Basement Impact Assessment

in connection with proposed development at

53 Platt's Lane
London
NW3 7NL

for

Mr. Hasan Hameed

LBH4502 Ver 1.3

January 2018

LBH WEMBLEY

ENGINEERING

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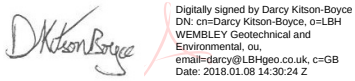
Report prepared by:

Ronnie Lancaster

BSc (Hons) MSc DIC FGS

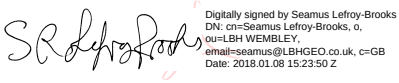
Report supervised by:



Darcy Kitson-Boyce

MEng (Hons) GMICE FGS FRGS

Report approved by:



Seamus R Lefroy-Brooks

BSc (Hons) MSc CEng MICE CGeol FGS CEnv MIEnvSc FRGS SiLC RoGEP UK Registered Ground Engineering Adviser

LBH WEMBLEY ENGINEERING

12 Little Balmer

Buckingham Industrial Park

Buckingham

MK18 1TF

Tel: 01280 812310

email: enquiry@lbhgeo.co.uk

website: www.lbhgeo.co.uk

Contents

Foreword-Guidance Notes

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VALIDITY

Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances shall be at the client's sole and own risk. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should therefore not be relied upon in the future and any such reliance on the report in the future shall again be at the client's own and sole risk.

THIRD PARTY INFORMATION

The report may present an opinion based upon information received from third parties. However, no liability can be accepted for any inaccuracies or omissions in that information.

1. Introduction

1.1 Background

It is proposed to construct a front lightwell that will be set at the same level as the existing basement beneath a Victorian terraced property.

1.2 Brief

LBH WEMBLEY have been appointed by Mr. Hasan Hameed to complete a Basement Impact Assessment (BIA) for submission to London Borough of Camden in order to satisfy the specific requirements of the 2017 Camden Planning Policy and Supplementary Planning Guidance CPG4 on Basements and Lightwells, and associated Camden geological, hydrogeological and hydrological study 2010 (referred to as the 'Arup' report).

1.3 Planning Policy

The 2017 Camden Local Plan Policy A5 Basements reads as follows:

> *"The Council will only permit basement development where it is demonstrated to its satisfaction that the proposal would not cause harm to:*
>
> *a) neighbouring properties;*
> *b) the structural, ground, or water conditions of the area;*
> *c) the character and amenity of the area;*
> *d) the architectural character of the building; and*
> *e) the significance of heritage assets.*
> *In determining proposals for basements and other underground development, the Council will require an assessment of the scheme's impact on drainage, flooding, groundwater conditions and structural stability in the form of a Basement Impact Assessment and where appropriate, a Basement Construction Plan.*
>
> *The siting, location, scale and design of basements must have minimal impact on, and be subordinate to, the host building and property. Basement development should:*
>
> *f) not comprise of more than one storey;*
> *g) not be built under an existing basement;*
> *h) not exceed 50% of each garden within the property;*
> *i) be less than 1.5 times the footprint of the host building in area;*
> *j) extend into the garden no further than 50% of the depth of the host building measured from the principal rear elevation;*
> *k) not extend into or underneath the garden further than 50% of the depth of the garden;*
> *l) be set back from neighbouring property boundaries where it extends beyond the footprint of the host building; and*
> *m) avoid the loss of garden space or trees of townscape or amenity value.*
>
> *Exceptions to f. to k. above may be made on large comprehensively planned sites.*
>
> *The Council will require applicants to demonstrate that proposals for basements:*

n. do not harm neighbouring properties, including requiring the provision of a Basement Impact Assessment which shows that the scheme poses a risk of damage to neighbouring properties no higher than Burland Scale 1 'very slight';
o. avoid adversely affecting drainage and run-off or causing other damage to the water environment;
p. avoid cumulative impacts;
q. do not harm the amenity of neighbours;
r. provide satisfactory landscaping, including adequate soil depth;
s. do not harm the appearance or setting of the property or the established character of the surrounding area;
t. protect important archaeological remains; and
u. do not prejudice the ability of the garden to support trees where they are part of the character of the area.

The Council will not permit basement schemes which include habitable rooms and other sensitive uses in areas prone to flooding.

We will generally require a Construction Management Plan for basement developments.

Given the complex nature of basement development, the Council encourages developers to offer security for expenses for basement development to adjoining neighbours."

The following policies in the Local Plan are also relevant to basement development and will be taken into account when assessing basement schemes:

- "Policy A2 Open space";
- "Policy A3 Biodiversity";
- "Policy D1 Design";
- "Policy D2 Heritage"; and
- "Policy CC3 Water and flooding".

In addition to the Local Plan Policy Camden publishes Camden Planning Guidance on Basements and Lightwells. These CPG documents do not carry the same weight as the main Camden Development Plan documents (including the above Policy A5) but they are important supporting documents.

It is noted that the current CPG4 Planning Guidance on Basements and Lightwells (2015) has not yet been updated to reflect the Local Plan and refers primarily to the now withdrawn Planning Policy DP27 on Basements and Lightwells.

1.4 Report Structure

The report commences with a desk study and characterisation of the site, before progressing to BIA screening and scoping assessments, whereby consideration is given to identifying the potential hydrogeological, hydrological and stability impacts to be associated with the proposed development. Following this the findings of an intrusive ground investigation are reported and a ground model is developed, followed by a discussion of the geotechnical issues.

Finally, an Impact Assessment is presented, including an assessment of the ground movements associated with the proposed works, along with consideration of the potential damage to the host building and neighbouring structures.

1.5 Documents Consulted

The following documents have been consulted during the preparation of this document:

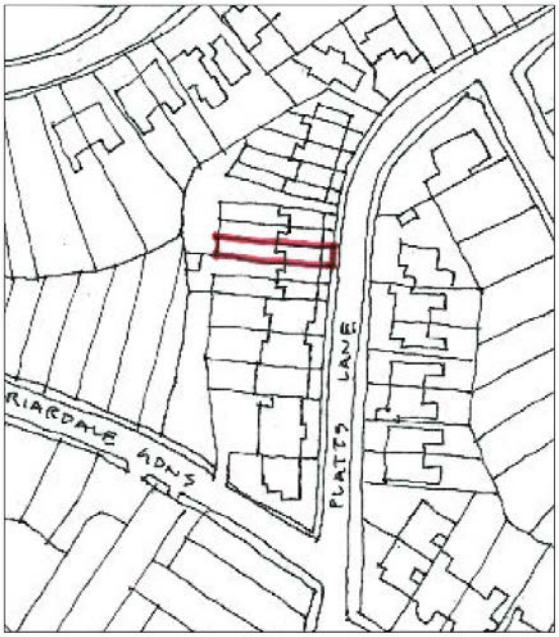
1. Structural Methodology Report by Richard Tant Associates, dated December 2017, RT/SMS/4591
2. Indicative Front Light Well Lower Ground Floor by Richard Tant Associates, dated December 2017, Drawing No. 4591-SM01
3. Suggest Method of Works by Richard Tant Associates, dated December 2017, Drawing Nos. 4591-SM02 and 4591-SM03
4. Design and Access Statement by ROH Architects, dated July 2017, Job No. 16020
5. Plans as Existing and Proposed by ROH Architects, dated June 2017, Job No. 16019, Dwg No. P-100
6. Front Elevation as Existing and Proposed by ROH Architects, dated June 2017, Job No. 16019, Dwg No. P-101
7. Camden Planning Guidance 4, Basements and Lightwells, 2015
8. Camden Development Policies DP27 – Basements and Lightwells, 2010
9. London Borough of Camden Geological, Hydrogeological and Hydrological Study (CHGGS), by Ove Arup & Partners Limited, dated 18th November 2010, Issue 01
10. Flood Risk Assessment by LBH Wembley, dated December 2017, LBH4502fra Ver. 1.0

2. The Site

2.1 Site Location

The site is situated on the western side of Platt's Lane, some 350m to the southwest of West Heath.

