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Netley Cottage, 10 Lower Terrace, London NW3

Structural Assessment Report

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1.0 INTRODUCTION

1.1 This report considers the civil and structural implications of the refurbishment of Netley Cottage and construction of a swimming pool in the garden immediately to the north of the property.

1.2 The report is based upon the latest guidance provided by the London Borough of Camden, namely *Camden Planning Guidance: Basements*, prepared to support the policies in the Camden Local Plan 2017.

1.3 Any topics listed in this report are purely related to the civil and structural implications. Other disciplines (architecture, MEP, etc.) will be covered by others in separate documentation.

2.0 PROPOSALS

2.1 It is proposed to refurbish, renovate and upgrade the house and garden, provide an internal and external link to Grove Lodge (a neighbouring property also owned by the client) and construct a covered external swimming pool in the garden.

2.2 The scope of structural works will entail:

- Formation of an opening at Ground floor through the party wall of Netley Cottage and Grove Lodge to accommodate a new link staircase
- Reconfiguration of the existing circulation space at Ground floor in Netley Cottage adjacent to the new staircase requiring the removal of selected loadbearing walls and removal of a pier in the kitchen area
- Opening made through a wall at Ground floor in the location of an original opening
- Formation of retaining walls within Netley Cottage to provide a structural enclosure for the new staircase link to Grove Lodge
- Formation of a door opening at First floor through the party wall of Netley Cottage and Grove Lodge
- Opening up of the internal roof spaces
- Construction of a new swimming pool and single storey pool house to the north of the garden area
- Formation of a door opening to boundary garden wall between Grove Lodge and Netley Cottage to link garden areas

3.0 HISTORIC ENVIRONMENT

3.1 Netley Cottage is a Grade II Listed two storey residential building located within the Hampstead Conservation Area in The London Borough of Camden.

3.2 The property comprises loadbearing masonry walls supporting traditional timber joist & board floors and cut timber roofs, and both it plus the properties adjacent to it – Grove End to the north, Grove Lodge to the south and Admiral's House to the east – are the result of various campaigns of construction spread over several periods reaching right up to the present day.

3.3 The genesis of Netley Cottage, Grove End, Grove Lodge and Admiral's House is described in detail in the Heritage Appraisal report prepared for Netley Cottage by Portico Heritage Ltd in March 2020, to which the reader is referred.

3.4 The site does not lie in an area of known archaeological importance.

3.5 A basement has recently been constructed beneath part of Grove Lodge and there is a pre-existing basement beneath part of Grove End and Admiral's House. There are no known records of any previous or proposed basement works to any of the other adjacent buildings.

4.0 USE, COMFORT & SAFETY

4.1 All items within this category will be addressed by other disciplines.

5.0 FLOODING

5.1 With reference to the Environment Agency's website the site is located in Flood Zone 1 zone with less than a 1 in 1000 chance of flooding each year.

5.2 Since the size of the development is less than 1 hectare in area no further flood risk assessment is required.

6.0 ENVIRONMENTAL SUSTAINIBILITY.

6.1 Wherever possible, construction materials have been specified in order to mitigate detrimental impact on the environment.

7.0 CONSTRUCTION STRATEGY

7.1 A number of trial pits have been formed at the boundaries of the garden of Netley Cottage, and a site investigation comprising two boreholes has been undertaken close to the site of the proposed swimming pool (refer to Appendix A for details).

7.2 These investigations have confirmed that the basic ground profile is as follows:

- EGL* – 0.6m Made ground
- 0.6m – 7.0m Medium dense silty sand (Bagshot Sands)
- 7.0m – depth Medium dense sandy clay (Claygate Member)

*Existing ground level

7.3 The water table has been identified with seepage occurring at approximately 6.3m below existing ground level.

7.4 The trial pits can be summarised as follows:

- TP1 Boundary wall comprising brickwork wall constructed on mass concrete trench footing terminating approx. 1m below existing ground level (refer to Appendix A for details).
- TP2 Former boundary wall comprising brickwork wall constructed on slightly corbelled brickwork footing terminating approx. 0.5m below existing ground level (refer to Appendix A for details).
- TP3 Former boundary wall comprising brickwork wall constructed on slightly corbelled brickwork footing terminating approx. 0.5m below existing ground level (refer to Appendix A for details).

7.5 Hydrogeology and hydrology are discussed in general terms within the site investigation report. A separate hydrogeological assessment has been undertaken by others and will be reported on separately. In summary the proposed swimming pool is unlikely to intercept groundwater flowing at a shallow depth and will be wholly situated within the Bagshot Sands so does not provide any form of cut-off into less permeable strata, therefore the development should not have any significant effect on the local groundwater flows and levels.

7.6 Based on the data contained in the site investigation report a safe bearing pressure of at least 150kN/m^2 can be assumed at the proposed formation level of the new swimming pool. Contiguous piles will be used to form the excavation and will support the reinforced concrete slabs and walls forming the swimming pool structure. All loads will be transferred to the piles which will transmit them into the sands using skin friction and end bearing. The design of the piles will be undertaken by a specialist contractor based on the loads provided to them by us. The use of piles taken into a stratum capable of supporting the proposed loads avoids loading adjacent structures founded near the ground surface while preventing penetration of the water table.

7.7 Laboratory classification tests indicate that in the Bagshot Sands stratum there is negligible volume change potential, therefore removal of the existing surcharge will result in negligible heave. A proprietary compressible material will nevertheless be placed beneath the base slab of the swimming pool to accommodate any local heave that may occur due to movement of the underlying clays forming the Claygate Member lying beneath the Bagshot Sands at depth.

8.0 CONSTRUCTION METHODOLOGY

8.1 Swimming pool

8.1.1 The perimeter walls of the new swimming pool will be formed using contiguous piles. The piles will support the vertical loads from new pool structure and the pool house located directly above.

8.1.2 The piles will form retaining walls which will be required to support lateral pressures generated by both the earth and surcharge loads from adjacent structures, including imposed loads associated with pedestrian-only usage within the garden. Lateral hydrostatic pressure will be resisted by the structural liner walls which will be formed from reinforced concrete which together with the reinforced concrete base slab will from a water resisting barrier. The reinforced concrete walls and slab will contain a water resisting admixture and will be designed to minimum crack width requirements in accordance with BS 8500.

8.1.3 The base slab will be directly supported by the piled walls, and for added security an anti-heave layer will be provided beneath the slab to accommodate any residual ground heave that may occur due to the relief of overburden pressure, however the risk of this is negligible.

8.1.4 The proposed structural arrangement is shown on drawings SSK100 and SSK101 provided within Appendix B.

8.1.5 Careful consideration has been given to the existing property and adjoining properties when designing the swimming pool construction and devising the construction sequence. In order to minimise deflection at the head of the piled retaining walls during excavation a 'top down' construction method has been adopted. This approach will require the piled walls to be temporarily propped prior to any significant excavation taking place, and analysis has been undertaken which indicates that the expected ground movement will be negligible (refer to Appendix C

8.1.6 The partial reinforced concrete ground floor slab will act as a permanent prop during and after construction, reducing the need for temporary props to the retaining walls and helping to maintain the stability of the nearby ground and thus minimising ground movement to a structurally insignificant degree.

8.1.7 The proposed sequence of construction is illustrated in Appendix D in a step-by-step manner showing how the temporary and permanent structure provides lateral restraint during the works. This method of construction minimises the risk of lateral movement related to the transfer of load from temporary to permanent structure, consequently the potential for ground movement or instability to adjacent neighbouring structures is minimised, but this does not restrict their natural ability to move under normal conditions.

8.1.8 The topography of the local area is generally level with no local anomalies, as can be seen on the topography survey. Therefore the proposed works will not initiate any slope instability which may threaten adjoining properties.

8.1.9 There are no man made cavities; public sewers or tunnels below the footprint of the site or adjacent to it, therefore there are no implications related to these concerns for the present design.

8.1.10 An appropriate monitoring regime will be implemented during the construction of the swimming pool in order to monitor any ground movements against those predicted. This will include the use of targets fixed to adjoining properties to measure 3D horizontal and vertical movements and the use of inclinometers to measure horizontal movement of the piles. A 'green, amber, red' system will be employed with trigger levels agreed in advance with the party wall surveyors based on specialist geotechnical advice. An action plan will be put in place that will be implemented if any trigger levels are exceeded during the construction works.

8.2 Staircase link

8.2.1 The perimeter retaining walls of the substructure required to create the new staircase link between Netley Cottage will be formed using reinforced concrete installed in a top down sequence in a manner to the formation of traditional underpinning.

8.2.2 The retaining walls will support lateral pressures generated by both the earth and surcharge loads from adjacent structures, including imposed loads associated with residential usage within the properties, plus pressures exerted by any prevailing hydrostatic pressure. The reinforced concrete walls and slab will contain a water resisting admixture and will be designed to minimum crack width requirements in accordance with BS 8500.

8.2.3 The base slab will be directly supported on the ground and cast monolithically with the surrounding walls, as well as being secured to the adjacent existing brickwork walls via resin-anchored steel dowels. Due to the shallow depth of the excavation coupled with the integration of the new structure with the existing any residual ground heave that may occur due to the relief of overburden pressure will be negligible.

8.2.4 The proposed structural arrangement is shown on drawings SSK200 and SSK201 provided within Appendix B.

8.2.5 Careful consideration has been given to the existing property and adjoining properties when designing the staircase structure and devising the construction sequence. In order to minimise movement of the adjacent ground and buildings a ‘top down’ construction method has been adopted which will render negligible the expected ground movement.

8.2.6 The uppermost portion of the reinforced concrete retaining walls will be formed first in 1m long by 0.5m deep bays cast in a ‘hit and miss’ sequence with a minimum of two bays between working bays, each section being interlinked with high yield steel reinforcement. High yield steel reinforcing dowel bars will also be driven into the ground at the base of the excavation and the reinforcement cage/shuttering installed to link to the subsequent section that will be cast below. After each section has gained sufficient strength the process will be repeated on adjacent bays until the first pour is complete around the perimeter of the new staircase.

8.2.7 Following this construction of the next section directly below can commence, again carried out in 1m long by 0.5m deep hit and miss bays interlinked with high yield steel reinforcement to the reinforced concrete wall directly above. After curing all gaps between adjoining sections of the wall will be filled with well compacted drypack.

8.2.8 Once the reinforced concrete retaining walls are complete and have gained sufficient strength the base slab will be cast, which will provide permanent propping to the retaining walls.

8.2.9 There are no manmade cavities; public sewers or tunnels below the footprint of the site or adjacent to it, therefore there are no implications related to these concerns for the present design.

