

Former Texaco Filling Station, Bury Old Road, Prestwich
Geotechnical Assessment Report



**FORMER TEXACO FILLING STATION,
BURY OLD ROAD, PRESTWICH
GEOTECHNICAL ASSESSMENT REPORT
FOR
UNIMORE LTD.**

Mr. C. Eccles - Brownfield Land Consultant

Contaminated Land Assessments, Options Appraisals, Remediation Strategy & Verification,
Geotechnical Design, Earthworks & Materials Reuse, Waste Assessments & Classification

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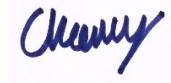
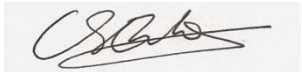
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1 INTRODUCTION

C Eccles Brownfield Land Consultancy (EBLC) was commissioned by Unimore Ltd. (The Client) to provide a geotechnical assessment report for a site at a former Texaco filling station on Bury Old Road, Prestwich, M25 0EY.

It is proposed to construct a two-story steel framed retail building with a basement. Due to the fall in land surface from Bury Old Road in the northeast down to towards the south west, the basement floor level will nearly be at ground level at the southwest end of the site.

It is understood that the proposals are to construct a retaining wall adjacent to the north western and south eastern sides of the site and on the end of the building facing towards Bury Old Road. The new building will be constructed within this cut/retained area. It is proposed to construct the building using shallow concrete foundations and a ground bearing slab if this is technically feasible rather than having deep foundations (e.g. piles). The building will be of a steel frame construction.

Figure 1 shows the proposed a draft site layout but note that it is understood that the width of the new building is likely to be narrower than the 25 m indicated due to boundary constraints and retaining wall construction requirements.

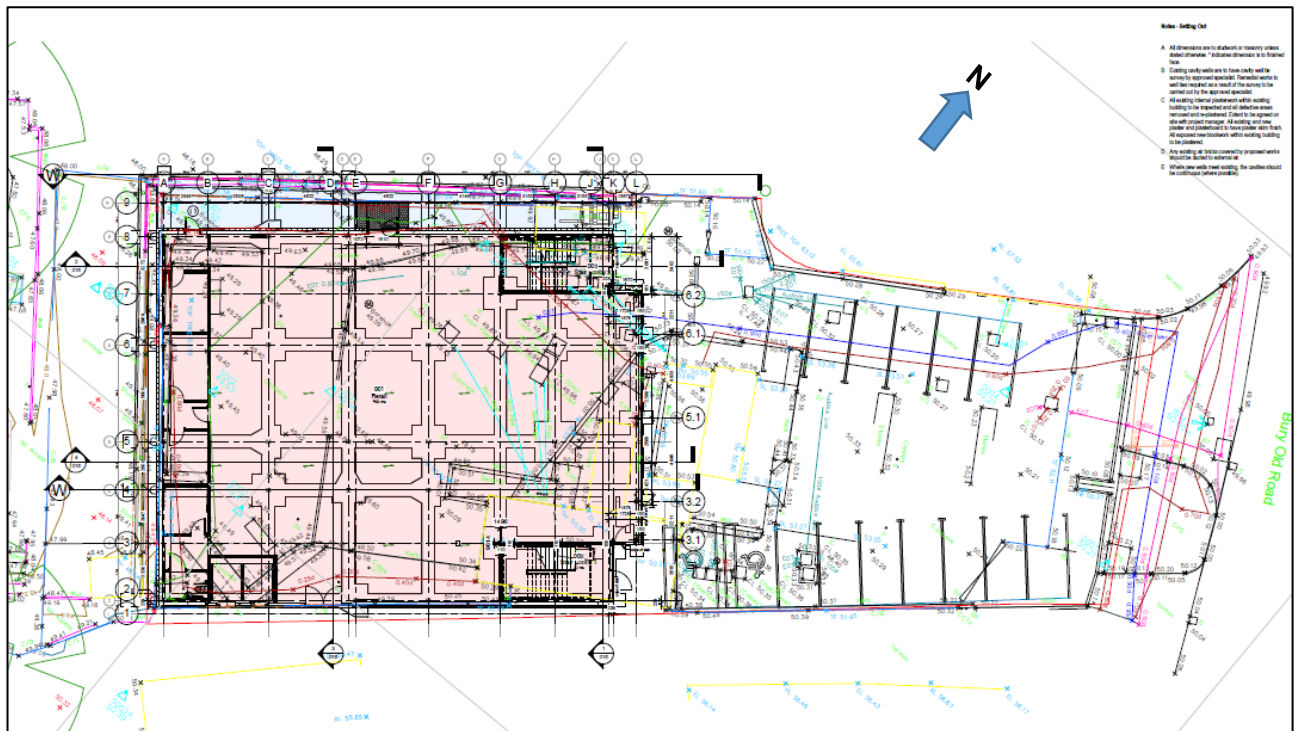


Figure 1: Proposed Site Layout (from Debtal drawing DA14079.2 010 Rev 2)

A 3-D isometric image of the currently proposed development is presented in Figure 2

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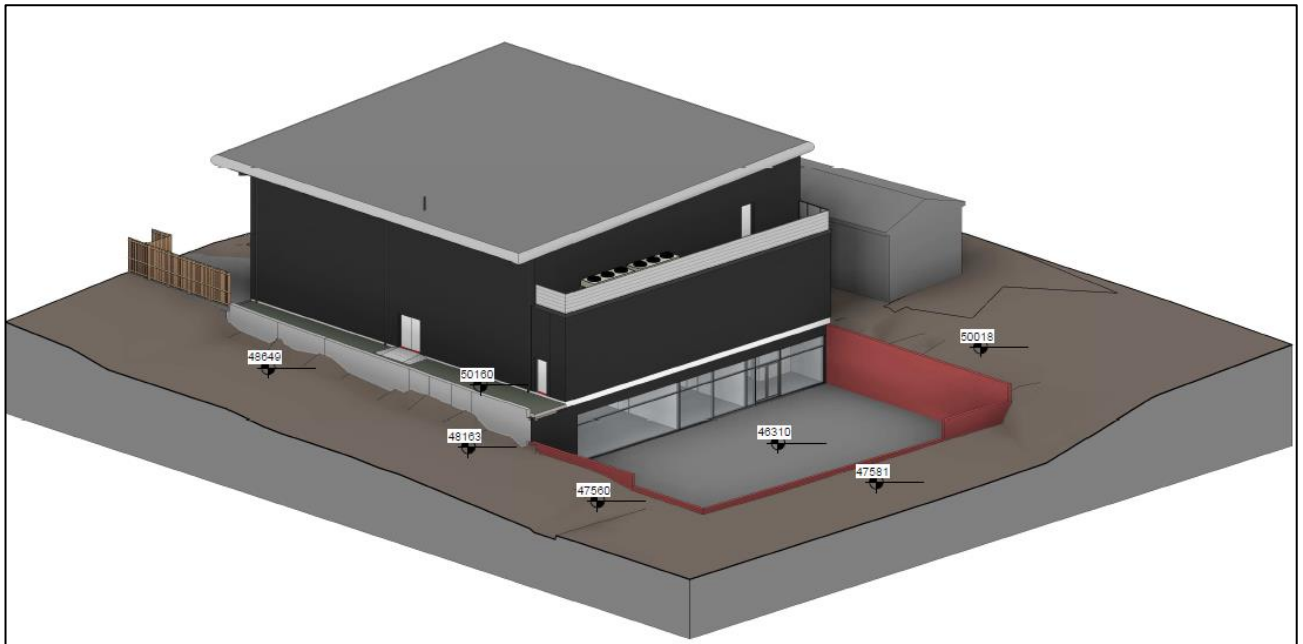


Figure 2: 3-D Image From Rear of Development (View Looking Southwest)

1.1 Previous Reports

The following previous reports have been reviewed and should be read in conjunction with this report:

- GeoAssist Ltd: Phase II Contaminated Land Risk Assessment - Texaco Fuel Station Bury Old Road, Prestwich. Date: January 2014. Report Ref: 5594/FSPCLRA v1.00. Note that this summarises the findings of an earlier Phase 1 Desk Study
- GeoAssist Ltd: Ground Investigation - Geotechnical - Texaco Fuel Station, Bury Old Road, Prestwich. Date Jan 2014. Report Ref: 5594/FSP-G
- Redstart Northwest Ltd: Phase 3 Site Investigation – Bury Old Road. Date August 2021. Report Ref 649.00.01.
- Redstart Northwest Ltd: Geotechnical Investigation Factual Report Former Texaco Fuel Station, Bury Old Road, Prestwich, M25 0EY. Date 3rd March 2022 Report Ref 649.00.02

The first two reports by GeoAssist (2014) principally looked at the shallow ground conditions relating to contamination and shallow geotechnical conditions with the investigations going down to a depth of up to 6 m below road level/main site ground level. The deepest hole penetrated to about 1 m below the proposed basement floor level).

