BASEMENT
IMPACT
ASSESSMENT

24 - 28 Warner Street
Clerkenwell
London
EC1

for

24-28 WARNER STREET LLP

LBH4006

OCTOBER 2012

LBH WEMBLEY

Geotechnical & Environmental

Report prepared by:

S R Lefroy Brooks BSc MSc CEng MICE CGeol FGS CEnv MIEnvSc FRGS SiLC
Principal Engineer

Project No: LBH4006

Report Ref: LBH4006 Ver 3.2

Date: 24/10/2012

LBH WEMBLEY Geotechnical & Environmental
Unit 12 Little Balmer
Buckingham Industrial Park
Buckingham
MK18 1TF

Tel: 01280 812310
Fax: 01280 812332
email: enquiry@lbhgeo.co.uk
website: www.lbhgeo.co.uk

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FOREWORD - GUIDANCE NOTES

GENERAL

This report has been prepared for a specific client and to meet a specific brief. The preparation of this report may have been affected by limitations of scope, resources or time scale required by the client. Should any part of this report be relied on by a third party, that party does so wholly at its own risk and LBH WEMBLEY Geotechnical & Environmental disclaims any liability to such parties.

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THIRD PARTY INFORMATION

The report may present an opinion on the disposition, configuration and composition of soils, strata and any contamination within or near the site based upon information received from third parties. However, no liability can be accepted for any inaccuracies or omissions in that information.

DRAWINGS

Any plans or drawings provided in this report are not meant to be an accurate base plan, but are used to present the general relative locations of features on, and surrounding, the site.

1.0 INTRODUCTION

It is proposed to re-develop this 300m^2 former Latchfords Timber Merchants site with a residential flat development that will include an area designated as basement.

1.1 Brief

LBH WEMBLEY Geotechnical & Environmental were commissioned to provide a Basement Impact Assessment (BIA) to support the planning application to London Borough of Camden in 2011. This report is a revision of that assessment to take account of changes to the configuration of the planned basement and additional exploratory information.

The BIA is directed to determine whether the proposed basement will:

- cause harm to the built and natural environment
- result in flooding
- lead to ground instability

In order to complete the assessment, a previous desk study and site investigation were supplemented by further desk study to retrieve geotechnical information from nearby sites, a site walkover and monitoring of standpipes installed in two of the site investigation boreholes.

1.2 Report Structure

This report commences with a characterisation of the site and then progresses to a formal Basement Impact Assessment. The latter has been achieved by implementing a staged assessment as follows:

- Stage 1 - Screening;
- Stage 2 - Scoping;
- Stage 3 - Site investigation and study;
- Stage 4 - Impact assessment

1.3 Previous Reports

In addition to information set out in Camden Geological, Hydrogeological and Hydrological Study (CGHHS) prepared for the London Borough of Camden by Ove Arup in November 2010 as guidance for subterranean development, this assessment draws upon information contained in the following reports that have been prepared specific to the site and the proposed development.

- Site Investigation Survey by Soil Environment Services Report Ref: SES/TH/WS/1#1 dated 8th August 2011
- Archaeological Desk Based Assessment by CGMS Report Ref: MS/12570 dated February 2011
- Archaeological Written Scheme of Investigation by AOC Report Ref: 32177 dated May 2012
- Phase I Desk Top Study Report by H&E Ref:10847 dated May 2012

- Geotechnical Letter Report by H&E Ref: CSG/10792 dated 18th June 2012
- Phase II Remediation Report by H&E Ref:10847 dated June 2012
- Phase III Remediation Report by H&E Ref:10847 dated July 2012
- Archaeological Evaluation and Geoarchaeological Report Ref: 32177 dated June 2012

2.0 SITE CHARACTERISATION

2.1 Site Location

The site is situated on the southwest side of Warner Street and may be approximately located by National Grid Reference TQ 312 821.

2.2 Topographical Setting

The site lies at an elevation of approximately +13m OD, on a southwest-facing slope near the base of a southeast trending shallow valley that contains the (now culverted) River Fleet.

2.3 Site Description

The site layout is currently a single property used until recently as a timber merchant. The main structure occupies Nos. 26 and 28 Warner Street and comprises a pair of tall open brick built shed buildings extending to the back of the site and separated by an open area that has been recently covered in. A toilet block stands at the rear end of the site, and a brick office is located in the eastern corner of the site. The structure is single storey with a partial mezzanine floor around the edges.

The building at No. 28 Warner Street is a similar timber storage shed but is a more recent construction constructed on what had previously been left as an open timber yard. This structure extends back in to Warner Yard as far as the adjacent Nos. 26 and 28, but the site extends slightly further. The latter area comprises an open walled-off section of overgrown yard situated at the lower level of Warner Yard, which stands at approximately +11.5m OD.

The entire site is covered in concrete flooring at level of approximately +13.3m OD. (It should be noted that the levels shown on the drawings submitted for planning relate to an arbitrary site datum level of +50.0 SD assigned to this existing ground floor level.)

2.4 Site History

The site lay within open sloping land to the northeast of the Fleet River until the development of Great Warner Street in the 18th Century, when residential properties were

constructed. Throughout the 19th Century the site comprised three adjacent separate properties.

No. 24, at the west of the site, was the Red Lion public house, comprising a main building at the street frontage with two outbuildings extending back to the Red Lion Yard (the precursor of Warner Yard).

Nos. 26 and 28 Warner Street appear to have been residential properties again with the main structures located on the street frontage and outhouse, likely toilets, in the backyards.

The construction of Warner Street across the slope would have led to these properties either all lying below the street level or to them being raised up on building platforms. A likely scenario is that the rear outbuildings and toilets were situated at the lower level of the Yard to the rear of the properties but that the main buildings were constructed with an undercroft or basement cut into the rising ground.

The overpass (Rosebery Avenue) which crosses Warner Street to the northwest of the site was constructed at the end of the 19th Century and saw the demolition of the properties to the northwest of 24 Warner Street and the creation of the sloping alleyway of Warner Yard that is now present to the northwest of the site.

During the Second World War it seems that the central property, 26 Warner Street, may have suffered a direct hit and that the adjacent properties (24 and 28 Warner Street) were damaged beyond repair. Goad Plans from 1942, 1951, 1961 and 1967 appended to this report show the area of clearance after the War and the progressive development of the timber yard and storage sheds that remain on site today.

2.5 Geological Information

The British Geological Survey (BGS) (England and Wales sheet 256 North London 1994) indicates the site to lie on Alluvial Deposits associated with the valley of the River Fleet, underlain by the London Clay Formation.

2.6 Hydrological Information

The Environment Agency (EA) indicates that the site is located upon superficial soils that are designated as a Secondary A aquifer by the British Geological Survey (BGS). These are defined as permeable layers capable of supporting water supplies at a local rather than strategic scale and are generally aquifers formerly classified as minor aquifers. The site does not lie within any groundwater abstraction Source Protection Zone (SPZ).

2.7 Ground Conditions

The anticipated geological conditions have been confirmed by the site investigations in that the site has been shown to be underlain, at least in part, by the feather edge of an alluvial tract overlying the London Clay.

The various exploratory holes have established that beneath approximately 200mm of concrete surfacing, the site is underlain by some made ground extending to between 3.4m at the front of the site and 4.8m at the rear of the site. The made ground appears to comprise a mixture of dirty black/brown and grey sandy gravel containing abundant brick fragments and an assortment of stone fragments, brick, clinker metal and glass that are suggestive of demolition materials.

No specific relic basement floor seems to have been noted, but the presence of this thickness of made ground of this nature may be taken as reasonable evidence of probable former basements or undercrofts that were backfilled after the War.

There appears to be a sloping surface to the underlying natural soils, so that these were apparently encountered some 600mm higher at the front of the site.

The natural firm to stiff grey or stiff dark grey clay encountered in the base of the 2011 SES Borehole Nos. 3 and 4 in the northwestern building at depths of 3.4 and 4.0m respectively probably reflects downwashed London Clay Formation material. However, this material appears to have been found at a deeper level of approximately 4.8m in SES Borehole No. 2, the southernmost borehole, and is capped here by an approximately 800mm thickness of soft dark grey organic silt. This organic silt can be interpreted as representing alluvial deposition associated with the channel of the River Fleet, the course of which can be identified from old maps as running within approximately 20m of this borehole.

A more recent borehole, constructed in May 2012 towards the rear of the site by H&E, (unfortunately also labelled as Borehole One), also found the fine-grained organic alluvium associated with the Fleet River floodplain. Here the London Clay Formation seems to have been reached at 5.5m depth, capped by a 1m thickness of soft downwashed clay containing gravel, and a 500mm thickness of soft organic peaty clay.

A second recent borehole was constructed towards the rear of the site in May 2012 by AOC to a depth of 6.4m. This borehole did not reach the London Clay Formation, but appears to have proved over 1.3m of downwashed clay and gravel capped by some 300mm of organic clay.