The site may be located approximately by postcode NW3 7NL or by National Grid Reference 525280, 186185.



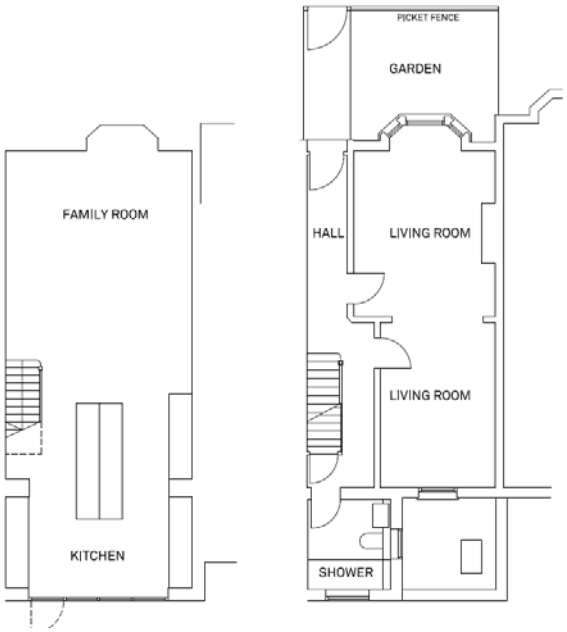
Location Plan

2.2 Topographical Setting

The site lies on the slopes of Hampstead Hill that is gently falling to the west towards a culverted tributary of the River Brent.

Street level immediately to the east of the site appears to be situated at approximately +91m OD.

2.3 Site Description



Existing Floor Plans –

Left: Lower Ground Floor. Right: Ground Floor

The site is currently occupied by a Victorian terraced house comprising two storeys and attic accommodation. The dwelling also contains a single storey basement beneath the full extent of the house.

The existing ground floor level of the house appears to be located at around street level, approximately +91m OD. The existing basement extends to roughly 3m below existing ground level, at around +88m OD.

A small patio area is located immediately to the front of the house, which is bordered by a hedge. A c.120mm diameter vitreous clay pipe, possibly a private rainwater drain, is present beneath this patio area at roughly 1m depth and appears to runs along the front gardens to the properties fronting onto Platt's Lane. The pipe may be disused.

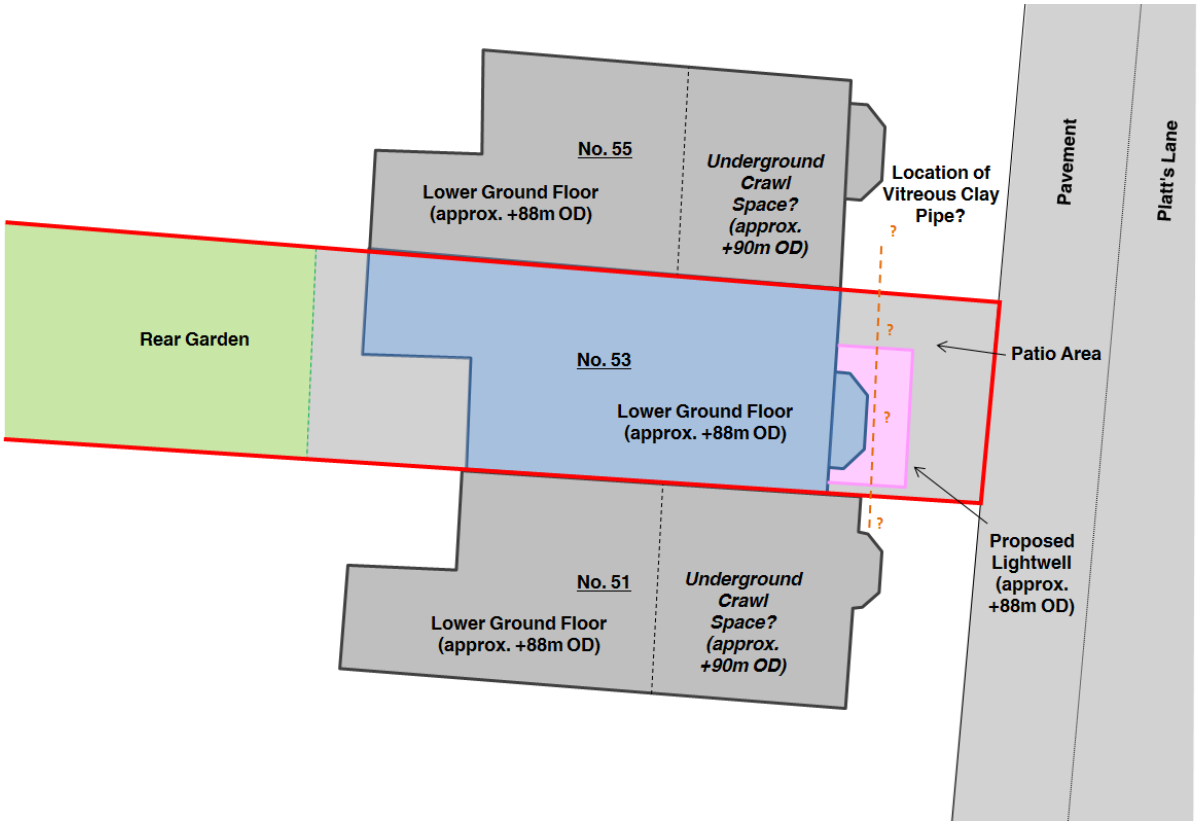
A garden is present to the rear of the house and comprises several trees.

The site is adjoined to the north and south by terraced properties at 55 and 51 Platt's Lane respectively.

These dwellings appear to comprise single storey lower ground floors beneath the rear halves of their footprints. In addition, shallow underfloor spaces are understood to be present beneath the front halves, which are situated at roughly +90m OD.

2.4 Proposed Development

It is proposed to construct a lightwell to front of the existing house, which will be set at the same level as the existing basement (roughly +88m OD).



Site plan showing proposed development and existing features

3. Desk Study

3.1 Site History

The site and surrounding area was generally open fields until the 19th Century, although the land to the southwest appeared to be occupied by a brick field.

By the end of the 19th Century, the existing row of terraced houses on Platt's Lane including 53 Platt's Lane was constructed.

It is understood that the house comprised a partial basement, which was situated beneath the rear half of the building. It is suggested that this basement extended up to a depth of around 2.2m, which would be similar to the partial basements currently present beneath the neighbouring properties. A shallow underground space was located beneath the front half of the house, which extended to a depth of 0.85m.

By the time of the First World War, the rest of the houses on Platt's Lane were built and the surrounding area experienced dense residential development.

Following the construction of 53 Platt's Lane, the site has remained relatively unchanged since the turn of the 21st Century. However, it is understood that the partial basement and shallow underground space have recently been deepened to around 3m depth, in order to create a single storey habitable basement that occupies the full extent of the building footprint.

3.2 Geological Information

The British Geological Survey (BGS) records indicate that the site is underlain by the Claygate Member, which is subsequently underlain by the London Clay Formation.

3.3 Hydrogeological / Hydrological Information

The permeability of the Claygate Member depends entirely upon the connectivity and continuity of the sandier seams and lenses. While larger seams of sand can give initially rise to appreciable volumes of groundwater if intercepted, sustained flow is hampered by the inter-bedded nature of the clays, silts and sand that make up the unit. The London Clay Formation may be considered virtually impermeable.

4. Screening & Scoping Assessments

The Screening & Scoping Assessments have been undertaken with reference to Appendices E and F of the CGHSS, which is a process for determining whether or not a BIA is usually required.

4.1 Screening Assessment

The Screening Assessment consists of a series of checklists that identifies any matters of concern relating to the following:

- Subterranean (groundwater) flow
- Surface flow and flooding
- Slope stability

4.1.1 Screening Checklist for Subterranean (Groundwater) Flow

Question	Response	Justification
Is the site is located directly above an aquifer?	**Yes**	The Environment Agency (EA) maps indicate that the site is underlain by a 'Secondary A Aquifer'.
Will the proposed basement extend beneath the water table surface?	**Unknown**	Carried forward to Scoping.
Is the site within 100m of a watercourse, well (used/disused) or potential spring line?	**No**	The nearest watercourse is the source of a tributary of the River Brent, roughly 200m to the north of the site.
Is the site within the catchment of the pond chains on Hampstead Heath?	**No**	The site is not within catchment of the Hampstead Heath Ponds.
Will the proposed development result in a change in the area of hard-surfaced/paved areas?	**No**	The lightwell will replace part of the existing patio area.
Will more surface water (e.g. rainfall and run-off) than at present will be discharged to the ground (e.g. via soakaways and/or SUDS)?	**No**	There is not expected to be any change to discharge.
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?	**No**	

4.1.2 Screening Checklist for Surface Flow and Flooding

Question	Response	Justification
Is the site within the catchment area of the pond chains on Hampstead Heath?	**No**	The site is not within catchment of the Hampstead Heath Ponds.
As part of the site drainage, will surface water flows (e.g. rainfall and run-off) be materially changed from the existing route?	**No**	Surface water will be disposed of by the existing means.
Will the proposed basement development result in a change in the proportion of hard-surfaced/paved areas?	**No**	The lightwell will replace part of the existing patio area.
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**	Surface water drainage is to be to the sewer as per existing.
Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	**No**	Surface Water Drainage is to the sewer as per existing.
Is the site in an area known to be at risk from surface water flooding, 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?	**Yes**	Environment Agency (EA) maps indicate that the site is at a very low risk of surface water flooding. Platt's Lane is reported to have flooded in both 1975 and 2002.

4.1.3 Screening Checklist for Stability

Question	Response	Justification
Does the existing site include slopes, natural or manmade, greater than 7 degrees?	**No**	There are no slopes greater than 7 degrees within the site.
Does the proposed re-profiling of landscaping at the site change slopes at the property boundary to more than 7 degrees?	**No**	No re-profiling is planned at the site.
Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7 degrees?	**No**	
Is the site within a wider hillside setting in which the general slope is greater than 7 degrees?	**No**	The general slope of the wider hillside is less than 7 degrees.

Is London Clay the shallowest strata at the site?	**No**	The British Geological Survey (BGS) records indicate that shallow stratum to be Claygate Member.
Will trees be felled as part of the proposed development and/or are works proposed within tree protection zones where trees are to be retained?	**Yes**	A 2.5m high hedge will be removed in order to construct the lightwell.
Is there a history of seasonal shrink-swell subsidence in the local area, and/or evidence of such effects at the site?	**No**	No evidence of cracks or building movements was evident upon visiting the site.
Is the site within 100m of a watercourse of a potential spring line?	**No**	The nearest watercourse is the River Tyburn, roughly 600m to the west of the site.
Is the site within an area of previously worked ground?	**No**	The British Geological Survey (BGS) records indicate that the site is not underlain by worked ground.
Is the site within an aquifer?	**Yes**	The Environment Agency (EA) maps indicate that the site is underlain by a 'Secondary A Aquifer'.
Will the proposed basement extend beneath the water table such that dewatering may be required during construction?	**Unknown**	Carried forward to Scoping.
Is the site within 50m of the Hampstead Heath ponds?	**No**	The site is not within catchment of the Hampstead Heath Ponds
Is the site within 5m of a highway or pedestrian right of way?	**Yes**	The proposed lightwell is situated around 2m from the pedestrian right of way. In addition, it is understood that a vitreous clay pipe runs through the area of the proposed lightwell and appears to traverse along the front gardens to the properties fronting onto Platt's Lane.
Will the proposed basement significantly increase the differential depth of foundations relative to the neighbouring properties?	**Yes**	Carried forward to Scoping.
Is the site over (or within the exclusion zone of) tunnels, e.g. railway lines?	**No**	The site is not within any exclusion zones or over tunnels.

4.2 Scoping Assessment

Where the checklist is answered with a "yes" or "unknown" to any of the questions posed in the flowcharts, these matters are carried forward to the scoping stage of the BIA process.

The scoping produces a statement which defines further the matters of concern identified in the screening stage. This defining should be in terms of ground processes, in order that a site specific BIA can be designed and executed (Section 6.3 of the CGHHS).

4.2.1 Scoping for Subterranean (Groundwater) Flow

- **Is the site located directly above an aquifer?**

The basement may extend into the underlying aquifer and thus affect the groundwater flow regime.

- **Will the proposed basement extend beneath the water table surface?**

The guidance advises that the groundwater flow regime may be altered by the proposed basement. Changes in flow regime could potentially cause the groundwater level within the zone encompassed by the new flow route to increase or decrease locally. For existing nearby structures then the degree of dampness or seepage may potentially increase as a result of changes in groundwater level.

4.2.2 Scoping for Surface Flow and Flooding

- **Is the site in an area known to be at risk from surface water flooding, or is it at risk from flooding for example because the proposed basement is below the static water level of nearby surface water feature?**

The guidance advises that a Flood Risk Assessment may be required.

4.2.3 Scoping for Stability

- **Will any tree/s 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?**

The guidance advises that the soil moisture deficit associated with felled trees will gradually recover. In high plasticity clay soils (such as London Clay) this will lead to gradual swelling of the ground until it reaches a new value. This may reduce the soil strength which could affect the slope stability. Additionally the binding effect of tree roots can have a beneficial effect on stability and the loss of a tree may cause loss of stability.

- **Is the site within an aquifer? If yes, will the proposed basement extend beneath the water table such that dewatering may be required during construction?**

The guidance advises that Dewatering can cause ground settlement. The zone of settlement will extend for the dewatering zone, and thus could extend beyond a site boundary and affect neighbouring structures. Conversely, an increase in water levels can have a detrimental effect on stability.

- **Is the site within 5m of a highway or pedestrian right of way?**

The guidance advises that excavation for a basement may result in damage to the road, pathway or any underground services buried in trenches beneath the road or pathway.

- **Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?**

The guidance advises that excavation for a basement may result in structural damage to neighbouring properties if there is a significant differential depth between adjacent foundations.

5. Stage 3 – Site Investigation

A limited investigation comprising a window sampler borehole was carried out in November 2017, in order to assess the ground conditions and recover samples for geotechnical laboratory testing.

The site plan below indicates the approximate position of the exploratory borehole, while the associated records and laboratory test results are appended.

5.1 Ground Conditions

The ground investigation indicates that the site is underlain by approximately one metre of made ground over the Claygate Member

5.2 Made Ground

Made ground is present to roughly 1m depth and, beneath the hard surfacing, generally comprises dirty brown sandy clay with stones and extraneous material including brick.

5.3 Downwash Deposits

Downwash Deposits underlie the made ground and extend to roughly 2.5m. These soils consist of firm pale grey mottled brown sandy clay with gravel. The presence of gravel indicates that these soils have experienced downwash or creep.

5.4 Claygate Member

The Claygate Member underlies the Downwash Deposits and generally comprises firm becoming firm to stiff, dark greenish-grey sandy clay.

The results of the plasticity index testing indicate that these soils are of medium plasticity.

5.5 Groundwater

No groundwater was encountered during the investigation. However, subsequent groundwater monitoring immediately following an exceptionally wet period recorded water with the standpipe at 3.6m depth. It is evident from the dry state of the existing basement, which includes an open section at the front of the property exposing the soils from floor to ceiling, that there is no water table at or above the proposed lightwell level.

6. Discussion of Geotechnical Issues

6.1 Lightwell Construction

It is proposed to construct a lightwell to the front of the existing basement and will be placed at around 3m depth below the existing ground floor level (+88m OD).

In the absence of any expectation of substantial groundwater inflows into the excavation, the retaining walls to the lightwell may possibly be formed by means of the 'hit and miss' excavation methods that are normally adopted for conventional underpinning.

However, in view of the proximity of No. 51 Platt's Lane and the pedestrian right of way, a greater degree of temporary stability is required. Hence, the proposed lightwell is to be formed via the use of temporary propping, as shown on appended Drawings 4591-SM02 and 4591-SM03.

6.2 New Foundations

The light structural loads applied by the lightwell will be accommodated by the perimeter walls.

Outside the zone of influence of any trees, the perimeter walls should be placed in suitably firm clay, expected at the depth of the proposed lightwell, and may be designed to apply a net allowable bearing pressure of 120kN/m^2.

6.3 Stability of Neighbouring Structures

A small section of the proposed lightwell (~1m) will be constructed adjacent to the neighbouring property at 51 Platt's Lane.

51 Platt's Lane appears to have an underground floor space that is assumed to be set at 1m depth (+90m OD). As the proposed lightwell will be set at around 2.5m depth (+88.m OD), the differential depth of foundations relative to 51 Platt's Lane is expected to be increased.

Subject to discussions with the Party Wall Surveyor, this section of the neighbouring property may require the use of transitional underpinning, as shown on appended Drawing 4591-SM02.

6.4 Flooring

Following excavation, loading will be reapplied to the soil as a result of the weight of the new lightwell. It is envisaged that there will be a mismatch between the weight of the soil that is to be removed and the weight of the new structure that is to replace this.

Approximately 5mm of additional long term heave is predicted to occur beneath the proposed lightwell. In order to counter the total heave, it is suggested that the lightwell should be designed as a reinforced rigid box structure that is tied into the existing basement, such that that new structure responds uniformly to any residual unloading.

6.5 Waterproofing

Groundwater was not encountered within the envisaged depth of the excavation. Nevertheless, there is potential for water to collect around the lightwell in the long term unless perimeter and under floor drainage is assured. Hence, it is recommended that the lightwell should be fully waterproofed and

designed to withstand hydrostatic pressures in accordance with Guidance provided in BS8102:2009, Code of Practice for the Protection of Below-Ground Structures against Water from the Ground. An assumed groundwater level at 1m depth below external ground level would be prudent for the purposes of assessing hydrostatic pressures in order to allow for the possibility of surface water flooding due to a water main burst or similar.

6.5.1 Retaining Walls

The following parameters may be considered in the design of the retaining walls:-

Stratum	Bulk Density	Effective Cohesion	Effective Friction Angle
	(kg/m^3)	(c' - kN/m^2)	(ϕ'- degrees)
Made Ground	1800	Zero	25
Downwash Deposits	1900	Zero	10
Claygate Member	1900	Zero	25

6.6 Foundation Concrete

The results of chemical analyses carried out on selected samples of the soils encountered indicate soluble sulphate concentrations falling within Class DS-1 as defined by BRE Special Digest 1 (2005). The recommendations of that guidance for Class DS-1 sulphate conditions should therefore be followed, assuming an Aggressive Chemical Environment for Concrete (ACEC) site classification of AC-1 for mobile groundwater.

6.7 Waste Disposal

All material to be disposed of off-site should be properly recorded, including the retention of any waste tickets, details of excavated soil export destinations and the waste classification.

The results have suggested that the made ground may be classed as Non-Hazardous for waste disposal purposes, while the underlying natural soils may be also expected to be Non-Hazardous. Provided that they can be adequately separated from any made ground, it may be possible to dispose of these natural soils to a tip licensed to accept Inert material.

7. Impact Assessment

The screening and scoping stages have 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.

7.1 Potential Hydrogeological Impacts

7.1.1 Aquifer

The proposed lightwell will extend into the Claygate Member, although there is no expectation of substantial groundwater inflows into the excavation.

It is therefore envisaged that groundwater flow will not be impeded by the development and there is expected to be no significant cumulative impact.

7.2 Potential Hydrological Impacts

7.2.1 Surface Water Flooding

Platt's Lane has experienced flooding in 1975 and 2002. In accordance with the Camden Local Plan, a Flood Risk Assessment (LBH4502fra Ver. 1.0) has been prepared, in order to demonstrate that the proposed scheme will result in a minimal impact on surface water drainage conditions.

7.3 Potential Stability Impacts

7.3.1 Trees

The results of the plasticity index have confirmed the Downwash Deposits and Claygate Member beneath the site to be of medium volume change potential.

A 2.5m high hedge that lies within the area of the proposed lightwell is to be removed. No threat to slope stability is perceived as a result of the removal of this shrub.

7.3.2 Aquifer

As the proposed lightwell is not expected to penetrate a shallow groundwater table, there is no potential concern with regards to stability.

7.3.3 Pavement and buried services

The proposed lightwell lies some 2m from the pavement.

In order to preserve the integrity of the pedestrian right of way and highway, temporary propping will need to be used to construct the outer side of the lightwell.

A vitreous clay pipe, runs beneath the proposed lightwell. This is thought to be possibly a rainwater drain since the main sewer run is indicated to lie at the rear off the property. The purpose of the pipe will need to be further investigated and it may need to be diverted around the new lightwell rather than simply removed.

7.4 Ground Movement to Neighbouring Structures

The key factor to consider when undertaking a ground movement assessment for the development is that the design of the new lightwell will need to preserve the stability of the adjacent building, both during excavation and construction and in the permanent situation.

7.4.1 Structures Assessed for Ground Movement

7.4.1.1 51 Platt's Lane

51 Platt's Lane is a two storey terraced building that is present just to the south of the proposed lightwell, which was constructed at around the same time as 53 Platt's Lane.

The property also appears to have an underground crawl space that lies 0.5m from the proposed lightwell and is assumed to extend to a depth of roughly 1m below external ground level (+90m OD).

7.4.1.2 55 Platt's Lane

55 Platt's Lane is a two storey terraced building that is present to the northwest of the proposed lightwell and was constructed at around the same time as 53 Platt's Lane.

The property also has an underground crawl space that extends to a similar depth as 51 Platt's Lane. However, as the property lies some 4m from the proposed lightwell, the ground movements that may affect this property are expected to be negligible and cannot be meaningfully modelled.

7.4.2 Modelled Ground Conditions

Excavation of the proposed lightwell will result in unloading of the clay leading to theoretical heave movement of the underlying soil in both the short and long term, depending upon the reapplication of loading.

Therefore, an analysis of the vertical movements has been carried out for a modelled situation, based on a soil model devised from the results of the ground investigation, together with nearby data. The soil layers of this model are detailed in the table below.

Analysis Layer:	Upper Boundary (+m OD)	Thickness (m)	Average C_u (kN/m^2)	Soil Stiffness (kN/m^2)	
				E_u	E'
Claygate Member	88.50	1	50	22500	12500
Claygate Member	87.50	1	55	24750	13750
Claygate Member	86.50	1	60	27000	15000
Claygate Member	85.50	1.5	65	29250	16250
Claygate Member	84.00	2	70	31500	17500
Claygate Member	82.00	2	80	36000	20000
London Clay Formation	80.00	3	90	40500	22500
London Clay Formation	77.00	3.5	100	45000	25000
Assumed Rigid Boundary	73.50				

The Undrained Modulus of Elasticity (Eu) has been based upon an empirical relationship of Eu = 450 x Cu, and the Drained Modulus of Elasticity (E') has been based upon an empirical relationship of 250 x Cu.

Poisson's Ratios of 0.5 and 0.2 have been used for short term (undrained) and long term (drained) conditions respectively.

Based on the above parameters and loading/unloading and ignoring any benefit gained from the loading of previous buildings on site, the potential vertical displacements and the post construction movements have been analysed.

