ecc}+M_p) =	28.3	kNm
Total Mmt on EXTERNAL face (M_{ext}+0.5M_{ecc}) =	-42.3	kNm



		EXTERNAL FACE		INTERNAL FACE				
WALL REINFORCEMENT :	Min. As =	390		390		mm^2		Table 3.25
	ϕ =	16		12		mm		
	centres =	200	< 766	200	< 762	mm	OK	3.12.11.2.7(b)
	As =	1005	> 390	565	> 390	mm^2	OK	
MOMENT of RESISTANCE :	d =	252		254		mm		
	z =	238		241		mm		3.4.4.4
	As' =	0		0		mm^2		3.4.4.4
	M_{res} =	104.0	> 42.33	59.3	> 28.35	kNm	OK	

		BASE of WALL		TOP of WALL				
SHEAR RESISTANCE:	As =	1005	ϕ =	10	@200 mm	393		mm^2/m
	100As/bd =	0.40%	=	0.15%				
	vc =	0.58		0.43		N/mm^2		Table 3.8
	V_{res} =	147.2	> 61.91	108.0	> 15.48	kN	OK	3.5.5.2

							BS8007
CRACK WIDTH to BS8100/8007	X =	73.51	mm	εm =	0.00020		
Temp & shrinkage effects not included	Acr =	102.92	mm	**W** =	0.04	< 0.30 mm OK	App. B.2

REINFORCEMENT SUMMARY for WALL

	Type	ϕ mm	centres mm	As mm^2	Min. As mm^2	
INTERNAL FACE	H	12	200	565	390	OK
EXTERNAL FACE	H	16	200	1005	390	OK
TRANSVERSE	H	10	200	393	390	OK

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OUTER BASE (per metre length) — BS8110 reference

γ_f = 1.50 (ASSUMED)

Ult. Shear = 8.43 kN (AT d from FACE of WALL)

Ult. MT. = 0.00 kNm TENSION - TOP FACE

BOTTOM REINFORCEMENT : — Table 3.25

Min. As =	455	mm^2		
ϕ =	12	mm		
centres =	225	mm	< 762	OK
As =	503	mm^2	> 455	OK

MOMENT of RESISTANCE : — 3.4.4.4

d =	304	mm		
Z =	289	mm		
As' =	0	mm^2		
Mres =	63.12	kNm	> 0.00	OK

SHEAR RESISTANCE: — Table 3.8 — 3.5.5.2

100As/bd =	0.20%			
vc =	0.42	N/mm^2		
Vres =	126.35	kN	> 8.43	OK

CHECK CRACK WIDTH IN ACCORDANCE WITH BS8100/80 Temp & shrinkage effects not included — BS8007

X = 60.69 mm ε_m = -0.00114

Acr = 115.54 mm W = -0.26 mm < 0.30 OK — App. B.2

NO CRACKING

INNER BASE (per metre length)

Ult. Shear = -37.56 kN (AT d from FACE of WALL)

Ult. MT. = 36.76 kNm TENSION - BOTTOM FACE

BOTTOM REINFORCEMENT : — Table 3.25

Min. As =	455	mm^2		
ϕ =	12	mm		
centres =	225	mm	< 762	OK
As =	503	mm^2	> 455	OK

MOMENT of RESISTANCE : — 3.4.4.4

d =	304	mm		
Z =	289	mm		
As' =	0	mm^2		
Mres =	63.12	kNm	> 36.76	OK

SHEAR RESISTANCE: — Table 3.8 — 3.5.5.2

100As/bd =	0.17%			
vc =	0.42	N/mm^2		
Vres =	126.35	kN	> 37.56	OK

CHECK CRACK WIDTH IN ACCORDANCE WITH BS8100/80 Temp & shrinkage effects not included — BS8007