The August 2021 Redstart report for the site was to document the removal of three petrol tanks and determine whether any further remediation was required following this removal. No remediation of contamination was required after the tanks had been removed.

In late 2021, there was removal of a significant volume of soil from the area of the proposed building as part of initial enabling works for this development. The majority of the basement excavation had been carried out.

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At the end of January and in early February 2022 Redstart carried out further geotechnical site investigation to present factual information from deeper boreholes drilled for geotechnical design of the new building and basement. This report was issued in early March 2022.

The ground conditions are discussed in greater detail in Section 2.3 and Section 3.3 plus 4.1.

1.2 Scope

The purpose of this report is to provide:

1. Advice on choice and selection and sizing of foundations including, if required, proposals for ground strengthening.
2. Advice on provision of drainage for ground and surface water to the building to facilitate “conventional” construction of the slab and foundations.
3. Advice on temporary and permanent soil slopes external to the proposed retaining walls.

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2 THE SITE

2.1 Site Location

The site is on the western side of Bury Old Road in the suburban area of Prestwich, Bury and is accessed directly off Bury Old Road. The Post Code is M25 0EY. The approximate grid reference for the centre of the site is 382875, 402531 and the total area of the site is approximately 1,300 m² (0.13 ha).

2.2 Site History

The site was a former Texaco filling station. The site was operational during the investigations by GeoAssist in 2014, and included a carwash and a shop.

The site's fuel tanks were decommissioned (foam filled) in January 2016. There were 4 below ground tanks: 3 "Unleaded" (petrol) and 1 "Derv" (Diesel Engine Road Vehicle).

The site then operated as a car washing site with sales of second-hand vehicles which closed in early 2021. The above ground structures were demolished in July and August 2021.

The three underground petrol tanks were removed in early August 2021. It is reported that the excavations found no hydrocarbons in the tanks or in the ground around the tanks. The resultant void after tank removal was backfilled with imported granular material (recycled 6F5). Surface concrete and former foundation have been removed below the footprint of the proposed building.

The fourth decommissioned tank (diesel) remains in the ground. It is understood that this is because:

- The new building does not overlie this area as it is close to the road and will be under proposed car parking.
- The tank had no history of any leaks or spillages.
- The tank has been decommissioned and foam filled.

Later in 2021 the area of the proposed basement was excavated down to formation level with a 0.50 m thick layer of capping (Class 6F5 material) placed over the base of the excavation. In August 2021 the area of the proposed building had a ground level of 49.6 to 50.0 mOD with the forecourt area closer to the road being at about 50.2 mOD. The excavations in the area of the building in late 2021 left the base of the excavation at 45.85 to 46.0 mOD indicating that the excavation was about 4.0 m deep.

An aerial image of the site prior to the demolition of the former filling station is shown in Figure 3, with the filling station in the central and north eastern sectors of the site, close to Bury Old Road. The south western part of the site, at the bottom of the slope, shows an area of parked cars.

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Figure 3: The Site Showing Former Filling Station

2.3 Geology and Ground Conditions

The published geology of the site indicates deep drift deposits of glacial sand and gravel, which may overlie Glacial Till (sandy gravelly clay) at depth. Bedrock is indicated to comprise Permo-Triassic strata of the Collyhurst Sandstone Formation which overlies the Upper Carboniferous Coal Measures. Boreholes and maps available from the British Geological Survey online database indicates the site is within a deep glacial channel, with rockhead some 70m deep.

A coal mining search carried out as part of a Phase 1 report and summarised in the GeoAssist 2014 report indicated that neither coal mining nor brine extraction were present below the site area.

The 2014 investigation encountered shallow Made Ground to depths ranging from 0.90m to 2.80m, overlying sand with silt/clay. Bedrock was not encountered. Monitoring of the standpipe installations in the boreholes confirmed that the depth to groundwater has varied between 4.20m and 4.50m across the site (about 46.5 mOD).

The three underground petrol storage tanks were removed in early August 2021. Soon after this trial pitting was across this area encountered Made Ground to between 1.20m and 2.00m depth. The Made Ground was described as demolition materials including asphalt, clinker, slag, concrete, brick, metal and wood, and ashy sand. Natural ground comprised brown silty fine glaciofluvial sand. No groundwater was encountered.

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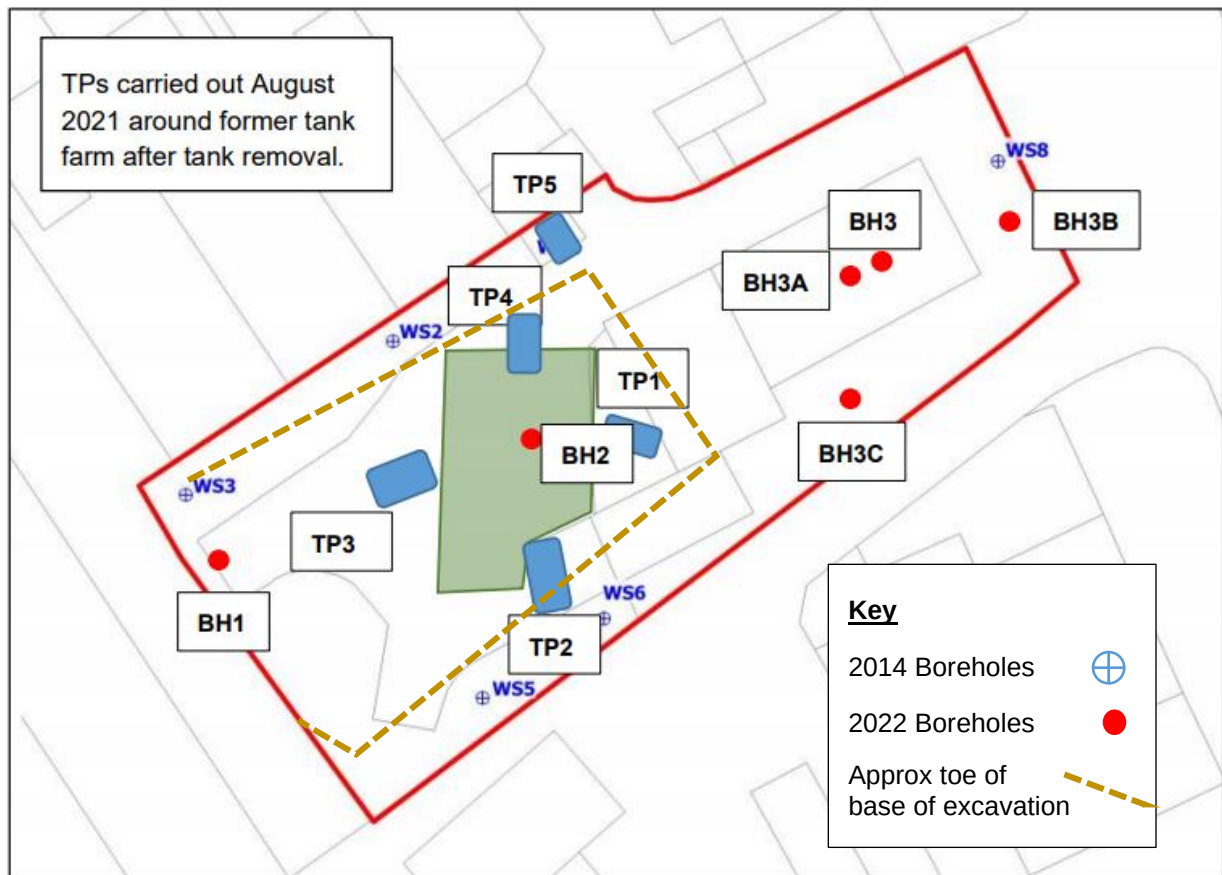


Figure 4: Borehole Location Plan

The deeper boreholes drilled in 2022 were undertaken after the excavations for the basement and are therefore at around 4.0 m below the previous ground levels. Made Ground (imported 6F5 capping) was found to 0.5m and 0.8m depth. This was underlain by predominantly granular glacial deposits although sandy silt deposits were present with Glacial Till present at depth in one of the two boreholes. Possible weathered bedrock was identified in one hole at 16.70m depth, although this may represent a boulder. Groundwater was at a depth of about 0.50 m below the top of the capping in the excavated area at about 45.35 to 45.5 mOD.

The ground conditions and stratigraphy are discussed in greater depth in Sections 3.3 and 4.2.

2.4 Contamination

There were formerly four underground fuel storage tanks: A diesel tank under the forecourt and three petrol tanks towards the rear of the site. The tanks were monitored electronically during the site's operational phase and no leaks were detected.

The Contaminated Land Risk Assessment by GeoAssist (2014) did not identify any elevated levels of soil contaminants, VOCs or ground gases.

All of the tanks were decommissioned and foam filled in 2016 and the three petrol tanks were removed in 2021.

