

32 Stafford Road HA4 6PJ
**Structural Survey / Basement Impact Assessment– Rev
01**

Authored By: Janaka Solanga CEng MICE
Date: Nov 2023

CONTENTS

1. Introduction/Executive Summary	3
2. Desk Study - Site and the Existing Building	4
3. The proposed works, Existing Structures and the adjoining buildings and structures	5
4. Site Investigation, Flood risk and drainage	8
5. High level Construction Sequence (Only the Lower ground floor extension works) .	10
6. Conclusion	10
Appendix 1: Borehole Data	11
Appendix 2: Flood map for planning	12
Appendix 3: Draft permanent work design	13

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.

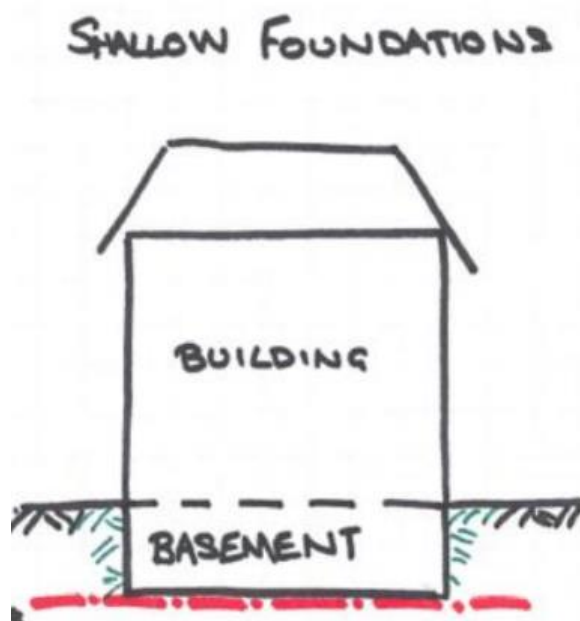


Figure 1: Basement with shallow foundation

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

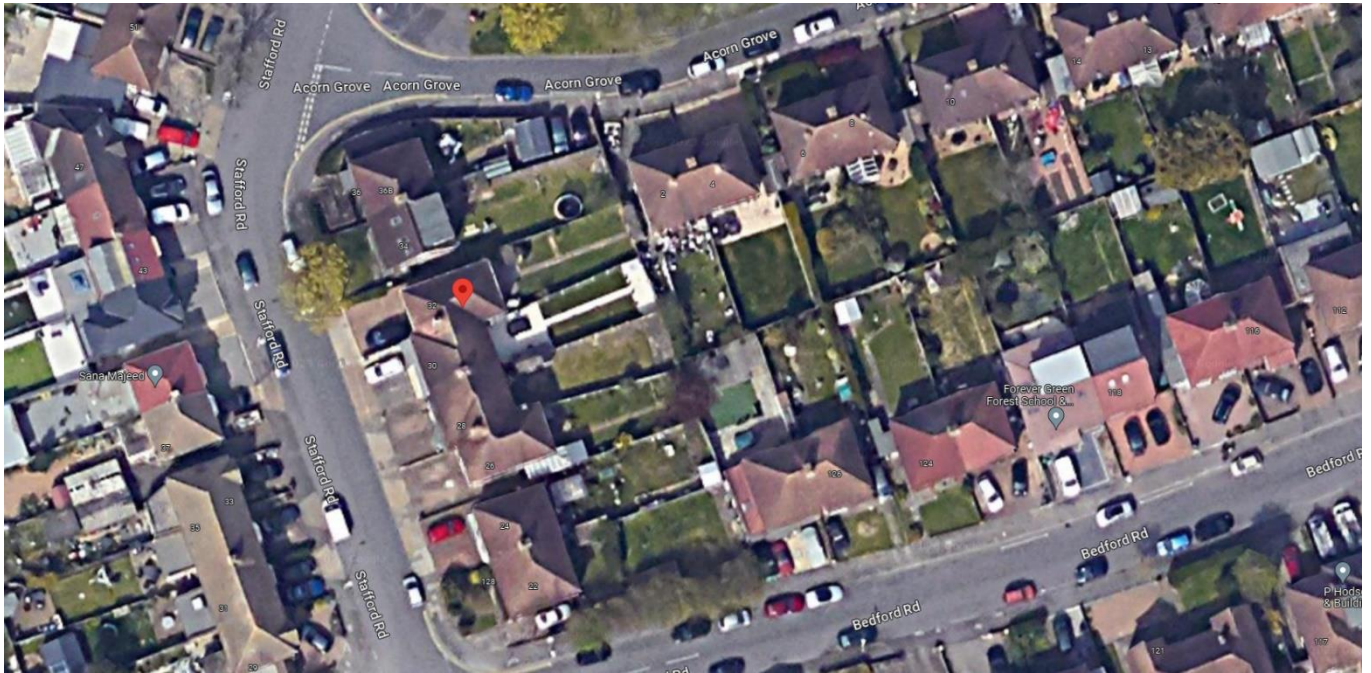


Figure 3: Location of the property

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 main 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 underlying 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)

