



halsteadASSOCIATES

10-12 Bidwell Gardens

LONDON, N11

STRUCTURAL METHODOLOGY STATEMENT

**PREPARED FOR
Ms E Wibye**

Date: January 2024

**Ref: 18141
Prepared by: MM
Checked by: DO**

1 Athenaeum Road
Whetstone
London N20 9AA

t. 020 8445 7721
e. office@halsteads.co.uk
w. www.halsteads.co.uk

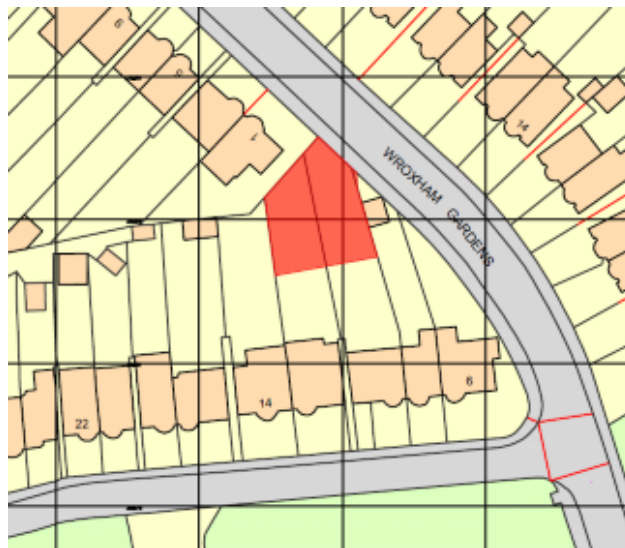
CONSULTING engineers
QUANTITY surveyors
PROJECT coordinators
CDM coordinators
Party Wall surveyor

Contents

1	BRIEF.....	3
2	SCREENING	4
3	SITE INVESTIGATIONS	6
4	BASEMENT FORMATION	9
5	GROUND MOVEMENT & PREDICTED DAMAGE CATEGORY	10
6	MONITORING.....	11
7	WATERPROOFING.....	14
8	PARTY WALLS.....	14
9	TEMPORARY WORKS	15
10	APPENDIX A	16

1 BRIEF

- 1.1 The Structural Engineering design brief was to produce a structural methodology for the construction of a new two storey property including a single storey basement to approximately 3.00m depth below ground level at land to rear of 10-12 Bidwell Gardens, London N11 2AX. The site is situated in Haringey, in north London. It is immediately bound by Wroxham Gardens to the northeast and residential properties to all other directions. The site is roughly pentagonal in shape covers an approximate area of 0.04 Hectares with the general area being under the authority of the London Borough of Haringey. The site mostly comprised undeveloped land which is currently not in use. A derelict greenhouse is located in the north of the site and the majority of the site covering is soft-landscaped and with a gently slope from north to south. The nearby surrounding areas to the site are residential in all directions.



(Figure 1: Showing site location plan).

1.2 This Report is to be read in conjunction with Halstead Associates Drawings:

- No. 18141-PL01, PL02 & PL03

1.3 This report is also to be read in conjunction with Site Analytical Services Ltd:

- Site Investigation, ref: 20/32436-1
- Basement impact assessment, ref: 20/32436-2
- Report on phase 1 preliminary risk assessment, ref: 20/32436

2 SCREENING

2.1 Structural Stability Screening Assessment

I.	Does the proposed basement involve underpinning of an existing building?	No
II.	Does the proposed basement extend lower than the party fence structure to the right?	Yes
III.	Does the proposed basement extend lower than the building structure to the left?	Yes
IV.	Does the proposed basement extend below the Party Wall footing level to the right?	N/A
V.	Does the proposed basement extend lower than the building structure to the left?	Yes
VI.	Does the proposed basement undermine the public highway?	No

2.2 Potential issues, impacts and actions.

Subterranean (Groundwater Flow)

Potential Issue (Screening Question)		Potential impacts and actions
1b	Will the proposed basement extend beneath the water table surface?	Potential impact: Local restriction of groundwater flows (perched groundwater or below groundwater table). Action: Ground investigation required, then review.