9.0 SERVICES & GROUND WATER

9.1 The surface water discharged from the roof of the new pool house will be discharged to an infiltration system (e.g. a soakaway) at a discharge rate in accordance with the requirements of Thames Water, and will be situated within the south/west area of the garden at least 5m from the structure. Suitable infiltration tests will be undertaken in due course to confirm the existing infiltration rate and thus to design the system, however the current proposals are considered feasible as we anticipate a reasonable permeability figure based on known data for the prevailing ground.

9.2 No new flows will be discharged to the existing below ground drainage system at Netley Cottage nor those of the adjacent properties, so the flows into the existing Thames Water sewer that runs beneath the main highway will remain unchanged.

9.3 The development will only impact on below ground services serving Netley Cottage, which will be diverted where required a to avoid clashing with the proposed excavations. As noted above there will be no impact on the below ground services, including drainage and sewage to adjoining properties.

9.4 A CCTV Survey has been commissioned and will be undertaken to ascertain the existing below ground drainage system layout and condition, enabling any essential cleaning and/or repairs to be undertaken. The survey will also identify the presence of any unrecorded below ground drainage routes that may pass through or near the sites of the proposed pool and soakaway in advance of works commencing, and suitable remediation proposals to be developed.

10.0 MITIGATING DAMAGE, NOISE & NUISANCE

10.1 To prevent harm to the living conditions of neighbouring occupiers the main contractor will implement measures in accordance in accordance with The London Borough of Camden's requirements to keep impacts associated with potentially disruptive basement construction activities within acceptable limits for the duration of the works.

10.2 Such impacts include noise; vibration; dust and odours, in addition to demolition, excavation and construction-related traffic. Furthermore, the construction work associated with the proposed development will not restrict parking availability, traffic flow, road safety, residential amenity or pedestrian convenience.

10.3 We have developed the proposed design of the basement structure mindful of the above considerations to ensure that construction-related disturbance is controlled appropriately. We recommend that such measures include the following:

- Using cutting methods for demolition, such as sawing or water-jetting, to eliminate the use of high volume pneumatic and hydraulic breakers, before further breaking down of demolition materials is carried out off-site using conventional techniques.
- Adoption of manual excavation techniques instead of diesel-powered excavators, where appropriate.
- The use of top-down basement construction and/or temporary noise and dust-reducing enclosures to contain potentially disruptive areas of the site.

10.4 Details of how potential noise and nuisance are to be managed during construction are to be provided by the main contractor, once appointed. A Construction Traffic Management Plan (CTMP) will form part of the post-planning application to be submitted together with a Construction Method Statement. The CTMP sets out how the impact of construction-related traffic and other activities on parking availability, traffic flow, road safety, residential amenity and pedestrian convenience are to be controlled. Key items addressed in these submissions will include, but are not limited to, the following:

- Steps by which noise, dust and vibration from site activity and traffic will be minimised
- Detailed programmes and method statements for temporary and permanent works, describing the types of machinery and equipment to be used
- The means by which residents are to be informed of the works and any concerns addressed

- The use where possible of plant or machinery to reduce noise (e.g. mains generated electricity in preference to diesel generators)
- Monitoring of background noise before works begin and periodically during the contract to ensure limits are not exceeded

10.5 The environmental impact of materials has been taken into account in the specification and design of all elements, including the sourcing of materials.

10.6 All on-site trees have been inspected by a specialist and checked to establish the TPO's associated with them.

10.7 The proposed construction method and techniques have been developed to minimise any damage to the nearby trees during the construction process.

10.8 This report has been prepared on behalf of Conisbee by:

Kevin Clark BSc (Hons) PhD DIC CEng MICE Conservation Accredited Engineer (CARE)

Associate & Head of Heritage Engineering

Date: 07.09.2020

APPENDIX A SITE INVESTIGATION REPORT

CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING,
CONTAMINATED LAND SURVEYS, DESK
STUDIES, RISK ASSESSMENT.

MRH GEOTECHNICAL

GROUND INVESTIGATION FOR

NETLEY COTTAGE
10 LOWER TERRACE
LONDON
NW3 6RR

Job No: 111281

Date September 2011

60 Station Road, Chingford, London E4 7BE Tel: 020 8559 3134 Fax: 020 8559 3135

REPORT ON A GROUND INVESTIGATION AT NETLEY COTTAGE, 10 LOWER TERRACE, LONDON NW3 6RR

1 INTRODUCTION

1.1 This report has been prepared for Howard Cavanna, Consulting Engineers, who are acting on behalf of Spyer and Dove Limited.

1.2 Our brief for the investigation was to:

a) Construct two boreholes with associated soil sampling and in situ testing
b) Provision and installation of two piezometers
c) Laboratory testing of soil samples for classification

2 DETAILS OF FIELD WORK

2.1 The fieldwork comprised the construction of two boreholes at the positions indicated in appendix A.

2.2 Soil samples were recovered at regular intervals during the drilling operations, sealed in inert, airtight containers and transported to the laboratory for testing and detailed descriptions.

2.3 Water level observations were made during the drilling works and noted on the borehole logs.

2.4 The fieldwork was carried out between the 12th and 14th September 2011.

3 GENERAL GEOLOGY AND REVEALED STRATA

3.1 The boreholes proved Made Ground to depths of 0.15m and 0.60m.

3.2 Medium dense silty Sand was then noted, becoming clayey in borehole 1 at 6.30m, while at 7.70m in borehole 2.

3.3 Details of the boreholes, sample depths, in situ test results and revealed stratum are given in appendix B.

3.4 The 1:50,000 scale geological map indicates the natural deposits of the area to be Bagshot Beds overlying Claygate Beds.

4 GROUNDWATER

4.1 Water seepage's were note at depths of 6.30m and 6.20m in boreholes 1 and 2 respectively. On completion of the drilling works, piezometers were installed to allow long term monitoring.

5 LABORATORY TESTING

5.1 The recovered soil samples were tested for moisture levels , although due to the non plasticity of the Sand, it was not possible to determine Atterberg Limits.

5.2 The results and detailed sample descriptions are tabulated in appendix C.

6 CONCLUSIONS

6.1 The findings of the boreholes indicate natural ground in the form of silty Sand at depths of between 0.15m - 0.60m.

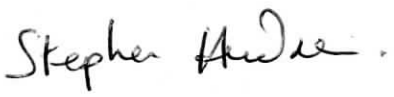
6.2 We understand that the proposed development comprises the construction of a single storey basement, affording a swimming pool.

6.3 Due to the non cohesive nature of the Sand, it would be recommended that suitable shoring is utilised during the construction period.

6.4 With regard to the structural design, details of the SPT (N) values are given on the borehole logs.

7 REFERENCES

1) British Standard EN ISO 14688-1:2002
2) British Standard 5930: 1999
3) British Standard 1377: Parts 1-9
4) British Geological Survey Sheet 256 (1:50,000 scale) North London
5) NHBC Standards, Chapter 4.2
6) Foundation Design and Construction (M.J. Tomlinson, Fifth Edition)

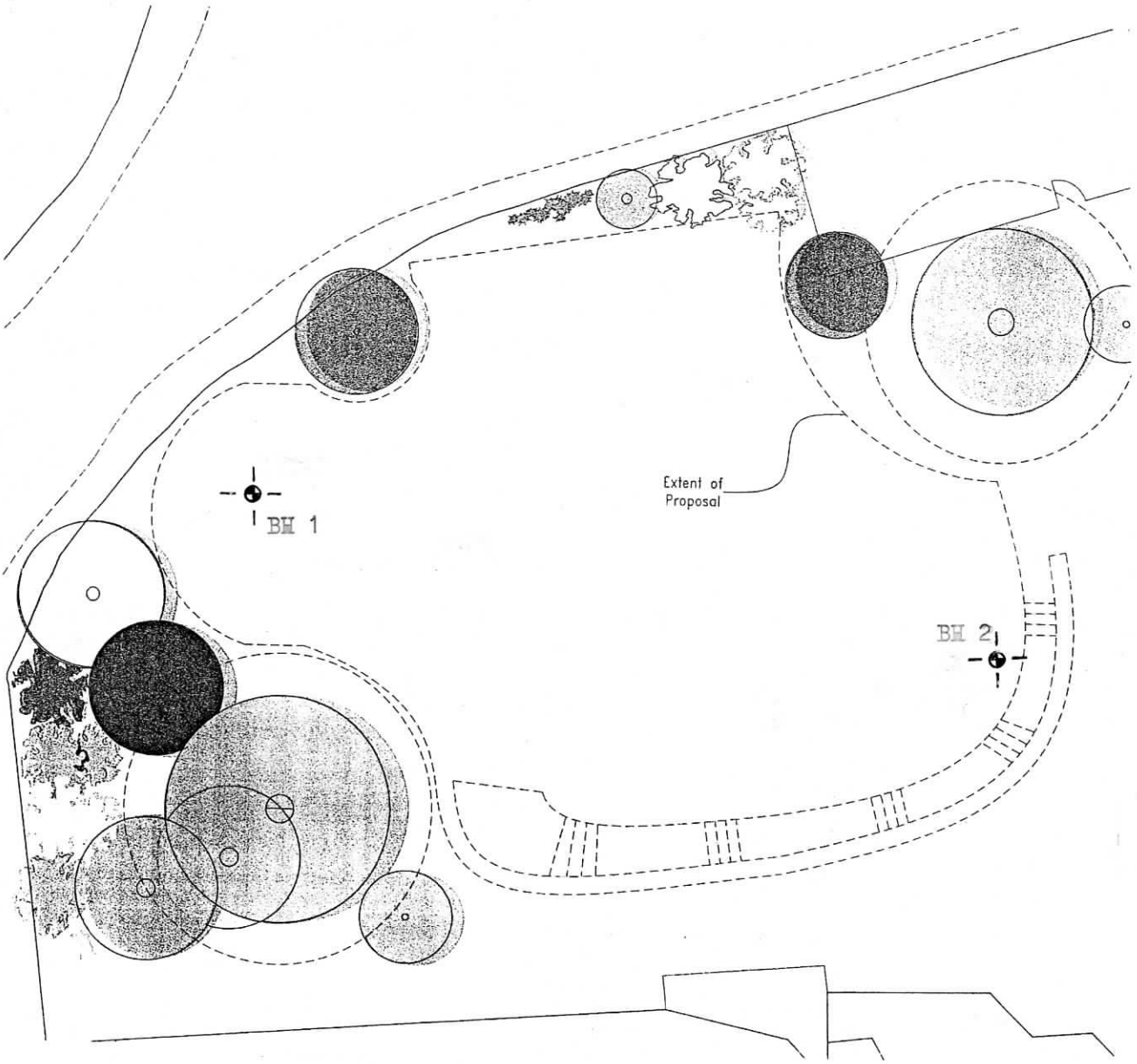


Stephen J. Hudson
mail@mrhgeotechnical.com

APPENDIX A

BOREHOLE LOCATION PLAN

BOREHOLE LOCATION PLAN



N.T.S.