The records of previous boreholes constructed on a site to the southeast have been studied and these found some evidence of possible alluvium and confirm the course of the Fleet

Valley feature, suggesting the river course to lie at a possible depth of approximately 6m below the street level.

A borehole constructed at a similar level to the site but to the east of the site on the opposite side of Warner Street found some 5m of made ground and groundwater on the surface of the London Clay at 5.4m depth. This borehole seems to have demonstrated that the London Clay formation is relatively thin in the locality and the presence of the underlying Lambeth Group (Woolwich and Reading Clay) at less than 10m depth, and the Thanet Sand at around 24m depth. The May 2012 borehole by H&E that is referred to above appears to have found possible Lambeth Group material as high as 8.3m depth, and to have been terminated in the basal Lambeth Beds at 25m depth without reaching the underlying Thanet Sand.

2.8 Groundwater Conditions

During the 2011 site investigation survey groundwater seepages were noted within the alluvial silt that extended from approximately 4.0m to 4.8m depth in SES Borehole No. 2. A further seepage was noted emanating from a more permeable layer within the underlying clay deposits at 5.5m depth.

Subsequent monitoring (24th November 2011) of standpipes installed in SES Borehole Nos. 2 and 3 of the original survey confirmed an absence of groundwater in Borehole No.3, and a groundwater table standing at 4.15m depth (approximately +9.15m OD).

Further monitoring (29th August 2012) of the standpipe installed in Borehole No. 3 of the original survey is understood to have encountered groundwater at 4.36m depth. However, in view of the upper surface of the clay lying a 3.5m depth this is interpreted as the collection of water into an effective sump. SES Borehole No. 2 was not dipped on this occasion, but a standpipe in the more recently installed H&E Borehole One within the rear central area of the site is understood to have showed groundwater at 3.88m depth at that time, suggesting the groundwater table standing at approximately +9.40m OD).

Most recent monitoring,(22nd October 2012) by means of a deep trial pit constructed in the area of the Borehole SES No.2, has encountered the groundwater table at 4.00m depth (+9.3m OD).

2.9 Proposed Development

The proposed development will comprise demolition of the existing buildings and the construction of twelve residential apartments situated in four above ground floors with a single basement level under the rear two thirds of the property. Because the site is located on a hillside, the floor level of the new basement (approximately +10.1m OD) will in fact lie less than 1.5m below the ground level of Warner Yard at the rear of the property.

Excavation for the new basement is therefore not expected to reach the surface of the natural soils, which appear to lie at over 3m below the level of Warner Street at the front of the property and over 2m below the Yard level at the rear of the property. The latest groundwater monitoring data suggests that the new basement temporary excavation, to around +9.5m OD, will approach but not actually reach the standing groundwater table.

The front section of the party wall to No. 30 Warner Street has been assumed to be founded at a level of approximately +8.8m OD, where it is understood there is a basement, and the rear section of this wall has been assumed to be founded at approximately +10.7m OD. On the other side of the property, the section of boundary wall adjacent to entrance to Warner Yard has been assumed to be founded at the same level, of approximately +10.7m OD. Underpinning will be required for all neighbouring foundations that do not extend safely below the planned excavation levels.

The foundations to the adjacent No. 8 Warner Yard have been established as piles and hence there should not be any requirement for underpinning on the rear boundary.

Given the substantial depth of made ground beneath the site, it is anticipated that piled foundations will be adopted throughout the new development. These will be small diameter bored piles terminated in the Lambeth Group or Thanet Sand at depth beneath the site.

Although geotechnically poor ground conditions were suggested towards the rear of the site by the investigations, it is understood that recent a trial excavation (22nd October 2012) witnessed by the structural engineer has confirmed the practical possibility of adopting conventional underpinning techniques throughout the areas required.

3.0 BASEMENT IMPACT ASSESSMENT

3.1 Stage 1 - SCREENING

The first stage of the BIA is the identification of any matters of concern relating to:

- Groundwater flow
- Land stability
- Surface flow and flooding

In order to identify what issues are relevant to the proposed scheme a series of questions are addressed. Where the answer is “Yes” or “Unknown” to any of the questions these matters are given further consideration in Section 3.2. Justification is given for “No” answers.

3.1.1 Groundwater Flow

Question 1: Is the site located directly above an aquifer?
YES
Information from the Environment Agency indicated that the site is located upon superficial soils that are designated as a Secondary A aquifer by the British Geological Survey (BGS). These are defined as permeable layers capable of supporting water supplies at a local rather than strategic scale and are generally aquifers formerly classified as minor aquifers.

Question 1 b: Will the proposed basement extend beneath the water table surface?
NO
(see section 2.9 – under current conditions the general basement excavation will not reach the groundwater table)

Question 2: Is the site within 100m of a watercourse, well (used/disused) or a potential spring line?
YES
The historical course of the River Fleet is located some 20m to the rear (south) of the property

Question 3: Is the site within the catchment of the pond chains on Hampstead Heath?
NO
(see CGHHS)

Question 4: Will the proposed basement development result in a change in the proportion of hard surfaced/paved areas?
NO
(see submitted plans)

Question 5: As part of the site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?
NO
(see submitted plans)

Question 6: Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to, or lower than, the mean water level in any local pond (not just the pond chains on Hampstead Heath) or spring line?
NO
(see section 2.9)

3.1.2 Land Stability

Question 1: Does the existing site include slopes, natural or manmade, greater than 7°?
NO
(see submitted plans)

Question 2: Will proposed re-profiling or landscaping at the site change slopes at the property boundary to more than 7°?
NO
(see submitted plans)

Question 3: Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7°?
NO
(see submitted plans)

Question 4: Is the site within a wider hillside selling in which the general slope is greater than 7°?
NO

Although there are some areas relatively close to the site that have slopes greater than 7° this cannot be said to be the general slope angle. The alley, Warner Yard, adjacent to the site slopes down at an angle of approximately 5°. (see submitted plans)

Question 5: Is the London Clay the shallowest strata at the site?
NO
(see exploratory boreholes)

Question 6: Will any trees be felled as part of the proposed development and/or are any works proposed within any tree protection zones where trees are to be retained?
NO
(see submitted plans)

Question 7: Is there a history of seasonal shrink-swell subsidence in the local area and/or evidence of such effects at the site?
NO
(local knowledge)

Question 8: Is the site within 100m of a watercourse or a potential spring line?
YES
The historical course of the River Fleet is located some 20m to the rear (south) of the property.

Question 9: Is the site within an area of previously worked ground?
NO
(local knowledge)

Question 10: Is the site within an aquifer?
YES
Information from the Environment Agency indicated that the site is located upon superficial soils that are designated as a Secondary A aquifer by the British Geological Survey (BGS). These are defined as permeable layers capable of supporting water supplies at a local rather than strategic scale and are generally aquifers formerly classified as minor aquifers.

If so will the proposed basement extend beneath the water table such that dewatering may be required during construction?
POSSIBLY
(see section 2.9)

Question 11: Is the site within 50m of the Hampstead Heath ponds?
NO

Question 12: Is the site within 5m of a highway or pedestrian right of way?
YES
The site adjoins Warner Street and Warner Yard

Question 13: Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?
YES
At least part of the adjacent property No. 30 Warner Street is understood not to contain a basement.

Question 14: Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?
NO
(local knowledge)

3.1.3 Surface Water Flow and Flooding

Question 1: Is the site within the catchment of the pond chains on Hampstead Heath?
NO
(see CGHHS)

Question 2: As part of the proposed site drainage, will surface water flows (e.g. volume of rainfall and peak run-off) be materially changed from the existing route?
NO
(see submitted plans)

Question 3: Will the proposed basement development result in a change in the proportion of hard surfaced */* paved external areas?
NO
(see submitted plans)

Question 4: Will the proposed basement result in changes to the profile of the inflows (instantaneous and long-term) of surface water being received by adjacent properties or downstream watercourses?
NO
(see submitted plans)

Question 5: Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?
NO
(see submitted plans)

Question 6: Is the site in an area known to be at risk from surface water flooding, such as South Hampstead, West Hampstead, Gospel Oak and King's Cross, or is it at risk from flooding, for example because the proposed basement is below the static water level of a nearby surface water feature?
NO
(see CGHHS)

3.2 Stage 2 - SCOPING

The scoping stage of the BIA requires identification of the potential impacts of the proposed scheme.

The Stage 1 Screening has identified the following potential matters of concern:

1. The site lies on an aquifer. This could affect both groundwater flow and land stability.
2. The site lies within 100m of a watercourse. This could affect both groundwater flow and land stability.
3. The site lies within 5m of a highway or pedestrian right of way. This could affect land stability.
4. The proposed basement will significantly increase the differential depth of foundations relative to a neighbouring property. This could affect land stability.

3.2.1 **Aquifer**

If the basement were to extend into the underlying aquifer this could affect the groundwater flow regime and in that case any dewatering for the basement could cause ground settlement that could affect neighbouring structures.