Slope Stability

5	Is the London Clay the shallowest strata at the site?	Potential impact: The London Clay is prone to seasonal shrink-swell (subsidence and heave). Action: Ground investigation required, then review.
7	Is there a history of seasonal shrink-swell subsidence in the local area and/or evidence of such effects at the site?	Potential impact: Ground movements will occur during and after the basement construction. Action: Ground investigation required, then review.
11	Is the site within 5m of a highway or a pedestrian right of way?	Potential impact: Excavation of basement causes loss of support to footway/highway and damage to the services beneath them. Action: Ensure adequate temporary and permanent support by use of best practice working methods.
12	Will the proposed basement substantially increase the differential depth of foundations relative to neighbouring properties?	Potential impact: Loss of support to the ground beneath the foundations to the surrounding properties if basement excavations are inadequately supported. Action: Ensure adequate temporary and permanent support by use of best practice methods.

Surface Water and Flooding

2	Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas.	Potential impact: May increase flow rates to sewer, and thus increase the risk of flooding Action: Assess net change in hard surfaced/paved areas and, if required, recommend appropriate types of SUDS for use as site-specific mitigation.
---	--	--

(Figure 2: Showing potential issues, impacts and actions).

3 SITE INVESTIGATIONS

- 3.1 A basement impact assessment, a preliminary risk assessment and a site investigation was carried out in August and September 2020 by Site Analytical Service Ltd. Which include historical Borehole from BGS archive, located 540m to south-west of the site at Muswell Hill Golf Club and shows 16.0m of grey and brown clay over 18.0m of brown clay over 13.0m of grey, blue clay mudstone over 7.0m of hard grey silty clay over 11.5m of red green clay over chalk and flints to 120.0m. The records of the British Geological Survey indicate the following:

Ground Stability Hazard	Risk Assessment
Collapsible Ground	Very Low
Compressible Ground	No Hazard
Ground Dissolution	No Hazard
Landslide	Very Low
Running Sand	Very Low
Shrinking or Swelling Clay	Moderate
Coal Mining	Not Affected

(Figure.3: Showing BGS records).

- 3.2 Summary of potential environmental receptors indicated below:

Receptor Type	Receptor(s)	Sensitivity	Comments
Groundwater/ Water Abstraction	Unproductive Aquifer	Low	Due to the presence of an Unproductive Aquifer beneath the site, the risk is low.
Surface Water	Pond 195m N	High	Due to the distance from the site, the risk is deemed high.
Flooding	The Site	Low	Due to there being no zones of extreme flooding or flooding from rivers or sea without defence within 1km of the site, the risk can be deemed as low.
Sensitive Land	Nitrate Vulnerable Zone, 99m NE Local Nature Reserve, 651m S	Low	There are 2 sensitive land uses within 1km of the site. Due to the nature of the Nitrate Vulnerable Zone and the distance of the Local Nature Reserve from the site, the risk from contamination on-site can be deemed low.

(Figure 4: Showing potential environmental receptors).

3.3 Ground conditions revealed by the investigation are summarised below:

Strata	Depth to top of strata (mbgl)	Depth to base of strata (mbgl)	Description
Made Ground	0.00	0.60	Brown silty sandy clay (Topsoil) containing occasional brick fragments.
London Clay	0.60	12.00 (Base of BH1)	Firm becoming stiff silty sandy clay containing partings of silty fine sand and occasional gypsum crystals.

(Figure 5: Showing SI findings).

3.4 Allowable net bearing pressure of approximately 90kN/mm² at 3m depth in order to allow for a factor of safety of 2.5 against general shear failure.

3.5 Monitoring of groundwater levels during the geotechnical investigation found no groundwater within the depth of the expected excavation for the basement. It is not, therefore, expected that water ingress during excavation of the basement will be an issue and that the works will remain essentially dry. Furthermore it is not expected that there will be any sub-surface water flows of note which will affect the short term stability of any open excavation elements of the works.

Structural Methodology Statement - 10-12 Bidwell Gardens, LONDON, N11 2AX

Site Analytical Services Ltd.							Site	Borehole Number	
Boring Method ROTARY PERCUSSIVE		Casing Diameter		Ground Level (mOD)		Client ELENA CRISTOU	Job Number 2032436		
		Location		Dates					
		TQ295910		27/08/2020		Engineer HALSTEAD ASSOCIATES	Sheet 1/2		
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	
0.25	D1	DRY		1, 1/2, 1, 2, 2		(0.20)	MADE GROUND: Topsoil containing occasional brick fragments		
0.50	D2					(0.40)	MADE GROUND: Dark brown silty sandy clay		
0.75	D3					0.60	Firm, brown silty sandy CLAY		
1.00	D4								
1.20-1.65	SPT(C) N=7								
1.20	D5								
1.85	D6	DRY		40 blows		(3.90)			
2.00-2.45	D6 U1								
2.75	D7								
3.00-3.45	SPT N=10								
3.00	D8								
3.75	D9	DRY		55 blows		4.50			
4.00-4.45	U2								
4.75	D10								
5.00-5.45	SPT N=13								
5.00	D11								
6.00	D12	DRY		75 blows		(5.50)			
6.50-6.95	U3								
7.50	D13								
8.00-8.45	SPT N=18								
8.00	D14								
9.00	D15	DRY		100 blows					
9.50-9.95	U4								
Remarks D= Disturbed Sample U= Undisturbed 100mm Diameter Sample C= Dynamic Penetration Test - Cone S= Standard Penetration Test - Cone Groundwater was not encountered during boring/excavation Excavating from 0.00m to 1.00m for 1 hour.								Scale (approx) 1:50 Logged By EW	
								Figure No. 2032436.BH1	

Produced by the GEOtechnical Database System (GEODASY) (C) all rights reserved

4 **BASEMENT FORMATION**

- 4.1 Several methods of retaining wall construction can be considered. Contiguous pile walls consisting of piles arranged in line with a typical gap in between can be cast to enable the retaining structure construction and form the proposed basement. This method will be ideal as the excavation will not compromise the integrity of adjacent structures, in particular the garage to No.8 Bidwell Gardens, and will allow easier work in open excavation.

Retaining wall design parameters to be used below:

Stratum	Depth to top (m)	Bulk Density (Mg/m ³) (γ)	Effective Angle of Internal Friction (Φ)
London Clay Formation	0.60	2.00	21

(Figure 5: Showing retaining wall design parameters).

- 4.2 At an approximate 3.00m depth down to formation level, heave forces caused by the removal of overburden are expected to be significant and contractor should account for these upward ground movements such as providing heave protection measures to the floor slab. The actual amount of movement will depend upon a number of factors including the construction timetable, ultimate loads and critically the depth of the final excavation. Nevertheless, any theoretical heave pressures will be accounted for in the detailed design by the inclusion of anti-heave boarding under the slab or alternatively by increasing the rebar in the top surface of the slab.
- 4.3 It is considered that any buried concrete at depth may be attacked by sulphates and that it would be prudent to design any such concrete in accordance with full Class DS-2 conditions.
- 4.4 All inhabitable basements are to be afforded an appropriate level of protection against water and soil moisture that may also occur from other sources such as leaking drainage or water mains and ground water levels may vary seasonally or with changes in drainage.

- 4.5 The Contractor will provide a method statement prior to commencement of work on site in which full details of hours, site set up and method for the formation of the basement slab and reinforced concrete perimeter walls will be detailed.

5 GROUND MOVEMENT & PREDICTED DAMAGE CATEGORY

- 5.1 Any ground works pose an elevated risk to adjacent properties. But the proposed works are not undermining the adjacent property along the Party Wall line.
- 5.2 It is not expected that any cracking will occur during the works. However, there is a risk of movement to the neighbours.
- 5.3 The excavation and construction of the basement at the site has the potential to cause some movements in the surrounding ground if not properly managed. However, it is understood that ground movements and/or instability will be managed through the proper design and construction of mitigation measures during the works..
- 5.4 To reduce the risk to the development:
- Employ a reputable firm for extensive knowledge of basement works
 - Employ suitably qualified Consultants
 - Design the contiguous piles to retain the soil and any surcharge loads during construction and forming of the basement
 - Provide method statements for the Contractors to follow

6 MONITORING

6.1 In order to safeguard the existing structures during underpinning and new basement construction movement monitoring is to be undertaken.

Monitoring Level Proposed	Type of Works
Monitoring 1 Visual inspection and production of condition survey by Party Wall Surveyors at the beginning of the works and also at the end of the works.	Loft conversion, cross wall removals, insertion of padstones Survey of LUL and Network Rail tunnels. Mass concrete, reinforced and piled foundations to new build properties.
Monitoring 2 Visual inspection and production of condition survey by Party Wall Surveyors at the beginning of the works and also at the end of the works. Visual inspection of existing Part Wall during the works. Inspection of the footing to ensure that the footings are stable and adequate.	Removal of lateral stability and insertion of new stability frames. Removal of main masonry load bearing walls. Underpinning works less than 1.2m deep.
Monitoring 3 Visual inspection and production of condition survey by Part Wall Surveyors at the beginning of the works and also at the end of the works. Visual inspection of existing Party Wall during the works. Inspection of the footing to ensure that the footings are stable and adequate. Vertical monitoring movement by standard optical equipment.	Lowering of existing basement and cellars more than 2.5m. Underpinning works less than 3.0m deep in clays. Basements up to 2.5m deep in clays.

Monitoring 4 Visual inspection of production of condition survey by Party Wall Surveyors at the beginning of the works and also at the end of the works. Visual inspection of existing Party Wall during the works. Inspection of the footing to ensure that the footings are stable and adequate. Vertical monitoring movement by standard optical equipment. Lateral movement between walls by laser measurements.	New basements greater than 2.5m and shallower than 4m deep in gravels. Basements up to 4.5m deep in clays. Underpinning works to Grade I Listed Building.
Monitoring 5 Visual inspection of production of condition survey by Party Wall Surveyors at the beginning of the works and also at the end of the works. Visual inspection of existing Party Wall during the works. Inspection of the footing to ensure that the footings are stable and adequate. Vertical & lateral monitoring movement by theodolite at specific times during the project.	Underpinning works to Grade I Listing Building. Basements to Listed Building. Basements deeper than 4m in gravels. Basements deeper than 4.5m in clays. Underpinning basements to buildings that are expressing defects.
Monitoring 6 Visual inspection of production of condition survey by Party Wall Surveyors at the beginning of the works and also at the end of the works. Visual inspection of existing Party Wall during the works.	Double storey basements supported by piled retaining walls in gravels and soft sands (N<12).

Inspection of the footing to ensure that the footings are stable and adequate. Vertical & lateral monitoring movement by electronic means with live data gathering. Weekly interpretation.	
Monitoring 7 Visual inspection of production of condition survey by Party Wall Surveyors at the beginning of the works and also at the end of the works. Visual inspection of existing Party Wall during the works. Inspection of the footing to ensure that the footings are stable and adequate. Vertical & lateral monitoring movement by electronic means with live data transfer.	Larger multi-storey basements on particular projects.
Monitoring Conclusion	
Monitoring Level	Type of Works
Monitoring 2 • Visual inspection and production of condition survey by Party Wall Surveyors at the beginning of the works and also at the end of the works. • Visual inspection of existing Part Wall during the works. • Inspection of the footing to ensure that the footings are stable and adequate.	➤ Removal of lateral stability and insertion of new stability frames. ➤ Removal of main masonry load bearing walls. ➤ Underpinning works less than 1.2mm deep.

7 WATERPROOFING

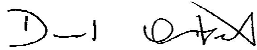
- 7.1 As this form of construction will not allow external damp proofing systems to be employed, it is envisaged that waterproof concrete will be used, in combination with a proprietary drained cavity system to line the external face of the retaining wall and slab. Any inflow of ground water which may result would then be directed to an internal sump and then pumped as necessary into the surface water system.

8 PARTY WALLS

- 8.1 Given the proximity of adjacent buildings, Party Wall Agreements will be required with neighbouring home owners, because houses lie within a defined space around the proposed building works. The party wall process should be followed and adhered to during this development.

9 TEMPORARY WORKS

- 9.1 A competent Contractor, experienced in this form of residential basement construction must be used, and a Temporary Works Coordinator should be employed to ensure that the stability of the ground and adjoining buildings is maintained throughout the construction process.
- 9.2 The contiguous piles will act as the temporary works retaining the soil during construction of the basement. This is a specialist activity and detailed design would be provided by a specialist piling contractor.
- 9.3 It will be the responsibility of the Contractor and Temporary Works co-ordinator to provide detailed proposals for the methodology for the Structural Engineer and design team to review.



.....

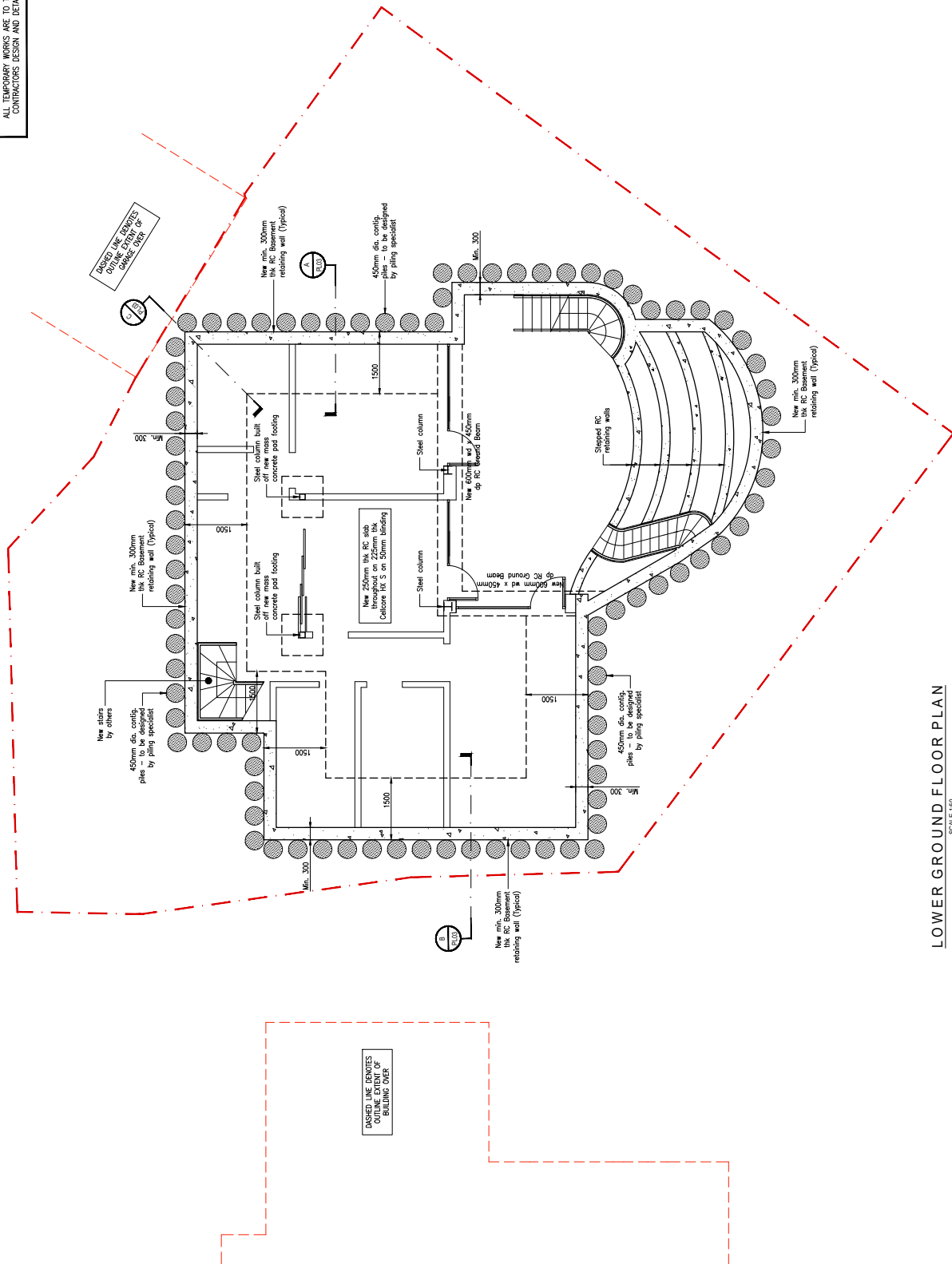
David Oates CEng BEng (Hons) MStructE

APPENDIX A

Halstead Associates Drawing No:

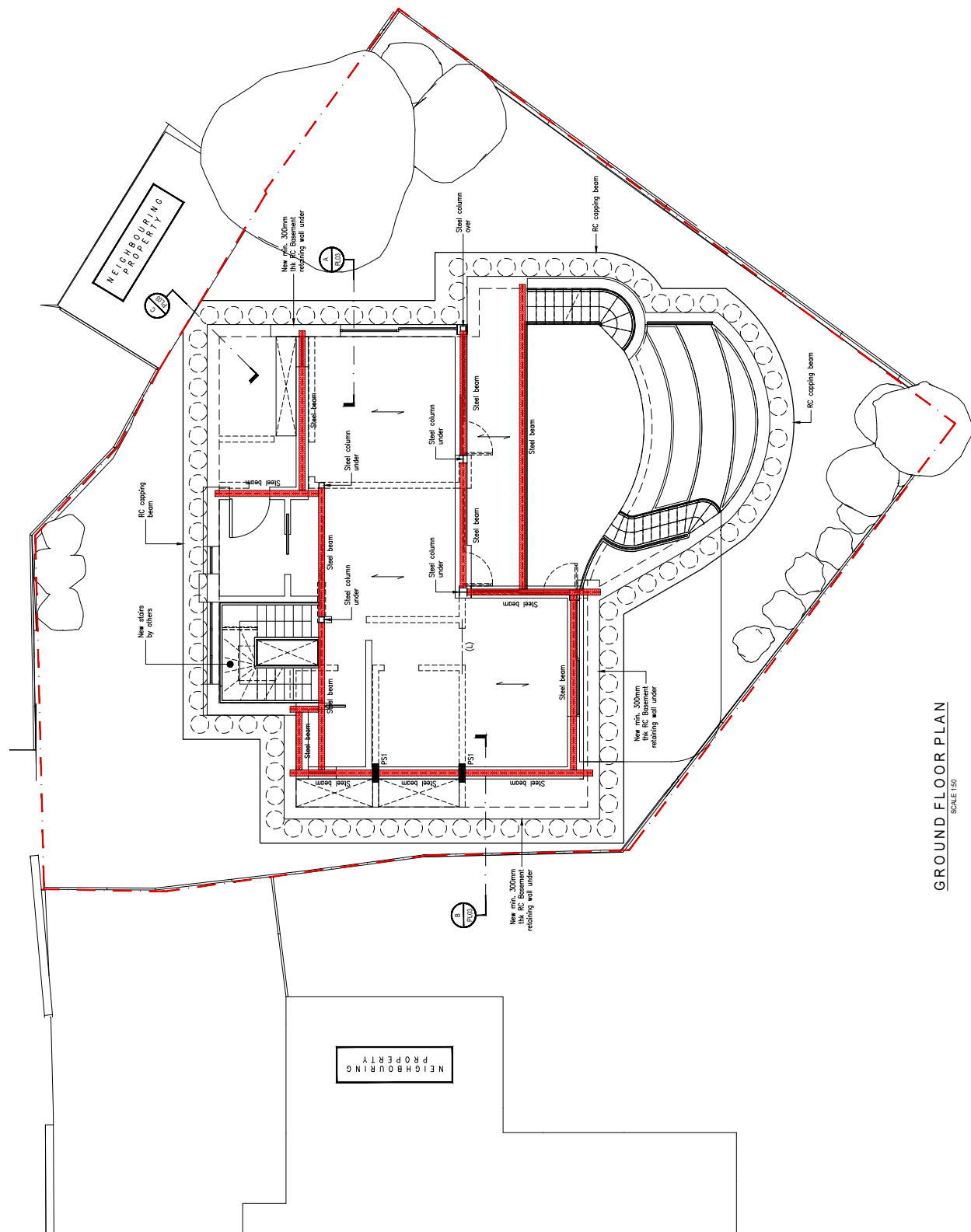
- No. 18141-PL01
- No. 18141- PL02
- No. 18141-PL03

ALL LOWER GROUND REINFORCED CONCRETE IS TO BE WATERPROOF BY 'CEMENTAID' OR SIMILAR



LOWER GROUND FLOOR PLAN

[illegible]



GROUND FLOOR PLAN
SCALE 1/50

[illegible]

SCALE 1:21

SCALE 1:25

SCALE 1:2

[illegible]