Location:	Netley Cottage 10 Lower Terrace London NW3 6RR	**Appendix:**	A
		Job No:	111281
		Date:	September 2011

APPENDIX B

BOREHOLE LOGS

BOREHOLE LOG - M R H GEOTECHNICAL

HOLE NO. BH 1
Sheet 1 of 1

CLIENT	SITE	DATE OF FIELDWORK	SCALE	LEVEL/POSITION	OPERATOR	LOGGED BY	JOB NO.
Spyer and Dove Limited	Netley Cottage, 10 Lower Terrace, London NW3 6RR	14/09/11 - 14/09/11	1:50	GROUND / AS APPENDIX A	PA/SA	SH	111281

SAMPLE DEPTH	RECORD TYPE	SPT N (Cu-kN/m^2)	Standp/ Piezo	DESCRIPTION OF STRATUM (thickness)	DEPTH
				Turf over topsoil (0.15)	0.15
0.50	D1			Medium dense pale brown silty fine SAND (1.15)	
1.00 - 1.45	D2	N=34			1.30
1.50	D3			Medium dense orange brown silty SAND (3.90)	
2.00 - 2.45	D4	N=37			
2.50	D5				
3.00	D6				
3.50 - 3.95	D7	N=38			
4.00	D8				
4.50	D9				
5.00 - 5.45	D10	N=36			
5.50	D11			Medium dense orange brown silty SAND with occasional black rounded gravel (1.10)	5.20
6.00	D12			Water standing at 5.80m on completion	
				Medium dense orange brown laminated pale bluish grey clayey SAND (3.70)	6.30
7.00 - 7.45	D13	N=32		Water seepage at 6.30m	
8.00	D14			Piezometer installed	
9.00 - 9.45	D15	N=35			
				Borehole ends	10.00
10.00	D16				

GROUNDWATER AND CASING INFORMATION

DEPTH STRUCK	DEPTH CASED	ELAPSED TIME	WATER LEVEL	DEPTH SEALED	REMARKS ON GROUNDWATER AND CASING
6.30	-	1HOUR	5.80	-	Water seepage at 6.30m, rising to 5.80m after 1 hour. Piezometer installed

BORING METHOD AND REMARKS

Mechanical auger
Piezometer / gas monitoring well installed

KEY: D = Disturbed Sample B = Bulk Sample
U = Undisturbed Sample W = Water Sample
All dimensions are in metres unless otherwise stated

BOREHOLE LOG - M R H GEOTECHNICAL

HOLE NO. BH 2
Sheet 1 of 2

CLIENT	SITE	DATE OF FIELDWORK	SCALE	LEVEL/POSITION	OPERATOR	LOGGED BY	JOB NO.
Spyer and Dove Limited	Netley Cottage, 10 Lower Terrace, London NW3 6RR	12/09/11 - 12/09/11	1:50	GROUND / AS APPENDIX A	PA/SA	SH	111281

SAMPLE DEPTH	RECORD TYPE	SPT N (Cu-kN/m^2)	Standp/ Piezo	DESCRIPTION OF STRATUM (thickness)	DEPTH
				Turf over topsoil (0.10)	0.10
				Soft greyish brown clayey sand with some topsoil and gravel. MADE GROUND (0.50)	0.60
0.50	D1				
				Medium dense greyish brown SAND with traces of fine gravel (2.00)	
1.00 - 1.45	D2	N=29			
1.50	D3				
2.00 - 2.45	D4	N=31			
2.50	D5				2.60
				Medium dense dark orange brown silty, slightly clayey SAND (1.10)	
3.00	D6				
3.50 - 3.95	D7	N=36			3.70
				Medium dense pale brown SAND with occasional black rounded gravel (1.90)	
4.00	D8				
4.50	D9				
5.00 - 5.45	D10	N=39			
5.50	D11				5.60
				Medium dense brown silty SAND (0.60)	
6.00	D12			Water standing at 6.00m on completion	6.20 ▽
				Medium dense orange brown silty SAND with traces of fine gravel (1.50) Water seepage at 6.20m	
6.50 - 6.95	D13	N=34			
7.00	D14				
7.50	D15				7.70
				Medium dense pale orange brown with traces of pale grey very clayey SAND (1.80) Piezometer installed	
8.00 - 8.45	D16	N=38			
9.00	D17				
				Medium dense pale orange brown with traces of pale grey silty very clayey SAND, occasional black rounded gravel (7.50)	9.50
				Borehole continues on Sheet 2	
10.00-10.45	D18	N=29			

GROUNDWATER AND CASING INFORMATION

DEPTH STRUCK	DEPTH CASED	ELAPSED TIME	WATER LEVEL	DEPTH SEALED	REMARKS ON GROUNDWATER AND CASING
6.20	-	1HOUR	6.00	-	Water seepage at 6.20m, rising to 6.00m after 1 hour. Piezometer installed

BORING METHOD AND REMARKS

Mechanical auger
Piezometer / gas monitoring well installed

KEY: D = Disturbed Sample B = Bulk Sample
U = Undisturbed Sample W = Water Sample
All dimensions are in metres unless otherwise stated

BOREHOLE LOG - M R H GEOTECHNICAL

HOLE NO. BH 2
Sheet 2 of 2

CLIENT	SITE
Spyer and Dove Limited	Netley Cottage, 10 Lower Terrace, London NW3 6RR

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	OPERATOR	LOGGED BY	JOB NO.
12/09/11 - 12/09/11	1:50	GROUND / AS APPENDIX A	PA/SA	SH	111281

SAMPLE DEPTH	RECORD TYPE	SPT N (Cu-kN/m^2)	Standp/ Piezo	DESCRIPTION OF STRATUM (thickness)	DEPTH	LEGEND
				Medium dense pale orange brown with traces of pale grey very clayey SAND, occasional black rounded gravel		
11.00	D19					
12.00-12.45	D20	N=33				
13.00	D21					
14.00	D22					
15.00-15.45	D23	N=30				
16.00	D24					
				Borehole ends	17.00	
17.00	D25					

GROUNDWATER AND CASING INFORMATION

DEPTH STRUCK	DEPTH CASED	ELAPSED TIME	WATER LEVEL	DEPTH SEALED	REMARKS ON GROUNDWATER AND CASING
6.20	-	1HOUR	6.00	-	Water seepage at 6.20m, rising to 6.00m after 1 hour. Piezometer installed

BORING METHOD AND REMARKS

Mechanical auger
Piezometer / gas monitoring well installed

KEY: D = Disturbed Sample B = Bulk Sample
U = Undisturbed Sample W = Water Sample
All dimensions are in metres unless otherwise stated

APPENDIX C

MOISTURE CONTENT TEST RESULTS

TEST REPORT.

ISSUED BY : M R H GEOTECHNICAL LTD

Appendix C PAGE 1

Contract
Netley Cottage, 10 Lower Terrace, London NW3 6RR

Job No.
111281

SUMMARY OF MOISTURE CONTENT, LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Liquidity Index (%)	Description (BS 5930:1981:41)
BH 1	0.50	D1	6.0	-	-	-		Medium dense pale brown silty fine SAND
BH 1	1.00 -1.45	D2	7.0	-	-	-		Medium dense pale brown silty fine SAND
BH 1	1.50	D3	8.0	-	-	-		Medium dense orange brown silty SAND
BH 1	2.00 -2.45	D4	8.0	-	-	-		Medium dense orange brown silty SAND
BH 1	2.50	D5	7.0	-	-	-		Medium dense orange brown silty SAND
BH 1	3.00	D6	7.0	-	-	-		Medium dense pale orange brown silty SAND
BH 1	3.50 -3.95	D7	7.0	-	-	-		Medium dense pale orange brown silty SAND
BH 1	4.00	D8	7.0	-	-	-		Medium dense orange brown silty SAND
BH 1	4.50	D9	7.0	-	-	-		Medium dense brown silty SAND
BH 1	5.00 -5.45	D10	7.0	-	-	-		Medium dense pale orange brown silty SAND
BH 1	5.50	D11	8.0	-	-	-		Medium dense orange brown silty SAND with occasional black rounded gravel
BH 1	6.00	D12	9.0	-	-	-		Medium dense orange brown silty SAND
BH 1	7.00 -7.45	D13	12	-	-	-		Medium dense orange brown laminated pale bluish grey slightly clayey SAND
BH 1	8.00	D14	13	-	-	-		Medium dense orange brown laminated pale bluish grey clayey SAND
BH 1	9.00 -9.45	D15	20	-	-	-		Medium dense orange brown laminated pale bluish grey clayey SAND
BH 1	10.00	D16	22	-	-	-		Medium dense orange brown laminated pale bluish grey clayey SAND
BH 2	0.50	D1	14	-	-	-		Soft greyish brown clayey sand with some topsoil and gravel. MADE GROUND

METHOD OF PREPARATION : BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS :

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

TEST REPORT.

ISSUED BY : M R H GEOTECHNICAL LTD

Appendix C PAGE 2

Contract: Netley Cottage, 10 Lower Terrace, London NW3 6RR

Job No. 111281

SUMMARY OF MOISTURE CONTENT, LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Liquidity Index (%)	Description (BS 5930:1981:41)
BH 2	1.00 -1.45	D2	14	-	-	-		Medium dense brown SAND with traces of fine gravel
BH 2	1.50	D3	12	-	-	-		Medium dense greyish brown SAND with traces of fine gravel
BH 2	2.00 -2.45	D4	10	-	-	-		Medium dense greyish brown SAND
BH 2	2.50	D5	13	-	-	-		Medium dense greyish brown SAND with traces of fine gravel
BH 2	3.00	D6	16	-	-	-		Medium dense dark orange brown silty, slightly clayey SAND
BH 2	3.50 -3.95	D7	14	-	-	-		Medium dense dark orange brown silty, slightly clayey SAND
BH 2	4.00	D8	12	-	-	-		Medium dense pale brown SAND with occasional black rounded gravel
BH 2	4.50	D9	10	-	-	-		Medium dense pale brown SAND
BH 2	5.00 -5.45	D10	10	-	-	-		Medium dense brown SAND with occasional black rounded gravel
BH 2	5.50	D11	10	-	-	-		Medium dense pale brown SAND
BH 2	6.00	D12	11	-	-	-		Medium dense brown silty SAND
BH 2	6.50 -6.95	D13	11	-	-	-		Medium dense orange brown silty SAND with traces of fine gravel
BH 2	7.00	D14	10	-	-	-		Medium dense orange brown silty SAND with traces of fine gravel
BH 2	7.50	D15	12	-	-	-		Medium dense orange brown silty SAND with traces of fine gravel
BH 2	8.00 -8.45	D16	15	-	-	-		Medium dense pale orange brown with traces of pale grey very clayey SAND
BH 2	9.00	D17	12	-	-	-		Medium dense orange brown SAND
BH 2	10.00 -10.45	D18	22	-	-	-		Medium dense pale orange brown with traces of pale grey silty very clayey SAND

METHOD OF PREPARATION : BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS :

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

TEST REPORT.