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The Redstart investigation (2021), undertaken after the removal of the tanks, found no evidence of significant presence of petroleum or diesel range hydrocarbons. There was some visual evidence of potential contamination with asphalt/tarmac and ash being present in the Made Ground. Adjacent electrical transformers were assessed as a potential off-site source of contamination and no elevated levels of PCBs were found.

It is concluded that the site poses a negligible risk with regards to human health, controlled waters and the wider environment.

3 GEOTECHNICAL APPRAISAL - FOUNDATIONS & FLOOR SLAB

3.1 Foundation Requirements

The initial proposals for the site as provided by the Client's Structural Engineer are as follows together with items to be assessed as part of this report:

"The current thinking is to construct long strips of concrete foundation, designed as a "flexible" foundation with reduced ground design pressures in the central portion between column centres to reflect the stiffness of the foundation along its length between column centres. It is envisaged that the strip around the perimeter of the building would have strip footings approximately 50% of the width of those supporting the internal main columns within the building area. This will give us the space around the building the construct a suitable perimeter drain.

Typical "central" strip would be say 1.5m wide, with perimeter strip at say 0.75m wide.

The alternative is, of course, to consider "conventional" pad foundations to each column, these would likely be 2.0m x 2.0m nominal for the heaviest loaded internal columns (Refer to down loading calculations for indicative net GBP).

Both alternatives would require reinforcement in the concrete to support the ground pressures, although I understand that this would not enhance the stiffness of the foundations.

For each alternative, do you have a view on the depth of foundation that would be acceptable, given we would like to keep any foundations as shallow as possible, both to reduce cost and to avoid construction below the existing water table.

I have attached a short set of downloading calculations setting out nominal net bearing pressures from the new structure omitting foundation weights and basement floor slabs.

It appears to me that the indicative foundation loads are little more than the original overburden loads from the previous embankment which has been taken down to formation.

We'd be grateful if you could let us have your thoughts and comments on these options and advise on any ground strengthening e.g. compaction and/or stone columns, that may be recommended.

Maximum column loads (see Appendix C) are anticipated to be in the order of 227 kN (total dead load) plus 294 kN (total including live load).

3.2 Floor Slab Requirements

Ground bearing floor slabs are proposed. Loads (see appendix C) are expected to be in the order of 5kN/m².

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3.3 Ground Conditions

Borehole locations from the 2014 investigation and the 2021 investigation are shown in Figure 3 (Taken from the 2021 Redstart report)

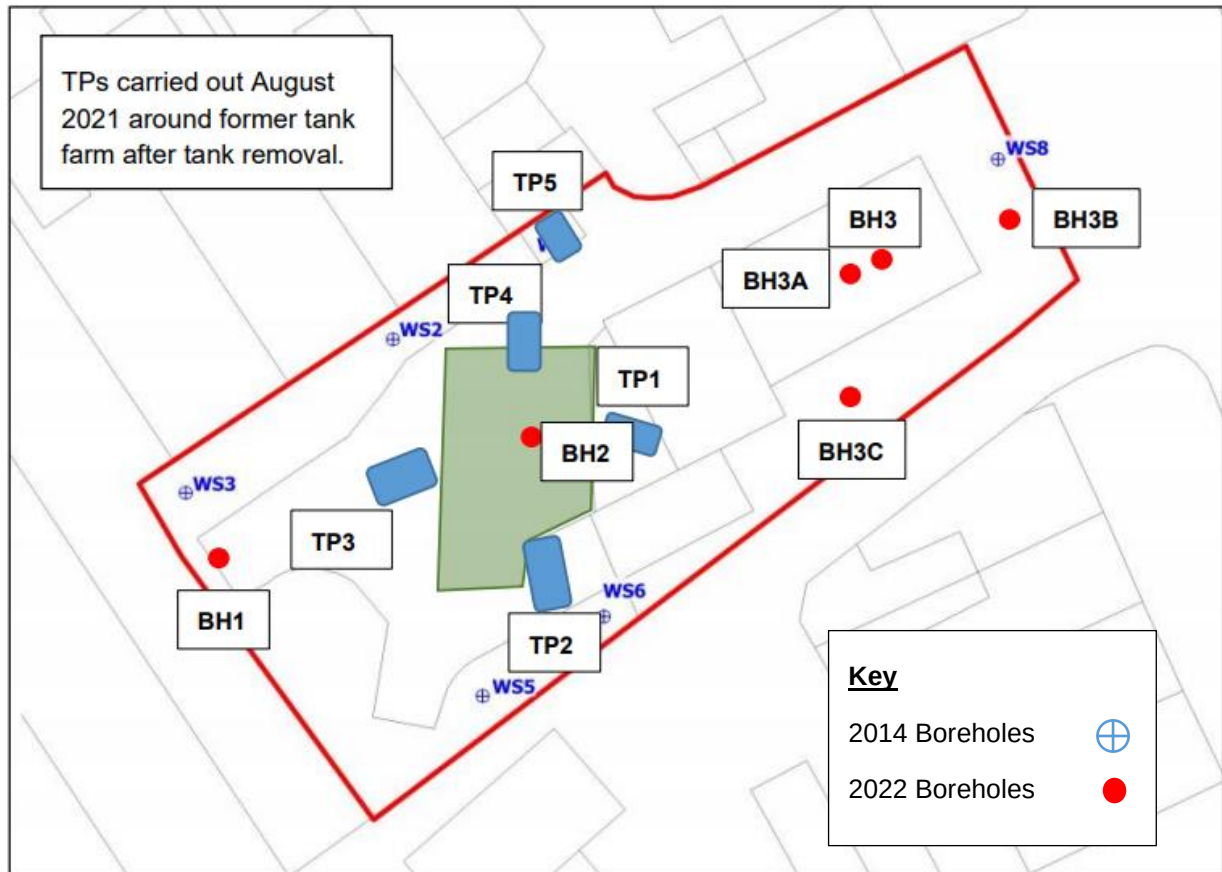


Figure 3: Borehole Location Plan

The following summary of the shallow (2014) boreholes is taken from the Redstart (2021) report:

The subsoil profile obtained from the shallow exploratory holes consists of grass/topsoil and concrete made ground to depths between 0.20m to 0.90m underlain by made ground to depths ranging from 0.90m and 2.80m and overlying sand with silt/clay. Exploratory holes WS1 and WS8 penetrated concrete hard standing to 0.20 and 0.30m depth respectively. Underlying the concrete and elsewhere, the Made Ground consists mainly of clay, sand and gravel with brick and concrete fragments and cinders in varying proportions. The made ground is variable in material constituents and ranges from very loose to dense in state of compaction.

Exploratory holes WS1, WS2, WS3 and WS8 penetrated a sandy Silt/Clay stratum at depths ranging from 1.30m to 2.80m. This sand Silt/Clay contained organic inclusions varied from 0.60m to 1.50m in thickness, from low to medium in strength and intermediate to high in plasticity. All the exploratory holes completed to depth were terminated in silty sand with irregular gravel horizons. The silty sand varied from loose to medium dense in state of compaction and extended to at least 6.00m depth.

Bedrock was not encountered in any of the exploratory holes.

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The deeper boreholes drilled in 2022 were undertaken after the excavations for the basement from grounds at around 45.9 mOD which is around 4.0 m below the ground levels of the site prior to the basement excavation. At the base of the excavation there was a layer of 6F5 type material which was 0.5m and 0.8m depth comprising demolition waste of gravel sized fragments of brick, concrete and natural rock.

Below this there is the sequence of Glacial Sand & Gravel comprising a loose becoming medium dense silty sand below to a depth of about 5.70 to 7.50 m. Below this layers of silt, sand and clay were encountered:

BH1	7.50 to 10.50 m	Medium dense fine sandy clayey SILT
	10.50 to 13.50 m	Medium dense slightly gravelly silty SAND
BH2	5.70 to 8.50 m	Inter-laminated slightly sandy CLAY AND silty SAND
	8.50 to 9.30 m	Medium dense fine sandy clayey SILT
	9.30 to 14.00 m	Medium dense slightly gravelly silty SAND
	14.00 to 16.70 m	Stiff sandy slightly gravelly CLAY
	16.70 to 16.88 m	Very dense brown SAND

The stratum from 16.70 to 16.88 m is possibly bedrock with an SPT N-value of more than 50 having been driven to refusal (extrapolated N-value for full 300 mm of penetration would be about 66).

Groundwater was at a depth of about 0.50 m below ground level which is a water level of about 45.4 mOD.