X = 60.69 mm ε_m = -0.00012

Acr = 115.54 mm W = -0.03 mm < 0.30 OK — App. B.2

NO CRACKING

REINFORCEMENT SUMMARY for BASE

	Type	ϕ mm	centres mm	As mm^2	Min. As mm^2	
TOP	H	12	225	503	455	OK
BOTTOM	T	12	225	503	455	OK
TRANSVERSE	T	12	225	503	455	OK

Project	63 Rosslyn Hill - Hampstead	The Concrete Centre		
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	Basement wall design to BS8110:2005			
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mpa The Concrete Centre

APPROXIMATE WEIGHT OF REINFORCEMENT per metre length of wall

		No.	Type	Dia	Length	Unit Wt	Weight
WALL	VERTICAL - Internal face	6	H	12	3246	0.888	17.29
	VERTICAL - External face	6	H	16	3278	1.578	31.04
	TRANSVERSE (Ext.+ Int.)	32	H	10	1000	0.617	19.73
BASE	TOP (MAIN)	5	H	12	1896	0.888	8.42
	BOTTOM (MAIN)	5	H	12	1896	0.888	8.42
	TRANSVERSE (T & B)	18	H	12	1000	0.888	15.98
	WALL STARTERS (Int.)	6	H	12	1001	0.888	5.33
	WALL STARTERS (Ext.)	6	H	16	1193	1.578	11.30

SUMMARY — Total reinforcement per metre length of wall (kg) 118

Project	63 Rosslyn Hill - Hampstead				
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	Basement wall design to BS8110:2005	sheet 1 of 2				Date	
	Originated from 'RCC81 Basement Wall.xls' v4.0	© 2006 TCC					

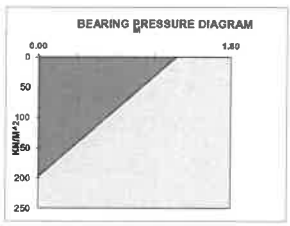
XX= 0

IF(ECCY>(B/1000)/6,IF(XX>(B/1000/2-ECCY)*3,0,(((B/1000/2-ECCY)*3-XX)/((B/1000/2-ECCY)*3))*BP),((VL/(B/1000)*(1-(6*ECCY)/(B/1000)))+(B/1000-XX)/(B/1000)*(BP-(VL/(B/1000)*(1-(6*ECCY)/(B/1000))))))

IF(ABS(ECCY)>(B/1000)/6,IF((B-XX)>(B/1000/2-ABS(ECCY))*3,0,(((B/1000/2-ABS(ECCY))*3-(B-XX))/((B/1000/2-ABS(ECCY))*3))*BP),((VL/(B/1000)*(1-(6*ABS(ECCY))/(B/1000)))) +(B/1000-(B-XX))/(B/1000)*(BP-(VL/(B/1000)*(1-(6*ABS(ECCY))/(B/1000))))))

IF(ABS(ECCY)>(B/1000)/6,IF(XX>(B/1000/2-ABS(ECCY))*3,0,(((B/1000/2-ABS(ECCY))*3-XX)/((B/1000/2-ABS(ECCY))*3))*BP), ((VL/(B/1000)* (1-6*ABS(ECCY))/(B/1000)))+(B/1000-XX)/(B/1000)*(BP-(VL/(B/1000)*(1-(6*ABS(ECCY))/(B/1000))))))

			197.4026
			197.4026
0	0.00	197.403	
1	0.04	191.906	
2	0.07	186.409	
3	0.11	180.912	
4	0.14	175.415	
5	0.18	169.918	
6	0.22	164.420	
7	0.25	158.923	
8	0.29	153.426	
9	0.32	147.929	
10	0.36	142.432	
11	0.40	136.935	
12	0.43	131.438	
13	0.47	125.941	
14	0.50	120.444	
15	0.54	114.947	
16	0.58	109.450	
17	0.61	103.953	
18	0.65	98.456	
19	0.68	92.959	
20	0.72	87.462	
21	0.76	81.965	
22	0.79	76.468	
23	0.83	70.971	
24	0.86	65.474	
25	0.90	59.977	
26	0.94	54.480	
27	0.97	48.983	
28	1.01	43.486	
29	1.04	37.989	
30	1.08	32.492	
31	1.12	26.995	
32	1.15	21.498	
33	1.19	16.001	
34	1.22	10.504	
35	1.26	5.007	
36	1.30	0.000	
37	1.33	0.000	
38	1.37	0.000	
39	1.40	0.000	
40	1.44	0.000	
41	1.48	0.000	
42	1.51	0.000	
43	1.55	0.000	
44	1.58	0.000	
45	1.62	0.000	
46	1.66	0.000	
47	1.69	0.000	
48	1.73	0.000	
49	1.76	0.000	
50	1.80	0	