3.2.2 **Watercourse**

If the new basement were to interrupt the groundwater flow associated with the Fleet River this could alter the groundwater flow regime.

3.2.3 **Highway**

The site lies adjacent to Warner Yard and to the pavement of Warner Street. The excavation of basements could threaten the structural stability of these.

3.2.4 **Neighbouring Property**

The proposed basement will be immediately adjacent to No. 30 Warner Street. The latter property is expected in part to have high level foundations such that there would be a risk of the adjacent deeper excavation causing structural damage to this property.

3.3 **Stage 3 – SITE INVESTIGATION AND STUDY**

An archaeological desk study that summarised the history of the site and its immediate surroundings was undertaken in February 2011 by CGMS. A geotechnical site investigation survey was subsequently undertaken in July 2011 by Soil Environment Services in order to develop a better understanding of the ground model beneath the site.

A further desk study, geotechnical investigation, environmental investigation and remediation report have all been carried out in 2012 by H&E. In addition, an archaeological investigation has been undertaken in 2012 by AOC.

For the purposes of the BIA, and to specifically address the issues of concern identified in the previous section, these studies have been supplemented by further desk study to retrieve geotechnical information from nearby sites, a site walkover and monitoring of standpipes installed in two of the site investigation boreholes.

3.4 Stage 4 – IMPACT ASSESSMENT

The scoping stage has identified potential effects of the development on those attributes or features of the geological, hydrogeological and hydrological environment. This stage is concerned with evaluating the direct and indirect implications of each of these potential impacts.

3.4.1 Aquifer

If the basement were to extend into the underlying aquifer this could affect the groundwater flow regime and in that case any dewatering for the basement could cause ground settlement that could affect neighbouring structures. However, the various site investigation information has shown that the new basement will not extend as deep as the natural soils beneath the site and hence will not reach the designated aquifer.

While the completed new basement structure will require to be designed as a waterproof structure, it will not extend significantly into the aquifer and hence there will be no significant long term impact on groundwater flow.

If the groundwater table was found to rise significantly prior to construction, some form of dewatering may be necessary in the temporary situation in order to permit the construction to take place. In such circumstances it will be essential to ensure that any such measures do not have an adverse effect upon neighbouring structures.

3.4.2 Watercourse

If the new basement were to interrupt the groundwater flow associated with the Fleet River this could alter the groundwater flow regime. However, the site investigation survey has shown that the new basement will not extend as deep as the natural soils beneath the site and the proposed lowest basement floor level of +10.1m OD will lie above surface of the natural soils within which the groundwater table appears to run. It is anticipated that piled foundations will be adopted for the new development, but it is anticipated that even the deepest excavations may not reach the natural soil in the rear areas of the site. Hence, although any groundwater flow will be penetrated by the piles themselves, the groundwater flow regime is not expected to be significantly affected on this basis and no impact is envisaged.

3.4.3 Highway

The site lies adjacent to Warner Yard and to the pavement of Warner Street. The proposed basement area will be set back from the street, such that a temporary slope batter of approximately 35° would extend to the rear of the pavement.

The basement area will sit immediately adjacent to Warner Yard, which provides vehicular access to neighbouring properties within the Yard. Full temporary and permanent support will need to be provided to retain the perimeter of both areas of proposed basement. It is possible that there are existing basement perimeter walls buried beneath the site that might be further explored and incorporated in to the design of the temporary works.

3.4.4 **Neighbouring Property**

The proposed basement will be immediately adjacent to No. 30 Warner Street. There is an apparent basement towards the front of this property but it must be assumed that the property has at least some high level foundations towards the rear so there will be a risk of any adjacent deeper excavation causing structural damage. It is intended to deepen these party wall foundations though conventional underpinning, and a recent trial dig (22nd October 2012) is understood to have confirmed the viability of this plan.

4.0 **CONCLUSION**

It appears that the proposed basement construction will do little other than to locally restore ground / floor levels to those that have been previously present. The following conclusions are drawn from this assessment.

1. The development is not expected to have any adverse impact upon the groundwater regime beneath the site and no specific drainage mitigation measures are warranted.

2. Lateral support will need to be maintained at all times to both Warner Street and the ramped access roadway leading down to Warner Yard at the rear of the site. It is possible that there are existing basement perimeter walls buried beneath the site that might be explored and incorporated in to the design of the temporary works.

3. Lateral and Vertical support will need to be maintained at all times to neighbouring properties including No. 30 Warner Street and No. 8 Warner Yard. Underpinning of No. 30 Warner Street is anticipated.

APPENDIX

GOAD PLANS

EXPLORATORY RECORDS EXTRACTED FROM PREVIOUS REPORTS

EXPLANATION OF SIGNS
USED ON
INSURANCE PLANS OF TOWNS & CITIES

CHAS. E. GOAD, LTD. CIVIL ENGINEERS — 36 CROUCH HILL LONDON N.4

ABBREVIATIONS

ASS.	ASBESTOS
CORR. IRON	CORRUGATED IRON
D.I.D.	DOUBLE IRON DOORS
DRA.	DRAPERY
D	DWELLING
ELECT	ELECTRICIAN
(E.M.)	ELECTRIC MOTORS
(ENG.)	STEAM ENGINE
FURNR.	FURNITURE
GAR.	GARAGE
(G.E.)	GAS ENGINE
H.W.	HARDWARE
I.COLS.	IRON COLUMNS OR STEEL STANCHIONS
JWLY.	JEWELLERY
M.Cl.	METAL CLAD
M.W.	MANCHESTER WAREHOUSE
W.I.	MATCH (OR WOOD) LINED
OIL	OIL & COLOR
(O.E.)	OIL ENGINE
P.H.	PUBLIC HOUSE
S.	SHOP
S.I.D.	SINGLE IRON DOORS
S.I.S.	SINGLE IRON SHUTTERS
TAI.	TAILORS
TENTS.	TENEMENTS
W.G.	WIRED GLASS
W.N.	WIRE NETTING OVER GLASS

COLORS

- BRICK, STONE OR CONCRETE
- WOOD
- AREAS CLEARED DUE TO ENEMY ACTION
- SKYLIGHTS ON 1 & 2 STORY BUILDINGS
- SKYLIGHTS ON HIGHER BUILDINGS
- METAL BUILDINGS
- TIMBER PILED OR STACKED

WALLS

- PARTY WALL 2 STORIES OR OVER, A PROBABLE FIRE CUT OFF
- ENTIRE WALL, BUT DOUBTFUL AS FIRE CUT OFF
- DEFECTIVE WALL = IMPERFECT
- WALL ABOVE, IRON COLS. UNDER
- WALL SOME FLOORS ONLY (OR WOOD OR PLASTER PARTITION)
- ABOVE ROOF 6" TO 1'-6"
- —Dº— 1'-6" TO 2'-6"
- W.L. MATCH OR WOOD LINED
- WOOD CLAD WITH CORRUGATED IRON

OPENINGS

- PASSAGE UNDER
- ON ALL FLOORS
- SOME FLOORS ONLY — UNPROTECTED
- ALL FLOORS (PROTECTED)
- ALL FLOORS (SOME PROTECTED) — SINGLE IRON DOORS
- SOME FLOORS ONLY (PROTECTED)
- ALL FLOORS (SOME PROTECTED)
- ALL FLOORS (PROTECTED) — DOUBLE IRON DOORS
- SOME FLOORS ONLY (PROTECTED)
- WOOD LOADING DOOR
- IRON LOADING DOOR

WINDOWS

- ON ALL OR MOST FLOORS — UNPROTECTED
- MORE THAN USUAL
- OVERLOOKING
- NEARLY ALL GLASS
- OPENINGS THRO' & WINDOWS OVER
- ON SOME FLOORS ONLY
- PROTECTED BY WIRED GLASS
- PROTECTED BY SINGLE IRON SHUTTERS
- PROTECTED BY DOUBLE IRON SHUTTERS

WINDOWS IN FRONT & REAR OF BUILDINGS UNDERSTOOD UNLESS OTHERWISE SHOWN

FLOORS

1.2.3.3½ M on BUILDINGS ARE NUMBER OF STORIES ABOVE GROUND (3½=3 FLOORS & ATTIC)

2.4.2.S MEANS 2 STORIES & 2 BASEMENTS BASY & SUB-BASEMENT

SKYLIGHTS

- A LESS THAN 50 SQUARE FEET (SAY 10'x5' OR 7'x7')
- OPENINGS THROUGH 2 FLOORS UNDER (EACH STROKE DENOTES AN OPENING)
- WITH WELL HOLE THROUGH 3 FLOORS
- LANTERN LIGHT, SIDES ONLY GLASS, OR VENT OR RAISED VENTILATOR — OVER 50 Sq. Ft. TO SCALE

HOISTS & LIFTS

- OPEN
- OPEN (WITH FLOOR)
- ENCLOSED WOOD OR PLASTER
- OPEN TO STREET
- ENCLOSED BRICK OR FIRE RESISTING WIRED GLASS DOORS

IRON DOORS SHOWN AS EXPLAINED UNDER "OPENINGS"

ROOFS

ASS	ASBESTOS
C	CONCRETE
CORR	CORRUGATED IRON
M	METAL
P	PATENT (FELT &c.)
S	SLATE
T	TILE

PROFILES WITH NORTH LIGHTS

SUNDRIES

- STEAM BOILERS
- —— BOILER SET IN BRICK
- FACTORY CHIMNEYS
- (ENG.) STEAM ENGINE
- OVERHANGING WOOD CORNICE
- FIRE ALARM BOX
- —— Dº —— ON KEY PLAN
- HYDRANT
- HYDRAULIC HYDRANT
- PRIVATE HYDRANT OR STAND PIPE
- DOUBLE HYDRANT
- SALT WATER HYDRANT
- SPRINKLER OR AUTO ALARM BELL

REFERENCE NUMBERS

NUMBERS PARALLEL WITH STREET ARE EXISTING STREET Nos.