The SPT tests in the Glacial Sand & Gravel sequence can be summarised as follows:

Number of tests	16	4 loose, 3 of these at shallow depth, 12 medium dense
Minimum N-Value	7	
Average N-value	13.2	
Maximum N-value	22	

The SPT tests show relatively little variation with depth with the N-value increasing linearly with depth. A plot of the SPT N values in all available boreholes is presented in Figure 4 with a suggested lower bound design line of:

$$\text{SPT N-value} = 6 + 0.81 \times \text{depth below basement ground level}$$

A more realistic characteristic SPT N-value profile is given by a design line of:

$$\text{SPT N-value} = 6 + 1.03 \times \text{depth below basement ground level}$$

Note that there is no drop in N-value for the laminated clays/clayey silt/sands in the middle of the Glacial Sand & Gravel sequence compared to the sands above and below this. With the removal of about 4 m of soil from above the basement floor level this will have resulted in unloading of the ground by about 75 kPa with the laminated clays/clayey silt/sands in the middle of the Glacial Sand & Gravel sequence being slightly over-consolidated due to this reduction in overburden.

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Also note that the SPTs are all the raw SPTs. They have not been corrected to N_{60} values which increases then by 7% and no corrections for rod length or other corrections to form $N_{1(60)}$ values. If corrections are made then the loose N-values at shallow depth are reclassified as medium dense.

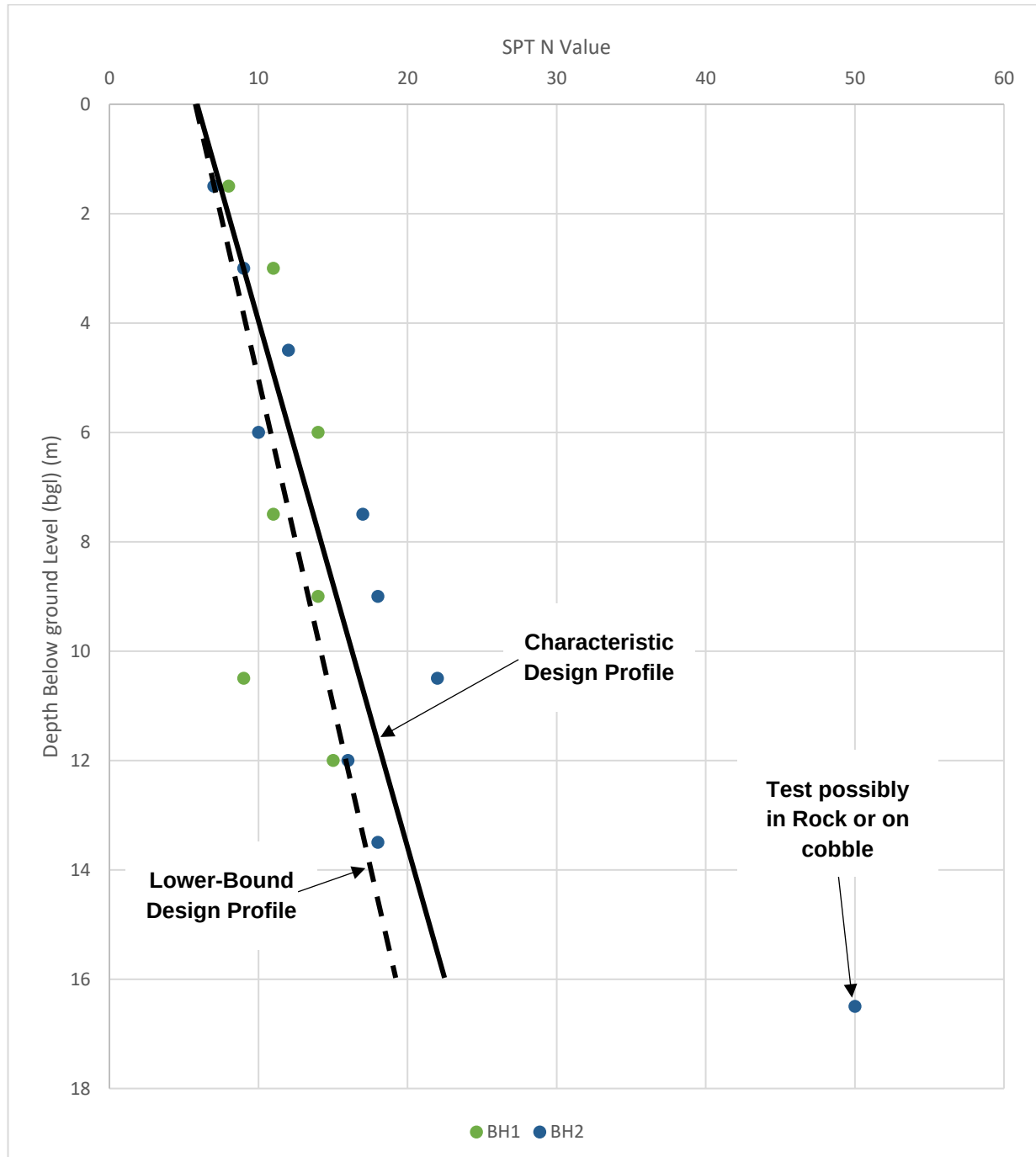


Figure 4: SPT N Values versus Depth Below Basement Excavation Level

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3.4 Loadings & Bearing Pressures

Maximum column loads (see Appendix C) are anticipated to be in the order of 227 kN (total dead load) plus 294 kN (total including live load). Typical “central” strip would be say 1.5m wide, with perimeter strip at say 0.75m wide with columns at about 5 m centres. Alternatively columns could be supported on “conventional” pad foundations to each column which would likely be 2.0m x 2.0m nominal for the heaviest loaded internal columns. Bearing pressures would be:

Typical Ground Bearing Pressure (Based on 2m x 2m pad foundation) = 130 kPa

Typical Ground Bearing Pressure (Based on 1.5m wide strip foundation) = 99.3 kPa
(Allowing 50% of GBP in the central section of the strip)

3.5 Ground Bearing Resistance

The preferred solution for the foundations are shallow spread footings in the top of the silty fine Sand within the upper part of the Glacial Sands & Gravel sequence. The allowable bearing pressure for the footings is higher than those quoted in the section above. Therefore the critical design case for these footings is not the Ultimate Limit State which is usual for most spread foundations.

3.6 Assessment of Settlement

For shallow foundations on sand, the critical mode of failure is always the Serviceability Limit State which is settlement. There are many different published methods for assessing settlement of foundations on granular soils. The ICE Manual of Geotechnical Engineering¹ recommends using a methodology published by Burland and Burbidge² or a slightly more refined version published by Craig³. However, the ICE manual states that

“Before a designer becomes entangled in the details of predicting settlement in sand he must satisfy himself whether a real problem exists and ascertain what advantages and economies can result from refinements in settlement prediction.”

This is because significant settlement on sand is very rare for standard monotonic loading and settlement on sands tends to only become a significant issue under cyclic or variable loading. This suggests that a settlement assessment is not even required for a structure such as this and the empirical approach in Figure 19.17 of the ICE Manual of Geotechnical Engineering¹ can be used. This is based on using a basic plot of settlement/load against foundation width.

¹ ICE Manual of Geotechnical Engineering Volume 1 Geotechnical Engineering Principals, Problematic Soils & Site Investigations. ICE Publishing, 2012.

² Burland JB & Burbidge M C (1985) Settlement of foundations on sand and gravel. Proceedings of Institution of Civil Engineers, Part 1, 78, 1325-1381.

³ Craig RF (2004) Craig’s Soil Mechanics (7th Edition) Oxford UK: Spon Press.

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Using the basic plot of settlement/load against foundation width in Figure 19.17 of the ICE Manual¹ the and SPT N-values the following can be deduced:

2m x 2m pad foundation, pressure 130 kPa

Settlement on loose sand	22 mm – upper bound assessment
Settlement on medium dense sand	10.4 mm – upper bound assessment

1.5m wide strip foundation, pressure 99.3 kPa

Settlement on loose sand	15 mm – upper bound assessment
Settlement on medium dense sand	7 mm – upper bound assessment

With relatively high 22 mm upper bound assessment for settlement on loose sand for the 2 x 2 m pad, it is worth carrying out a more sophisticated analysis for this loading case. Using the Burland and Burbridge² method as refined and published by Craig³, this uses the N_{60} values. This gives a characteristic N-value of 8.6 for the sand in the depth of influence below the footing for the 2m x 2 m pad and the calculated settlement will be up to 17.7 mm.

The settlements calculated for the 1.5 m wide strip footing will be 12 mm using the same methodology.

It should be noted that with such a high water table, one of the critical issues will be the water table at the time foundations are installed. Excavations below the water table in into silty fine sand are always problematic given that piping will occur leading to excavation instability. Having the formation of the footings within the capping layer at a depth of about 400 mm below current level in the base of the excavation will be appropriate.

4 GEOTECHNICAL APPRAISAL – SLOPES & RETAINING WALLS

4.1 Basement Excavation Retaining Wall Discussion

The two previous site investigation reports by GeoAssist are the main sources of information for the cut slopes and retaining walls:

- GeoAssist Ltd: Phase II Contaminated Land Risk Assessment - Texaco Fuel Station Bury Old Road, Prestwich. Date: January 2014. Report Ref: 5594/FSPCLRA v1.00. Note that this summarises the findings of an earlier Phase 1 Desk Study
- GeoAssist Ltd: Ground Investigation - Geotechnical - Texaco Fuel Station, Bury Old Road, Prestwich. Date Jan 2014. Report Ref: 5594/FSP-G

These indicate that below a layer of Made Ground, the basement excavations are into an upper layer of sandy Silt/Clay of intermediate to high plasticity to a depth of about 1.30 to 2.80 m and this overlies loose to medium dense silty Sand. Note that location WS5 had no cohesive strata present.

There were 13 SPT test results which ranged from 6 to 24 with a suggested 'Value for Design' of 13. Note that the lowest N-value of 6 can be ignored because this is assessed as being due to piping in the borehole due to a water imbalance.

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4.2 Basement Excavation Retaining Wall Discussion

It is proposed that the building will be designed to maximise the available width on this site requiring retaining walls along the three sides of the building. Along the north-eastern side of the building closest to Bury Old Road there will be a conventional concrete retaining wall integral with the building/basement. Along the two longer sides to the northwest and southeast it is proposed that the building will be constructed in the open without retaining walls and the ground adjacent to the building will have retaining walls with cut slopes above.

Initial concepts for the main walls along the two longer sides to the northwest and southeast was to have sheet piled walls but based on an initial assessment of cost sheet piles have been discounted and gabion walls are now proposed although these will reduce the available footprint of the new building.

A fairly typical Gabion Wall design for a 2 m high wall with a flat front face with a 4 m overall slope height would be:

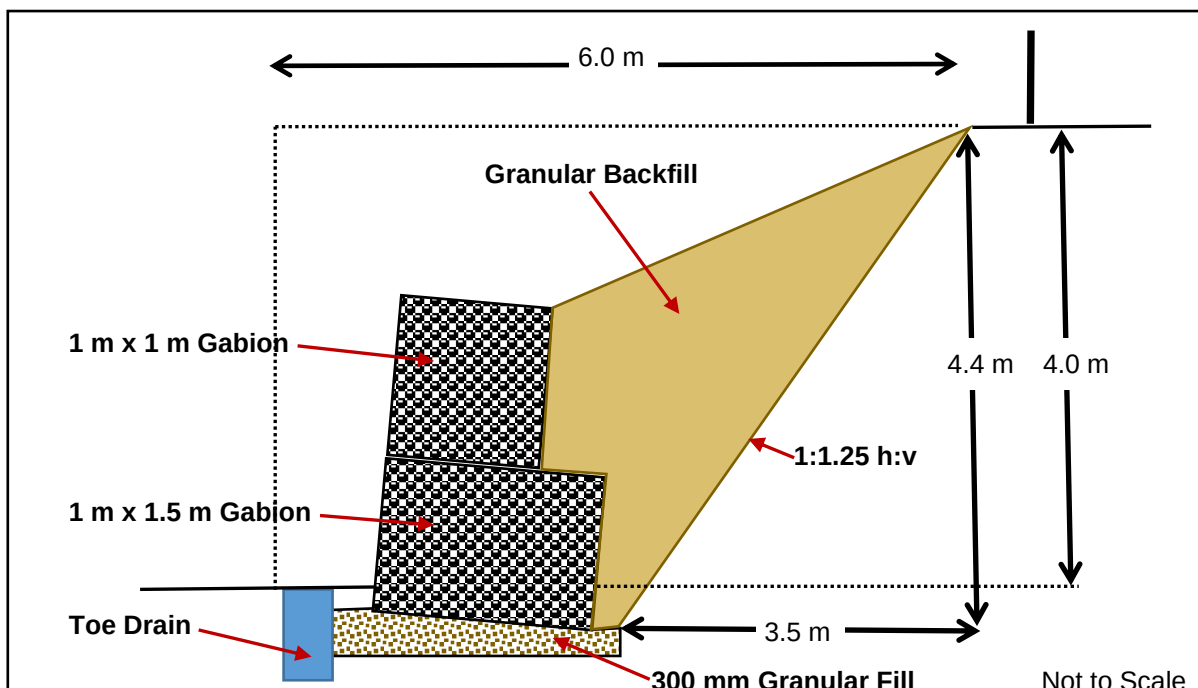


Figure 5: Conceptual Design of Gabion Retaining Structure - 4 m Retained Height

At this site the conceptual gabion design would require the edge of the building to be about 7 m from the perimeter of the site with the combined structure width of the wall, toe drain and granular footing plus the 2.5 m. The distance from the heel of the excavation to the crest would be 3.5 m based on a temporary angle of repose of 1:1.25 h:v (51.3°). In order to construct the front face of the wall closer to the perimeter of the site then a steeper temporary cut slope would have to be used or temporary propping/support used.

Where the retained height is less than about 2.0 m towards the southwest then a steeper a temporary angle of repose may be appropriate.

As alternative to gabion walls other types of retaining wall may be considered. One is to use large concrete Lego type interlocking blocks. These would cost more but have a number of advantages such as:

- A narrower wall would be required than for gabions due to the denser material.

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- It would be faster to construct.
- It would be safer to construct because there will be significantly lower worker hours to construct and much less time with personnel at the toe of a temporary unsupported face.
- It would be possible to have a steeper cut slope than 1:1.25 h:v as there would be a reduced time between excavation and wall placement if detailed sequencing of construction was carried out and relatively short lengths of excavation and wall were constructed at a time.

It is recommended that the retaining walls should be constructed from the southwest towards Bury Old Road so that there is some arching of lateral pressure onto the shallower sections of wall while the higher parts are constructed. This will increase the stability of temporary cut slopes compared to constructing in the reverse direction.

4.3 Basement Excavation Retaining Wall Design Parameters

Retaining walls should be designed in accordance with BS EN 1992 Design of concrete structures, BS EN 1996 Design of masonry structures, BS EN 1997-1 and 2 Geotechnical design, Ground investigation and testing and BS 8002:2015: Code of practice for earth retaining structures

It is recommended that the following parameters (presented unfactored) are used for the natural soils at this site when designing retaining walls:

Table 1: Soil Parameters For Use in Retaining Wall Design (Unfactored Characteristic Values)			
Stratum	Bulk Unit Weight (Weight Density) (kN/m ³)	Apparent Cohesion c' (kPa)	Effective Angle of Shearing Resistance ϕ' (degrees)
Glacial Sand	18	0	32

It is also recommended that a perimeter "French" drain is installed at the toe of the retaining wall to collect any surface water run-off from the building plus transfer any shallow ground water away from the slope. This will be linear drains which will terminate in a soakaway at the southwest of the site in the rear (yard) area some 5.0m away from any foundations.

4.4 Slope Design Parameters

For short-term cut slopes a temporary slope angle of 1:1.25 h:v (51.3°) is proposed with a slope only at this angle for a maximum of about a week. Note that this assumes that there are no seepages of perched water from the slope. If there are seepages then these will cause instability very quickly and counterfort drains will need to be installed contemporaneously with the excavation to ensure continued stability.

For long term slopes it is recommended that slopes of 1.75:1 h:v (29.75°) are used in the natural strata. Note that these are soils which are potentially erodible by heavy rain so they need to be vegetated at the earliest opportunity or erosion protection installed.

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4.5 Floor Slabs & Groundwater