		197.4
BPO	0	197.4
BPE	1E-08	197.4
BPI	0.3	151.59
BPZ	1.8	0

0	197.40	0.0000	0.00	0.00	0.036	7.11	0	0.00
1	191.91	0	0.00	0.00	0.036	6.91	0	0.00
2	186.41	0	0.00	0.00	0.036	6.71	0	0.00
3	180.91	0	0.00	0.00	0.036	6.51	0	0.00
4	175.41	0	0.00	0.00	0.036	6.31	0	0.00
5	169.92	0	0.00	0.00	0.036	6.12	0	0.00
6	164.42	0	0.00	0.00	0.036	5.92	0	0.00
7	158.92	0	0.00	0.00	0.036	5.72	0	0.00
8	153.43	0	0.00	0.00	0.036	5.52	0	0.00
9	147.93	0	0.00	0.00	0.036	5.33	0	0.00
10	142.43	0	0.00	0.00	0.036	5.13	0	0.00
11	136.94	0	0.00	0.00	0.036	4.93	0	0.00
12	131.44	0	0.00	0.00	0.036	4.73	0	0.00
13	125.94	0	0.00	0.00	0.036	4.53	0	0.00
14	120.44	0	0.00	0.00	0.036	4.34	0	0.00
15	114.95	0	0.00	0.00	0.036	4.14	0	0.00
16	109.45	0	0.00	0.00	0	0.00	0	0.00
17	103.95	0	0.00	0.00	0	0.00	0	0.00
18	98.46	0	0.00	0.00	0	0.00	0	0.00
19	92.96	0	0.00	0.00	0	0.00	0	0.00
20	87.46	0	0.00	0.00	0	0.00	0	0.00
21	81.97	0	0.00	0.00	0	0.00	0	0.00
22	76.47	0	0.00	0.00	0	0.00	0	0.00
23	70.97	0	0.00	0.00	0	0.00	0	0.00
24	65.47	0	0.00	0.00	0	0.00	0	0.00
25	59.98	0	0.00	0.00	0	0.00	0	0.00
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29	37.99	0	0.00	0.00	0	0.00	0	0.00
30	32.49	0	0.00	0.00	0	0.00	0	0.00
31	26.99	0	0.00	0.00	0	0.00	0	0.00
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48	0.00	0	0.00	0.00	0	0.00	0	0.00
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50	0.00	0	0.00	0.00	0	0.00	0	0.00
			0.00	0.00		89.96		0.00

Project	63 Rosslyn Hill - Hampstead	DATA FOR DIAGRAMS II	
Location	Wall A - Permanent	sheet 2 of 2	Made by RH Job No 7922
	Basement wall design to BS8110:2005	The Concrete Centre	Date
	Originated from 'RCC61 Basement Wall.xls' v4.0 © 2006 TCC		

MOMENTS

	MTE2=	41.50		
YY= 3.875	MTE1=	-0.36	0.00	82.943
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	MTLQ=	0.00		0.00
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	MTSQ=	-0.49		24.09
	MTW=	-54.14		96.98
	UTM=	-20.32		
		-20.32		