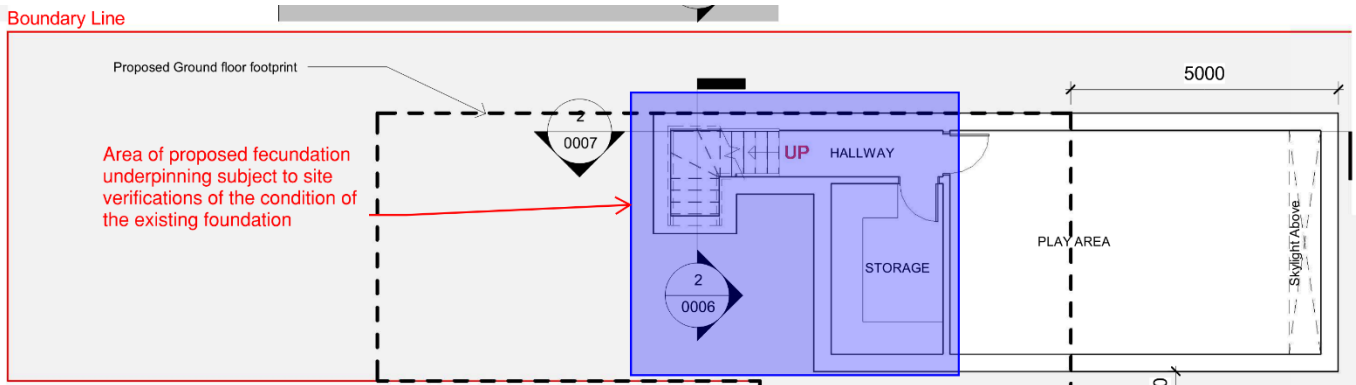


Figure 4 : Extent of the proposed underpinning



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.

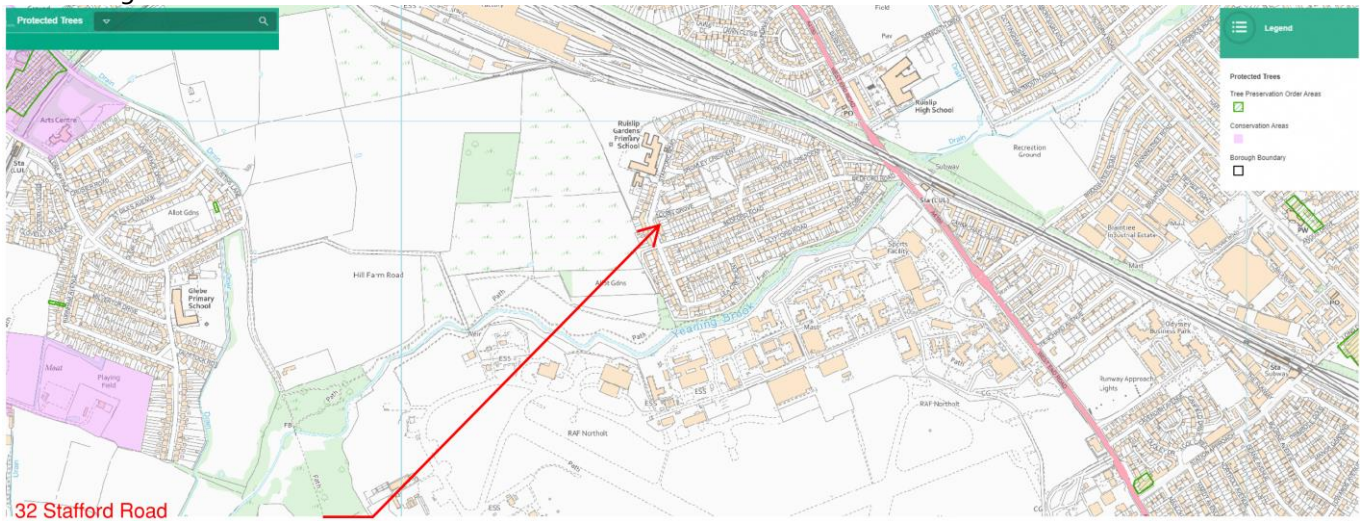


Figure 6 : Trees with TPO (Source: Council Website)

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.

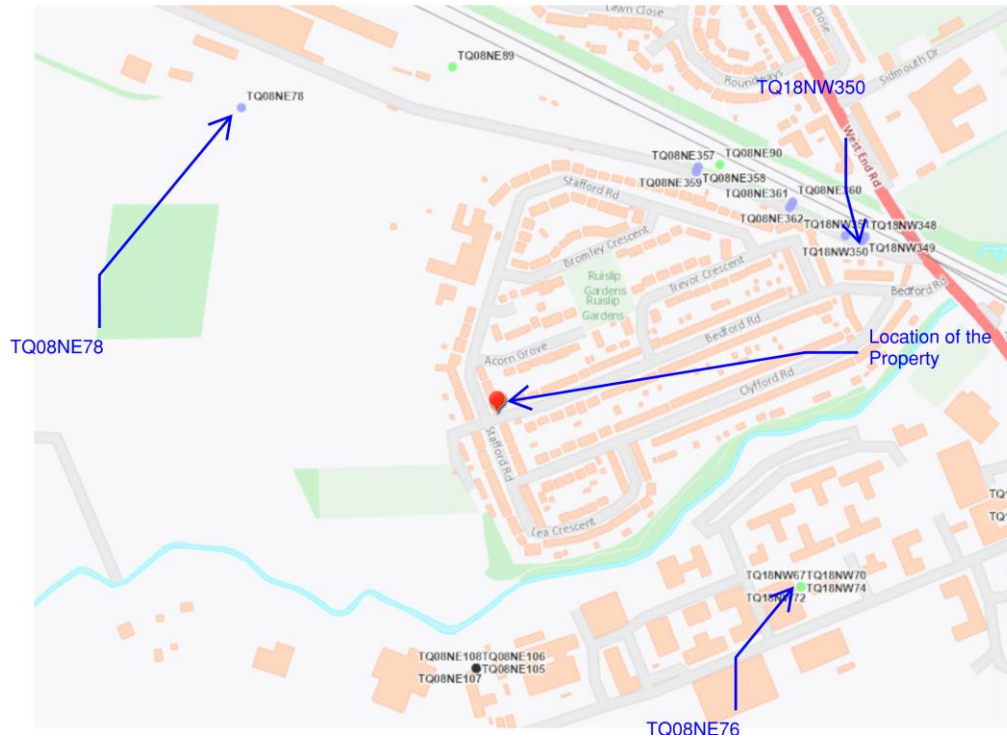


Figure 8 : Nearest Borehole Locations (Source: British Geological Survey)

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.

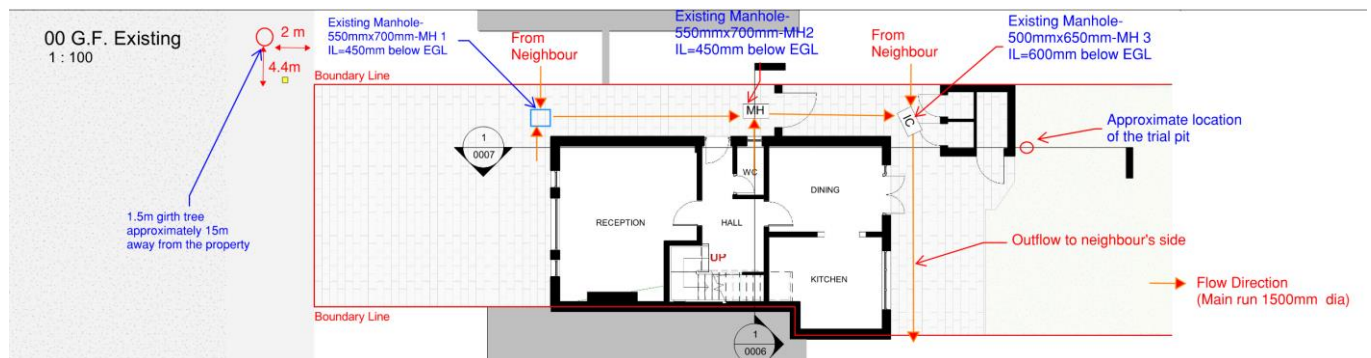


Figure 9 : Location of pit

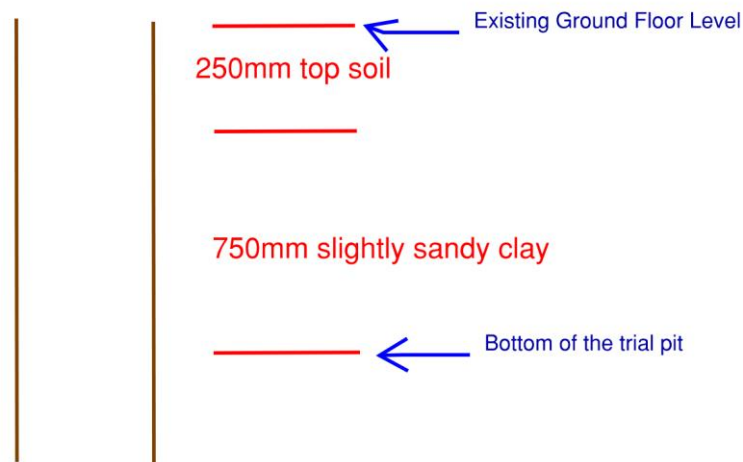


Figure 10 : Trial pit log

4.3 Flood Risk

The site is in a flood risk zone 3. Please refer to the Appendix 3. The proposed basement design would only crate a very small change to the existing ground profile; hence the existing flood risk would not change. The proposal to crate 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.

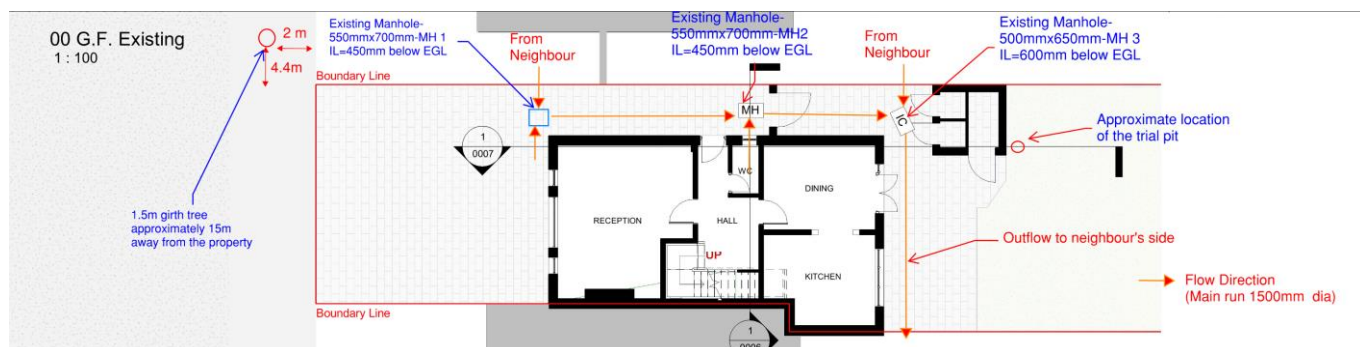


Figure 11 : View of the existing drainage system

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.

Janaka Solanga CEng MICE

Appendix 1: Borehole Data

Borehole Log

CD168A03W

Page 1 of 2

Project Name: Ruislip Depot CD168 EM1 Project No: D9455

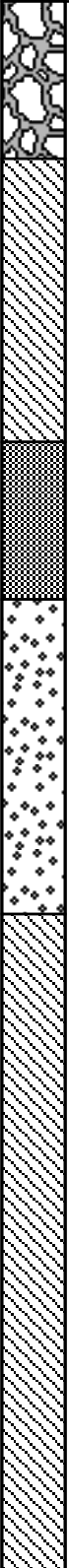
Borehole ID: CD168A03W

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					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		0.60			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	1.0
		1.5 - 2.0	D		1.50			White mottled brown orange silty GRAVEL Silt is of comminuted chalk Gravel is subangular fine to medium of chalk EMBANKMENT FILL CHALK	1.5
		2.0 - 2.5	D					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	2.0
		3.25 - 3.8	D		3.25			Firm dark green mottled black CLAY Slight organic odour POSSIBLE ALLUVIUM	3.0
		3.8 - 4.2	D		3.80			Firm brown mottled grey and orange slightly sandy CLAY Sand is fine POSSIBLE LONDON CLAY FORMATION	3.5
		4.6 - 5.0	D		4.60			Firm dark brown mottled orange CLAY Occasional white concretions LONDON CLAY FORMATION	4.0
					5.00				4.5

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. 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

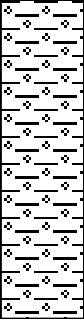
Borehole ID: CD168A03W

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. Generated 19-11-2023 at 20:15. BGS Reference 2020020611434553275



British
Geological
Survey

BGS ID: 575818 : BGS Reference: TQ08NE78
British National Grid (27700) : 509310,186090

GROUND
ENGINEERING

Location

WOOD LANE BRIDGE, RUISLIP

Client

LONDON UNDERGROUND LTD.