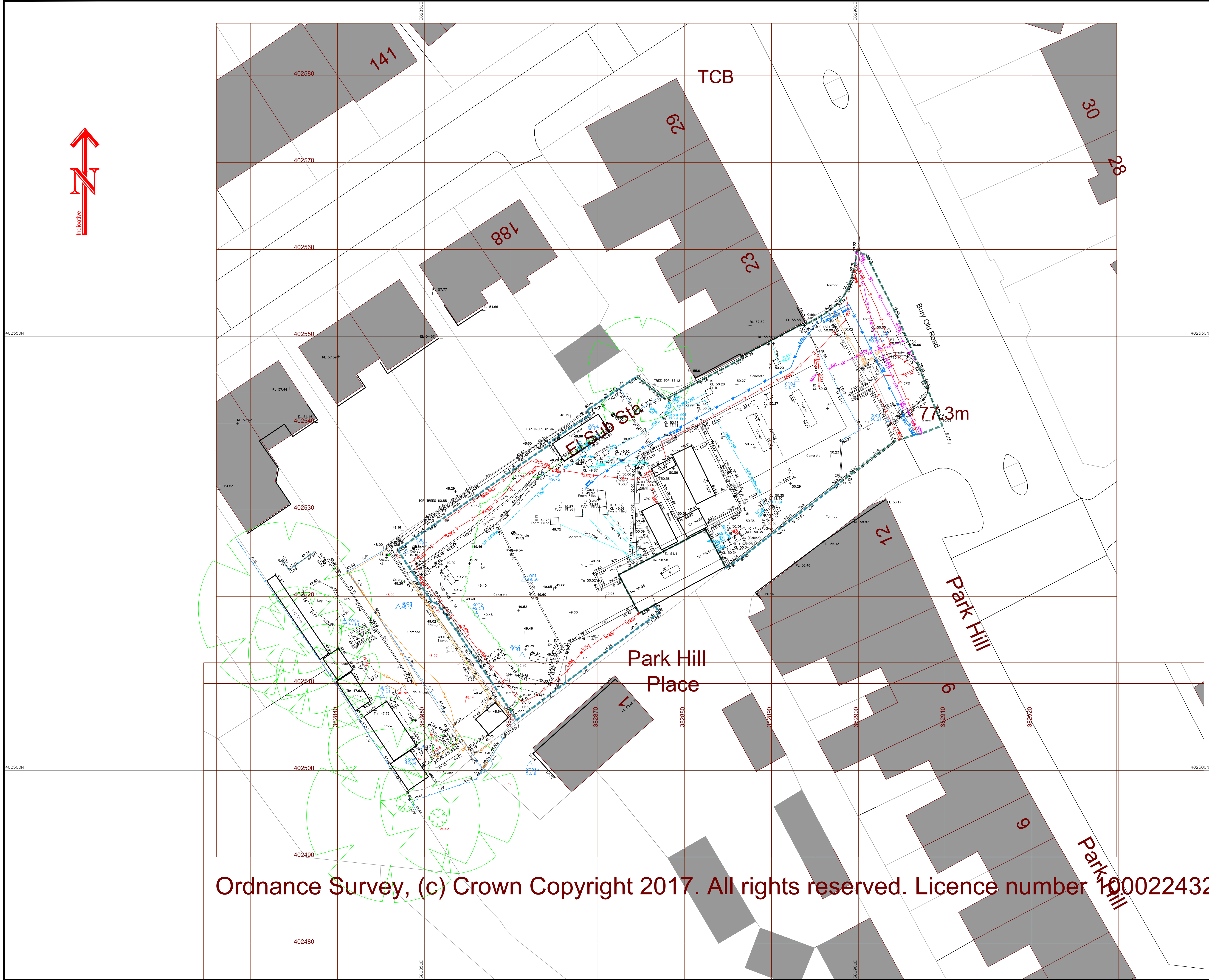
Given the width of the building and that the groundwater was at a depth of only 0.50 m at the time of the investigation and that the preceding month had been relatively dry, it is likely that after heavy rainfall that higher groundwater levels will occur. In order to not have to consider uplift pressures on the basement floor slab, it is recommended that in addition to the two retaining wall toe drains that five further French drains are constructed longitudinally below the floor slab to control groundwater levels and prevent uplift and seepage of water through the floor slab..

Former Texaco Filling Station, Bury Old Road, Prestwich

Geotechnical Assessment Report

Appendix A

Site Plans



Topographical Survey Legend

B	Bollard	h	Height	RWP	Rain Water Pipe	Level Prefix Descriptions	
BS	Bus Stop	Hyd	Hydrant	SP	Scal Pipe	AL	Arch Level
BT	Telecommunications IC	IC	Inspection Cover	SFS	Shore Fencing Slabs	BL	Bed Level
CPS	Concrete Paving Slabs	JB	Junction Box	ST	Stop Top	CL	Cover Level
CTV	Cable Television Cover	KO	Kerf Outlet	SV	Stop Valve	EL	Enave Level
DP	Downpipe	LP	Lamp Post	SV	Stop Valve	FL	Floor Level
DR	Drain	LP	Lamp Post	TCE	Telephone Cell Box	IL	Invert Level
ELC	Electrical IC	MP	Mile Post	TL	Traffic Light	OC	Overhead Cable Level
EP	Electric Pole	NP	Name Plate	TP	Telegraph Pole	PL	Parapet Level
ER	Earth Road	NP	Name Plate	TCS	Tactile Paving Slabs	RL	Roofing Level
FP	Flagpole	P	Post	VP	Vent Pipe	SL	Soft Level
FT	Floodlight	PM	Parking Meter	WM	Water Meter	Spr	Arch Springing Level
G	Gully	RE	Rodding Eye	WO	Water Outlet	TF	Top Of Fence Level
GS	Gate Post	RS	Road Sign	UTL	Unable To Lift	TW	Top Of Wall Level
GV	Gas Valve	RTW	Resisting Wall	UTL	Unable To Lift	Thr	Threshold Level
						WL	Water Level

Fence Annotation
B/W Barbed Wire
C/B Closed Boarded
C/I Corrugated Iron
C/L Chain Link
C/P Concrete Panel
H/R Hand Rail
I/R Iron Railings
O/B Open Boarded
P/C Post & Chain
P/R Post & Rail
P/W Post & Wire
W/M Wire Mesh

Fence
Safety Barrier
Gate
Site
Hedge
Limit of Foliage
& Tree Canopy

SS1
+50.00
50.00
Survey Control Station
(coordinated point)

Tree
MT Multi Trunk

Drainage/Services Legend

Surface	Electric	CCTV	Ducting
Combined	Street Lighting		
Drainage (unspecified)	Gas		
BT British Telecom	Water		
Telecom	Utility Survey		
Fibre optics	UK		
FG	Unknown / misc		
CAV			

Drainage plus size data has been determined from the surface, in order to comply with confined spaces health and safety legislation. Please regard this data as approximate.

Survey Station Coordinates

STN	EASTING	NORTHING	LEVEL
0001	382903.51	402540.45	50.21
0002	382861.27	402513.35	49.41
0003	382869.96	402538.62	50.00
0004	382892.94	402545.10	50.21

PAS128 Quality Levels

Please refer to PAS128:2014 Table 1 - "Quality level of survey outputs (normative)" for anticipated accuracy of quality levels.

All utilities are located to PAS128 QL-B2 unless otherwise stated.

The following table identifies the PAS128 quality level based on the notes shown on the drawing:

Annotation found on drawing	PAS128 Quality Level
Added from records	PAS128 QL-D
Trench scar, street furniture, visual note/reference to utility	PAS128 QL-C
Assumed route	PAS128 QL-B4
Unable to obtain depth	PAS128 QL-B3
QL-B1	PAS128 QL-B1
QL-B3P	PAS128 QL-B3P
QL-B2P	PAS128 QL-B2P
QL-B1P	PAS128 QL-B1P

Quality levels ending with a "P" refer to a utility that has been located with post processed Ground Penetrating Radar (GPR).

Drawing caveats, please note:
Survey Systems carry out surveys in accordance with site procedures using approved detectors.
Depth data is limited by the accuracy of the detection equipment. Average accuracy is +/- 10% of depth with GPR and +/- 5% of the depth with electromagnetic techniques.
It is SSL's procedure to use statutory undertakers plans prior to and during the survey as a guide for the survey team.
In accordance with British Telecom's national policy survey companies are not permitted to raise BT inspection chamber covers.
Drainage routes between manholes, if not able to be traced by Locate's survey methodologies, are assumed to be direct lines between manholes.
SSL advise that excavations in the vicinity of services are carried out with due diligence, please refer to HSG47.

01 Surveyed tied to GPS and overlaid with OS tile sheet.

Rev No. Details

Sep 2021

Date

Levels are related to TBM

Value 50.00m
Sited on IC cover indicated on plan by arrow.

Coordinates are related to GPS

Scale 1:200

0 2 4 6 8 10 12 14 16 18 metres

The accuracy of this survey is commensurate with the drawing scale specified within the title block. Copyright in this drawing remains with Survey Systems Ltd. Do not scale from this drawing, work to figured dimensions. Check all dimensions on-site. In the event of any discrepancy, please refer query to Survey Systems Ltd.

Title

Topographical Survey
Former Texaco Station
Bury Old Road
Prestwich M25 0EY

Surveyed AT DM DI IH SO JB Drawn AG BP

Date July 2021 Checked AG

File name 18192C-REV1 Revision No. 01 Sheet size A1

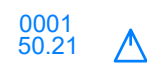
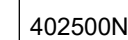
Drawing No. SSL:18291C:200:1:1:REV1

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www.surveys.co.uk

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SURVEYsystems

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Topographical Surveys

Detail, services and features may not have been surveyed if obstructed or not reasonably visible at the time of the survey.

Surveyed physical features may not necessarily represent the legal boundary line.

Measured Building Surveys

General

The contractor must check and verify all site and building dimensions, levels,

The survey control issued is only to be used for topographical surveys at the stated scale. All control must be checked and verified prior to use.

© Land Survey Solutions Limited holds the copyright to all the information contained within this document and their written consent must be obtained before copying or using the data other than for the purpose it was originally supplied.

Do not scale from this drawing.