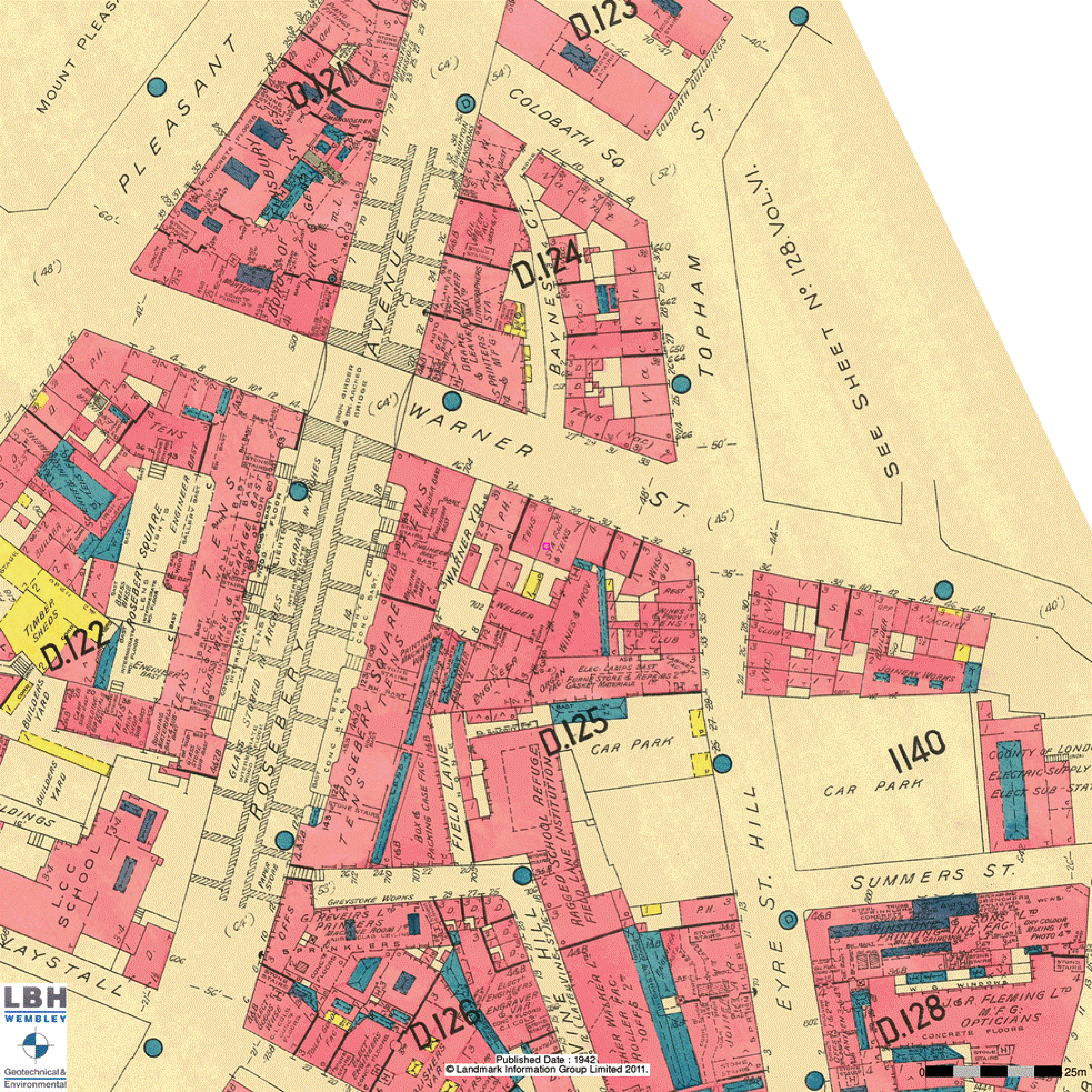
WHERE TWO SETS OF STREET Nos IN SAME BLOCK COINCIDE, ADDITIONAL ARBITRARY Nos ARE GIVEN TO ONE SET (500 & UPWARDS)

WHERE BUILDINGS TO WHICH THEY APPLIED ARE DEMOLISHED, STREET & ARBITRARY Nos ARE SHOWN & CROSSED THROUGH ON REVISION

—48'— (37) ARE STREET WIDTHS. ARE HEIGHTS OF GROUND ABOVE ORDNANCE DATUM

HEIGHT IN FEET OF ADJOINING BUILDINGS WHERE STORIES DIFFER IN HEIGHT

SIZES OF WATER MAINS SUPPLYING HYDRANTS



Published Date : 1942

MOUNT PLEASANT

PLEASANT

D.121

D.123

COLDBATH SQ

COLDBATH BUILDINGS

ST.

SEE SHEET No. 128. VOL. VI.

D.124

BAYNES ST.

AVENUE

WARNER

TOPHAM

ST.

PREFABRICATED

D.122

TIMBER SHEDS

BUILDERS YARD

ROSEBERY AVENUE

TENS

SQUARE

ENGINEER

LENS

FIELD LANE

D.125

LEGAL & GENERAL ASSURANCE Co MAINTENANCE

1140

CAR PARK

SUMMERS ST.

HILL ST.

EYRE

D.126

D.128

J & R. FLEMING L TD

M.F.G: OPTICIANS

WINSTONE PRINTING INK MFRS L TD

LONDON ELECTRIC BOARD BACKHILL ELEC SUB STA

SCRAP IRON YARD

TIMBER

SHEDS

SCHOOL

L.C.C.

LAYSTALL

Published Date : 1951

0 25m

Published Date : 1967

MOUNT PLEASANT

PLEASANT

D.121

D.123

COLDBATH SQ

COLDBATH BUILDINGS

ST.

SEE SHEET No. 128. VOL. VI.

AVENUE

D.124

BAYNES CT.

TOPHAM

WARNER

ST.

(48')

(54')

(52')

(50')

(45')

(40')

-60'-

-42'-

-50'-

-47'-

TENS

ROSEBERY SQUARE

ENGINEERS

GARAGE

ENGINEER

ORGAN FAC.

CLUB

REST

OFFS

BINS.

D.122

D.125

D.126

D.128

1140

LEGAL & GENERAL ASSURANCE Co MAINTENANCE

TIMBER STORE

GARAGE

P.H.

WAGES

ROLLER SHUTTERS

TIMBER YARD

SCRAP IRON YARD

BUILDERS

L.C.C. SCHOOL

PAINT STORE

PAPER STORE

FIELD LANE

GREYSTOKE WORKS

Vacant

1960.

VINE ST. (LATE ALVINE ST.)

HILL

EYRE ST.

BACK HILL SUB-STATION

LONDON ELECTRICITY BOARD

LONDON ELECTRIC BOARD BACKHILL ELEC SUB STATION

SUMMERS ST.