SHEARS

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17	1.13	15.569	1.13
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19	1.26	16.864	1.26
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23	1.53	18.898	1.53
24	1.60	19.276	1.60
25	1.66	19.599	1.66
26	1.73	19.862	1.73
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28	1.86	20.203	1.86
29	1.93	20.276	1.93
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31	2.06	20.214	2.06
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35	2.33	19.195	2.33
36	2.39	18.741	2.39
37	2.46	18.201	2.46
38	2.53	17.574	2.53
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45	2.99	10.549	2.99
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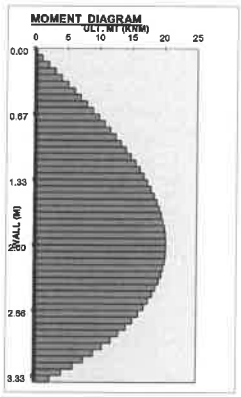

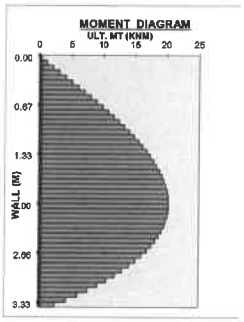

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20.075	-0.139	0.00	0.00
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		20.28	2.00

Geometry

0	0		
0	350		
1E-05	350		
1E-05	3650		
1800	3650		
1800	3350		
300	3350		
300	3650		
300	350		
1800	350		
1800	0		
0	0	3650	1800

Project	63 Rosslyn Hill - Hampstead		
Location	Wall A - Permanent	CRACK WIDTH CALCULATIONS	mpa The Concrete Centre
	Basement wall design to BS8110:2005		Made by RH Job No 7922
	Originated from 'RCC61 Basement Wall.xls' v4.0	© 2006 TCC	Date

WALL

MR=	15.06	MS=	766	Asreq =	409	fs =	135.64	\sprov%=	0.3989
As/bd=	0.004	MSS=	762	Assreq =	270	fs =	159.28	\sprov%=	0.2226
X=	73.51	MSBB=	762	ASBBreq=	0	fs =	4E-15	\sprov%=	0.1653
Ic=	614620645	MSBT=	762	ASBTreq=	293	fs =	194.14	\sprov%=	0.1653
STS=	0.000536								
ST1=	0.000680								
ST2=	0.00047647								
Acr=	102.923397								
W=	0.04								
εm=	0.0002								

MR=	15.06	MR=	15.06
AsBB/bd=	0.0017	AsBT/bd=	0.0017
X=	60.69	X=	60.69
Ic=	522535043	Ic=	522535043
STS=	0.0000	STS=	0.0009
ST1=	0.0000	ST1=	0.0010
ST2=	0.00114064	ST2=	0.00114064
Acr=	115.541145	Acr=	115.541145
W=	-0.26	W=	-0.03
εm=	-0.0011	εm=	-0.0001

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This spreadsheet should be used in compliance with the accompanying publication 'User Guide RC Spreadsheets: v4' available from The Concrete Centre www.concretecentre.com/rcdesign Tel +44 (0)1276 606800

Status of spreadsheet
Public release version.