Record of Borehole No. 1

Type of boring LIGHT CABLE PERCUSSION

Job No. 11310910

Ground level 47.05m O.D.

Diameter / 200mm

Casing /

TQ08NE 78

Daily Progress	Ground water levels	Depth of casing	Samples			S c a l e	Strata		Description of strata	Casing depth m	Ground level m
			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						
			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	Stiff orange brown mottled light grey sandy CLAY.		
			3.75	15	D						
			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)						
5.25	5.13		5.13	25	W		5.25	41.80	becoming very sandy clay with lenses of light grey fine to medium sand.		
			5.20	24	D						
									BOREHOLE COMPLETED.		
Key U.... undisturbed 102mm diameter sample D.... disturbed jar sample B.... disturbed bulk sample W.... water sample SI () standard penetration test C () cone penetration test (33)... number of blows ('N' value) X... groundwater encountered						Remarks i) Water level rose from 5.20m to 5.13m in 20 minutes.					

LAING



TQ 18 NW 76

Location : RAF NORTHOLT		Trial Pit No.: 5	
Project : 621 EOD & 4CCTF Facility		Dates : 27/2/91	
Client : PSA Services		Dimensions : 2.50m by 0.60m by 2.10m deep	
Report No. : G/0701		Ground Level : 40.28 m above OD	

Ref. Level	Description	Depth m.	Samples Taken	In-Situ Tests	Legend	Remarks
G.L.	Dark brown friable very sandy clay with some flint gravel and brick fragments. (MADE GROUND)	0.00				
	Layer of decayed wood at the base.	(0.45)				
39.83	Firm to stiff yellowish brown friable silty CLAY with a little fine to coarse subrounded flint gravel and tree roots. (Disturbed London Clay)	0.45				
		(0.35)		pp 90		
39.48	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				
		(0.70)		pp 90		
38.78	Stiff light brown slightly grey mottled closely fissured silty CLAY with occasional orange brown silty/sandy pockets. (Weathered London Clay)	1.50				
		(0.60)		pp110		
38.18	End Of Trial Pit	2.10				

Slab details

PG concrete floor slab 0.15m

Moderately strong concrete 0.70

Lean mix concrete 0.80

Seepage from base of concrete

PLAN

Concrete slab

2.50

0.60

Key		In-Situ Tests		General Remarks 1. Pit excavated alongside existing concrete slab to determine thickness.
Water		SPT SPT Value		
Piston		CPT CPT Value		
Jar		pp Pocket Penetrom. kPa		
Sample Types	Thin Wall	m/c Moisture Content %		
U Undisturbed	X No Recovery			
D Disturbed				
B Bulk Disturbed				
Equipment and Methods Fordson Excavator				Scale 4m/sheet
				Sheet No. 1 Of 1
				Depth 0 to 4 metres.
				Logged By DG Freame
				Appendix
				Figure No. B-6

Appendix 2: Flood map for planning

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
509586/185697

Created
27 Oct 2023 12:21

Your selected location is in flood zone 3, an area with a high probability of flooding.

This means:

- you must complete a flood risk assessment for development in this area
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (see www.gov.uk/guidance/flood-risk-assessment-standing-advice)

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>


Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
509586/185697

Scale
1:2500

Created
27 Oct 2023 12:21

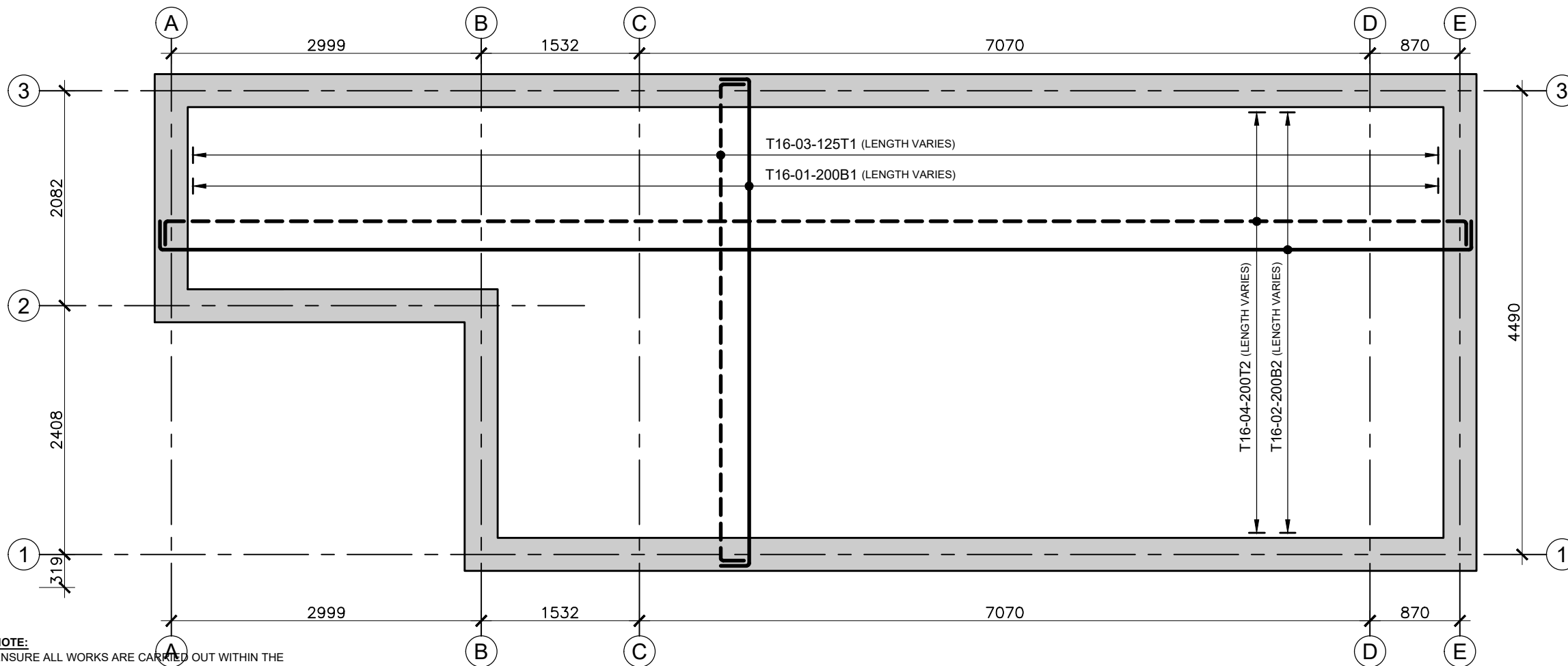
-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area

0 20 40 60m

Page 2 of 2



Appendix 3: Draft permanent work design



NOTE:
ENSURE ALL WORKS ARE CARRIED OUT WITHIN THE PRESCRIBED HOURS OF WORKING PROCEDURES AND THAT ALL TOOLS USED ARE OF A NON PERCUSSIVE TYPE WHERE POSSIBLE.

NOTE:
CONTRACTOR TO CONFIRM HIS PREFERRED METHOD AND SEQUENCE OF DEMOLITION WORKS PRIOR TO ANY WORKS TAKING PLACE.

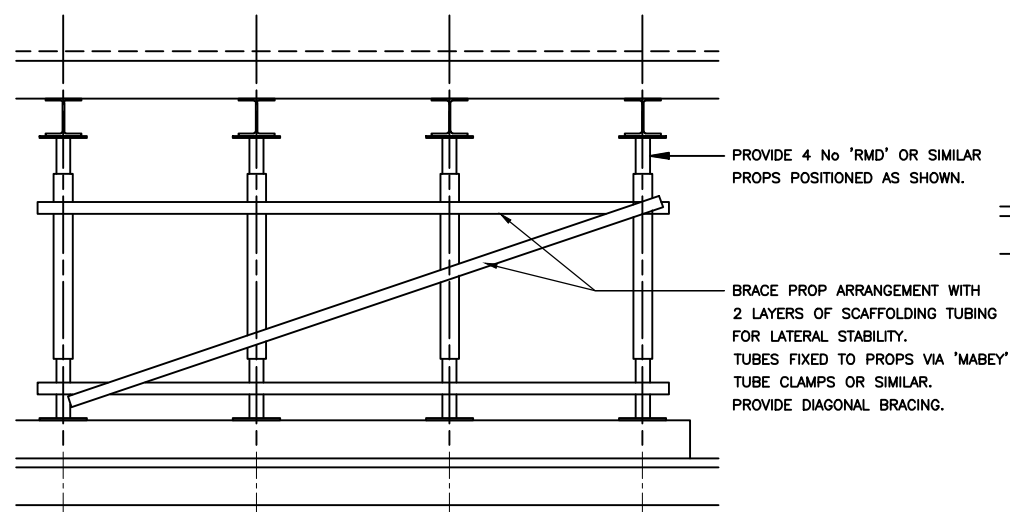
- NOTE:**
- 1.1. DEMOLITION CONTRACTOR TO CONFIRM ALL FLOOR SPANS AND FLOOR CONSTRUCTION PRIOR TO ANY DEMOLITION TAKING PLACE.
 - 1.2. DEMOLITION CONTRACTOR TO CONFIRM ALL WALL CONSTRUCTION PRIOR TO ANY DEMOLITION TAKING PLACE.
 - 1.3. DEMOLITION CONTRACTOR TO SUBMIT METHOD STATEMENTS TO ENGINEER FOR REVIEW AND COMMENT PRIOR TO ANY WORKS BEING CARRIED OUT.

DEMOLITION NOTES:**
PROPOSED NEW OPENINGS THROUGH EXISTING WALLS AT FLOOR LEVEL WILL REQUIRE THE FOLLOWING TEMPORARY WORKS:

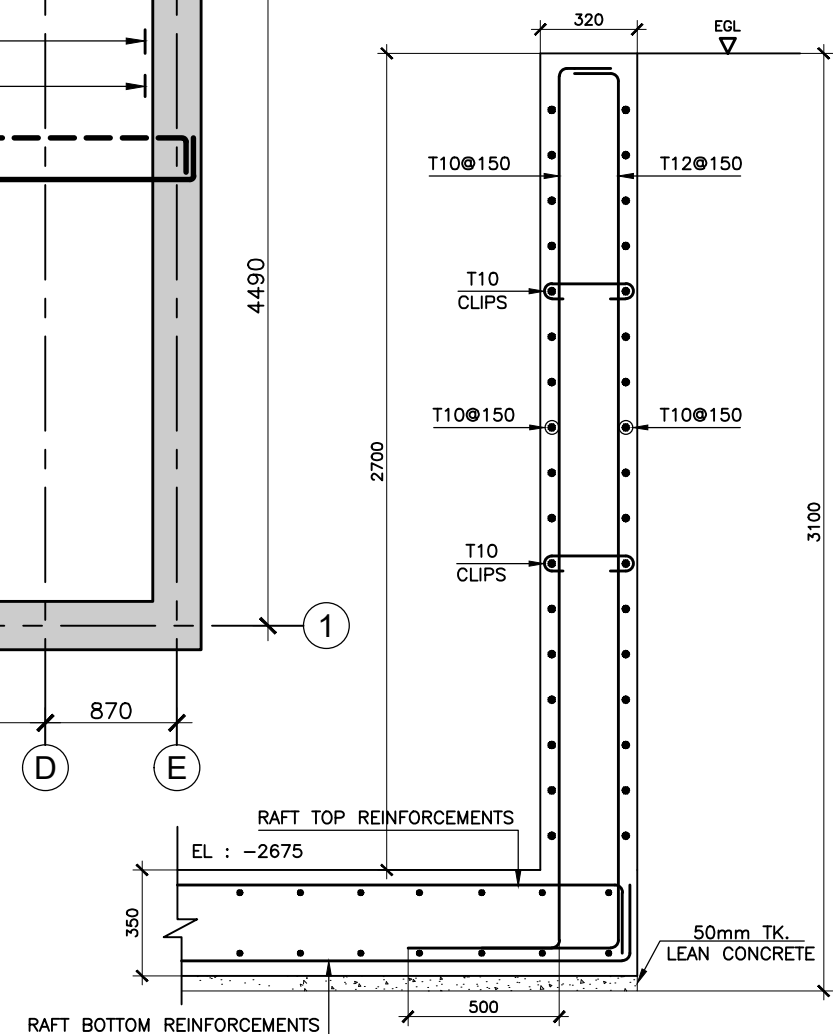
ALSO REFER TO MAIN DEMOLITION NOTES:

2. THE EXISTING WALL AT FIRST FLOOR LEVEL OVER WILL NEED TO BE NEEDED AND PROPPED PRIOR TO REMOVAL OF WALL AT GROUND FLOOR LEVEL.
3. A FIRM BASE WILL BE REQUIRED TO SUPPORT THE PROPS AT GROUND FLOOR LEVEL AND THIS MAY REQUIRE SECTIONS OF THE EXISTING GROUND FLOOR TO BE REMOVED TO FROM A FIRM BASE OR ALTERNATIVELY SPREADER BEAMS CLOUD BE USED.

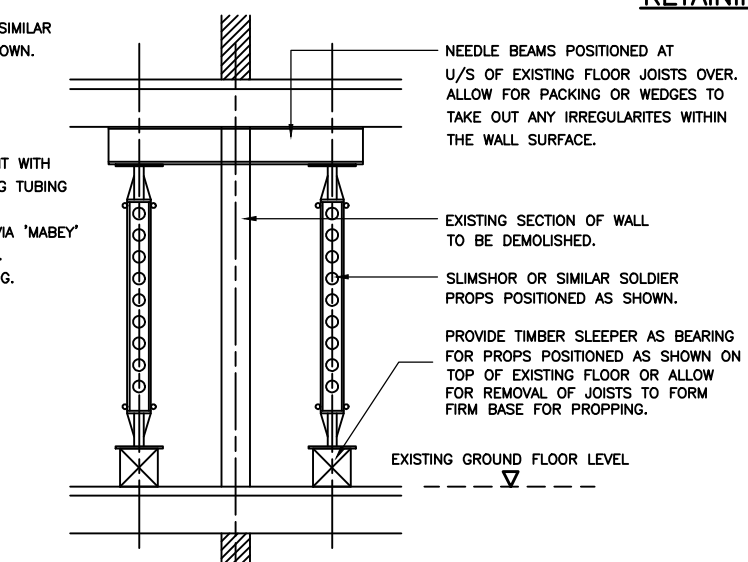
BASEMENT LEVEL REINFORCEMENT DETAILS



DETAILS OF WALL DEMOLITION & STEEL BEAM INSTALLATION

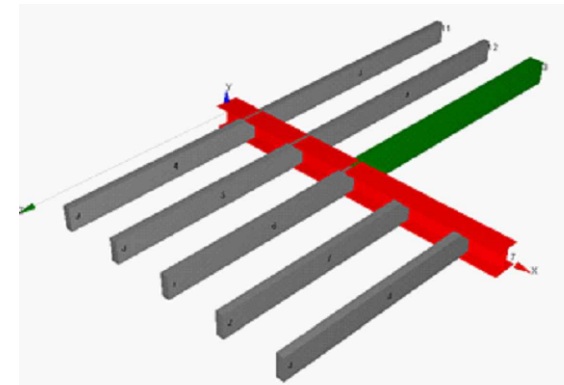
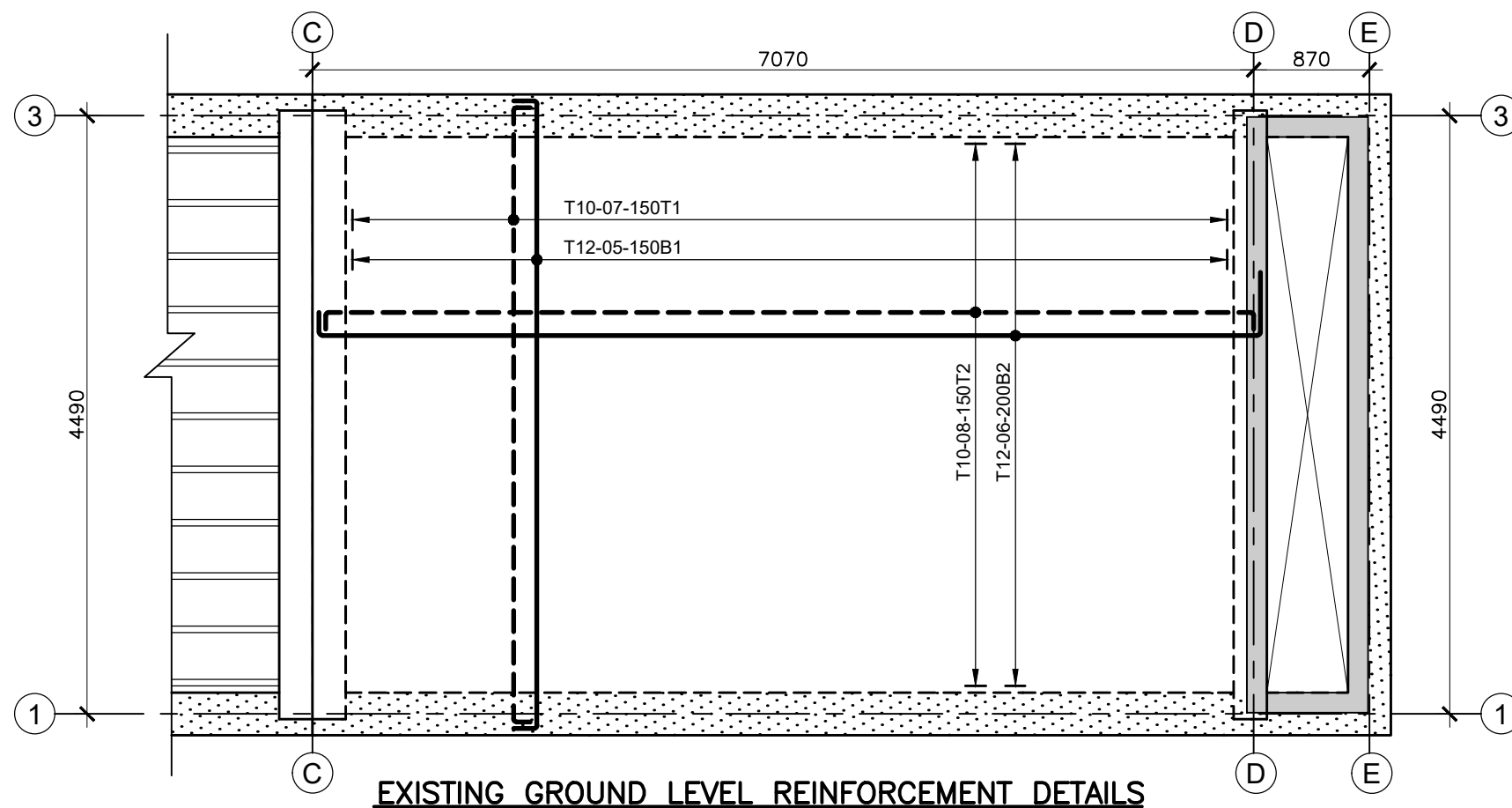
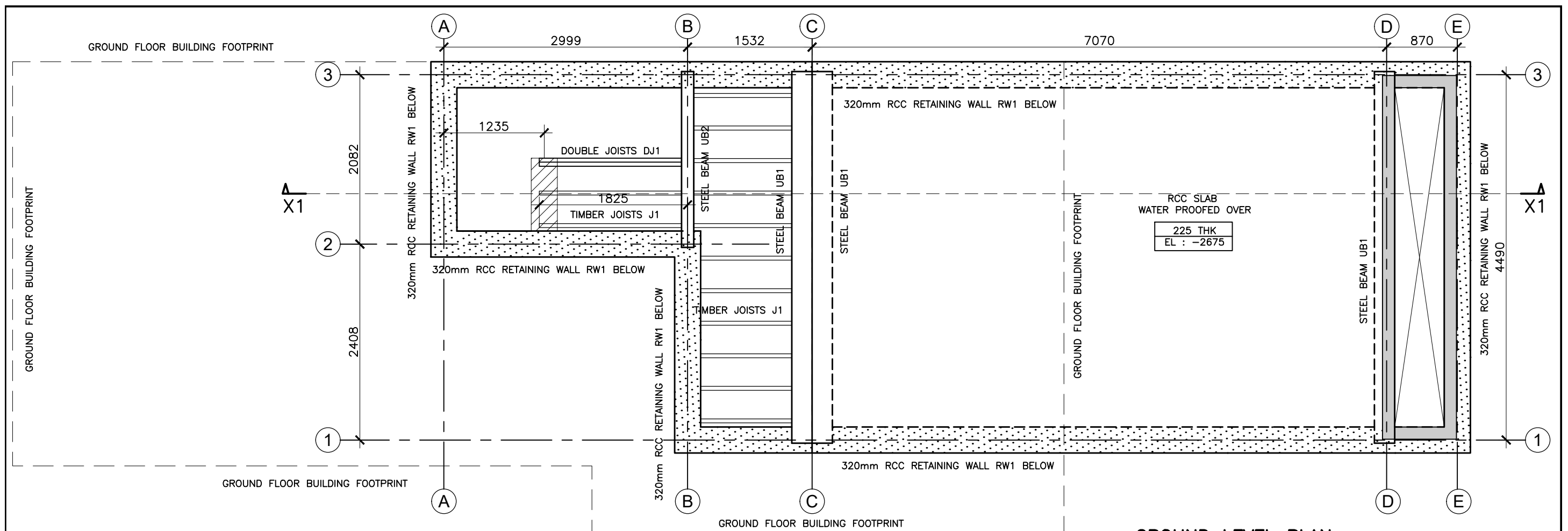


RETAINING WALL RW1 REINFORCEMENT SECTION



INDICATIVE PROPPING & BRACING PROPOSALS (NTS)

Client : WILLIAM DEAN	
Project : 32 STAFFORD ROAD	
Job Title : BASEMENT ADDITIONS	
Drawing Title : BASEMENT LEVEL REINFORCEMENT DETAILS AND INDICATIVE TEMPORARY PROPPING ARRANGEMENT	
Date : OCTOBER 2023	Drawing No : INT/2023/JD/SL/26-02
Scale : 1:50	Paper Size : A3
Revision : 0	Date : 16/10/2023





Timber Members and Joists :

J1 - 50 x 150 mm at 400mm C/C (Approx - As shown) C24
DJ1 - 2 Nos 50 x 150 mm C24