WINSTONE PARSONS FLETCHER LTD PRINTING INKS

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LBH WEMBLEY

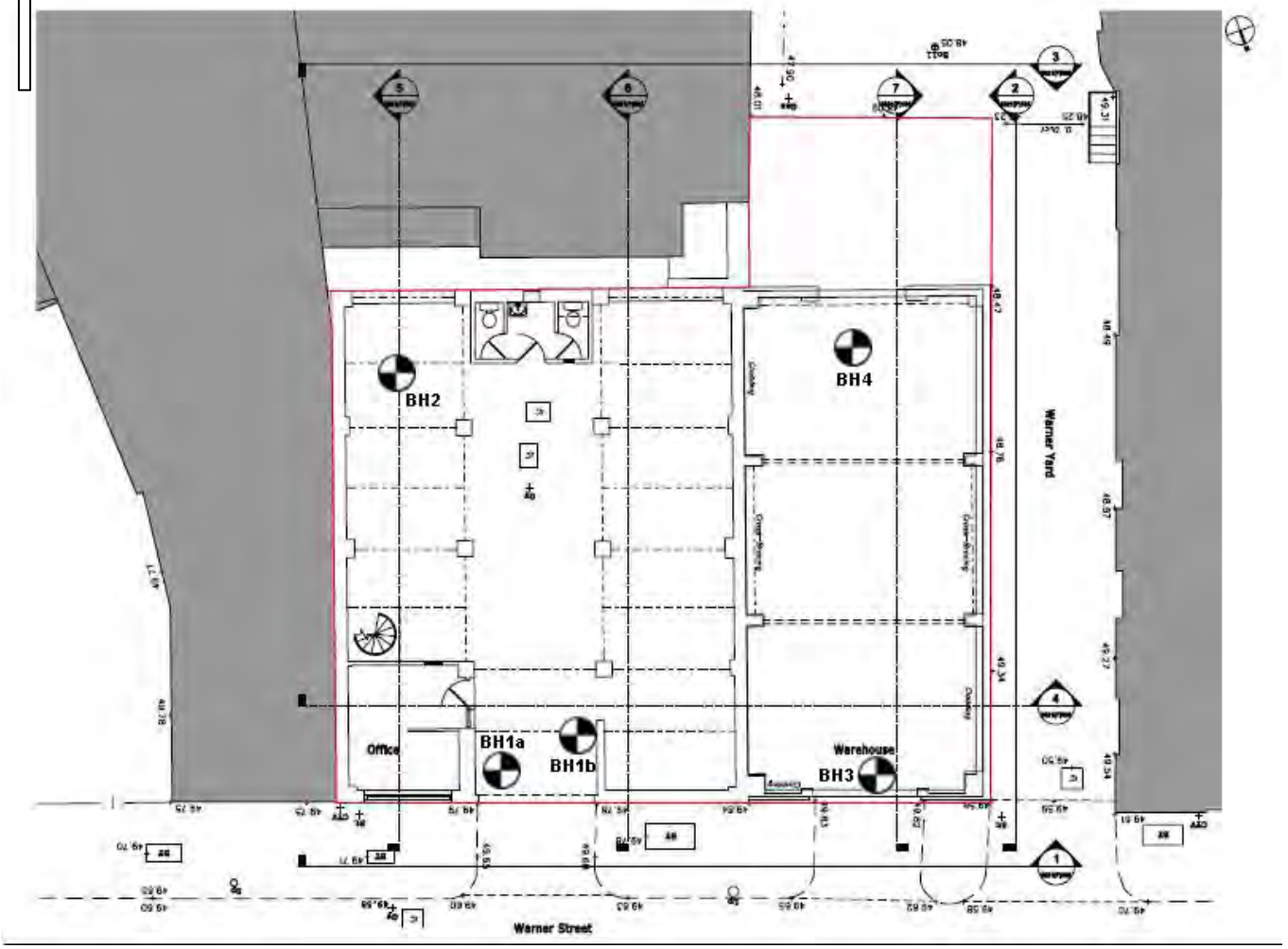
Geotechnical & Environmental

Published Date : 1960

0 25m

NOTES:	Soil Environment Services Tel.: 0191 243 0686 www.soilenvironmentservices.co.uk	
Borehole and LDP	Drawing Title: Site plan and borehole locations	Drawing No.: 1
	Client: Thorne Hiley Ltd	Project: 24-28 Warner Street
	Scale: n/a	Date: 27-28th July 2011

S



Soil Environment Services

Borehole/ Testpit Log

Excavation type and method: Borehole/Window Sampler

Date: 27/07/11

Client: Thorne Hiley Limited

Site: 24-28 Warner Street

BH/Pit Ref.: BH 1a and 1b

Surface (m OD): 20 m

Depth (m BGL)	Symbol	Description	Installations	Notes
1.0		MADE GROUND Concrete with large flint inclusions MADE GROUND Crushed brick, rock, ash with some flint inclusionswith loose gravel and light brown sand.		Terminated at 1.80 m suspected large metal grid. No groundwater was detected
2.0				
3.0				
4.0				
5.0				
6.0				
7.0				
8.0				
9.0				

Soil Environment Services

Borehole/ Testpit Log

Excavation type and method: Borehole/Window Sampler

Date: 27/07/11

Client	Site	BH/Pit Ref.
Thorne Hiley Limited	24-28 Warner Street	BH 2

Surface (m OD): 20 m

Depth (m BGL)	Symbol	Description	Installations	Notes
1.0		MADE GROUND Concrete with large flint inclusions		
2.0		MADE GROUND Brown/grey, loose sandy gravel with crushed brick and rock.		
3.0		MADE GROUND brown, medium dense sandy clay, with gravel, brick and ash.		
4.0		MADE GROUND Very dark brown, firm, silty clay with brick		
5.0		Dark grey, soft, oragnic SILT		Slight water seepage at 4.50 m
6.0		Dark grey, soft to firm, silty CLAY		
7.0				
8.0				
9.0				

Soil Environment Services

Borehole/ Testpit Log

Excavation type and method: Borehole/Window Sampler

Date: 27/07/11

Client: Thorne Hiley Limited

Site: 24-28 Warner Street

BH/Pit Ref.: BH 3

Surface (m OD): 20 m

Depth (m BGL)	Symbol	Description	Installations	Notes
		MADE GROUND Concrete with large flint inclusions		
		MADE GROUND orange, clayey sandy, gravel		
1.0		MADE GROUND Brown/grey, loose sandy gravel with crushed brick, rock, flint and glass.		
2.0		MADE GROUND Black/brown, loose, sandy gravel and ash.		
3.0		MADE GROUND Brown, soft, silty organic clay with brick		
4.0		Grey, firm to stiff, silty CLAY		
5.0				
6.0		Light brown/ grey mottled, firm to stiff, silty CLAY		No groundwater was detected
7.0				
8.0				
9.0				

Soil Environment Services

Borehole/ Testpit Log

Excavation type and method: Borehole/Window Sampler

Date: 27/07/11

Client	Site	BH/Pit Ref.
Thorne Hiley Limited	24-28 Warner Street	BH 4

Surface (m OD): 20 m

Depth (m BGL)	Symbol	Description	Installations	Notes
1.0		MADE GROUND Concrete with large flint inclusions		
2.0		MADE GROUND Brown/grey, loose sandy gravel with crushed brick, rock and ash.		
3.0				
4.0				
5.0		Dark grey, firm to stiff, silty CLAY		Slight water seepage at 5.50 m
6.0		Grey, firm, silty clay over brown mottled, firm silty CLAY		
7.0				
8.0				
9.0				

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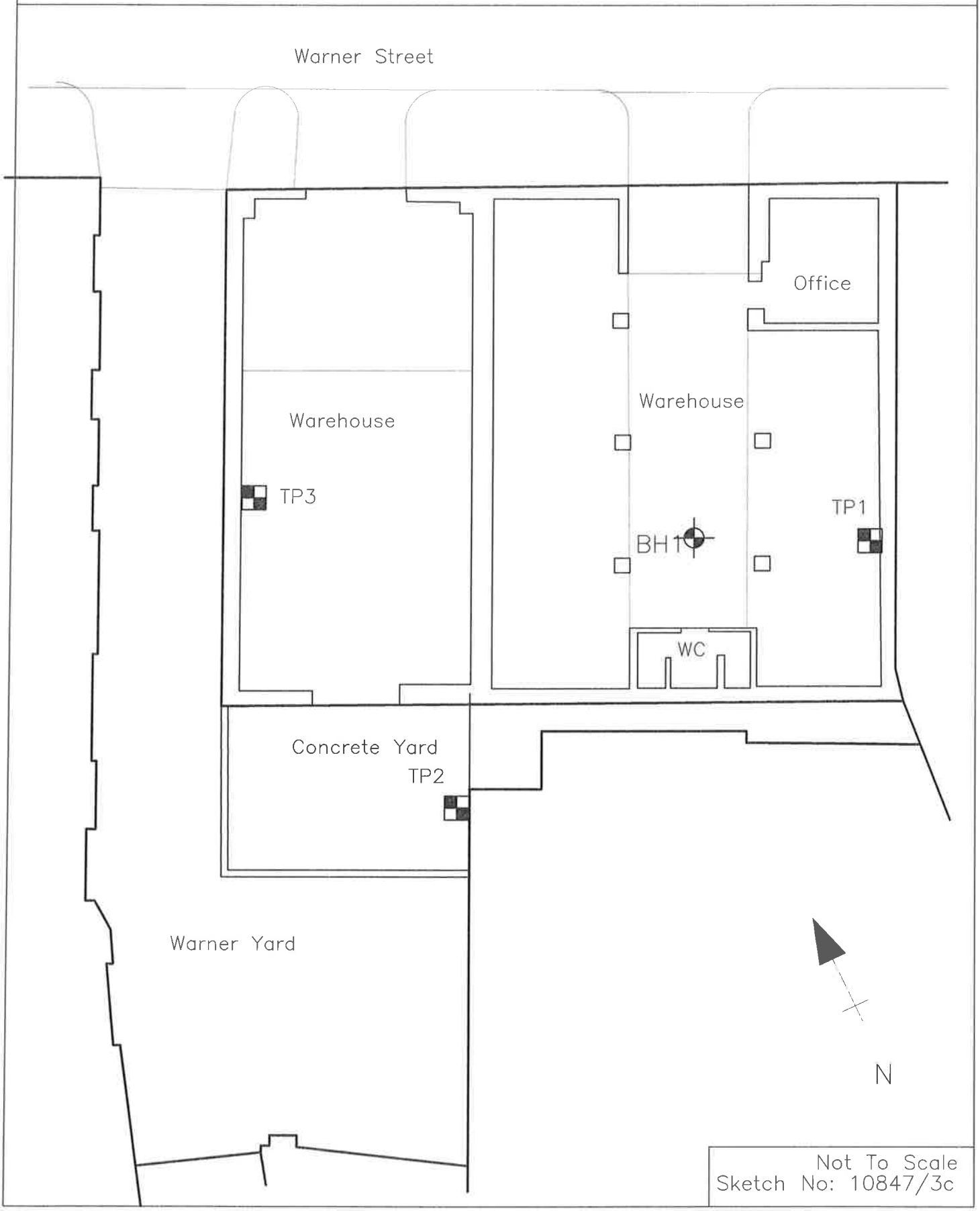
Appendix No.	1
Sheet No.	2
Job No.	10847
Date	May 2012

24–28 Warner Street, London EC1R 5EX

Existing Site Plan with Sample Locations



Not To Scale
Sketch No: 10847/3c

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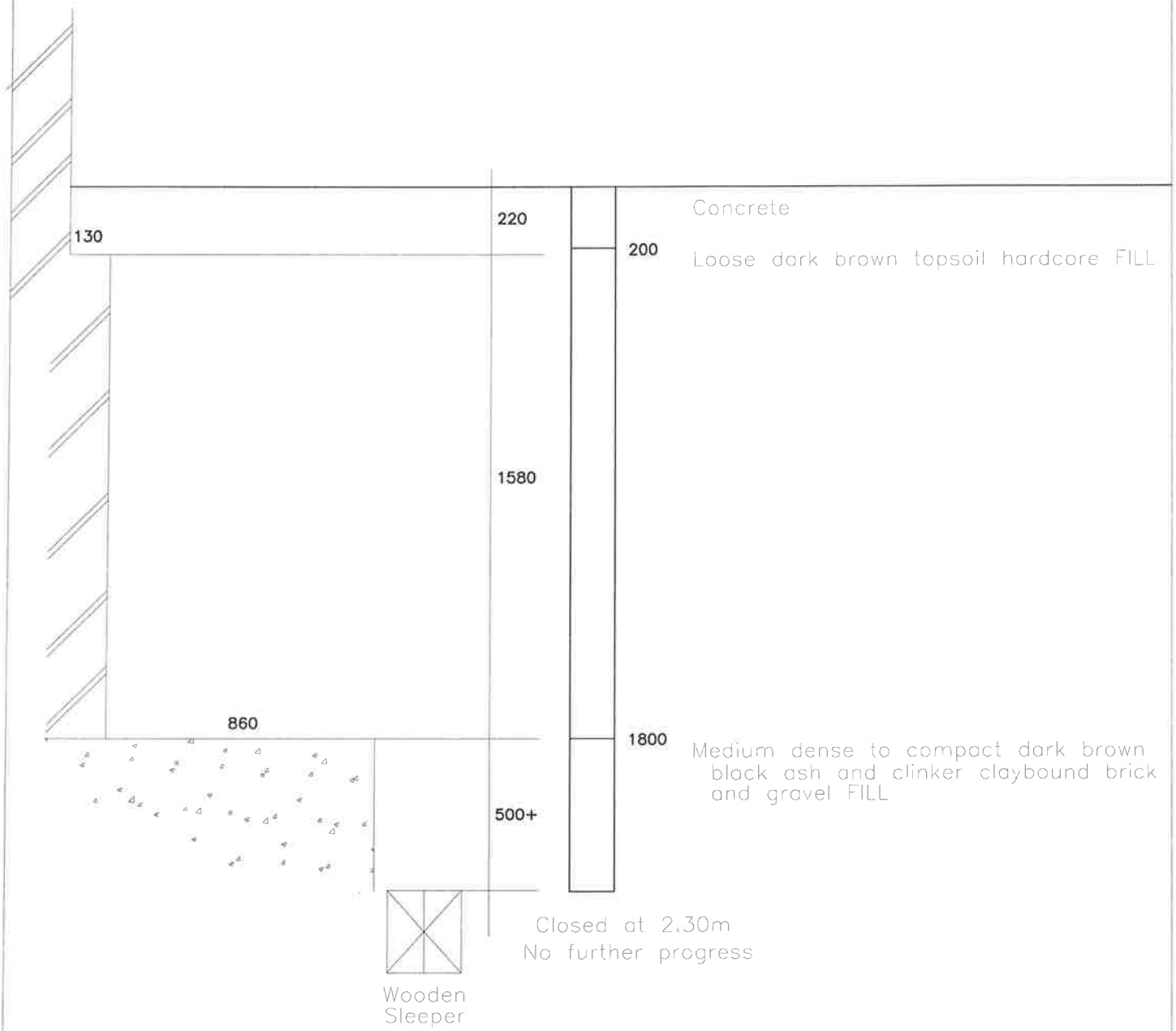
Appendix No. 2
Sheet No. 1
Job No. 10847
Date May 2012

24–28 Warner Street, London EC1R 5EX

Existing Footing Detail

Trial Pit One



SCALE: 1:20

B	BULK SAMPLE
D	DISTURBED SAMPLE
U	UNDISTURBED SAMPLE
V	SHEAR VANE TEST (Kn/m²)
▼	WATER STRUCK
▽	WATER STANDING
W	WATER SAMPLE
N	SPT 'N' VALUE

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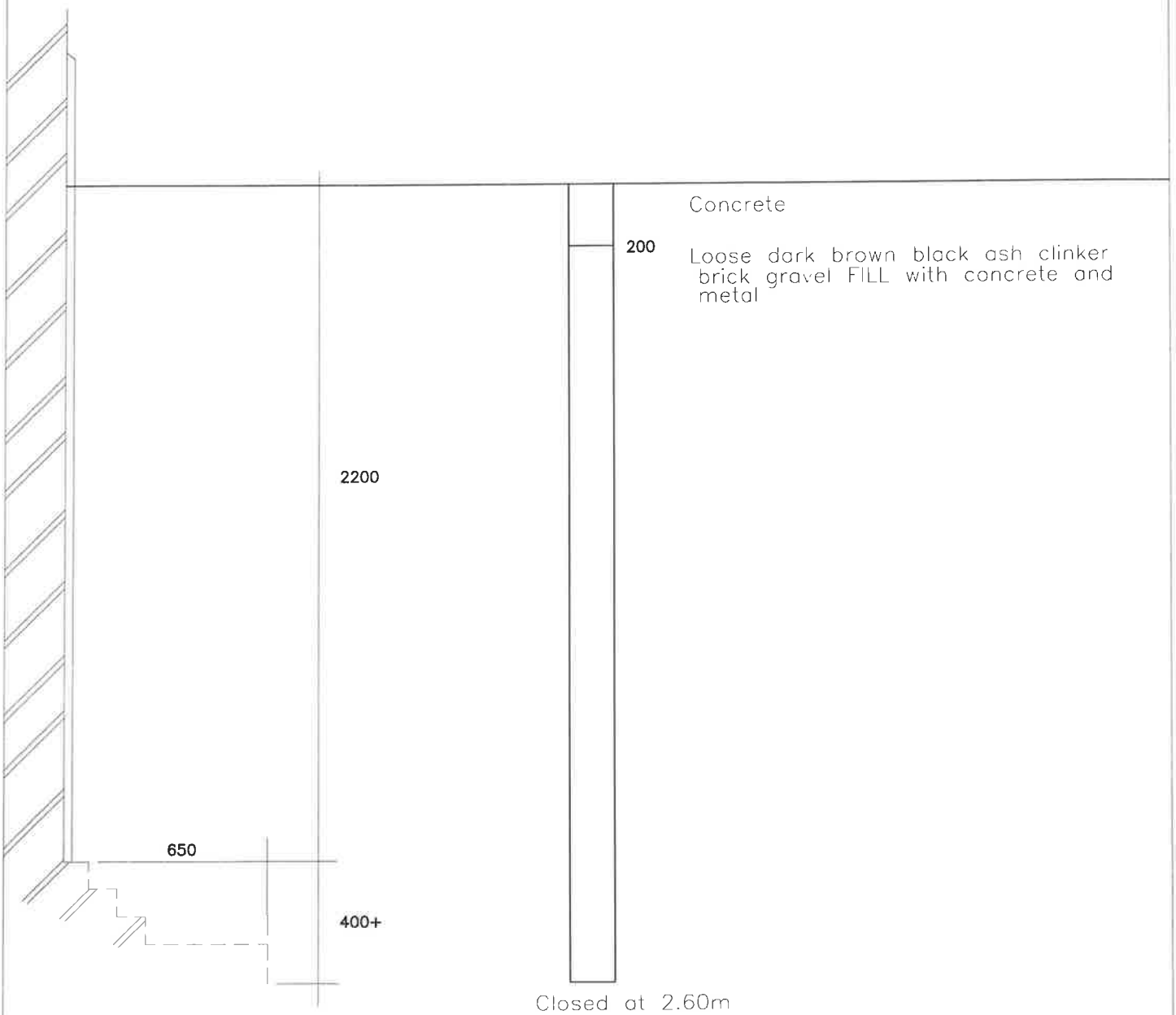
Appendix No.	2
Sheet No.	2
Job No.	10847
Date	May 2012