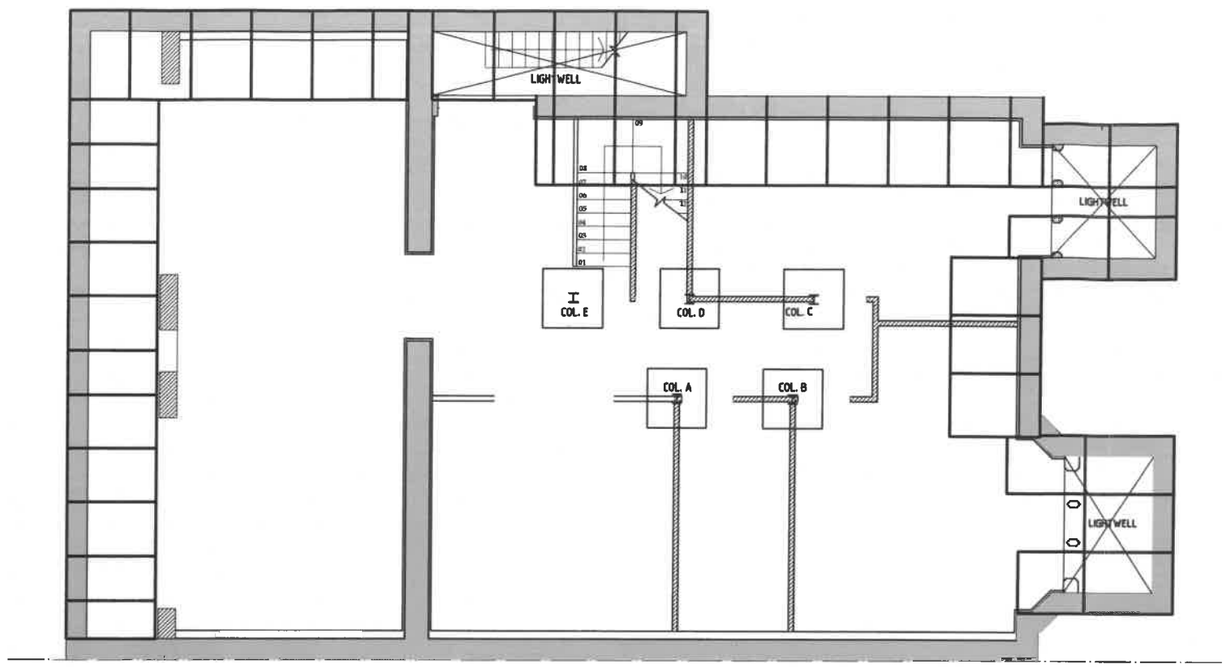
This spreadsheet is shareware but may not be used for commercial purposes until the user has registered with The Concrete Centre using the licence validation form available on The Concrete Centre website www.concretecentre.com/rcdesign

Revision history RCC61 Basement Wall.xls

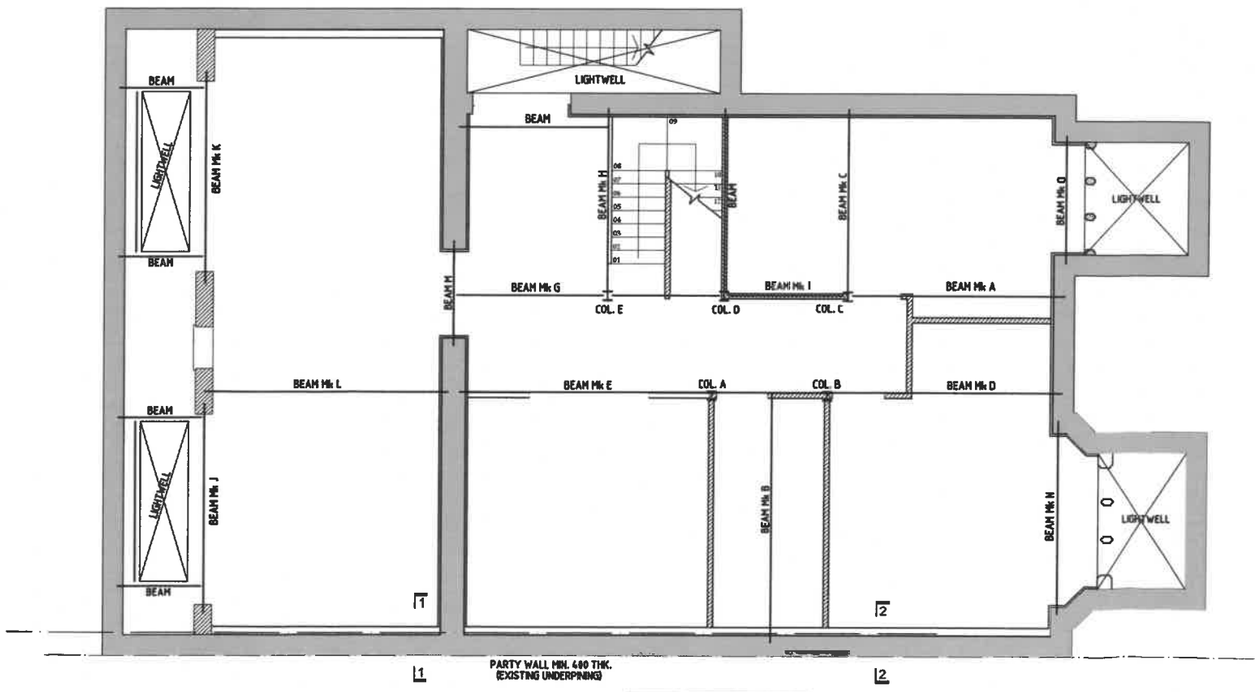
Date	Version	Action	Size (kB)
01-Apr-10	RCC61 v4.0	Re-badged as TCC/Mineral Products Association.	468
21-May-09	RCC61 v3.4	Corrupted picture replaced on DATA page.	462
01-Oct-08	RCC61 v3.3	Reference corrected at DESIGN!I107.	602
25-Sep-08	RCC61 v3.2	Correction to ST2 values on !Crackwidth.	565
28-Jun-06	RCC61 v3.1	v3 release. Page nos, User Guide and registration details amended.	565
12-Nov-05	RCC61 v3.0	Updated to 2005 versions of BS8110 & BS8666	586
22-Jan-03	RCC61 v2.1	DETR logo replaced by DTI.	563
11-Oct-02	RCC61 v2.0	Version 2 enhancements	591
29-May-02	RCC61 v1.4	Data! Main diagram made into jpg	399
15-Apr-01	RCC61 v1.3	Design section reinforcment summary amended.	399
20-Jun-00	RCC61 v1.2	Eccy Mt 7 & P-Delta Mt revised (DESIGN!D29:D30)	399
24-Mar-00	RCC61 v1.1	Crack width w for top of inner base amended. Notes re crack widths and cracking added.	398
06-Aug-99	RCC61 v1.0	First public release. Includes b version comments	398