ISSUED BY : M R H GEOTECHNICAL LTD

Appendix C PAGE 3

Contract Job No.
Netley Cottage, 10 Lower Terrace, London NW3 6RR 111281

SUMMARY OF MOISTURE CONTENT, LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Liquidity Index (%)	Description (BS 5930:1981:41)
BH 2	11.00	D19	19	-	-	-		Medium dense pale orange brown with traces of pale grey silty very clayey SAND, occasional black rounded gravel
BH 2	12.00 -12.45	D20	19	-	-	-		Medium dense pale orange brown with traces of pale grey silty very clayey SAND, occasional black rounded gravel
BH 2	13.00	D21	22	-	-	-		Medium dense pale orange brown with traces of pale grey silty very clayey SAND, occasional black rounded gravel
BH 2	14.00	D22	23	-	-	-		Medium dense pale orange brown with traces of pale grey silty very clayey SAND, occasional black rounded gravel
BH 2	15.00 -15.45	D23	23	-	-	-		Medium dense pale orange brown with traces of pale grey silty very clayey SAND, occasional black rounded gravel
BH 2	16.00	D24	25	-	-	-		Medium dense pale orange brown with traces of pale grey silty very clayey SAND, occasional black rounded gravel
BH 2	17.00	D25	25	-	-	-		Medium dense pale orange brown with traces of pale grey silty very clayey SAND, occasional black rounded gravel

METHOD OF PREPARATION : BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

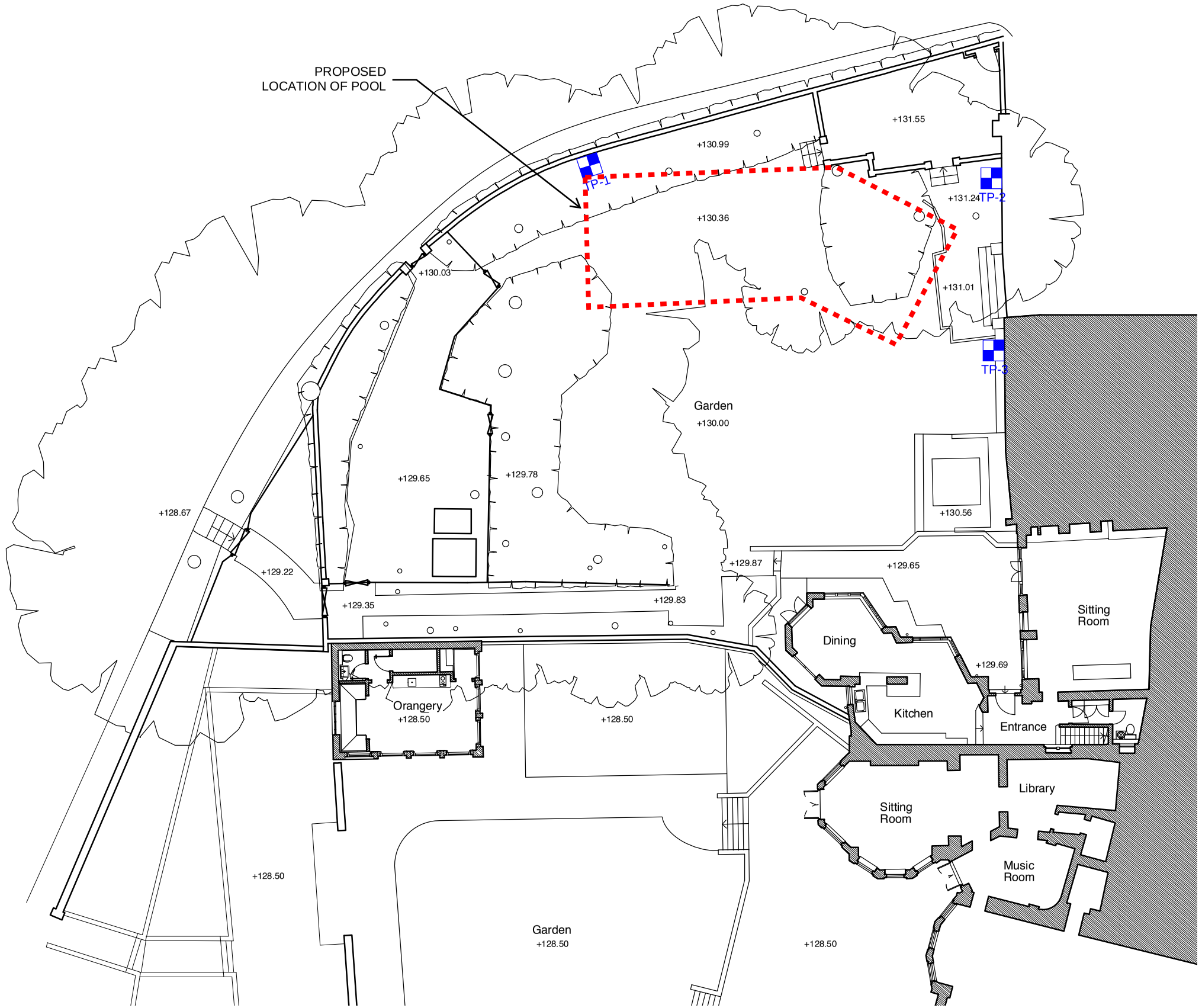
METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS :

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

This drawing must be read in conjunction with the specification and all other relevant drawings. Do not scale from this drawing.



NOTES

All site operations are to be undertaken by fully trained and qualified personnel.

All services (including drainage, electrical, gas routes etc.) are to be traced and their locations confirmed prior to commencing any intrusive works.

The contractor is to take all necessary precautions to screen and protect relevant areas from the residents.

All opened up areas are to be reinstated by the contractor to suit their original appearance following inspection by the structural engineer.

Additional opening up may be required following the results of the opening up shown in this drawing.

LEGEND

TP-1 Trial pit

Rev	Date	Description	Drawn	Check
P2	30.06.20	PRELIMINARY	ED	KC
P1	22.06.20	PRELIMINARY	ED	KC

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Project
Netley Cottage, 10 Lower Terrace, London

Title
Proposed trial pits

Drawing Status
PRELIMINARY

Project No
200302

Date
JUN 2020

Drawn
PM

Drawing No
SSK010

Scale
NTS

Engineer
KC

Revision
2

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Project: METLEY OTTAGE

Title: TP-1

Project No: 2050302

Sheet No:

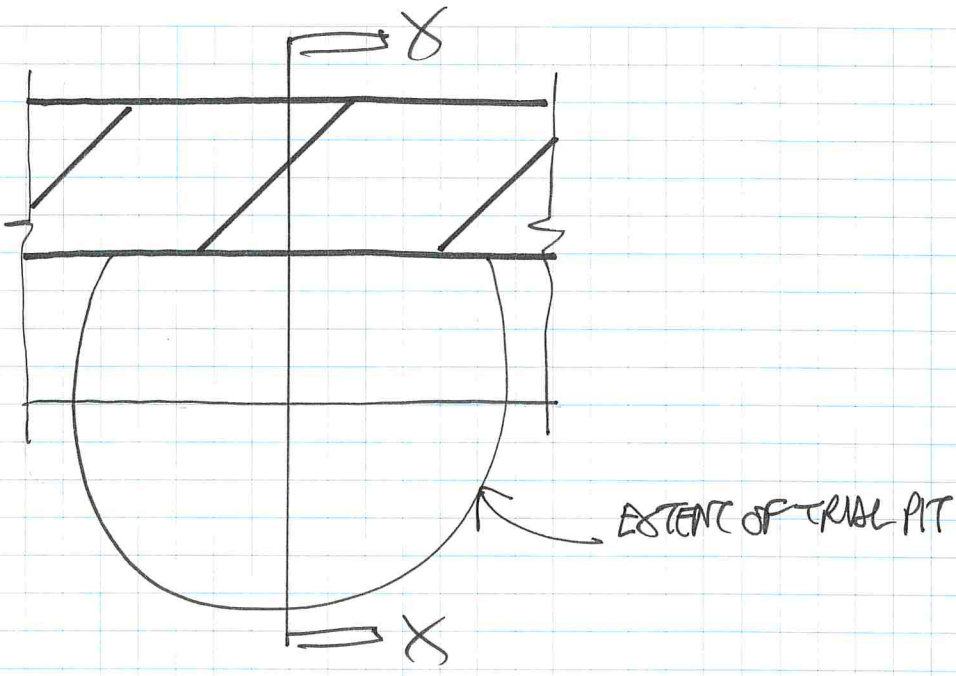
Date: JUN'20

Revision:

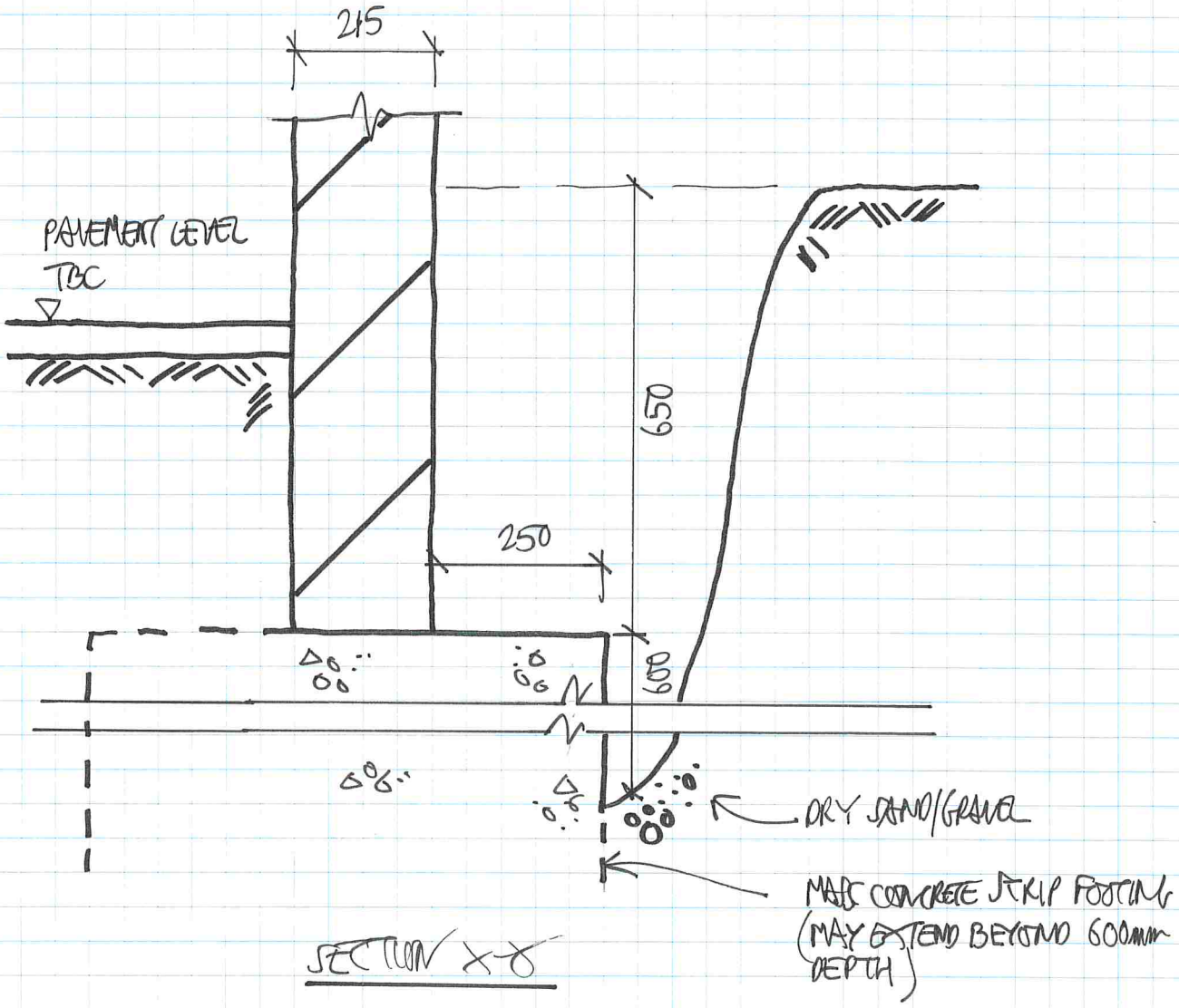
Engineer: KC

Checked:

Rev | Date | Description



PLAN



SECTION X-X

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Project
NETLEY COTTAGE

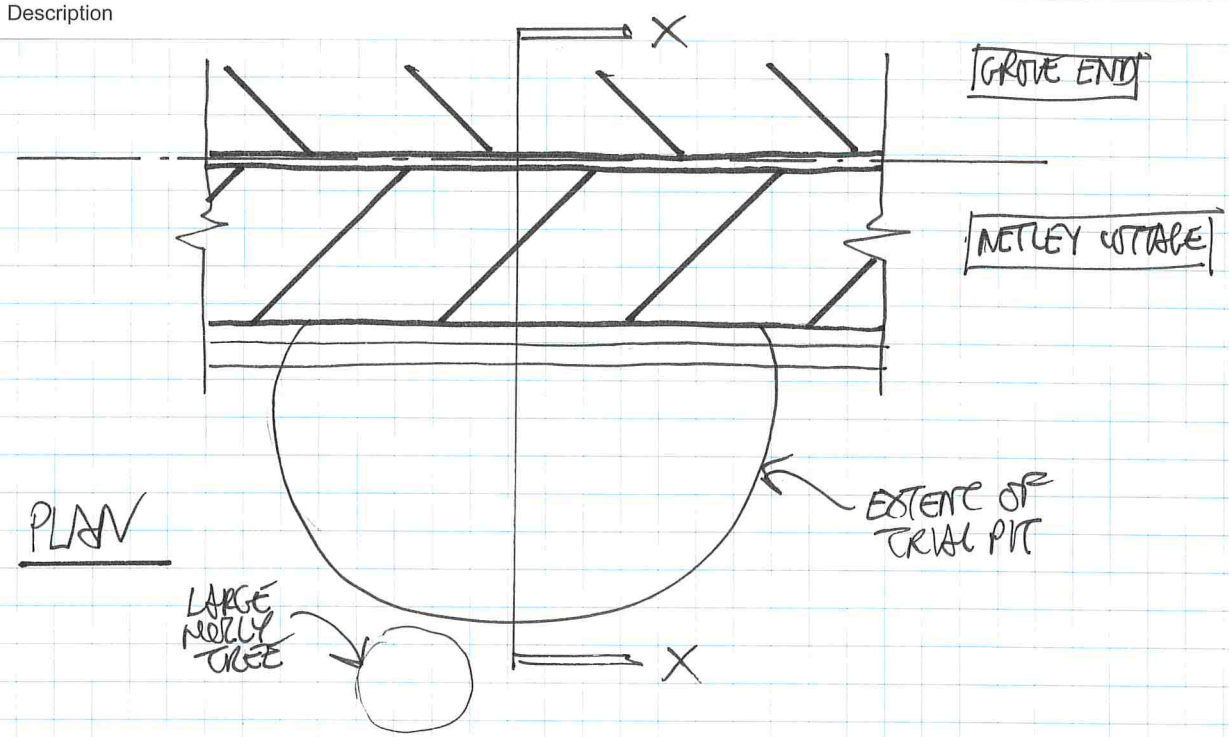
Title
TP-2

Project No 200302
Sheet No

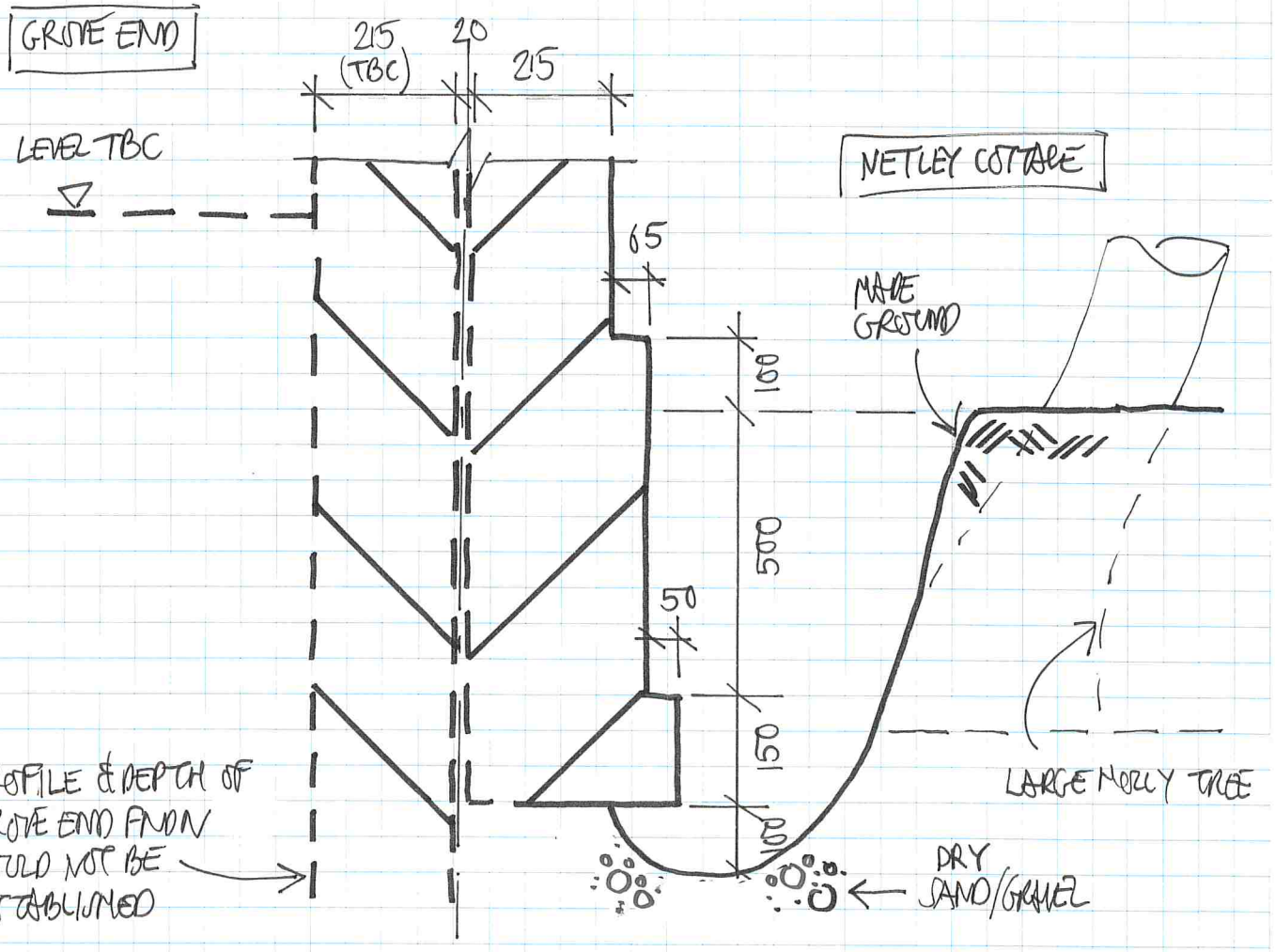
Date JUN'20
Revision

Engineer KC
Checked

Rev Date Description



PLAN



SECTION X-X

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Project: NETLEY COTTAGE

Title: TP-3

Project No: 200302

Sheet No:

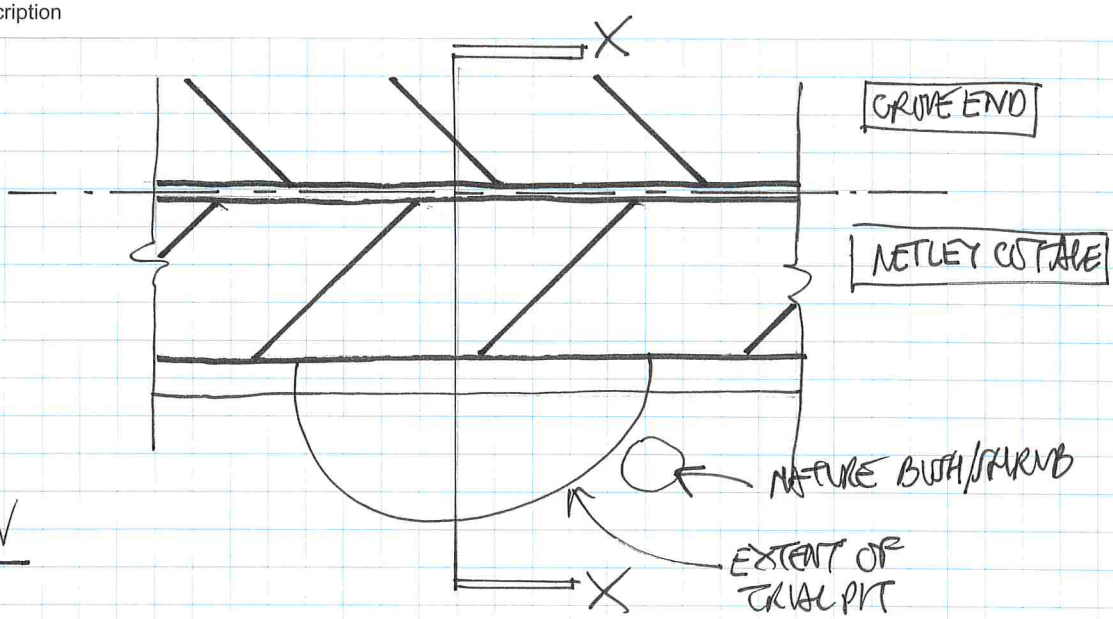
Date: JUN'20

Revision:

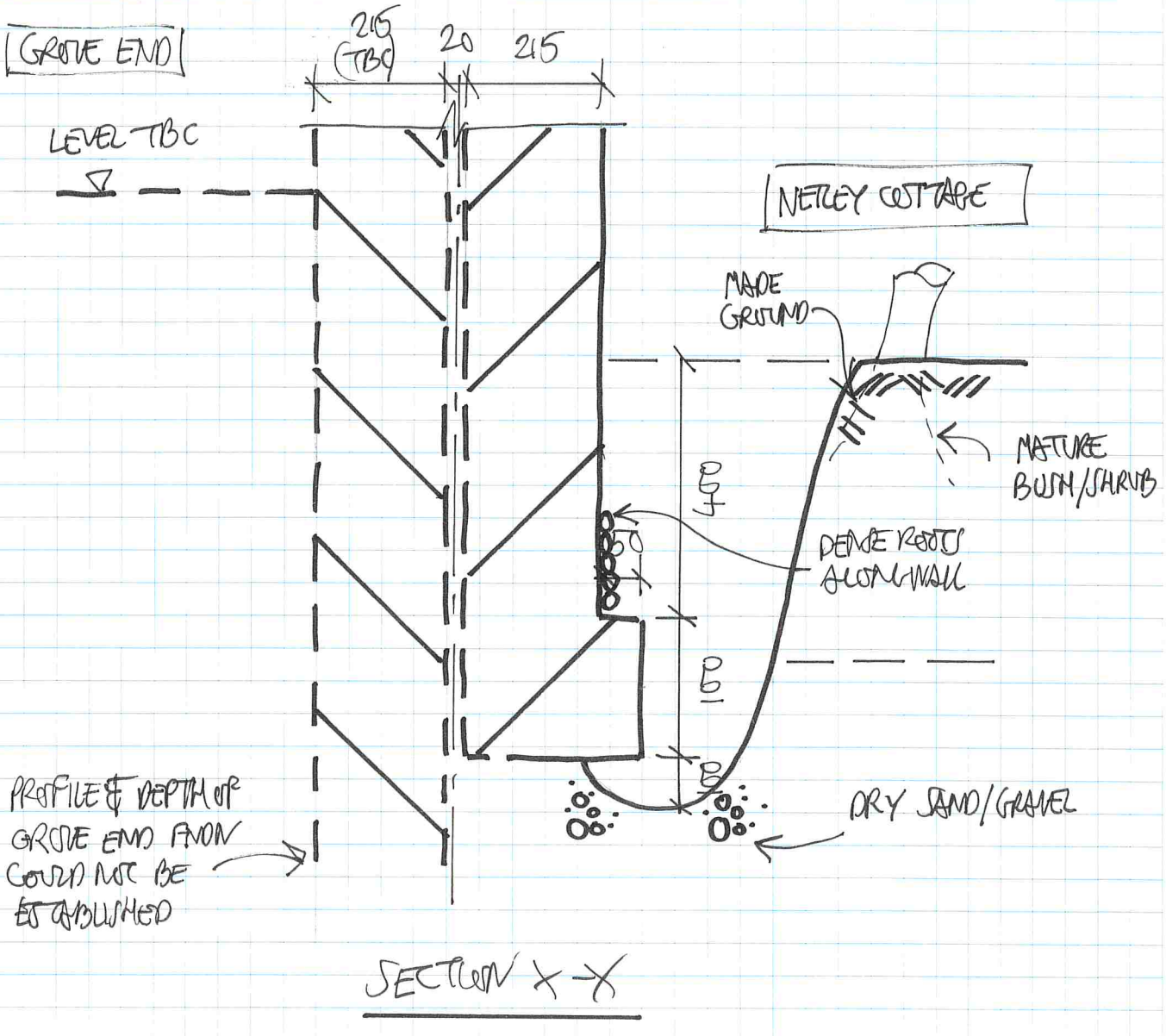
Engineer: KC

Checked:

Rev | Date | Description



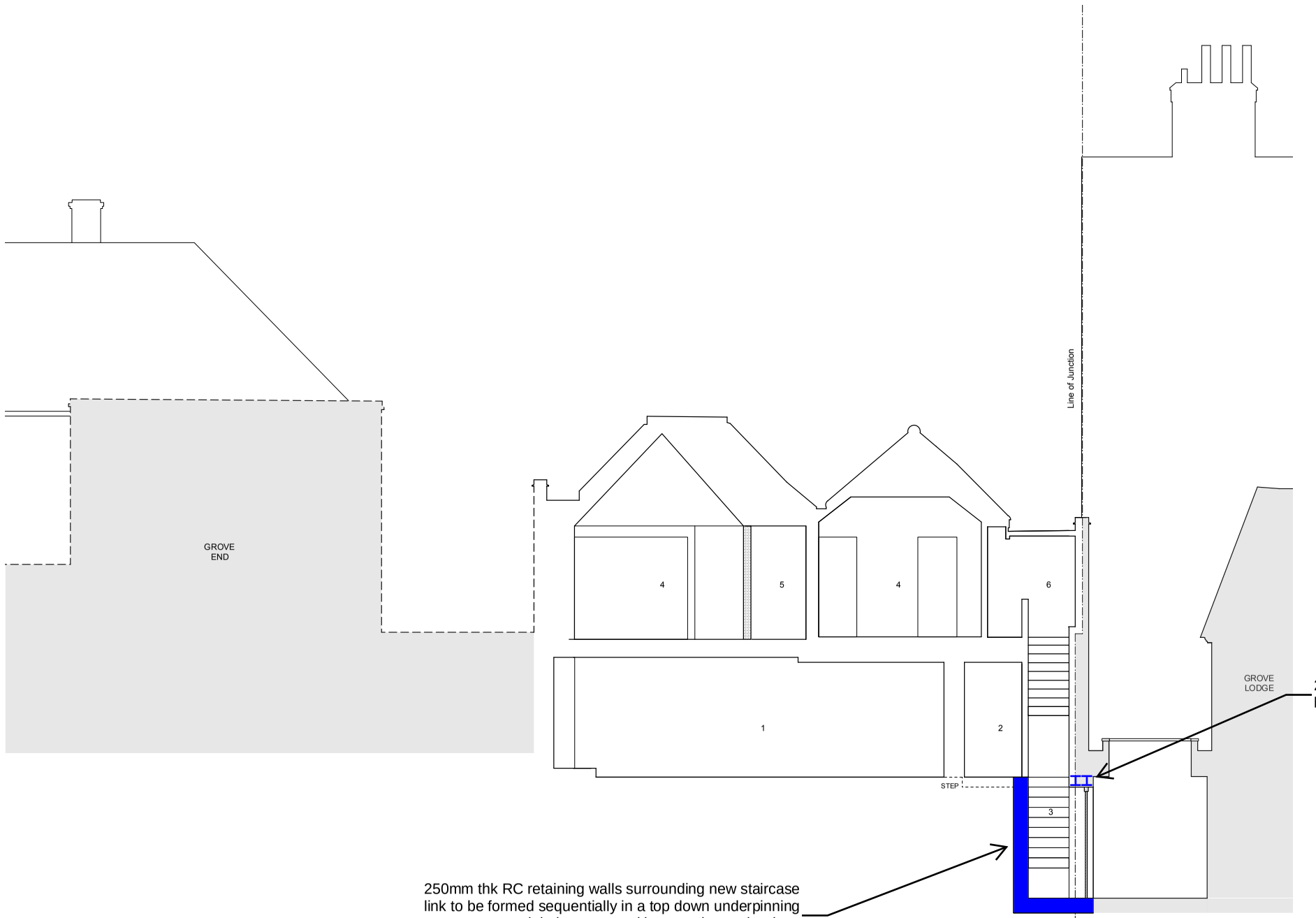
PLAN

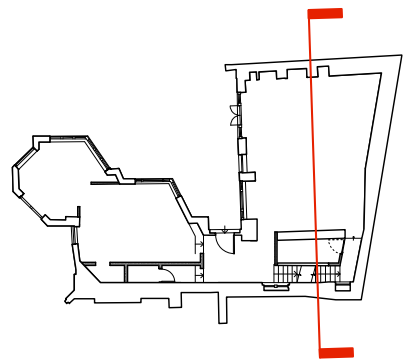


SECTION X-X

APPENDIX B PROPOSED STRUCTURAL ARRANGEMENT

This drawing must be read in conjunction with the specification and all other relevant drawings. Do not scale from this drawing.