24–28 Warner Street, London EC1R 5EX

Existing Footing Detail

Trial Pit Two



SCALE: 1:20

B	BULK SAMPLE
D	DISTURBED SAMPLE
U	UNDISTURBED SAMPLE
V	SHEAR VANE TEST (Kn/m²)
▼	WATER STRUCK
▽	WATER STANDING
W	WATER SAMPLE
N	SPT 'N' VALUE

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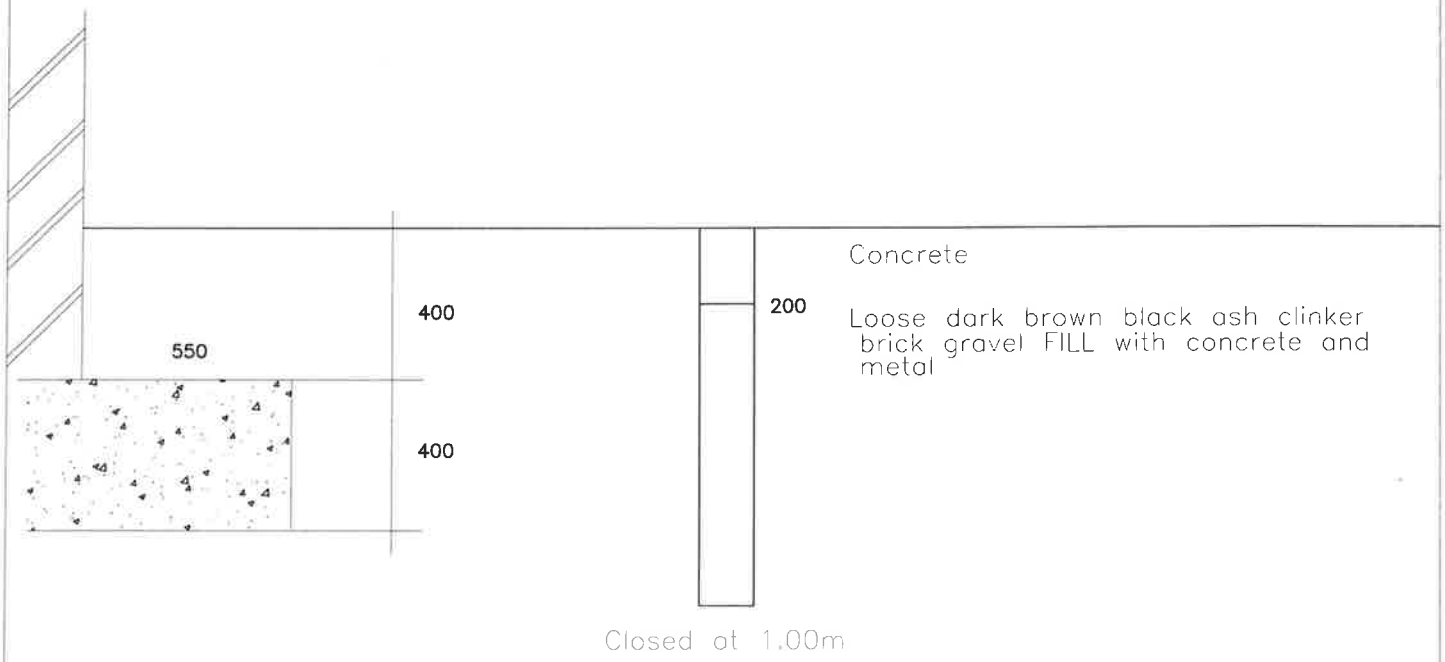
Appendix No. 2
Sheet No. 3
Job No. 10847
Date May 2012

24–28 Warner Street, London EC1R 5EX

Existing Footing Detail

Trial Pit Three



SCALE: 1:20

B BULK SAMPLE
D DISTURBED SAMPLE
U UNDISTURBED SAMPLE
V SHEAR VANE TEST (Kn/m²)

WATER STRUCK
WATER STANDING
W WATER SAMPLE
N SPT 'N' VALUE

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Appendix No. 2
Sheet No. 4
Job No. 10847
Date May 2012

24–28 Warner Street, London EC1R 5EX

Borehole One

Description of Strata	Depth	Thickness (m)	Legend	Installation installed	Water Level	Samples No.	Samples Type	Samples Depth (m)	S.P.T N–Value or Vane Strength	Casing Depth (m)
Concrete	0.20	0.20		None installed						
Loose to compact brown gravely brick FILL with sandy infill	4.00	3.80				1	B	1.00	N=14	
						2	B	2.00	N=12	
						3	B	3.00	N=10	
						4	B	4.00	N=8	
Soft brown slightly organic peaty CLAY	4.50	0.50						4.60	N=7	
Soft grey slightly silty CLAY with occasional to much flint gravel	5.50	1.00						5.50	N=18	
Soft to firm brown slightly silty CLAY	7.00	1.50				1	U	7.00		
Stiff grey silty CLAY	8.30	1.30								
Stiff grey brown slightly silty CLAY	10.00	1.70				2	U	8.50		

Remarks:

Scale 1:50

Key : U–Undisturbed Sample (100mm diameter) B –Bulk Sample ▼–Water Struck D –Disturbed Sample ▽–Water Standing W–Water Sample P–Piston Sample N–S.P.T. N–Value V–Vane Strength (kN/m²)

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Appendix No. 2
Sheet No. 5
Job No. 10847
Date May 2012

24–28 Warner Street, London EC1R 5EX

Borehole One .... Continued

Description of Strata	Depth	Thickness (m)	Legend	Installation installed	Water Level	Samples No.	Samples Type	Samples Depth (m)	S.P.T N–Value or Vane Strength	Casing Depth (m)
Stiff brown mottled grey slightly silty CLAY				None installed		3	U	10.00		
						4	U	11.50		
		6.00				5	U	13.00		
						5	B	14.50	N=50+	
	16.00					6	U	16.00		
Stiff grey slightly silty sandy CLAY						7	U	17.50		
		4.00				8	U	19.00		
	20.00					6	B	20.00	N=50+	

Remarks:

Scale 1:50

Key : U–Undisturbed Sample (100mm diameter) B –Bulk Sample ▼ –Water Struck D –Disturbed Sample ▽ –Water Standing W–Water Sample P–Piston Sample N–S.P.T. N–Value V–Vane Strength (kN/m²)

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Appendix No. 2
Sheet No. 6
Job No. 10847
Date May 2012

24–28 Warner Street, London EC1R 5EX

Borehole One .... Continued

Description of Strata	Depth	Thickness (m)	Legend	Installation installed	Water Level	Samples No.	Samples Type	Samples Depth (m)	S.P.T N–Value or Vane Strength	Casing Depth (m)
Very stiff light grey moderately sandy CLAY	21.00	1.00		None installed		6	B	20.00	N=50+	
						7	B	21.00	N=50+	
Dense grey mottled reddish brown SAND & GRAVEL	25.00	4.00				8	B	22.50	N=50+	
						9	B	24.00	N=50+	25.00
Borehole closed at 25.00m										

Remarks:

Scale 1:50

Key : U–Undisturbed Sample (100mm diameter) B –Bulk Sample ▼ –Water Struck D –Disturbed Sample ▽ –Water Standing W–Water Sample P–Piston Sample N–S.P.T. N–Value V–Vane Strength (kN/m²)