APPENDIX D

Design Principle Drawings



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



PROPOSED BASEMENT PLAN
SHOWING LOWER GROUND FLOOR SUPPORT STRUCTURE OVER
[Scale 1:50]

UNDERPINNING NOTES:-

1. ALL REINFORCED CONCRETE CAST ON THE GROUND TO BE PLACED ON 50mm C28 CONCRETE BLINDING
2. FOUNDATIONS HAVE BEEN DESIGNED ASSUMING A SAFE GROUND BEARING PRESSURE OF 200kN/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 C28 CONCRETE MIX. IN THE EVENT OF ANY EXTENSIVE ADDITIONAL EXCAVATION BEING REQUIRED THE ENGINEER MUST BE INFORMED FRESH INSTRUCTIONS OBTAINED IF REQUIRED.
3. THE ENGINEERS DESIGN ASSUMES & TAKES ACCOUNT OF A GROUND WATER TABLE EXISTING WITHIN 2.0m OF THE BASEMENT FORMATION LEVEL.- ALLTO BE CONFIRMED BY SOILS INVESTIGATION BY OTHERS. ANY GROUNDWATER SHALL BE NOTIFIED TO THE ENGINEER IN WRITING PRIOR TO EXECUTION OF THE BASEMENT WORKS SUCH THAT HIS DESIGN MAY BE REVIEWED AND SUBJECT TO HIS FURTHER INSTRUCTIONS.

CONCRETE:
4. 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.
5. SLAB TO BE GRADE C35 IN ACCORDANCE WITH BS 8110.
6. 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 f CONCRETE IN AGGRESSIVE GROUND Part 1 - Assessing the aggressive chemical environment, Special Digest 1, 2005. (T.B.C.)
7. UNDERPINNING TO BE CARRIED OUT IN 1000mm MAXIMUM LENGTHS.
8. ALL UNDERPINNING WALL STEMS AND BASE SECTIONS ARE TO BE DOWELED TOGETHER WITH H12 BARS AT 150mmc/c LENGTH OF BARS 600mm)
9. ANY BACKFILLING BEHIND RETAINING WALLS TO BE CARRIED OUT USING C20 CONCRETE MIX.