Rev	Date	Description	Drawn	Check
P1	03.09.20	PRELIMINARY	ED	KC

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Project
Netley Cottage, 10 Lower Terrace, London

Title
Proposed cross section at staircase link

Drawing Status
PRELIMINARY

Project No
200302

Date
SEP 2020

Drawn
PM

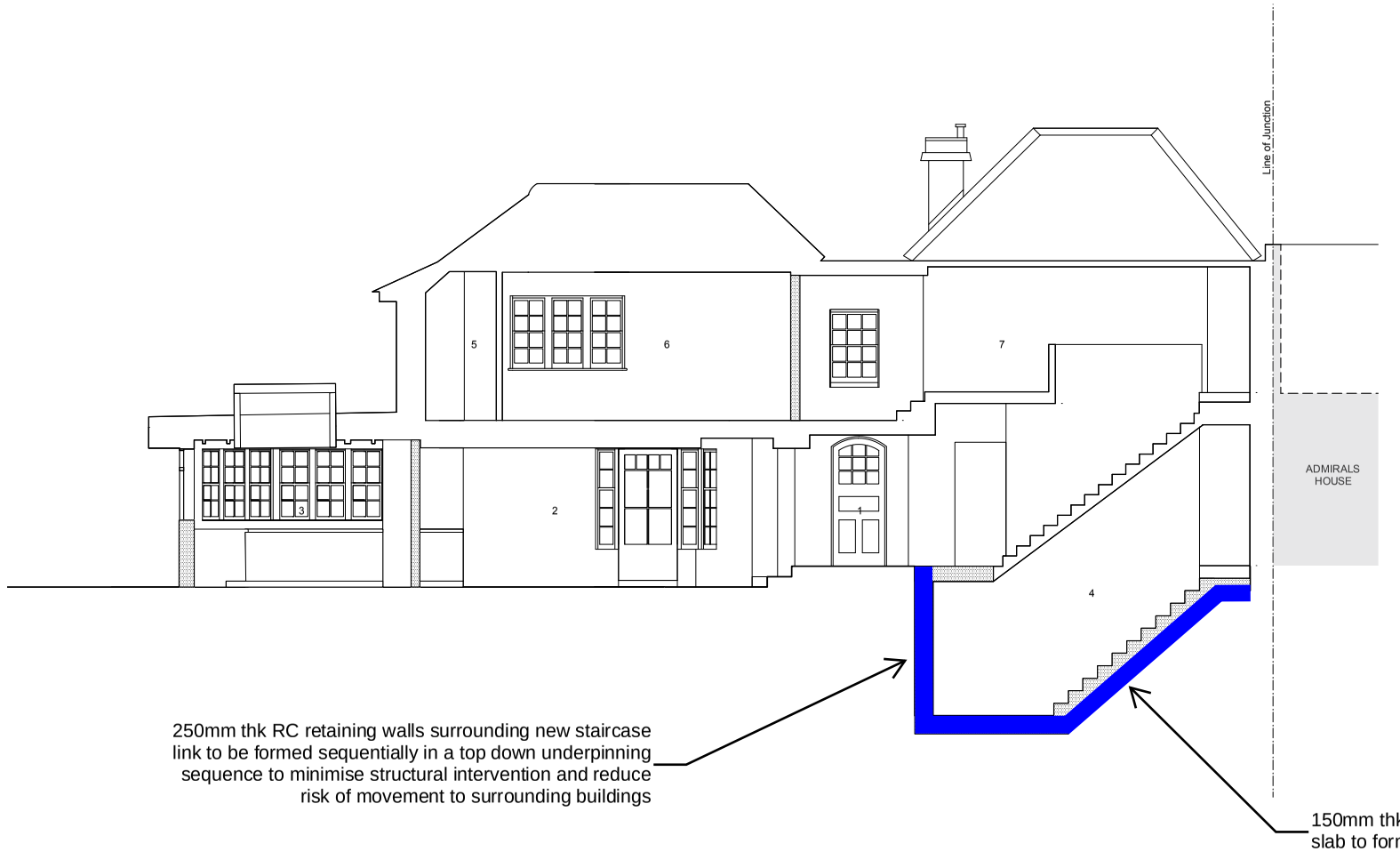
Drawing No
SS□200

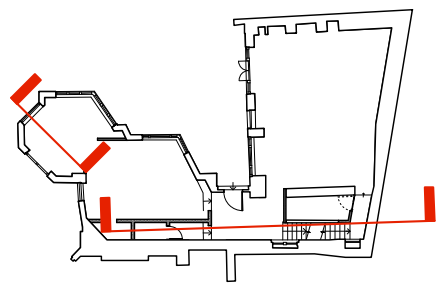
Scale
NTS

Engineer
KC

Revision
□**1**

This drawing must be read in conjunction with the specification and all other relevant drawings. Do not scale from this drawing.





Rev	Date	Description	Drawn	Check
P1	03.09.20	PRELIMINARY	ED	KC

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Project
Netley Cottage, 10 Lower Terrace, London

Title
Proposed long section at staircase link

Drawing Status
PRELIMINARY

Project No
200302

Date
SEP 2020

Drawn
PM

Drawing No
SS□201

Scale
NTS

Engineer
KC

Revision
□**1**

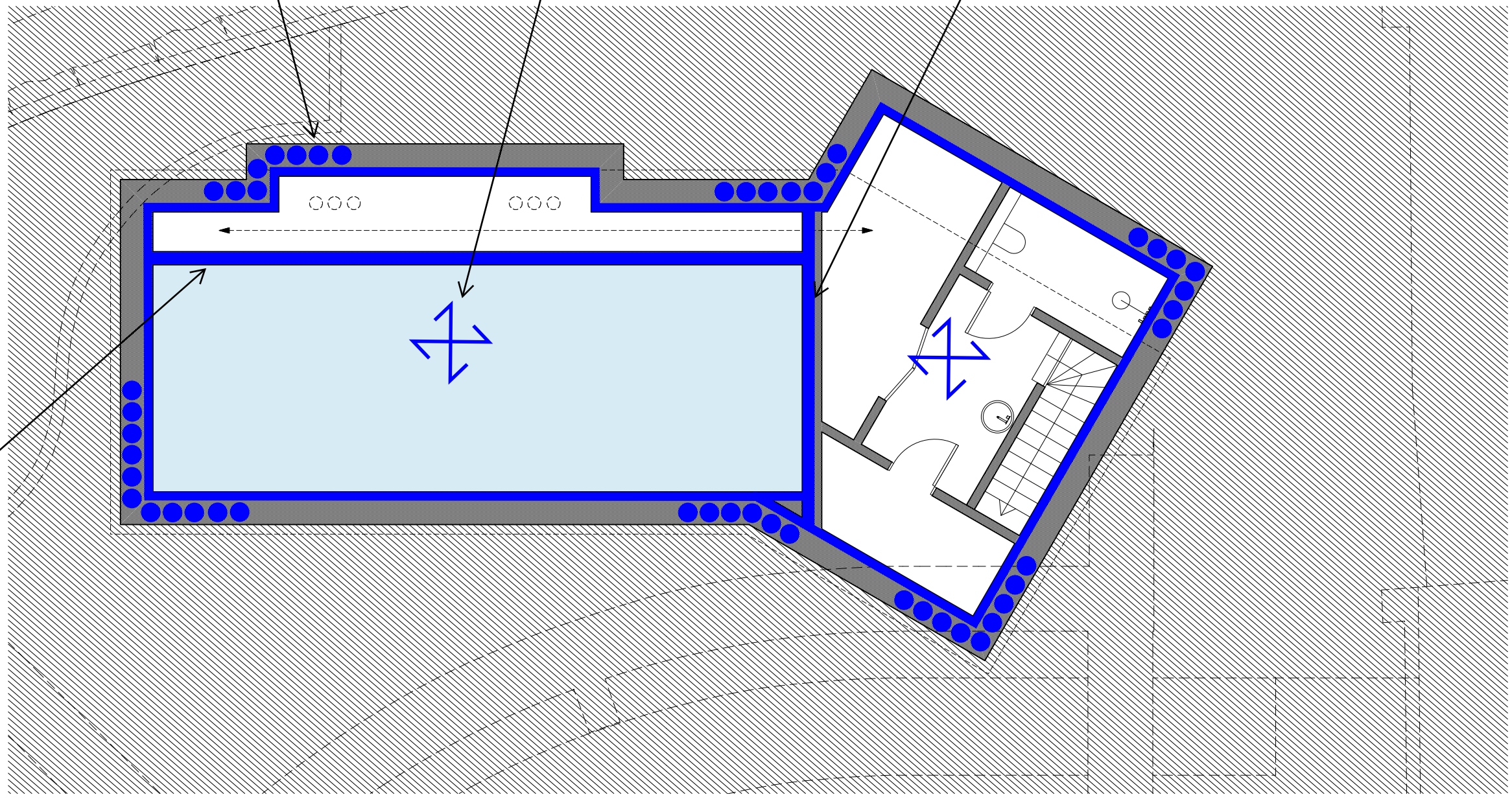
This drawing must be read in conjunction with the specification and all other relevant drawings. Do not scale from this drawing.

350mm diameter contiguous piled wall to entire perimeter of pool with 150mm thk RC liner wall cast against internal face of piles. Allow for 50mm zone between piles and liner wall for pile verticality tolerance. All RC walls will be designed to minimum crack width requirements in accordance with BS 8500. All piles will terminate 1m below formation level (approximately 4m below existing ground level) within the Bagshot sand stratum, at a depth approximately 1m above measured groundwater level.