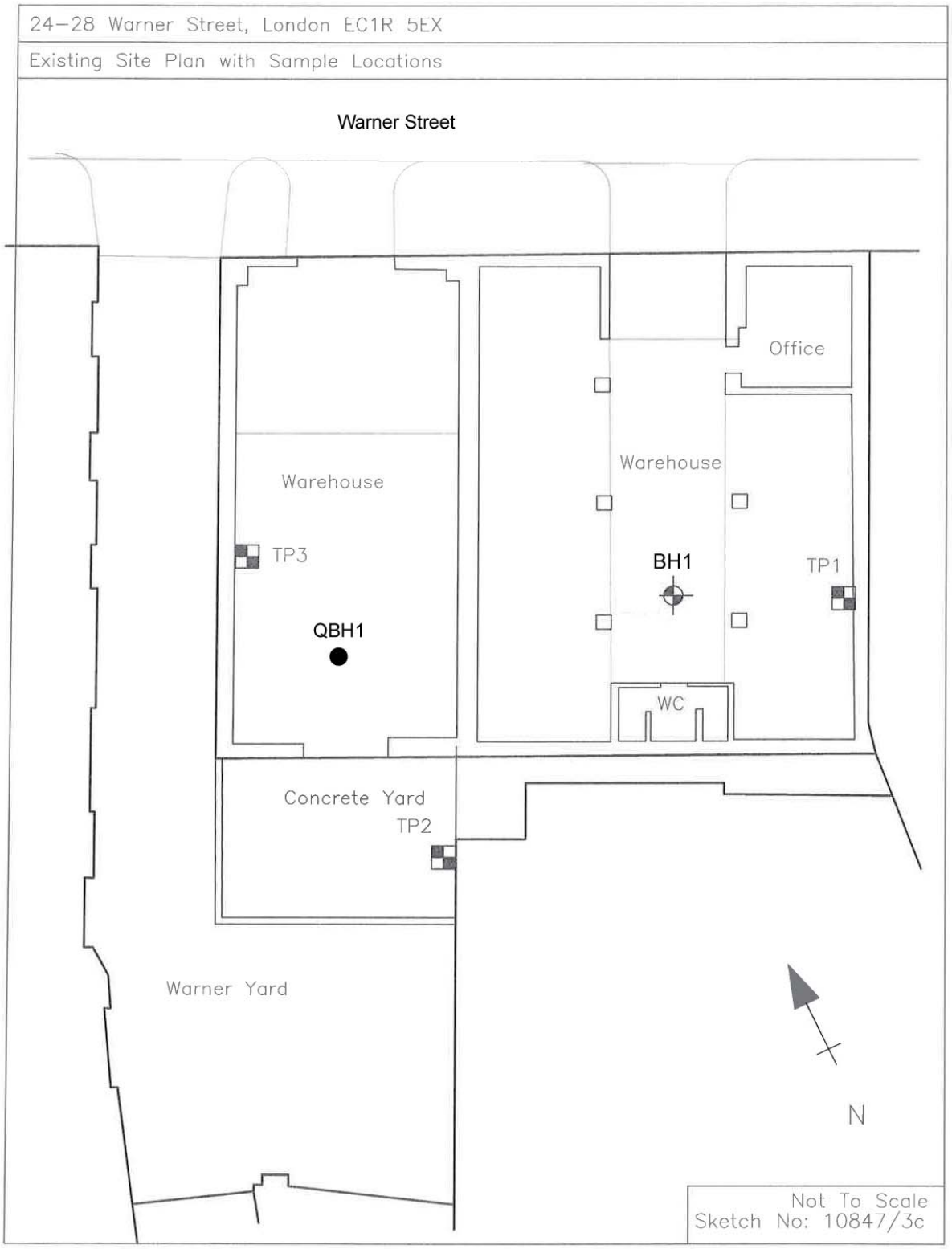

Figure 1: Approximate location of borehole QBH1, borehole BH1 and Test Pits 1-3, 24-28 Warner Street, London Borough of Camden (adapted from Herts & Essex Site Investigations (2012).

sequences and may well be pre-Holocene in age. A thickness of only 1.5m of sediment was recorded in BH1 resting on the London Clay, including 1.0m of gravelly clay. At least 1.63m of sediment was recorded in Borehole QBH1 without reaching the London Clay, including 0.94 m of sand and gravel. The average thickness of the sediment sequence overlying the London Clay in five nearby boreholes is 1.57m (Range 0.44-3.04m). The thickest sediments (BGS TQ38SW2033/F) come from a position that is likely to be close to the axis of the Fleet River valley. In the boreholes being considered here, organic material was recorded only in boreholes BH1 and QBH1 from the present site (sparse in both boreholes), although 'river mud' and 'black mud with stones' were recorded in other boreholes.

Table 1: Lithostratigraphic description of Borehole <QBH1>, 24-28 Warner Street, London Borough of Camden

Depth (m OD)	Depth (m bgs)	Description
13.20 to 8.43	0.00 to 4.77	Made ground.
8.43 to 8.11	4.77 to 5.09	5Y 4/2; As3 Ag1 Sh+; olive grey silty clay with occasional flecks of organic matter. Diffuse contact in to:
8.11 to 7.34	5.09 to 5.86	5Y 4/2; As4 Ag+; olive grey clay with a trace of silt. Sharp contact in to:
7.34 to 7.05	5.86 to 6.15	5Y 4/2; Gg2 Ag1 Ga1; olive grey silty sandy gravel. Diffuse contact in to:
7.05 to 6.91	6.15 to 6.29	5Y 4/2; As2 Ag1 Ga1; olive grey silty sandy clay. Diffuse contact in to:
6.91 to 6.80	6.29 to 6.40	5Y 4/2; Gg2 Ga1 Ag1; olive grey silty sandy gravel.

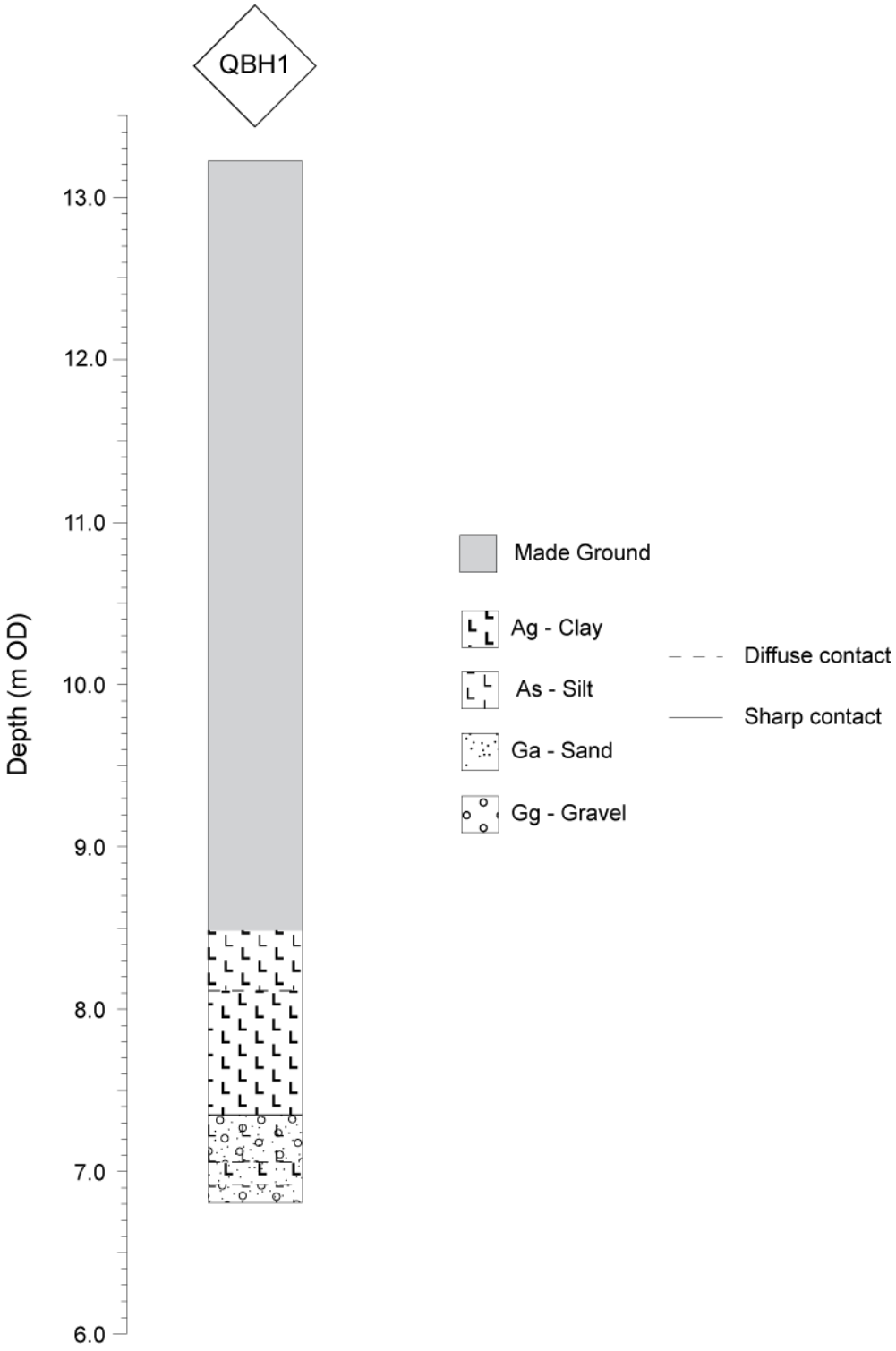

FIGURE 2: Lithostratigraphy of borehole QBH1, 24-28 Warner Street, London Borough of Camden