	Foil		CATV		CCTV
	Surface		Electricity		Electricity
	Combined		Street lighting		Street lighting
	Drainage (unspecified)		Traffic management		Traffic management
	British Telecom		Gas		Gas
	Telecom		Water		Water
	Fibre optics		Fuel		Fuel
	CATV		Unknown/misc		Unknown/misc
	Utility Survey Boundary		Ducting		Ducting
					Service depth (m)
					Pipe diameter (mm)
					End of trace
					Unable to trace

Drainage pipe size data has been determined from the surface, in order to comply with confined spaces health and safety legislation. Please regard this data as approximate.

PAS128 Quality Levels
Please refer to PAS128:2014 Table 1 - "Quality level of survey outputs (normative)" for anticipated accuracy of quality levels.
All utilities are located to PAS128 QL-B2 unless otherwise stated.

The following table identifies the PAS128 quality level based on the text notes shown on the drawing:

Quality levels ending with a "P" refer to a utility that has been located with post-processed Ground Penetrating Radar (GPR).

Drawing corrects, please note:

LSS carry out surveys in accordance with site procedures using approved detectors.

Depth data is limited by the accuracy of the detection equipment. Average accuracy is +/- 10% of depth with GPR and +/- 5% of the depth with electromagnetic technologies.

It is LSS procedure to use statutory undertakers plans prior to and during the survey as a guide for the survey team.

Drainage routes between manholes, if not able to be traced by LSS survey methodologies, are assumed to be direct lines between manholes.

LSS advise that excavations in the vicinity of services are carried out with due diligence, please refer to HSG47.

Levels are related to OSGB15
Value N/A

Coordinates are related to National Grid

Please note:

Any discrepancy found between an Ordnance Survey benchmark and an OSGB15 computed orthometric height is likely to be due to bench mark subsidence or uplift and, assuming precise GPS survey has been carefully carried out, the orthometric height given by OSGB15 should be considered correct in preference to archive benchmark heights. OSGB15 converts GPS ellipsoid heights to orthometric heights above mean sea level.



SURVEY SOLUTIONS

LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING

0845 040 5969
survey-solutions.co.uk

IPSWICH BIRMINGHAM COVENTRY GLASGOW LONDON NOTTINGHAM YORK

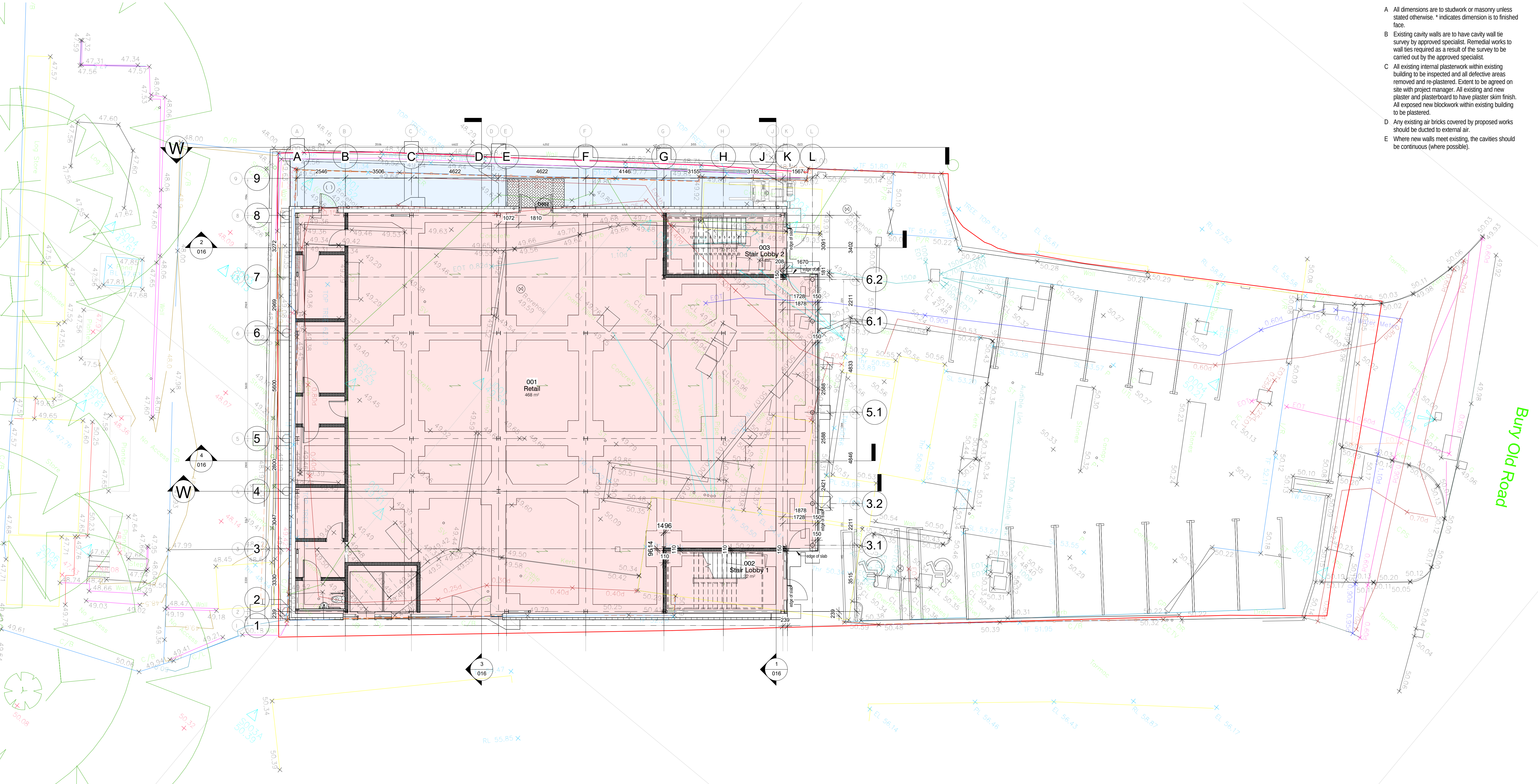
IPSWICH BIRMINGHAM COVENTRY GLASGOW LONDON MANCHESTER NORWICH

PROJECT TITLE
Former Texaco Station Bury Old Road Prestwich M25 0EY

DRAWING DETAIL
TOPOGRAPHICAL SURVEY
Sheet 1 of 1

CLIENT	SCALE
--------	-------

SURVEYOR PN	SURVEY DATE Nov 21	CHECKED BY PN	APPROVED BY PN	DWG STATUS FINAL
DRAWING NUMBER 18292C-REV1			REVISION	ISSUE DATE 14/03/22



Legend - Boundaries

- Site Boundary ————
- Site Ownership ————

Legend - Setting Out

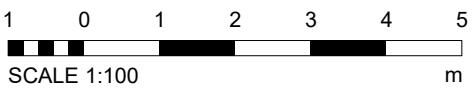
- New ————
- Retained ————
- Demolished - - - - -

Notes - Setting Out

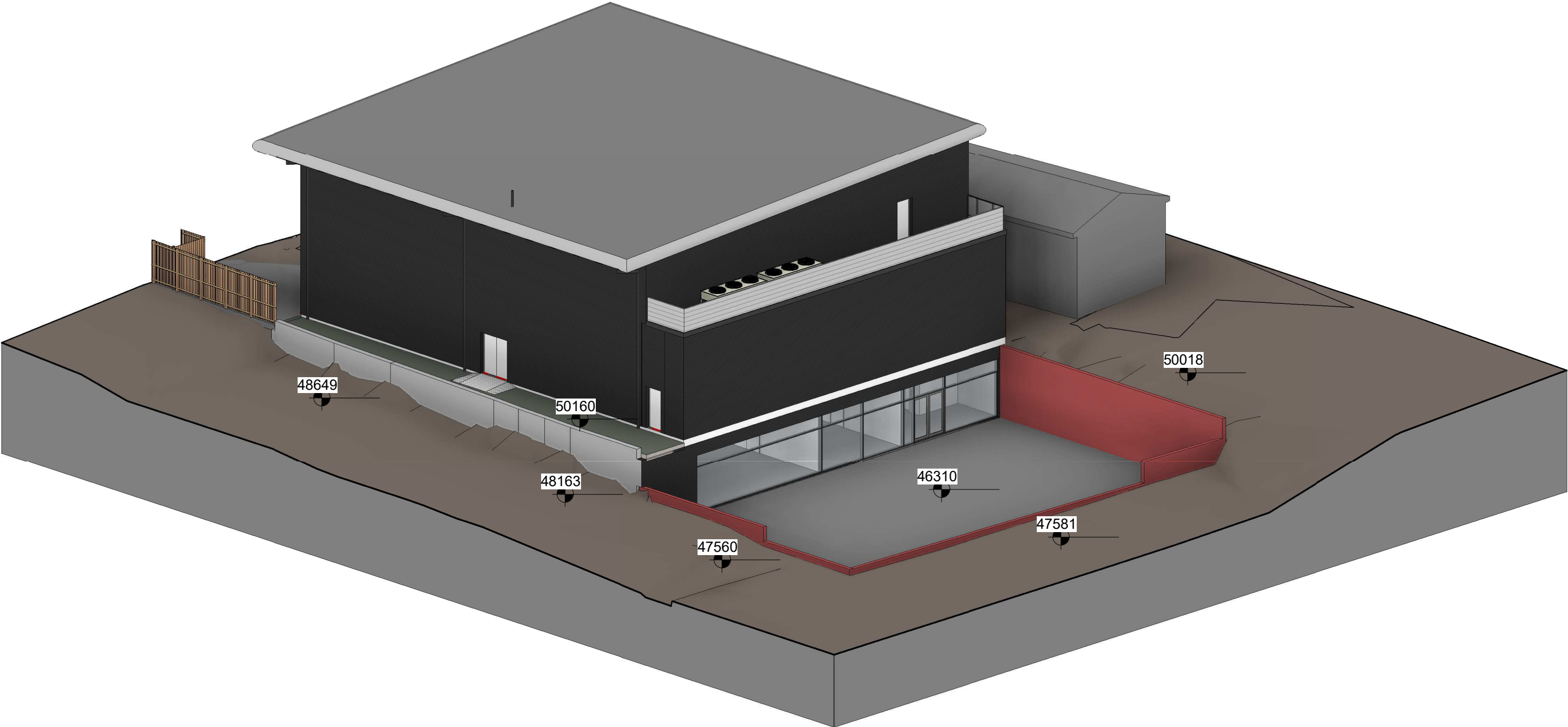
- A All dimensions are to studwork or masonry unless stated otherwise. * indicates dimension is to finished face.
- B Existing cavity walls are to have cavity wall tie survey by approved specialist. Remedial works to wall ties required as a result of the survey to be carried out by the approved specialist.
- C All existing internal plasterwork within existing building to be inspected and all defective areas removed and re-plastered. Extent to be agreed on site with project manager. All existing and new plaster and plasterboard to have plaster skim finish. All exposed new blockwork within existing building to be plastered.
- D Any existing air bricks covered by proposed works should be ducted to external air.
- E Where new walls meet existing, the cavities should be continuous (where possible).