350mm thk suspended RC slab basement area on proprietary anti-heave layer

250mm thk RC wall. All RC walls will be designed to minimum crack width requirements in accordance with BS 8500

250mm thk RC wall. All RC walls will be designed to minimum crack width requirements in accordance with BS 8500



Rev	Date	Description	Drawn	Check
P1	04.08.20	PRELIMINARY	ED	KC

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Project
Netley Cottage, 10 Lower Terrace, London

Title
Proposed basement plan

Drawing Status
PRELIMINARY

Project No
200302

Date
AUG 2020

Drawn
PM

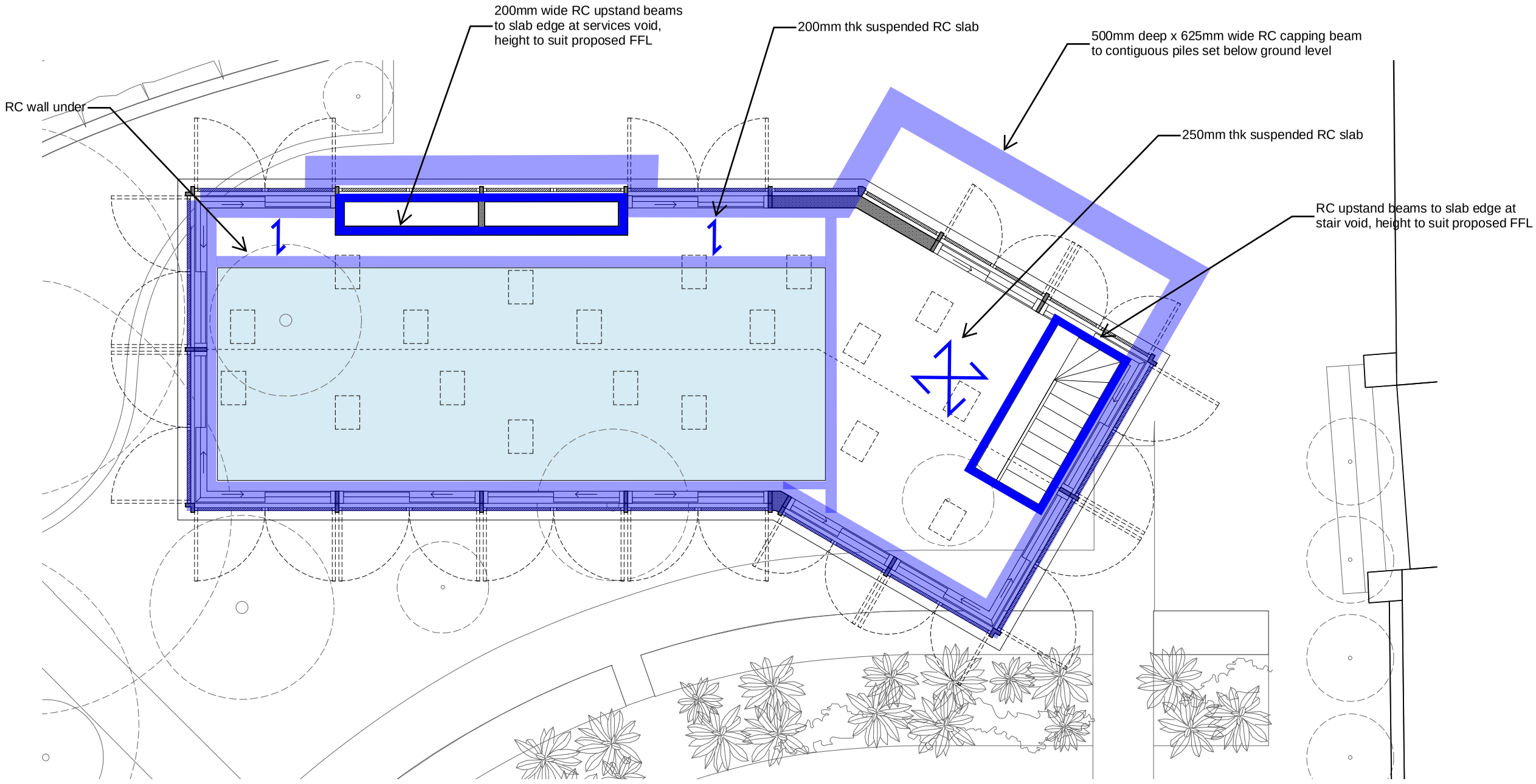
Drawing No
SS□100

Scale
NTS

Engineer
KC

Revision
□**1**

This drawing must be read in conjunction with the specification and all other relevant drawings. Do not scale from this drawing.



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Project
Netley Cottage, 10 Lower Terrace, London

Title
Proposed ground floor plan

Rev	Date	Description	Drawn	Check
P1	04.08.20	PRELIMINARY	ED	KC

Drawing Status: PRELIMINARY
Project No: 200302
Date: AUG 2020
Drawn: PM
Drawing No: SS□101
Scale: NTS
Engineer: KC
Revision: □1

APPENDIX C PROPOSED CONSTRUCTION SEQUENCE

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Project: METLEY COURSE, LONDON

Title: SWIMMING POOL - PROPOSED CONSTRUCTION SEQUENCE

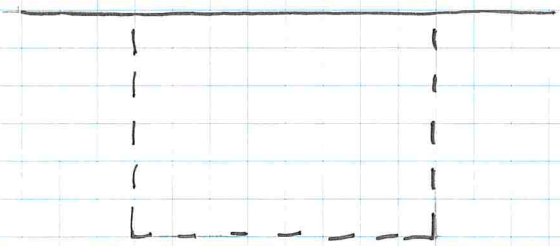
Project No | Sheet No

Date | Revision

Engineer | Checked

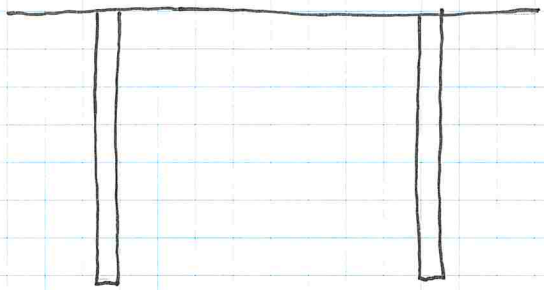
Rev | Date | Description

START



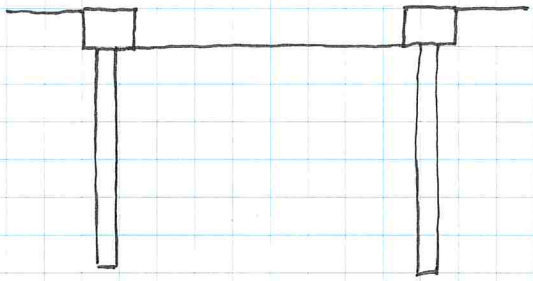
SET OUT PROPOSED SUBSTRUCTURE TAKING DUE ACCOUNT OF ALL ADJACENT BUILDINGS, SERVICES, TREES & OTHER NECESSARY CONSIDERATIONS.

STAGE 2



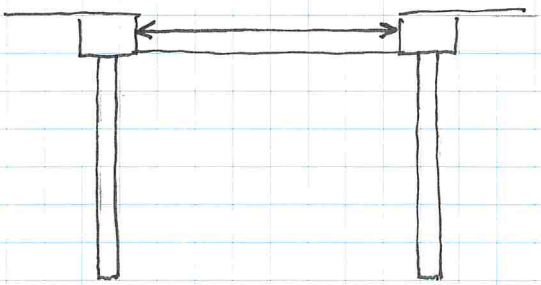
INSTALL CONTIGUOUS PILES TO POOL PERIMETER. LEAVE TO CURE.

STAGE 3



EXCAVATE TO 1m BELOW EXISTING GROUND LEVEL AND CAST RC CAPPING BEAMS TO PERIMETER. LEAVE RC TO CURE.

STAGE 4



INSTALL TEMPORARY PROPS BETWEEN CAPPING BEAMS

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Project: METLEY COTTAGE, LONDON

Title: SWIMMING POOL - PROPOSED CONSTRUCTION SEQUENCE

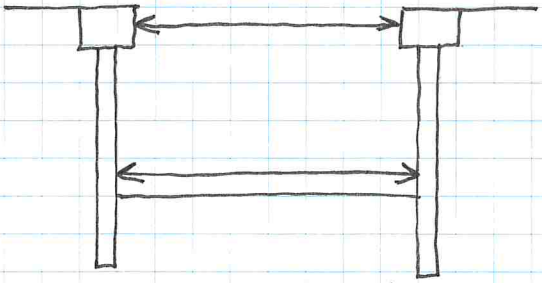
Project No | Sheet No

Date | Revision

Engineer | Checked

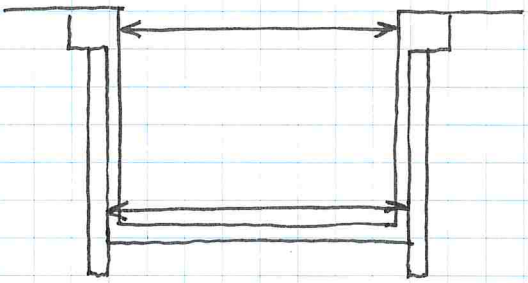
Rev | Date | Description

STAGE 5



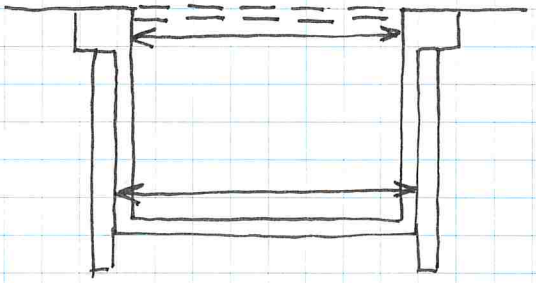
EXCAVATE TO 1m ABOVE FORMATION LEVEL AND INSTALL TEMPORARY PROPS BETWEEN PILES.

STAGE 6



CAST RC BASE SLAB AND LINER WALLS, LEAVING POCKETS AROUND PROP ENDS TO ALLOW REMOVAL ONCE CONCRETE HAS CURED. LEAVE CONCRETE TO CURE.

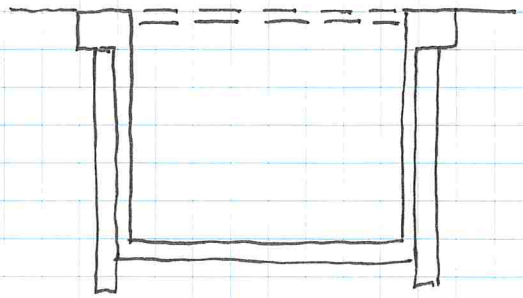
STAGE 7



CAST RC GROUND FLOOR SLAB WHERE REQUIRED, R/F RC UP STANDS.

LEAVE TO CURE.

STAGE 8



REMOVE PROPS AND MAKE GOOD POCKETS WITH RC FULLY BONDED INTO SURROUNDING RC LINER WALLS.

APPENDIX D PREDICTED GROUND MOVEMENT

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Project: NETLEY COFFERD, LONDON

Title: PREDICTED GROUND MOVEMENT

Project No | Sheet No

Date | Revision

Engineer | Checked

Rev | Date | Description

PREDICTED GROUND MOVEMENT

THE HEADS & BASES OF ALL PILES WILL BE PROPPED AT ALL TIMES DURING CONSTRUCTION, AND PILES WILL BE DESIGNED AS CANTILEVERS IN THE PERMANENT CONDITION WITH LATERAL MOVEMENT NO GREATER THAN A MAXIMUM OF 10mm.

DURING CONSTRUCTION EXCAVATION BELOW UNPROPPED PILE HEADS WILL BE NO MORE THAN 1m, THEREFORE GROUND MOVEMENT WILL BE NEGLIGIBLE (EQUIVALENT TO LESS THAN CATEGORY 1 ON THE BURLAND SCALE OF DAMAGE).

IN THE PERMANENT CONDITION: