

32 Stafford Road HA4 6PJ  
**Structural Survey / Basement Impact Assessment– Rev**  
Rev 02

Authored By: Janaka Solanga CEng MICE  
Date: Nov 2023

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## 1. Introduction/Executive Summary

This document proposal prepared as a supporting document to the planning application for the proposed Installation of new under garden basement with skylights and extended patio area the main house at 32 Stafford Road, Ruislip, HA4 6PJ.

This document produced to satisfy the requirements set out by The London Borough of Hillingdon local planning validation checklist.

This report presents the principles of the proposed structural basement scheme and sequencing along with the illustrations of techniques to be used.

The structural proposal includes a shallow basement with shallow foundations as illustrated in the figure 1 below. It is not expected that the damage category 1 on Burland scale (or Category 0 to 1, table 2.5 of the CIRIA report C580) will be exceeding on any surrounding building

A site investigation has been conducted including trial pits and to assess the groundwater condition to verify the suitability of the proposed construction method.

The proposed lower ground floor extension is above the ground water table. As per the relevant design guidelines the lower ground floor has been designed to withstand an emergency flooding scenario assuming that the water levels would reach the ground floor level. The lower ground floor waterproofing to be detailed by a specialist waterproofing company. The reinforced concrete basement box itself will provide additional protection in an unlikely event of water penetrating through the lower ground floor walls.

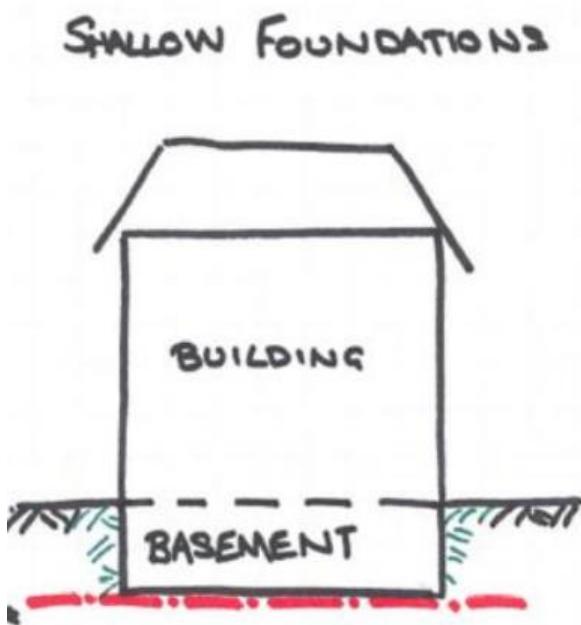


Figure 1: Basement with shallow foundation

## 2. Desk Study - Site and the Existing Building

The property is a end terraced property built between 1830-1949. The property is a cavity wall / filled cavity walls construction while the roof is pitched tiled roof. The property is not in a conservation area which is in the constituency of Uxbridge and South Ruislip.



Figure 2: Front view of the property

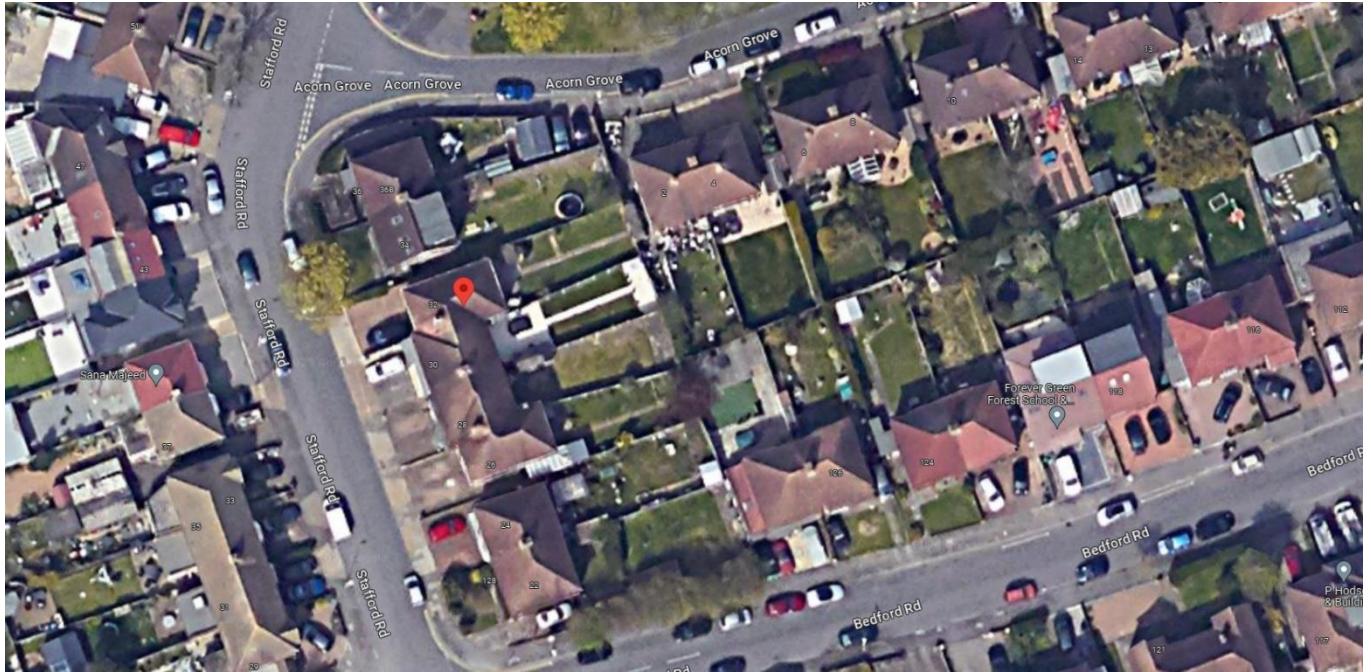


Figure 3: Location of the property

### 3. The proposed works, Existing Structures and the adjoining buildings and structures

Most of the front elevations of all the residential properties in the Stafford Road are generally much simpler frontages and most of just one material, pebble dashed front finish with timber sash windows and bay windows. For the most part, the rear elevations of properties in the Borough have had additions made over the years. Most commonly, loft conversions and single storey rear extensions.

The underground rail lines located approximately 400m from the proposed extension excavation and have no impact on the rail lines.

There are no underground utilities (except the combined sewer line of the property), rivers within the proximity those could be impacted by the excavation works.

As a principal requirement, the proposed works should not undermine the performance or risk of an unacceptable movement of adjacent structures, adjacent roads or buried services. The man stages where the requirements must be considered during demolition, excavation and transferring the load between temporary and permanent supports.

Although the excavation works reduces the vertical stress in the ground below, considering the depth of the London Clay and considering the very small area / volume of excavation required, the expected heave of the clay is negligible, and it is highly unlikely that this negligible heave would cause any impact on to the neighbouring properties. Movements to be monitored during the construction phase and actions and action plan to be implemented as described later in this document.

The expected movements are very minor could be classified as damage category 0 to 1 as per table 2.5 of the CIRIA report C580.

The proposed underpinning involves transferring the local foundation pressure to lower strata and could lead to some minor settlement. Some movement of the existing structure could also be caused by the sequential transfer of loads between different parts of the structure. The quality of the London Clay materials underlaying the building and careful control on underpinning sequence and the method will keep such movements to a practicable minimum. The work to be carried out in accordance with industry best practice and competent operatives to keep any movements to minimum. The expected damage

category would be very minor. (category 1 on Burland scale or Category 0 to 1, table 2.5 of the CIRIA report C580)

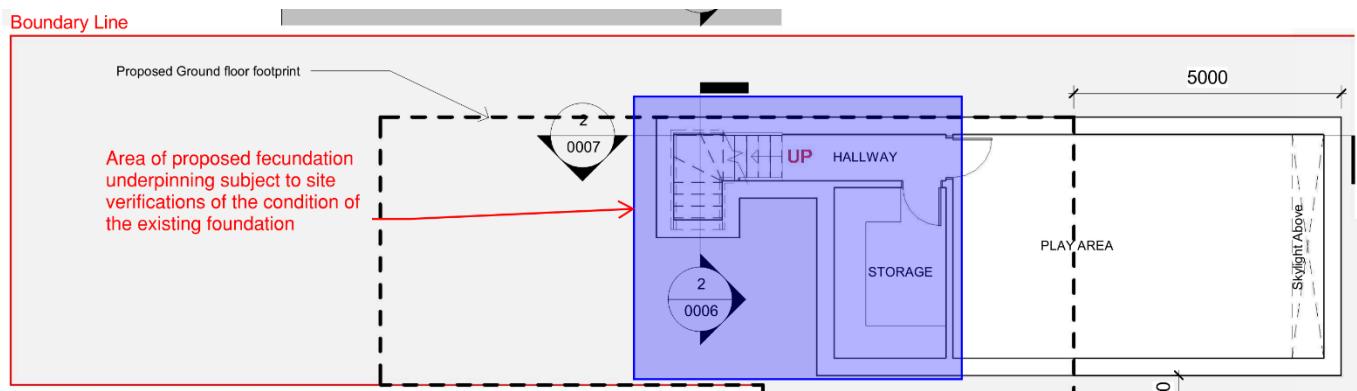


Figure 4 : Extent of the proposed underpinning



Figure 5 : Existing Rear View

### 3.1 Protected Trees within proximity

There are no trees with Tree Preservation order within the proximity to the proposed works. Refer to the Figure 6.

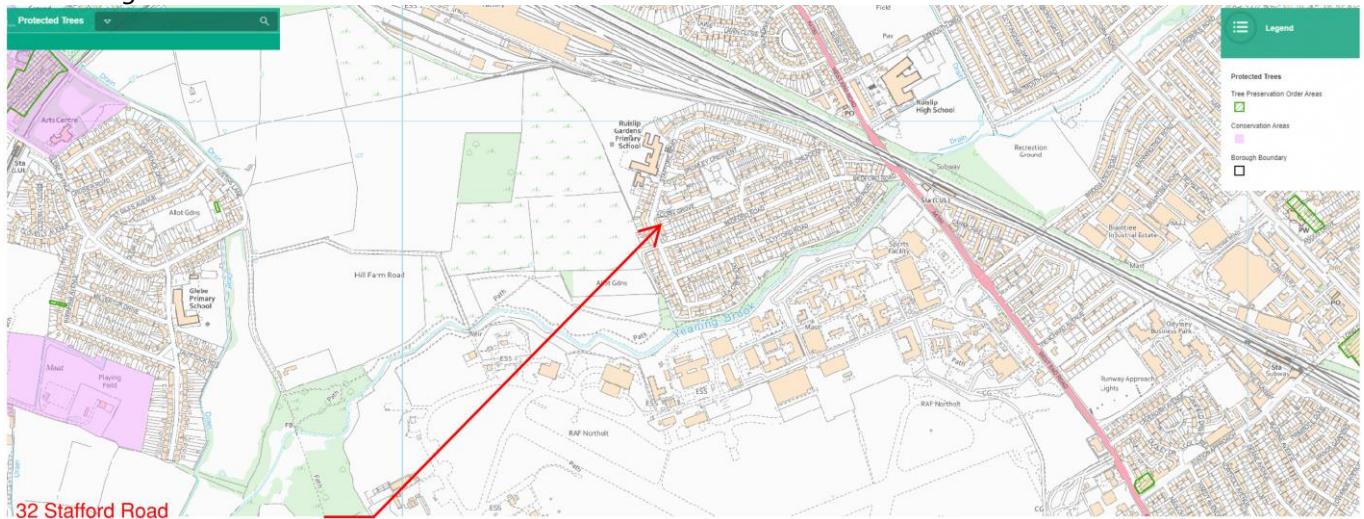


Figure 6 : Trees with TPO (Source: Council Website)

### 3.2 Bomb Sight Map

According to the bombsight.org, no high explosive bombs were stuck within the close proximity to Stafford Road, However Care must be taken when undertaking the excavation works for the lower ground floor extension works.

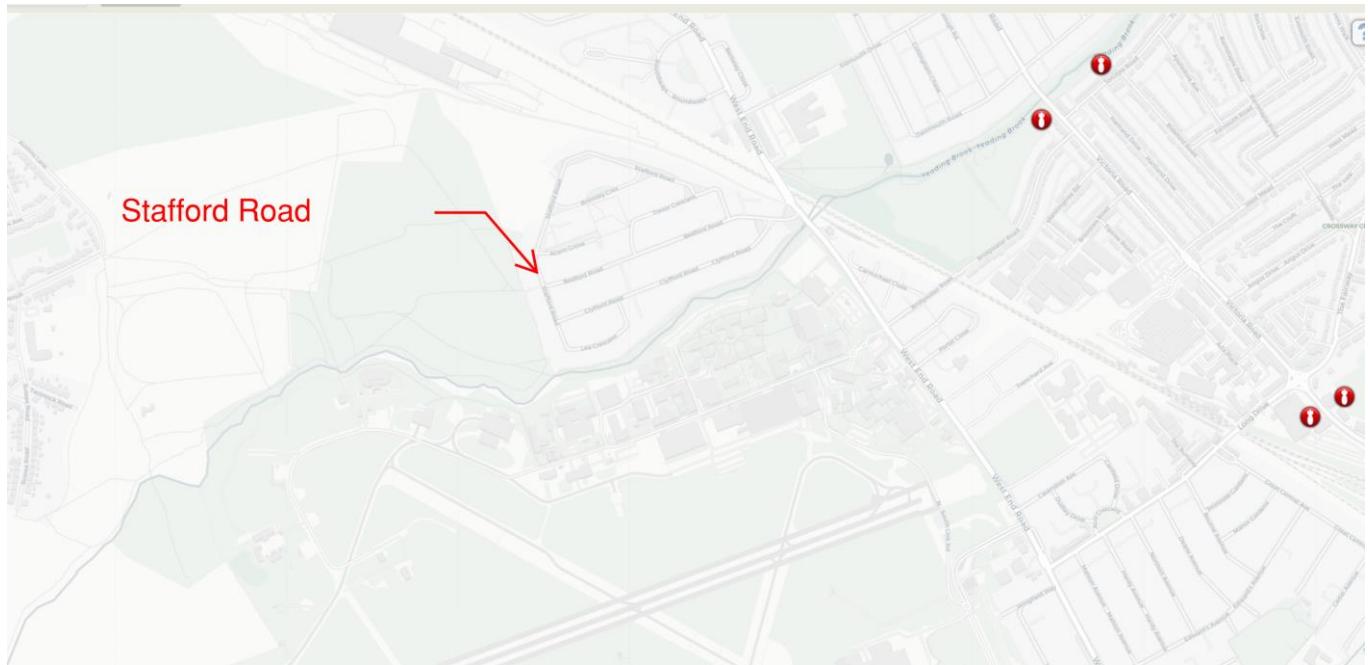


Figure 7 : Bombsight statistics

## 4. Site Investigation, Flood risk and drainage

### 4.1 Desk study of the Geology

British Geological Survey maps shows that the underlying soli strata is clay. Borehole logs extracted from British Geological Survey maps are included in the Appendix 2.

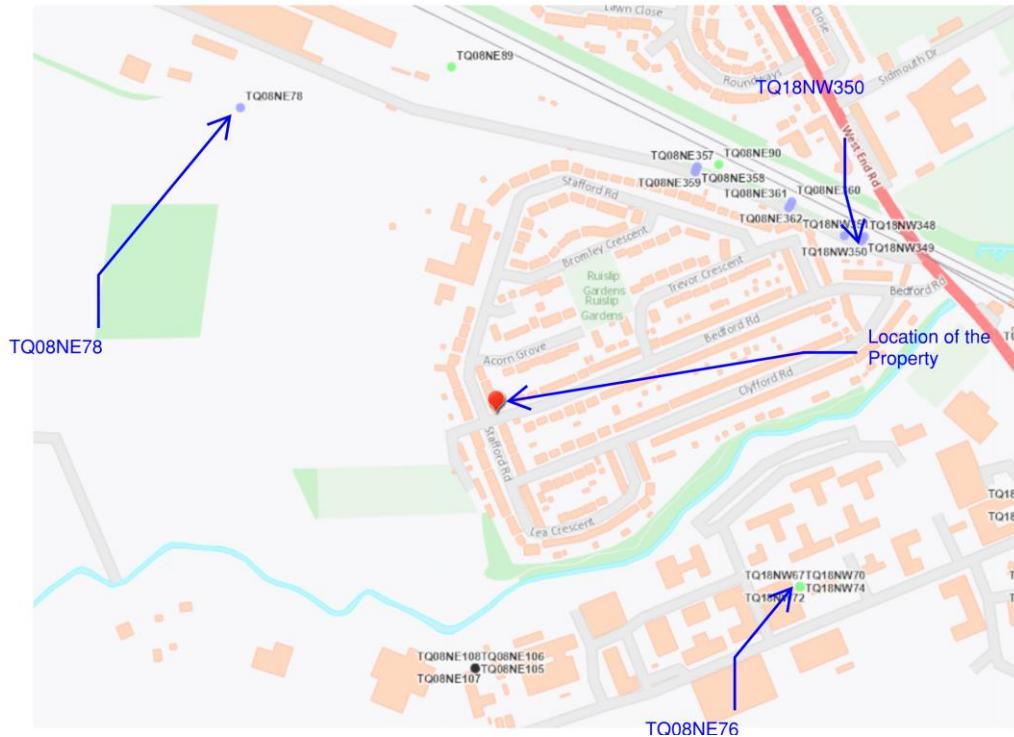


Figure 8 : Nearest Borehole Locations (Source: British Geological Survey)

### 4.2 Site Investigation

A trial pit and a site investigation were undertaken at the property during our site visit. Approximately 1m deep trial hole was excavated within 2m of the proposed lower ground floor works. The details of the trial pit are shown in Figure 9 and Figure 10.

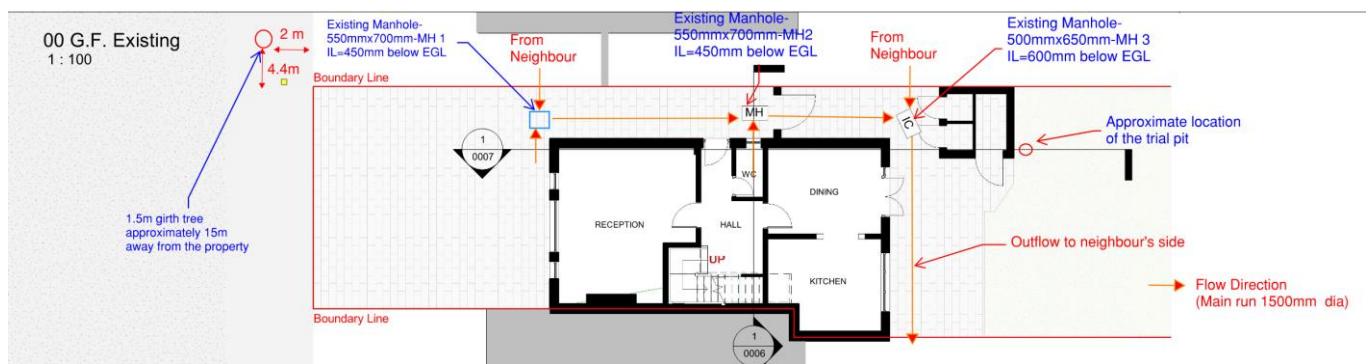


Figure 9 : Location of pit

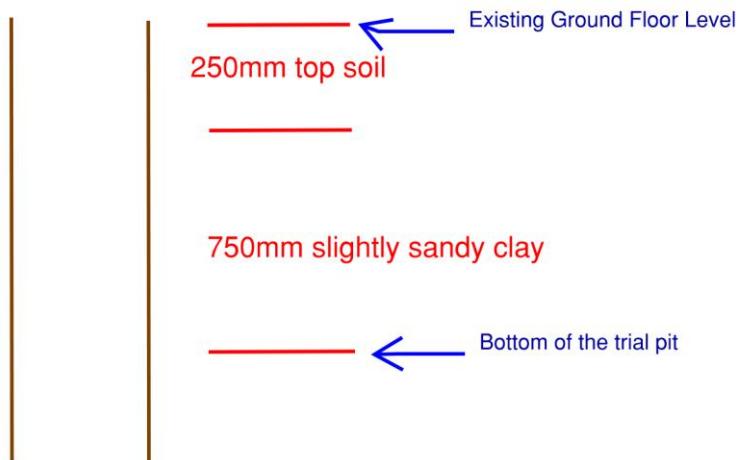


Figure 10 : Trial pit log

#### 4.3 Flood Risk

The site is in a flood risk Zone 1. Please refer to the Appendix 3. The proposed basement design would only create a very small change to the existing ground profile; hence the existing flood risk would not change. The proposal to create a lower ground floor area would require a pumping arrangement of any water/wastewater accumulation on the basement area as the gravity flow would not work.

#### 4.4 Drainage

The existing lower ground floor area already connected to a public drainage system. It is proposed to use this existing connected (altered where required). The view of the existing drainage connections are shown in Figure 11. The existing manholes to be relocated subject to statutory undertaker's approval and a drainage design.

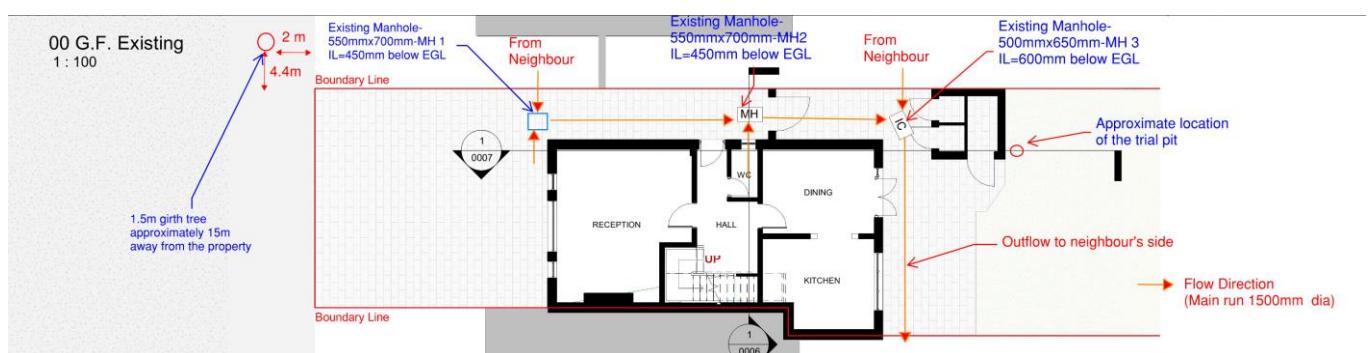


Figure 11 : View of the existing drainage system

## 5. High level Construction Sequence (Only the Lower ground floor extension works)

- Ensure all the accepted documentations are in place (e.g., Architectural design, structural designs, building regulations acceptance)
- Site mobilisation and setting out works.
- Undertake dilapidation surveys on neighbouring properties and ensure required agreements (e.g., Party Wall etc Act) are in place.
- Existing drainage arrangement to be altered subject to statutory undertaker's acceptance.
- Any ground movement monitoring designed by the structural engineer to be implemented (with some suggested trigger values in a form of monitoring action plan).
- The required underpinning to the main structure and the building walls to be undertaken to the satisfactory acceptance to the building regulation inspector.
- Carefully install the temporary works proposal as per the contractor's temporary works procedures.
- Carefully excavate the required footprint of the lower ground floor extension. The rear face of the extension can be excavated in a stepped style manner. Care must be taken not to damage any existing waterproofing on the neighbouring walls.
- Any ground movement exceedances to be carefully assessed and undertake appropriate actions as per the agreed monitoring action plan.
- Construct any drainage connections / extensions which is required for the above ground works.
- Construct the lower ground floor base slab as per the accepted design.
- Construct the lower ground floor walls as per the accepted design.
- Install the waterproofing as per the design / manufacturer's recommendation.
- Construct the lower ground floor upto the existing ground floor level as per the accepted architectural and structural design subject to all the material acceptance, workmanship and ,constructions work accepted to the building regulation inspector.

## 6. Conclusion

Based on the available borehole information and followed up site investigation works , it can be concluded that the works to be carried out above the water table level and no impact on the water sources below the proposed lower ground floor extension works.

The required volume of excavation is very small, it is not expected that the heave would cause any impact on the existing structures around the excavation.

After considering all these factors, the proposed works would not cause any noticeable impact on the existing building or the surrounding buildings.

## **Appendix 1: Borehole Data**

## Borehole Log

CD168A03W

Page 1 of 2

Project Name: Ruislip Depot CD168 EM1 Project No: D9455

Borehole ID: CD168A03W

Location: Co-ords (British National Grid): 510076.524 - 185925.655 Level:

Hole Type: WS Logged By: Dates: 2010-01-12 - 2010-01-12

Client: London Underground Contractor: Soil Mechanics Project Engineer:

Plant Used: SPT Hammer Serial No:

Well	Water	Samples		Result	Depth (m)	Level (m)	Legend	Stratum Description	Depth m
		Depth (m)	Type						
		0.2 - 0.5	B			0.60		Dark brown black clayey very sandy GRAVEL Sand is fine to coarse of ash Gravel is angular to subrounded fine to coarse of flint clinker rare brick and chalk Frequent rootlets Rare cobbles 90mm EMBANKMENT FILL ASH	0.5
		0.6 - 1.0	B						1.0
		1.5 - 2.0	D		1.50			Dark brown and white clayey gravelly SAND locally slightly sandy slightly gravelly CLAY Sand is fine to coarse of ash clinker and chalk Gravel is subangular fine to coarse of flint clinker white chalk and occasional cobbles Occasional rootlets EMBANKMENT FILL ASH	1.5
		2.0 - 2.5	D					White mottled brown orange silty GRAVEL Silt is of comminuted chalk Gravel is subangular fine to medium of chalk EMBANKMENT FILL CHALK	2.0
		3.25 - 3.8	D		3.25			Firm dark brown rarely gravelly CLAY Gravel is subangular fine of chalk and rare clinker Frequent pockets and partings 5mm of fine orange sand EMBANKMENT FILL COHESIVE	3.0
		3.8 - 4.2	D		3.80			Firm dark green mottled black CLAY Slight organic odour POSSIBLE ALLUVIUM	3.5
		4.6 - 5.0	D		4.20			Firm brown mottled grey and orange slightly sandy CLAY Sand is fine POSSIBLE LONDON CLAY FORMATION	4.0
					4.60			Firm dark brown mottled orange CLAY Occasional white concretions LONDON CLAY FORMATION	4.5
					5.00				

IMPORTANT: This is a basic log auto-generated from AGS data held by the National Geoscience Data Centre (NGDC) and does not necessarily include all of the information supplied in the original AGS file. If you wish to deposit AGS files to the NGDC please see [www.bgs.ac.uk/services/ngdc](http://www.bgs.ac.uk/services/ngdc). Generated 19-11-2023 at 20:15. BGS Reference 2020020611434553275

## Borehole Log

CD168A03W

Page 2 of 2

Project Name: Ruislip Depot CD168 EM1 Project No: D9455

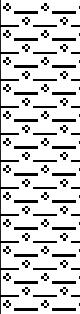
Borehole ID: CD168A03W

Location: Co-ords (British National Grid): 510076.524 - 185925.655 Level:

Hole Type: WS Logged By: Dates: 2010-01-12 - 2010-01-12

Client: London Underground Contractor: Soil Mechanics Project Engineer:

Plant Used: SPT Hammer Serial No:

Well	Water	Samples		Result	Depth (m)	Level (m)	Legend	Stratum Description	Depth m
		Depth (m)	Type						
		5.0 - 6.0	D			6.00		Firm dark brown mottled grey sandy CLAY Sand is fine Occasional pockets 20 mm of fine to medium grey sand Occasional partings of fine orange sand LONDON CLAY FORMATION	5.5
									6.0
									6.5
									7.0
									7.5
									8.0
									8.5
									9.0
									9.5

IMPORTANT: This is a basic log auto-generated from AGS data held by the National Geoscience Data Centre (NGDC) and does not necessarily include all of the information supplied in the original AGS file. If you wish to deposit AGS files to the NGDC please see [www.bgs.ac.uk/services/ngdc](http://www.bgs.ac.uk/services/ngdc). Generated 19-11-2023 at 20:15. BGS Reference 2020020611434553275



GROUND  
ENGINEERING

Location

WOOD LANE BRIDGE, RUISLIP

Client

LONDON UNDERGROUND LTD.

Job No. 11310910

Ground level 47.05m O.D.

## Record of Borehole No. 1

Type of boring LIGHT CABLE PERCUSSION

Diameter / 200mm

Casing /

TO ORNE 7R

Daily Progress	Ground water levels	Depth of casing	Samples			Scale	Strata		Description of strata	Length	Geology
			Depth	No.	Type		Depth	Reduced level			
6.1.86							0.35	46.70	TARMACADAM and ROAD BASE.		
			0.70 - 1.20	1	B		0.70	46.35	Orange brown fine to coarse sandy slightly clayey GRAVEL.		
			1.20 - 1.65	2	U (43)		1.20	45.25	Brick and concrete rubble in an orange brown sandy clay matrix.		
			1.20 - 1.70	3	B				Firm to stiff dark grey mottled orange brown slightly sandy CLAY with some medium brick fragments, clinker and some flint gravel.		
			1.65	4	D				---- lenses of orange brown fine sand.		
			1.70 - 2.15	5	U (36)						
			1.70 - 2.20	7	B						
			2.15	6	D						
			2.20 - 2.65	8	U (32)						
			2.20 - 2.80	10	B						
			2.65	9	D						
			2.80 - 3.25	11	U (34)						
			2.80 - 3.30	13	B						
			3.25	12	D						
			3.30 - 3.75	14	U (48)						
			3.30 - 3.80	16	B		3.65	43.40			
			3.75	15	D				Stiff orange brown mottled light grey sandy CLAY.		
			3.80 - 4.25	17	U (40)						
			3.80 - 4.30	19	B						
			4.25	18	D						
			4.30 - 4.75	20	U (42)						
			4.30 - 4.80	22	B						
			4.75	21	D						
			4.80 - 5.20	23	U (85)				---- becoming very sandy clay with lenses of light grey fine to medium sand.		
			5.13	25	M						
			5.20	24	D		5.25	41.80			
	▽ 5.13 5.20								BOREHOLE COMPLETED.		
Key				Remarks							
U.... undisturbed 102mm diameter sample				i) Water level rose from 5.20m to 5.13m in 20 minutes.							
D.... disturbed jar sample											
B.... disturbed bulk sample											
W.... water sample											
S( ).... standard penetration test											
C( ).... cone penetration test											
(33).... number of blows ('N' value)											
☒.... groundwater encountered											



TQ 18 NW 76

Location : RAF NORTHOLT Project : 621 EOD & 4CCTF Facility				Trial Pit No.: 6 Dates : 27/2/91
Client : PSA Services Report No. : G/0701				Dimensions : 2.50m by 0.60m by 2.10m deep Ground Level : 40.28 m above OD
Red Level	Description	Depth m.	Samples Taken	In-Situ Tests
G.L.		0.00		
	Dark brown friable very sandy clay with some flint gravel and brick fragments. (MADE GROUND)	(0.45)		
39.83	Layer of decayed wood at the base.	0.45		
39.48	Firm to stiff yellowish brown friable silty CLAY with a little fine to coarse subrounded flint gravel and tree roots. (Disturbed London Clay)	(0.35)	pp 90	Moderately strong concrete
	Firm to stiff light brown/orange brown mottled silty CLAY with occasional pockets and layers of light grey calcareous nodules. (Disturbed London Clay)	0.80	pp 90	Lean mix concrete
38.78	Stiff light brown slightly grey mottled closely fissured silty CLAY with occasional orange brown silty/sandy pockets. (Weathered London Clay)	1.50	pp 110	Seepage from base of concrete
38.18	----- End Of Trial Pit -----	2.10		
				<b>PLAN</b>
<b>Key</b> W Water P Piston SPT SPT Value J Jar CPT CPT Value U Undisturbed T Thin Wall pp Pocket Penetrom. kPa D Disturbed X No Recovery m/c Moisture Content %				General Remarks i. Pit excavated alongside existing concrete slab to determine thickness.
Equipment and Methods Fordson Excavator				Scale 1:4m/sheet Sheet No. 1 of 1. Depth 0 to 4 metres.  Logged By D G Freame Appendix Figure No. B-6

**Appendix 2: Flood map for planning**

### **Appendix 3: Draft permanent work design**

# Flood map for planning

Your reference  
**<Unspecified>**

Location (easting/northing)  
**509617/185754**

Created  
**11 Dec 2023 9:08**

**Your selected location is in flood zone 1, an area with a low probability of flooding.**

You will need to do a flood risk assessment if your site is **any of the following**:

- bigger than 1 hectare (ha)
- in an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

## Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence **which** sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2022 OS 100024198. <https://flood-map-for-planning.service.gov.uk/os-terms>



Environment  
Agency

## Flood map for planning

Your reference  
**<Unspecified>**

Location (easting/northing)  
**509617/185754**

Scale  
**1:2500**

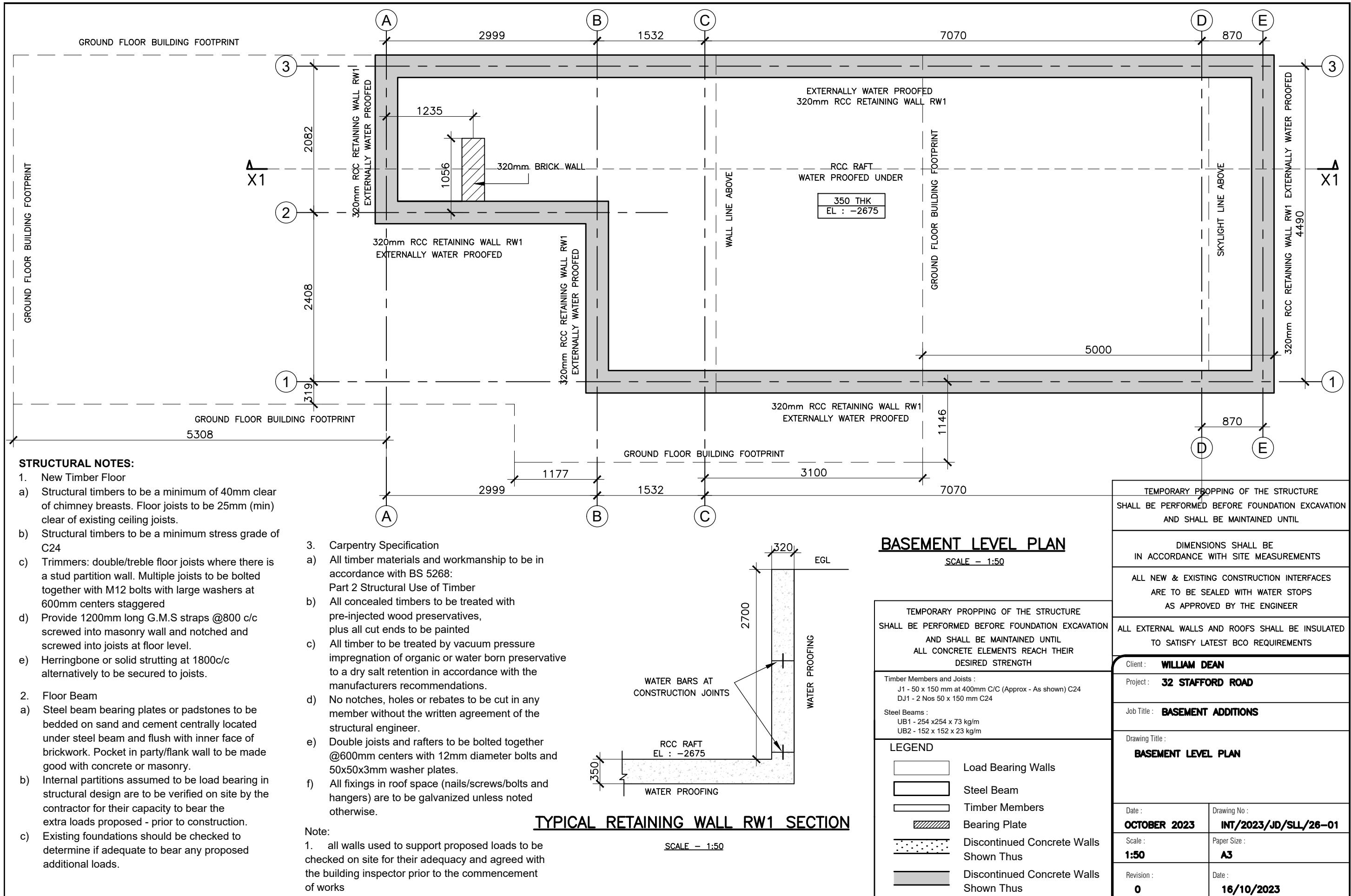
Created  
**11 Dec 2023 9:08**

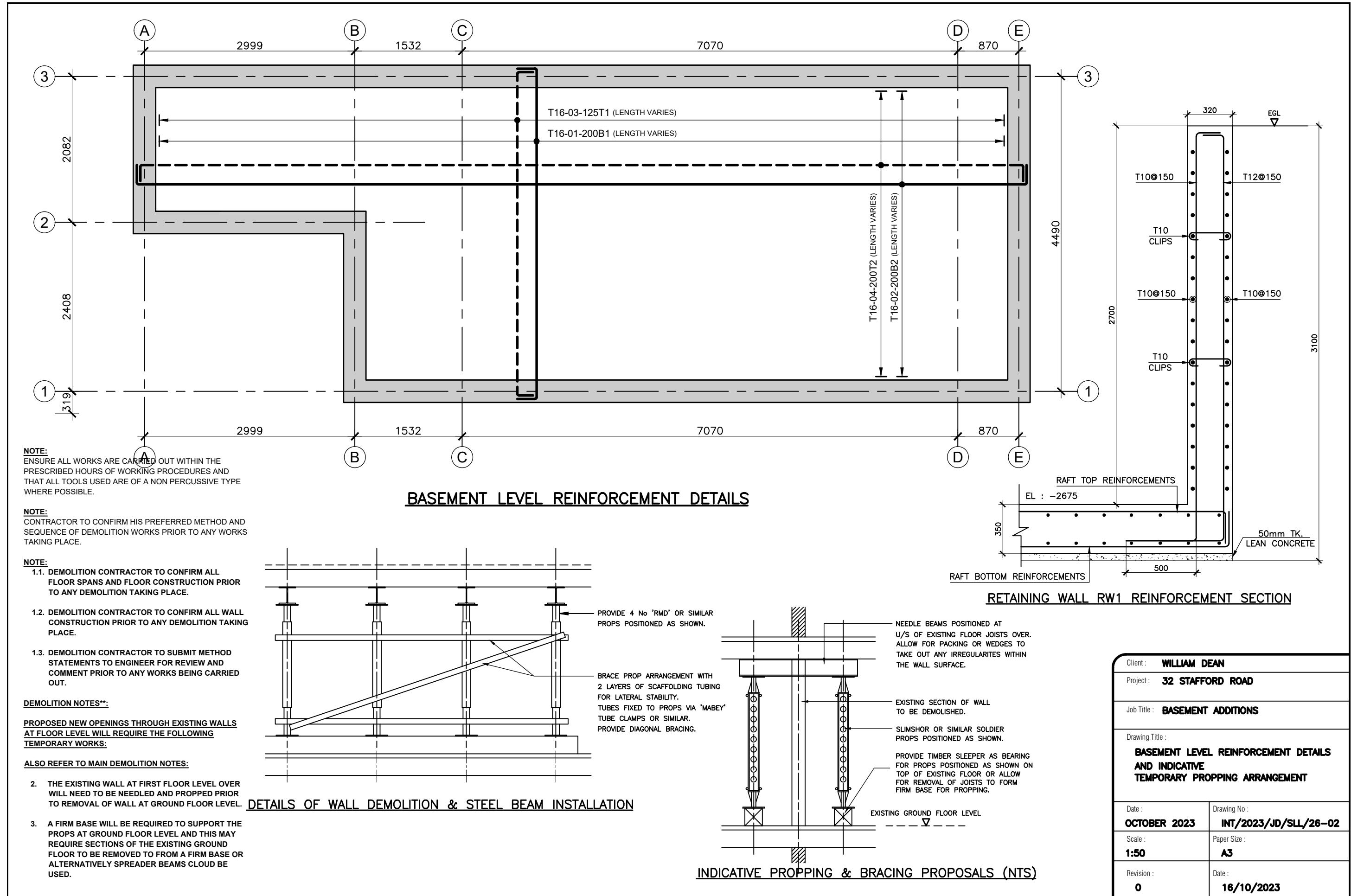
- Selected area
- Flood zone 3
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Water storage area

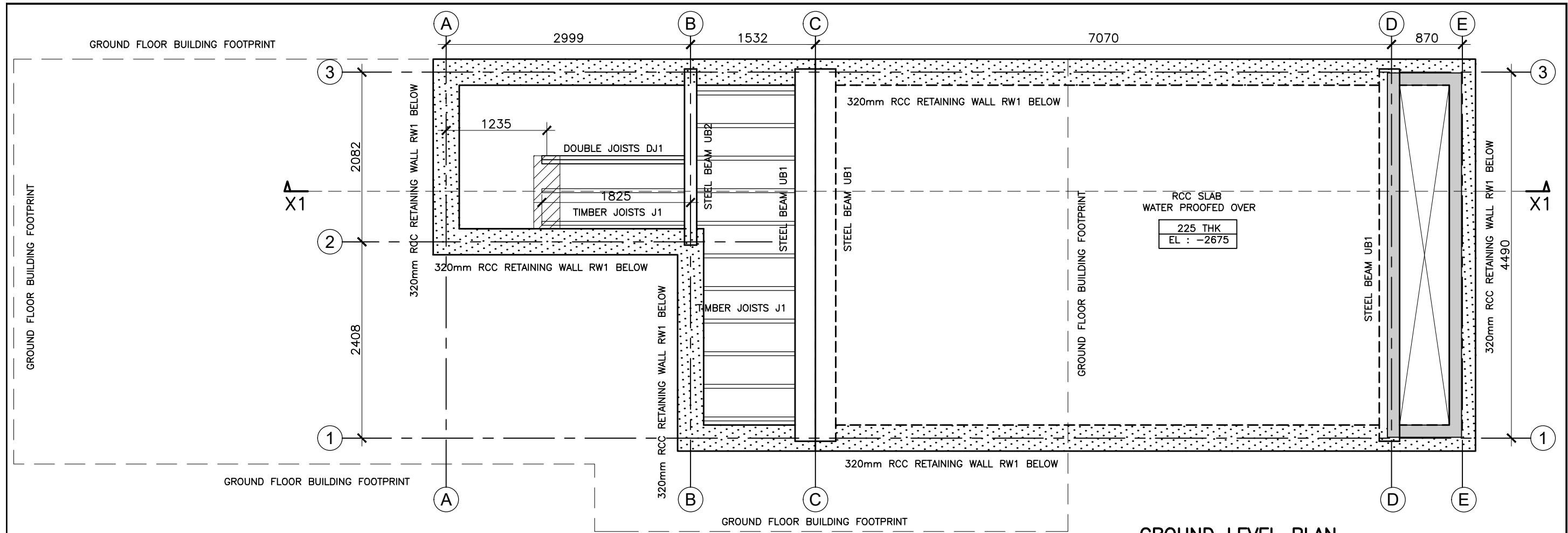


Page 2 of 2

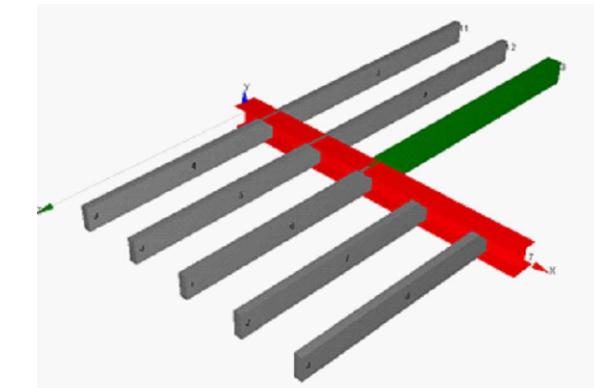
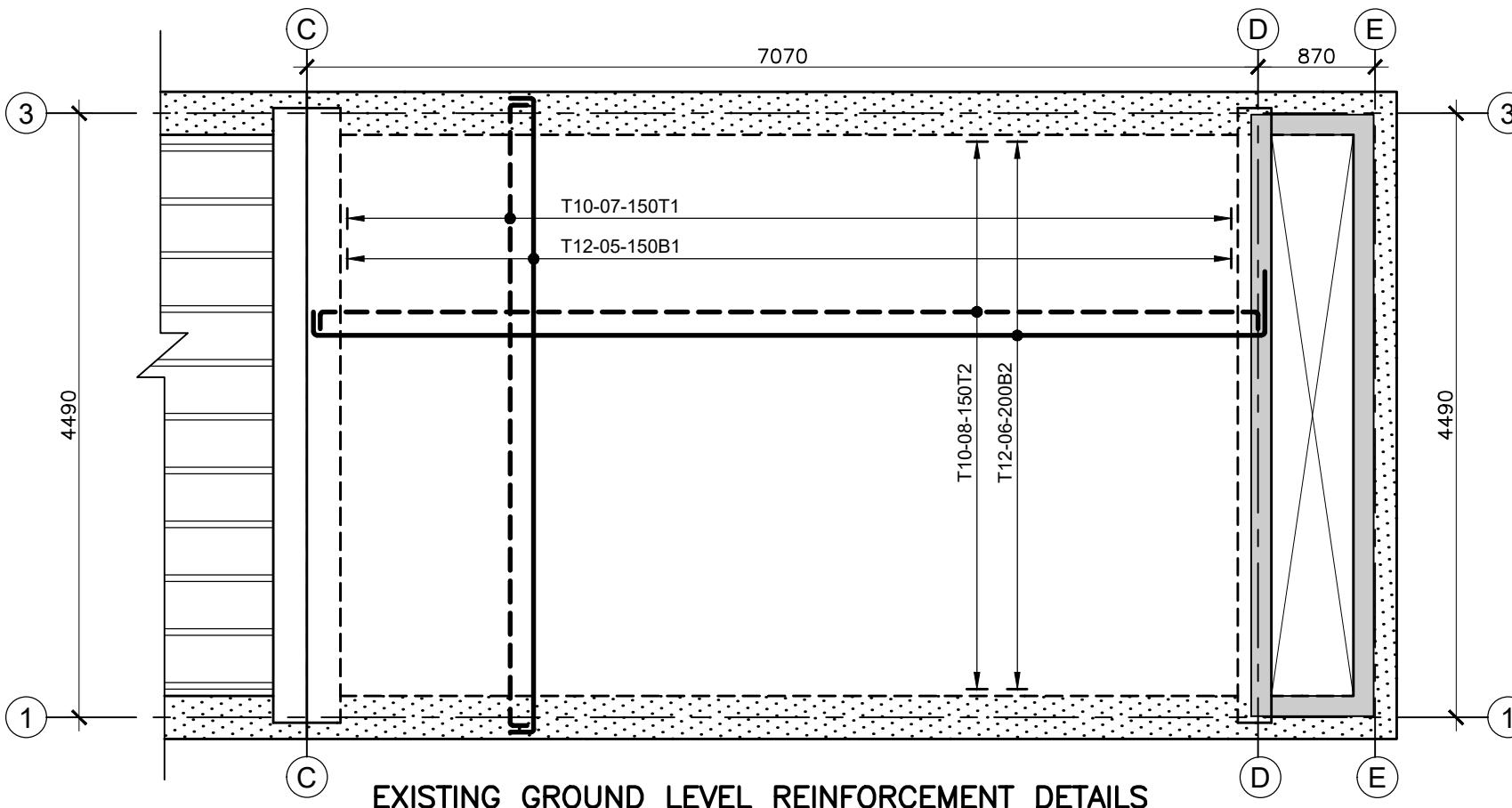




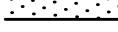


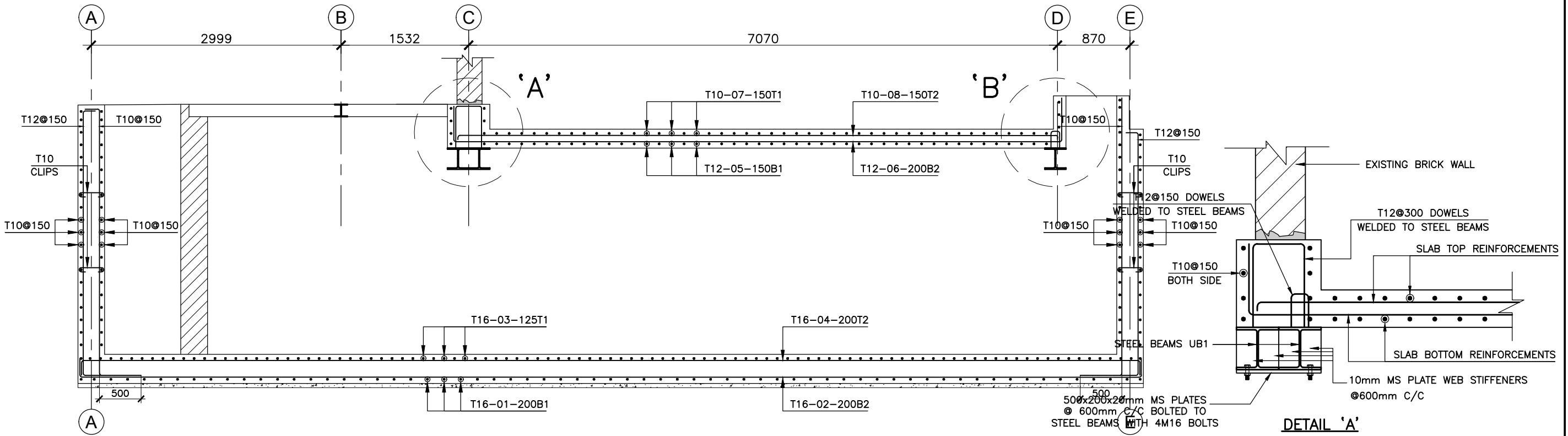


## GROUND LEVEL PLAN

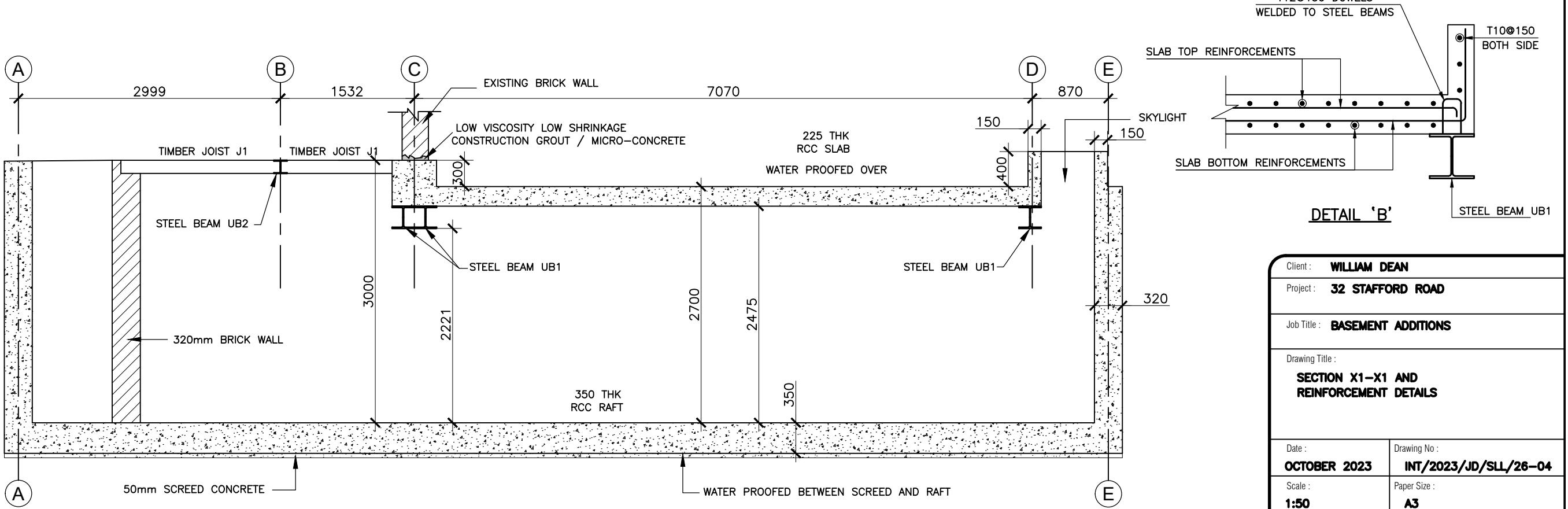


### EXISTING GROUND LEVEL REINFORCEMENT DETAILS

		<p>Client : <b>WILLIAM DEAN</b></p> <p>Project : <b>32 STAFFORD ROAD</b></p> <p>Job Title : <b>BASEMENT ADDITIONS</b></p> <p>Drawing Title :</p> <p style="text-align: center;"><b>BASEMENT LEVEL REINFORCEMENT DETAILS AND GROUND FLOOR PLAN OF PROPOSED DEVELOPMENT</b></p>	
<p>Timber Members and Joists :</p> <p>J1 - 50 x 150 mm at 400mm C/C (Approx - As shown) C24</p> <p>DJ1 - 2 Nos 50 x 150 mm C24</p> <p>Steel Beams :</p> <p>UB1 - 254 x254 x 73 kg/m</p> <p>UB2 - 152 x 152 x 23 kg/m</p>		<p>Date : <b>OCTOBER 2023</b></p> <p>Drawing No : <b>INT/2023/JD/SLL/26-03</b></p> <p>Scale : <b>1:50</b></p> <p>Paper Size : <b>A3</b></p> <p>Revision : <b>0</b></p> <p>Date : <b>16/10/2023</b></p>	
<p><b>LEGEND</b></p> <p> Discontinued Concrete Walls Shown Thus</p> <p> Discontinued Concrete Walls Shown Thus</p>			



SECTION X1-X1 – REINFORCEMENTS



SECTION X1-X1

Client :	WILLIAM DEAN
Project :	32 STAFFORD ROAD
Job Title :	BASEMENT ADDITIONS
Drawing Title :	
<b>SECTION X1-X1 AND REINFORCEMENT DETAILS</b>	
Date :	OCTOBER 2023
Drawing No :	INT/2023/JD/SLL/26-04
Scale :	1:50
Paper Size :	A3
Revision :	0
Date :	16/10/2023