   CONCRETE COVER UNLESS NOTED 35mm.
   BLINDED SURFACES TO BE 40mm.
   EARTH FACES 75mm.
10. 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.
11. AFTER EXCAVATING ADJACENT PREVIOUSLY CAST BASES, CLEAN AND SCABBLE EXISTING SURFACE OF CONCRETE.
12. ALLOW 48 HOURS MINIMUM BEFORE DRY-PACKING OVER WALLS.
13. SEQUENCE OF UNDERPINNING WORKS TO BE AGREED ON SITE WITH ENGINEER PRIOR TO COMMENCEMENT OF WORKS.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL NECESSARY DE-WATERING OF EXCAVATIONS DURING THE EXECUTION OF THE WORKS.

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 f CONTRACTOR TO NOTE THAT THE EXISTING FOUNDATIONS MAY BE FRIABLE, 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. TRIAL PITS ARE TO BE DUG PRIOR TO THE COMMENCEMENT BY 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.
15. REFER TO ARCHITECTS SPECIFICATION FOR ALL DAMP PROOFING DETAILS INCLUDING DPC, DPM'S & BASEMENT WATER PROOFING.
16. 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.

SUPERSTRUCTURE NOTES:-

1. STEELWORK TO BE MILD STEEL GRADE S275 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. ALL UNLESS NOTED OTHERWISE.
9. ALL MASONRY SHALL BE LAID IN CLASS (ii) MORTAR EXCEPT BELOW DPC CLASS (i).
10. ANY CUTTING AWAY OF EXISTING BRICKWORK TO BE CARRIED OUT CAREFULLY TO REDUCE DAMAGE TO SURROUNDING AREAS TO A MINIMUM.
11. 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.

REFER TO DRAWING 7922-101 FOR SECTIONS & DETAILS

Rev.	Description.	Date.

NOT FOR CONSTRUCTION

Cranbrook®
Basement design & construction

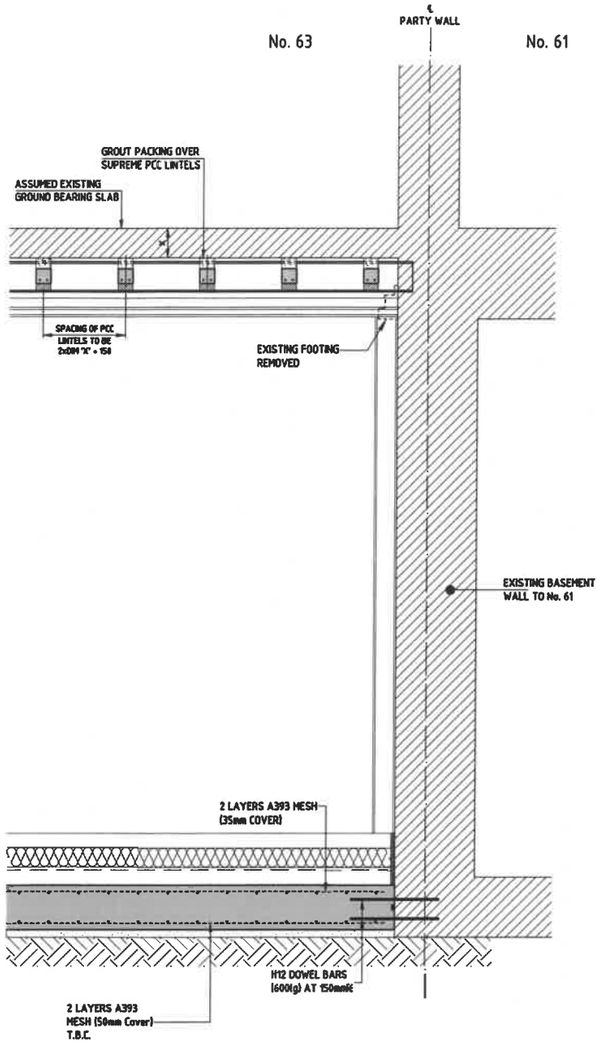
HORWITZ ASSOCIATES
Civil & Structural Engineering Consultants
Tel: 01245 809510 Web: www.rhorwitz.co.uk Email: rhh@rhorwitz.co.uk