The analysis uses classic modified Boussinesq elastic theory, assuming a fully flexible foundation applying a uniform loading/unloading to a semi-infinite elastic half-space, using the above parameters for stratified homogeneity and with the introduction of an assumed rigid boundary at approximately 15m depth (+73.50m OD).

The programme calculates the theoretical Boussinesq elastic stress increase/decrease due to the applied net loadings/unloadings (over the given loaded/unloaded areas) at the mid-level of each stratum.

Short-term and long-term displacements are then calculated at each calculation point for each stratum, using the given values of Stiffness Moduli and Poisson's Ratio of the whole area of the site on a 0.5m calculation grid.

7.4.3 Movements to Neighbouring Structures

The ground surface movements that might potentially interact to affect 51 Platt's Lane are ground movements associated with the underpinning and theoretical elastic vertical heave movements from excavation of the basement.

7.4.3.1 Underpinning

It is not possible to rigorously model the ground movements arising from underpinning of the front wall section of 51 Platt's Lane.

It is suggested that given dry conditions and good workmanship, the amount of vertical movement that can be expected at 51 Platt's Lane will be approximately 5mm.

The subsequent horizontal movements that may occur due to the yielding of the wall during the basement excavation may also be estimated. As a first approximation, the magnitude of the horizontal movement is assumed to be equal to the vertical movement; hence 5mm of horizontal movement can be expected at 51 Platt's Lane.

7.4.3.2 Excavation

It is envisaged that the excavation will extend to roughly 3m beneath the proposed lightwell. As a result, the potential effect of the basement excavation has been considered by applying a net unloading of up to -60kN/m^2 due to soil loading.

The potential effect of this soil excavation may be approximately 4mm of short term vertical heave. It can be seen that a maximum of approximately 1mm of short term vertical heave is theoretically predicted to occur beneath 51 Platt's Lane. An additional long term vertical heave of around 2mm is also predicted for the neighbouring property.

7.4.4 Impact on 51 Platt's Lane

The degree of movement due to the proposed lightwell construction has been assessed as Burland scale Category 1 (very slight) for 51 Platt's Lane.

7.4.5 Residual Impacts

It is concluded that the proposed lightwell will have no residual unacceptable impacts upon the surrounding structures, infrastructure and environment. No cumulative impacts are envisaged.

Appendix

Exploratory Log

Geotechnical Test Results

Chemical Results

Drawings

PROJECT: 53 Platt's Lane, London, NW3 7NL
CLIENT: Mr. Hasan Hameed

LBH4502

BOREHOLE BH01

BORING METHOD: Tracked Window Sampler Rig

Date: 24/11/2017

GROUND WATER: No groundwater observed during drilling

REMARKS: Groundwater Monitoring Standpipe installed to 4.2m depth (Response Zone: 2 - 4.2m)
Groundwater monitored at 3.6m depth on 07/12/17

G.L +91m OD

Samples No	Samples Type	Depth m	SPT N Value	Legend	Depth m	Description
					0.10	MADE GROUND (concrete)
						MADE GROUND (dirty brown sandy clay with stones, gravel, brick fragments, roots and rootlets)
1	D	0.70			1.00	
						Soft becoming firm pale grey mottled brown sandy CLAY with rare flint gravel
	SPT	1.30	4			
2	D	2.00				…becoming firm at 2m
	SPT	2.30	13			…150mm thick band of flint gravel at 2.3m
					2.50	Firm to stiff pale brown sandy CLAY
3	D	3.00				
	SPT	3.30	10			
4	D	4.00				…becoming very sandy at 4m
	SPT	4.30	12			
						…becoming dark greenish-grey at 5m

U=Undisturbed
B= Bulk
D=Disturbed
W=Water

LBH WEMBLEY ENGINEERING

PROJECT: 53 Platt's Lane, London, NW3 7NL
CLIENT: Mr. Hasan Hameed
LBH4502

BOREHOLE BH01

BORING METHOD: Tracked Window Sampler Rig
Date: 24/11/2017

GROUND WATER: No groundwater observed during drilling

REMARKS: Groundwater Monitoring Standpipe installed to 4.2m depth (Response Zone: 2 - 4.2m)
Groundwater monitored at 3.6m depth on 07/12/17

G.L +91m OD

Samples No	Samples Type	Depth m	SPT N Value	Legend	Depth m	Description
	SPT	5.30	14			Stiff dark greenish-grey very sandy CLAY
	SPT	6.30	16			
					6.45	

Sheet 2 of 2

U=Undisturbed
B= Bulk
D=Disturbed
W=Water

LBH WEMBLEY ENGINEERING

PROJECT: 53 Platt's Lane, London, NW3 7NL

Project No LBH4502

CLIENT: Mr. Hasan Hameed

SPT RESULTS

Borehole No	Depth at Start of Test (m)	Spoon or Sone	Blow for each successive 75mm penetration						Water Level (m)	Is Hole Blowing?	N Value
1	1.00		1	1	1	1	1	1	None	No	4
	2.00		1	2	2	3	4	4	None	No	13
	3.00		2	2	3	2	3	2	None	No	10
	4.00		1	2	3	3	3	3	None	No	12
	5.00		2	2	3	3	4	4	None	No	14
	6.00		3	3	4	4	4	4	None	No	16

GroundTech Laboratories

Geotechnical Testing Facility

Slapton Hill Barn, Blakesley Road, Slapton, Towcester, Northants. NN12 8QD

Telephone:- 01327 860947/860060 Fax:- 01327 860430 Email: groundtech@listersgeotechnics.co.uk

PROJECT INFORMATION		SAMPLE INFORMATION		
Site Location:-	53 Platt's Lane Hampden London NW3 7NL	**Laboratory Tests Undertaken:-**		
		TEST TYPE	**TEST METHOD**	**TESTED**
		Natural Water Contents (WC%)	(BS 1377:Part 2:1990 Clause 3.2)	✓
		Liquid Limits (%)	(BS 1377:Part 2:1990 Clause 4.3)	✓
		Plastic Limits (%)	(BS 1377:Part 2:1990 Clause 5.3)	✓
		Plasticity Index (%)	(BS 1377:Part 2:1990 Clause 5.4)	✓
		Linear Shrinkage (%)	(BS 1377:Part 2:1990 Clause 6.5)	
		PSD - Wet Sieving	(BS 1377:Part 2:1990 Clause 9.2)	
Client Reference:-	-	Engineering Sample Descriptions	(BS 5930 : Section 6)	
		Passing 425/63 (μm)	-	✓
		Hydrometer	(BS 1377:Part 2:1990 Clause 9.5)	
Date Samples Received:-	6th December 2017	Loss on Ignition (%)	-	
Date Testing Completed:-	11th December 2017	Soil Suctions (kPa)	BRE Digest IP 4/93, 1993	
		Bulk Density (Mg/m^3)	(BS 1377:Part 2:1990 Clause 7.2)	
		Strength Tests	(BS 1377:Part 7:1990 Clause 8 & 9)	
		Soluble Sulphate Content (SO_4g/l)	(BS 1377:Part 3:1990 Clause 5.3)	✓
		pH value	(BS 1377:Part 3:1990 Clause 9.4)	✓
		California Bearing Ratios (CBR)	(BS 1377:Part 4:1990 Clause 7)	
		Compaction Tests	(BS 1377:Part 4:1990 Clauses 3.0-3.6)	
The results relate only to the samples tested				

Laboratory testing in accord with BS EN ISO/IEC 17025-2000 and Quality Management in accord with ISO 9001

Signed on behalf of GroundTech Laboratories:- _____ **Technical Signatory**

Quality Assured to ISO 9001

GEOTECHNICAL LABORATORY TEST RESULTS

Report No: 17.12.002

GroundTech Laboratories

Geotechnical Testing Facility

Slapton Hill Barn, Blakesley Road, Slapton, Towcester, Northants. NN12 8QD
Telephone: 01327 860947/860060 Fax: 01327 860430 Email: groundtech@listersgeotechnics.co.uk

Quality Assured to ISO 9001

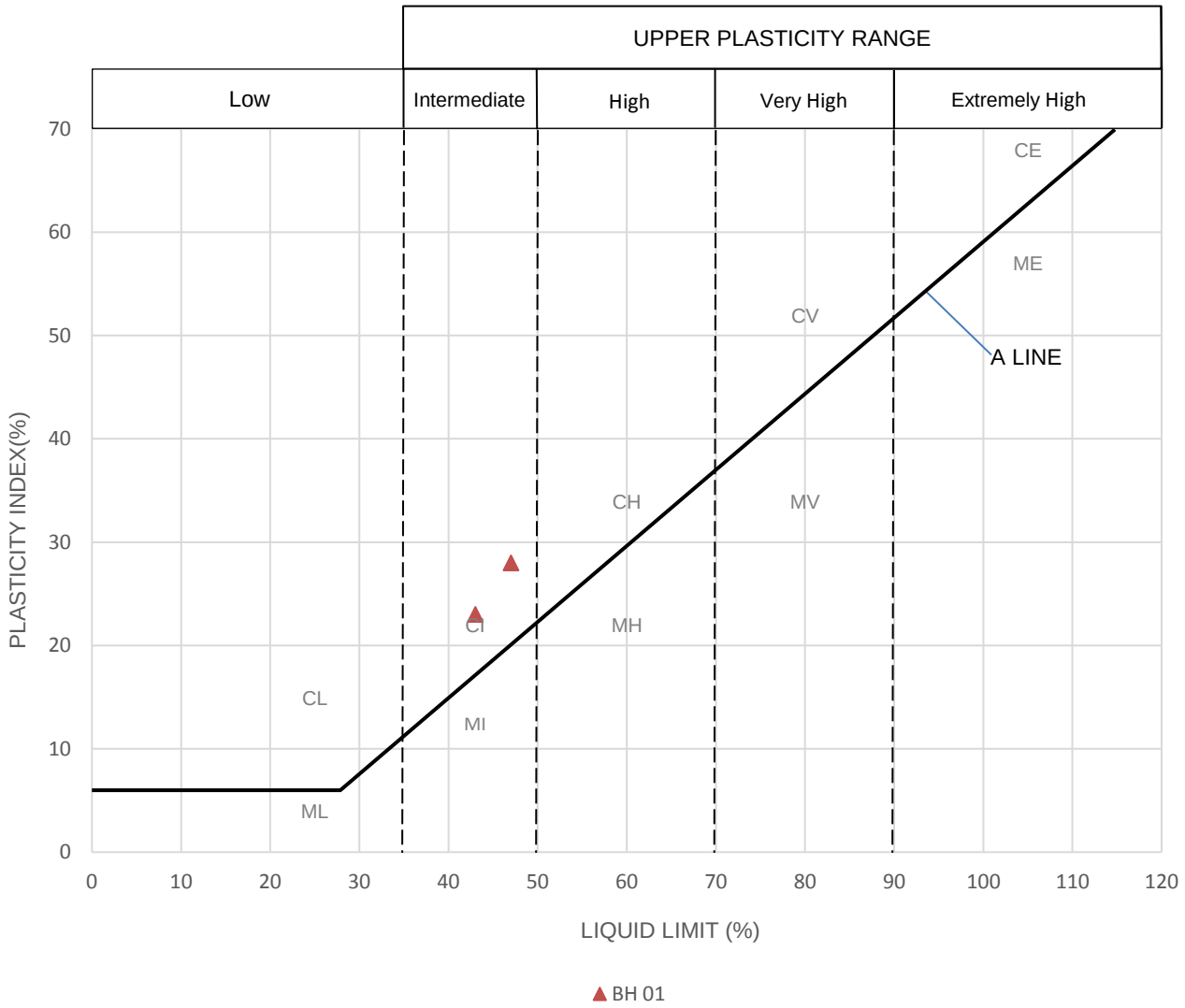
SAMPLES				CLASSIFICATION TESTS							CLASSIFICATION TESTS							STRENGTH TESTS					CHEMICAL TESTS	
Test Location	Sample Type	Sample Depth -m	Test Type	WC %	LL %	PL %	PI %	Passing 425 µm %	Modified PI %	Class	Passing 63 µm %	WC/ LL	PL+ 2%	Liquidity Index	Loss on Ignition %	Soil Suction kPa	Bulk Density Mg/m3	Test Type	Cell Pressure kN/m2	Deviator Stress kN/m2	Apparent Cohesion kN/m2	ϕ	pH Value	Soluble Sulphate Content SO4 g/l
BH 01	D	2.00	PI/63	23	47	19	28	99	28	CI	78	0.49	21	0.14									7.5	0.06
	D	3.00																					7.6	0.04
	D	4.00	PI/63	26	43	20	23	100	23	CI	60	0.60	22	0.26										

Symbols:

U	Undisturbed Sample	R	Remoulded	PI	Plasticity Index	T	Triaxial Undrained	L	100mm specimen
D	Disturbed Sample	63	Passing 63µm	F	Filter Paper Suction Tests	M	Multistage Triaxial	S	38mm specimen
B	Bulk Sample	H	Hydrometer	CC	Continuous Core	HP	Hand Penetrometer		
W	Water Sample	PSD	Wet Sieving			V	Vane Test		

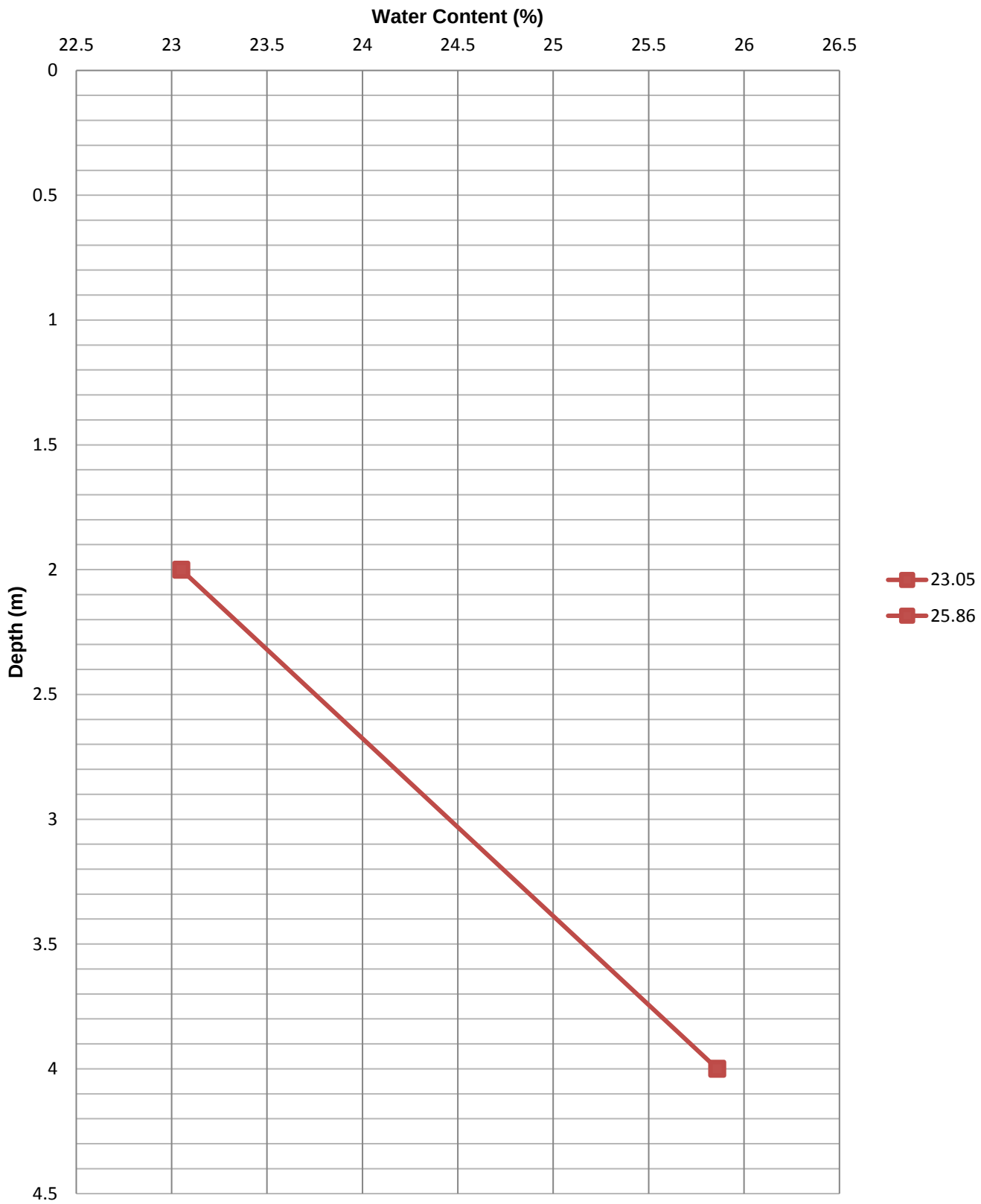
LABORATORY TEST RESULTS

Project Reference
17.12.002



PLASTICITY CHART

Report:
17.12.002



WATER CONTENT v DEPTH

Report:
17.12.002

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

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

Attention: Ronnie Lancaster

CERTIFICATE OF ANALYSIS

Date:	12 December 2017
Customer:	H_LBHWGE_BUK
Sample Delivery Group (SDG):	171201-7
Your Reference:	
Location:	53 Platt's Lane
Report No:	436484

We received 3 samples on Tuesday November 28, 2017 and 2 of these samples were scheduled for analysis which was completed on Tuesday December 12, 2017. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Approved By:

Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	171201-7	**Client Reference:**		**Report Number:**	436484
Location:	53 Platt's Lane	**Order Number:**		**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
16668253	BH01		0.70 - 0.70	24/11/2017
16668254	BH01		2.00 - 2.00	24/11/2017
16668252	NO ID			

Maximum Sample/Coolbox Temperature (°C) : **3.8**

ISO5667-3 Water quality - Sampling - Part3 -
During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG:	171201-7	**Client Reference:**		**Report Number:**	436484
Location:	53 Platt's Lane	**Order Number:**		**Superseded Report:**	

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)					16668253					16668254	
Customer Sample Reference					BH01					BH01	
AGS Reference											
Depth (m)					0.70 - 0.70					2.00 - 2.00	
Container					250g Amber Jar (ALE210)	400g Tub (ALE214)	60g VOC (ALE215)	250g Amber Jar (ALE210)	400g Tub (ALE214)	60g VOC (ALE215)	
Sample Type					S	S	S	S	S	S	
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 2			X			X			
Anions by Kone (soil)	All	NDPs: 0 Tests: 1			X						
Anions by Kone (w)	All	NDPs: 0 Tests: 2				X			X		
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 1				X					
Boron Water Soluble	All	NDPs: 0 Tests: 1			X						
CEN Readings	All	NDPs: 0 Tests: 2				X			X		
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1			X						
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2				X			X		
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 2				X			X		
Easily Liberated Sulphide	All	NDPs: 0 Tests: 1			X						
EPH	All	NDPs: 0 Tests: 1			X						
EPH by FID	All	NDPs: 0 Tests: 1			X						
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 1			X						
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 1			X						
Fluoride	All	NDPs: 0 Tests: 2				X			X		

Validated

CERTIFICATE OF ANALYSIS

SDG:	171201-7	**Client Reference:**		**Report Number:**	436484
Location:	53 Platt's Lane	**Order Number:**		**Superseded Report:**	

Results Legend

X Test

N No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
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US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)					16668253			16668254			
Customer Sample Reference					BH01			BH01			
AGS Reference											
Depth (m)					0.70 - 0.70			2.00 - 2.00			
Container					250g Amber Jar (ALE210)	400g Tub (ALE214)	60g VOC (ALE215)	250g Amber Jar (ALE210)	400g Tub (ALE214)	60g VOC (ALE215)	
Sample Type					S	S	S	S	S	S	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2					X			X	
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1			X						
Loss on Ignition in soils	All	NDPs: 0 Tests: 2			X			X			
Mercury Dissolved	All	NDPs: 0 Tests: 2				X			X		
Metals in solid samples by OES	All	NDPs: 0 Tests: 1			X						
Mineral Oil	All	NDPs: 0 Tests: 2			X			X			
PAH by GCMS	All	NDPs: 0 Tests: 2			X			X			
PCBs by GCMS	All	NDPs: 0 Tests: 2			X			X			
pH	All	NDPs: 0 Tests: 2			X			X			
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1			X						
Phenols by HPLC (W)	All	NDPs: 0 Tests: 2				X			X		
Sample description	All	NDPs: 0 Tests: 2			X			X			
Total Dissolved Solids	All	NDPs: 0 Tests: 2				X			X		
Total Organic Carbon	All	NDPs: 0 Tests: 2			X			X			
Total Sulphate	All	NDPs: 0 Tests: 1			X						

Validated

CERTIFICATE OF ANALYSIS

SDG:	171201-7	**Client Reference:**		**Report Number:**	436484
Location:	53 Platt's Lane	**Order Number:**		**Superseded Report:**	

Results Legend

X **Test**

N **No Determination Possible**

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
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US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)				16668253			16668254	
Customer Sample Reference				BH01			BH01	
AGS Reference								
Depth (m)				0.70 - 0.70			2.00 - 2.00	
Container				250g Amber Jar (ALE210)	400g Tub (ALE214)	60g VOC (ALE215)	250g Amber Jar (ALE210)	400g Tub (ALE214)	60g VOC (ALE215)
Sample Type				S	S	S	S	S	S
TPH CWG GC (S)	All	NDPs: 0 Tests: 1		X					

CERTIFICATE OF ANALYSIS

SDG:	171201-7	**Client Reference:**		**Report Number:**	436484
Location:	53 Platt's Lane	**Order Number:**		**Superseded Report:**	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	**fine**	0.063mm - 0.1mm	**medium**	0.1mm - 2mm	**coarse**	2mm - 10mm	**very coarse**	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
16668253	BH01	0.70 - 0.70	Dark Brown	Sandy Loam	Vegetation	None
16668254	BH01	2.00 - 2.00	Light Brown	Silt Loam	None	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