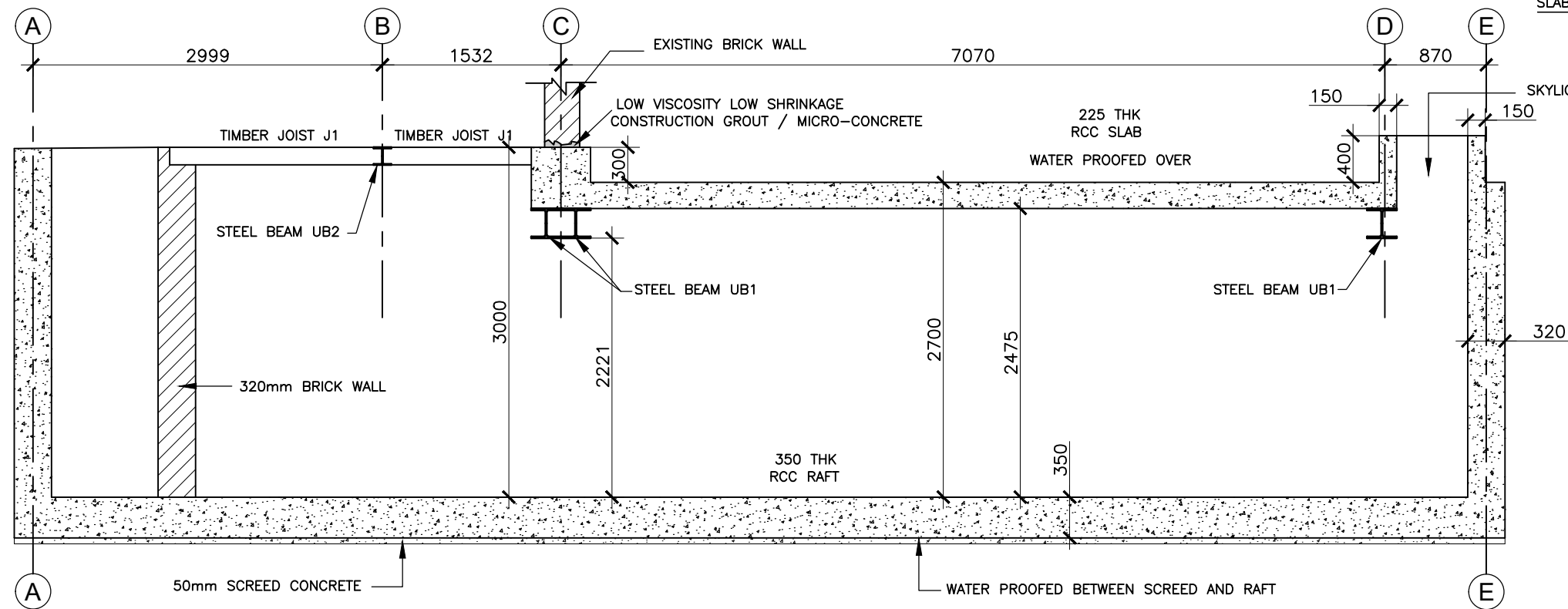
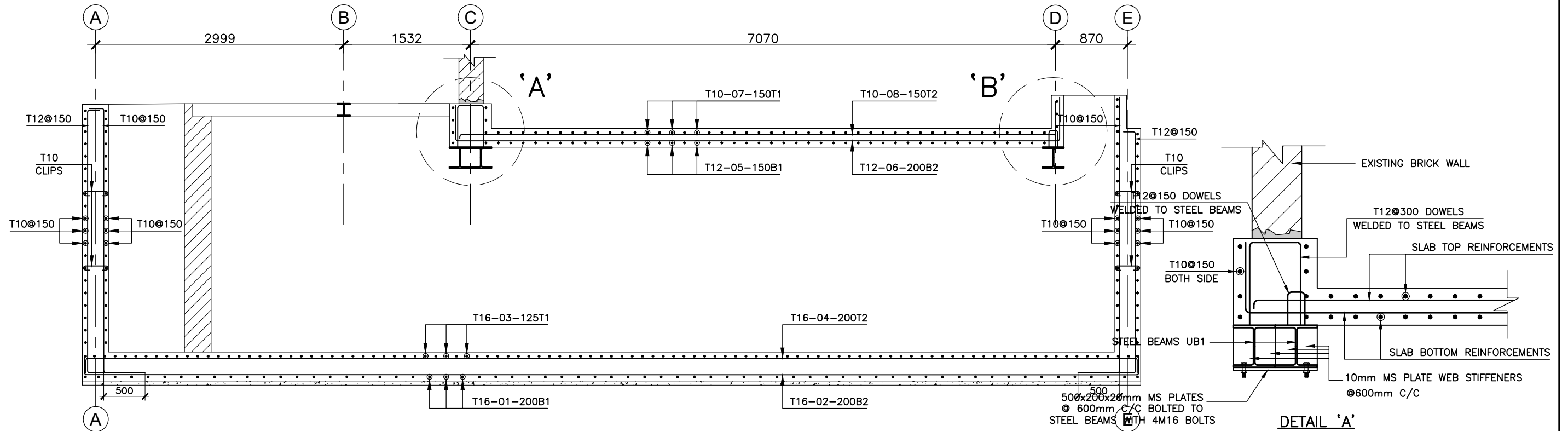
Steel Beams :

UB1 - 254 x 254 x 73 kg/m
UB2 - 152 x 152 x 23 kg/m

LEGEND

	Discontinued Concrete Walls Shown Thus
	Discontinued Concrete Walls Shown Thus

Client : WILLIAM DEAN	
Project : 32 STAFFORD ROAD	
Job Title : BASEMENT ADDITIONS	
Drawing Title : BASEMENT LEVEL REINFORCEMENT DETAILS AND GROUND FLOOR PLAN OF PROPOSED DEVELOPMENT	
Date : OCTOBER 2023	Drawing No : INT/2023/JD/SLL/26-03
Scale : 1:50	Paper Size : A3
Revision : 0	Date : 16/10/2023



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