PROPOSED BASEMENT AT No. 63
ROSSLYN HILL, HAMPSTEAD

PROPOSED BASEMENT & GROUND FLOOR
GENERAL ARRANGEMENT

Scale 1:50 @ A1		Date FEB. 2020	
Engineer R.H.		Drawn –	Checked –
Client CRANBROOK BASEMENTS		DRG No. 7922-PS-100	REV. –

FOR GENERAL NOTES REFER TO DRAWING
No. 7922 - 100.



SECTION 1 - 1
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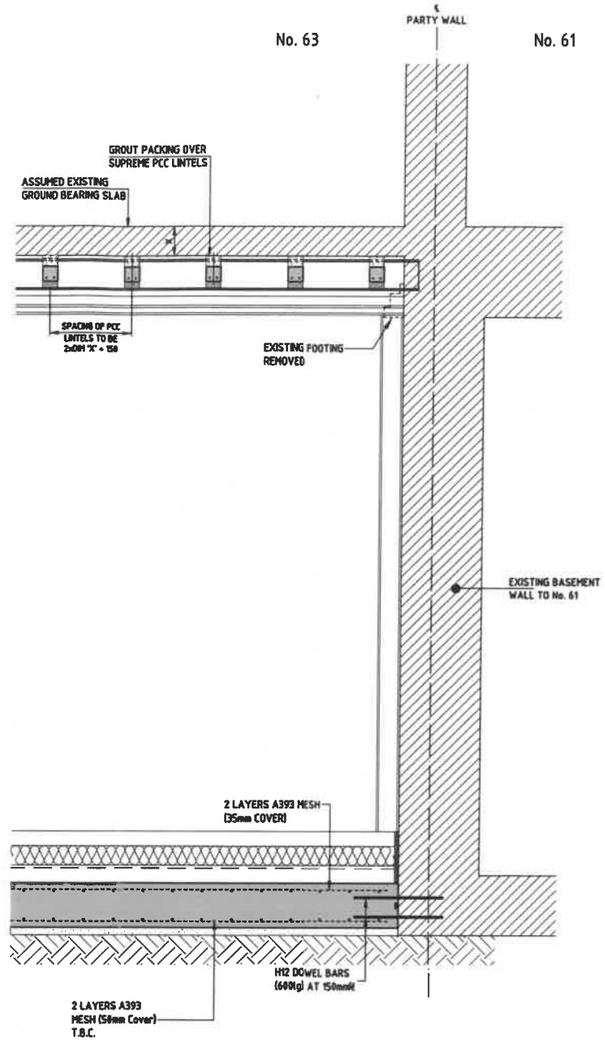

SECTION 2 - 2
[Scale 1:20]

NOT FOR CONSTRUCTION

Rev.	Description	Date
P2	AMENDED TO SHOW ADJACENT BASEMENT	01.05.2020

Cranbrook®
Basement design & construction

HORWITZ ASSOCIATES
Civil & Structural Engineering Consultants
Tel: 01245 809510 Web: www.rhorwitz.co.uk Email: rhh@rhorwitz.co.uk

PROPOSED BASEMENT AT No. 63
ROSSLYN HILL, HAMPSTEAD

SECTIONS
SHEET 1

Scale 1:20 @ A1	Date FEB. 2020	
Engineer R.H.	Drawn --	Checked --
Client	DRG No.	REV.
CRANBROOK BASEMENTS	*7922-PS-101*	*P2*

APPENDIX E

Specification

63 ROSSLYN HILL NW8 5UQ

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/mm^2 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/mm^2 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.