1. Level 0 - Setting Out - Site

1:100

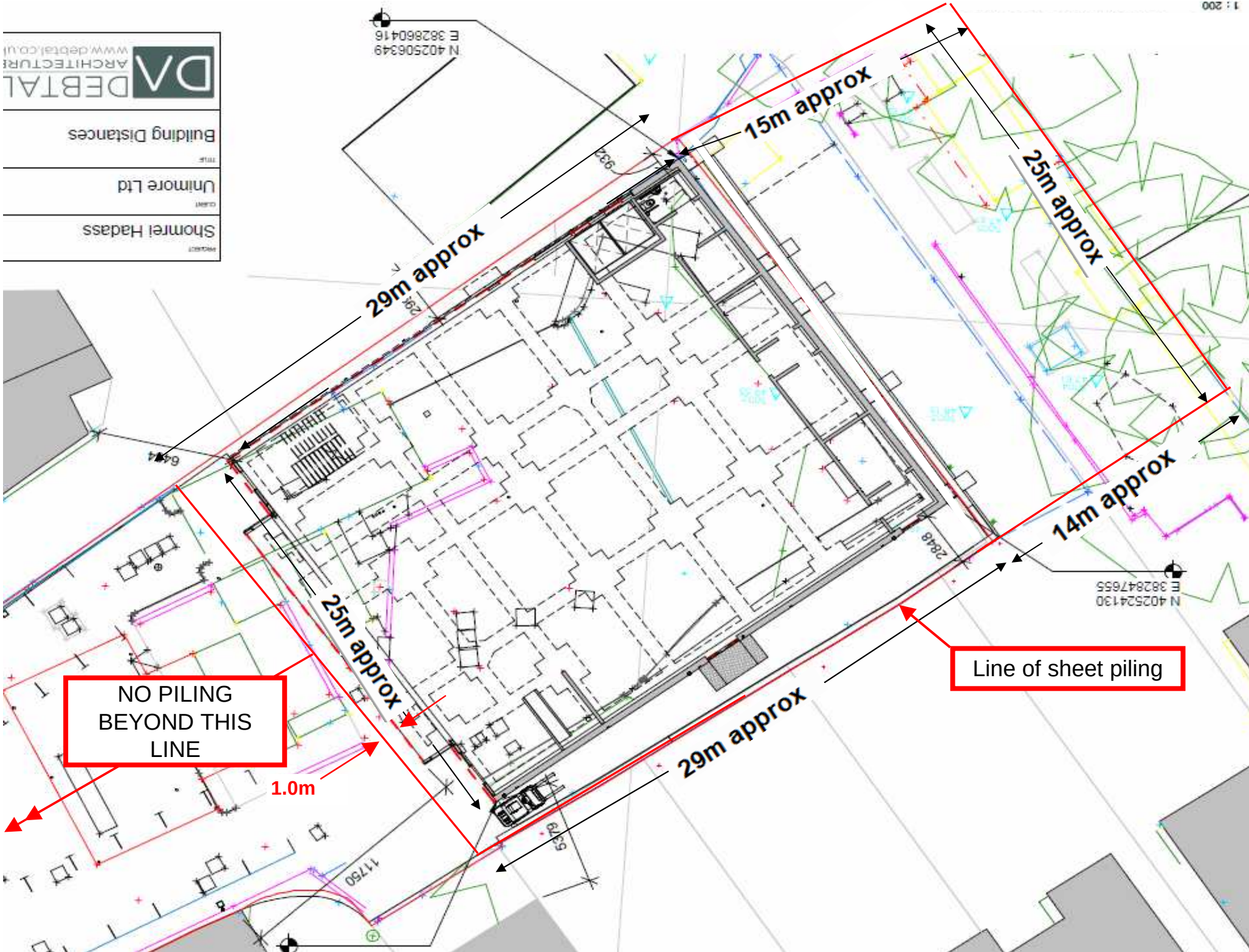


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1. 3D Axo - Proposed Levels - Rear

REV		DESCRIPTION	BY	DATE
PROJECT		SCALE @ A3	DATE	DRAWN BY
Unimore			25 OCT 2021	SP
CLIENT		STATUS		
Unimore Ltd		For Coordination		
TITLE		PROJECT NO.	DRAWING NO.	REV.
Site - Axo Levels			DA14079.2. 212.	
 DEBTAL ARCHITECTURE www.debtal.co.uk		NOTES		
		THIS DRAWING MUST NOT BE REPRODUCED WITHOUT PRIOR WRITTEN CONSENT. DRAWING TO BE USED FOR THE STATUS INDICATED ONLY. ALL DIMENSIONS AND SETTING OUT SHALL BE CHECKED AND CONFIRMED ON SITE. ANY DISCREPANCIES TO BE REPORTED TO THE DESIGNER PRIOR TO THE COMMENCEMENT OF ANY WORK. ALL WORK AND MATERIALS TO BE IN ACCORDANCE WITH CURRENT STATUTORY LEGISLATION, RELEVANT CODES OF PRACTICE AND BRITISH STANDARDS. ALL DIMENSIONS ON THIS DRAWING ARE IN MILLIMETRES (UNLESS OTHERWISE STATED).		



Appendix B

Load Calculations

[illegible]

77 Windsor Road
Prestwich
Manchester
M25 0DB
Tel: 0161-772-0404
Email: mail@cvestates.co.uk



Loadings

Loads at Ground and First Floors

150mm RC concrete = 4.0 kN/m²
Structural steelwork

Imposed Loading floors = 5.0 kN/m²

Roof Loading

Insulated cladding on cold rolled purlins = 0.3 kN/m²

Imposed Loading Roofs = 0.75 kN/m²

Maximum Column Loading from Dead Loads

Roof = $\frac{11.8 \times 9.24}{4} \times 0.30 = 8.2$ kN

First Floor = $\frac{11.8 \times 9.24}{4} \times 4.00 = 109.5$ kN

Ground Floor = $\frac{11.8 \times 9.24}{4} \times 4.00 = 109.5$ kN

Total Dead Load = 227.1 kN

Maximum Column Loading from Live Loads

Roof = $\frac{11.8 \times 9.24}{4} \times 0.75 = 20.5$ kN

First Floor = $\frac{11.8 \times 9.24}{4} \times 5.00 = 136.8$ kN

Ground Floor = $\frac{11.8 \times 9.24}{4} \times 5.00 = 136.8$ kN

Total Live Load = 294.2 kN

Typical Ground Bearing pressure (Based on 2m x 2m pad foundation) = 130 kN/m²

Typical Ground Bearing pressure (Based on 1.5m wide strip foundation) = 99.3 kN/m²
(Allowing 50% of GBP in the central section of the strip)

Mr. C. S. Eccles - Brownfield Land Consultant

Former Texaco Filling Station, Bury Old Road, Prestwich

Geotechnical Assessment Report

END OF REPORT