SDG:	171201-7	**Client Reference:**		**Report Number:**	436484
Location:	53 Platt's Lane	**Order Number:**		**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH01	BH01				
			Depth (m)	0.70 - 0.70	2.00 - 2.00				
			Sample Type	Soil/Solid (S)	Soil/Solid (S)				
			Date Sampled	24/11/2017	24/11/2017				
			Sample Time	.	.				
			Date Received	28/11/2017	28/11/2017				
			SDG Ref	171201-7	171201-7				
			Lab Sample No.(s)	16668253	16668254				
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		17	11				
Loss on ignition	<0.7 %	TM018		3.46 M	6.38 M				
Mineral oil >C10-C40	<1 mg/kg	TM061		12.4	7.36				
EPH (C5-C40)	<35 mg/kg	TM061		76.8					
Mineral Oil Surrogate % recovery**	%	TM061		82.6	81.4				
EPH Range >C10 - C40	<35 mg/kg	TM061		76.8 M					
Phenol	<0.01 mg/kg	TM062 (S)		<0.01 M					
Cresols	<0.01 mg/kg	TM062 (S)		<0.01 M					
Xylenols	<0.015 mg/kg	TM062 (S)		<0.015 M					
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)		<0.01 M					
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)		<0.015 M					
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)		<0.06 M					
Organic Carbon, Total	<0.2 %	TM132		0.811 M	0.241 M				
Soil Organic Matter (SOM)	<0.35 %	TM132		1.4 #					
pH	1 pH Units	TM133		7.46 M	7.44 M				
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6 #					
Cyanide, Total	<1 mg/kg	TM153		<1 M					
Cyanide, Free	<1 mg/kg	TM153		<1 M					
Thiocyanate	<1 mg/kg	TM153		<1 M					
PCB congener 28	<3 µg/kg	TM168		<3 M	<3 M				
PCB congener 52	<3 µg/kg	TM168		<3 M	<3 M				
PCB congener 101	<3 µg/kg	TM168		<3 M	<3 M				
PCB congener 118	<3 µg/kg	TM168		<3 M	<3 M				
PCB congener 138	<3 µg/kg	TM168		<3 M	<3 M				
PCB congener 153	<3 µg/kg	TM168		<3 M	<3 M				
PCB congener 180	<3 µg/kg	TM168		<3 M	<3 M				
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168		<21	<21				
Sulphide, Easily liberated	<15 mg/kg	TM180		<15 @ M					
Arsenic	<0.6 mg/kg	TM181		8.27 M					
Boron	<0.7 mg/kg	TM181		4.52 #					
Cadmium	<0.02 mg/kg	TM181		0.125 M					
Chromium	<0.9 mg/kg	TM181		16.3 M					
Copper	<1.4 mg/kg	TM181		26.2 M					

Validated

CERTIFICATE OF ANALYSIS

SDG:	171201-7	**Client Reference:**		**Report Number:**	436484
Location:	53 Platt's Lane	**Order Number:**		**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.							
			BH01	BH01						
			Depth (m)	0.70 - 0.70	2.00 - 2.00					
			Sample Type	Soil/Solid (S)	Soil/Solid (S)					
			Date Sampled	24/11/2017	24/11/2017					
			Sample Time	-	-					
			Date Received	28/11/2017	28/11/2017					
			SDG Ref	171201-7	171201-7					
			Lab Sample No.(s)	16668253	16668254					
			AGS Reference							
Lead	<0.7 mg/kg	TM181	92.4 M							
Mercury	<0.14 mg/kg	TM181	0.319 M							
Nickel	<0.2 mg/kg	TM181	8.13 M							
Selenium	<1 mg/kg	TM181	<1 #							
Zinc	<1.9 mg/kg	TM181	34.6 M							
ANC @ pH 4	<0.03 mol/kg	TM182	0.047	0.0558						
ANC @ pH 6	<0.03 mol/kg	TM182	<0.03	<0.03						
Total Sulphur (ASB)	<0.0016 %	TM221	0.00327							
Boron, water soluble	<1 mg/kg	TM222	<1 M							
Water Soluble Sulphate as SO4 2:1 Extract	<0.004 g/l	TM243	0.0361 M							

Validated

CERTIFICATE OF ANALYSIS

SDG:	171201-7	**Client Reference:**		**Report Number:**	436484
Location:	53 Platt's Lane	**Order Number:**		**Superseded Report:**	

GRO by GC-FID (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	**LOD/Units**	**Method**	**Customer Sample Ref.** BH01
			Depth (m) 2.00 - 2.00
			Sample Type Soil/Solid (S)
			Date Sampled 24/11/2017
			Sample Time .
			Date Received 28/11/2017
			SDG Ref 171201-7
			Lab Sample No.(s) 16668254
			AGS Reference
Methyl tertiary butyl ether (MTBE)	<5 µg/kg	TM089	<5 #
Benzene	<10 µg/kg	TM089	<10 M
Toluene	<2 µg/kg	TM089	<2 M
Ethylbenzene	<3 µg/kg	TM089	<3 M
m,p-Xylene	<6 µg/kg	TM089	<6 M
o-Xylene	<3 µg/kg	TM089	<3 M
sum of detected mpo xylene by GC	<9 µg/kg	TM089	<9
sum of detected BTEX by GC	<24 µg/kg	TM089	<24

Validated

CERTIFICATE OF ANALYSIS

SDG:	171201-7	**Client Reference:**		**Report Number:**	436484
Location:	53 Platt's Lane	**Order Number:**		**Superseded Report:**	

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH01	BH01				
			Depth (m)	0.70 - 0.70	2.00 - 2.00				
			Sample Type	Soil/Solid (S)	Soil/Solid (S)				
			Date Sampled	24/11/2017	24/11/2017				
			Sample Time	.	.				
			Date Received	28/11/2017	28/11/2017				
			SDG Ref	171201-7	171201-7				
			Lab Sample No.(s)	16668253	16668254				
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		101					
Acenaphthene-d10 % recovery**	%	TM218		97.6					
Phenanthrene-d10 % recovery**	%	TM218		95.2					
Chrysene-d12 % recovery**	%	TM218		91.2					
Perylene-d12 % recovery**	%	TM218		89.9					
Naphthalene	<9 µg/kg	TM218		18.7 M					
Acenaphthylene	<12 µg/kg	TM218		30 M					
Acenaphthene	<8 µg/kg	TM218		<8 M					
Fluorene	<10 µg/kg	TM218		<10 M					
Phenanthrene	<15 µg/kg	TM218		189 M					
Anthracene	<16 µg/kg	TM218		42.3 M					
Fluoranthene	<17 µg/kg	TM218		604 M					
Pyrene	<15 µg/kg	TM218		539 M					
Benz(a)anthracene	<14 µg/kg	TM218		310 M					
Chrysene	<10 µg/kg	TM218		336 M					
Benzo(b)fluoranthene	<15 µg/kg	TM218		405 M					
Benzo(k)fluoranthene	<14 µg/kg	TM218		189 M					
Benzo(a)pyrene	<15 µg/kg	TM218		329 M					
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218		186 M					
Dibenzo(a,h)anthracene	<23 µg/kg	TM218		59.2 M					
Benzo(g,h,i)perylene	<24 µg/kg	TM218		235 M					
PAH, Total Detected USEPA 16	<118 µg/kg	TM218		3470					
PAH total 17 (inclusive of Coronene)	<10 mg/kg	TM218		<10	<10				

Validated

CERTIFICATE OF ANALYSIS

SDG:	171201-7	**Client Reference:**		**Report Number:**	436484
Location:	53 Platt's Lane	**Order Number:**		**Superseded Report:**	

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	
			Depth (m)	0.70 - 0.70
			Sample Type	Soil/Solid (S)
			Date Sampled	24/11/2017
			Sample Time	.
			Date Received	28/11/2017
			SDG Ref	171201-7
			Lab Sample No.(s)	16668253
			AGS Reference	
GRO Surrogate % recovery**	%	TM089		108
GRO TOT (Moisture Corrected)	<44 µg/kg	TM089		<44 M
Methyl tertiary butyl ether (MTBE)	<5 µg/kg	TM089		<5 #
Benzene	<10 µg/kg	TM089		<10 M
Toluene	<2 µg/kg	TM089		<2 M
Ethylbenzene	<3 µg/kg	TM089		<3 M
m,p-Xylene	<6 µg/kg	TM089		<6 M
o-Xylene	<3 µg/kg	TM089		<3 M
sum of detected mpo xylene by GC	<9 µg/kg	TM089		<9
sum of detected BTEX by GC	<24 µg/kg	TM089		<24
Aliphatics >C5-C6	<10 µg/kg	TM089		<10
Aliphatics >C6-C8	<10 µg/kg	TM089		<10
Aliphatics >C8-C10	<10 µg/kg	TM089		<10
Aliphatics >C10-C12	<10 µg/kg	TM089		<10
Aliphatics >C12-C16	<100 µg/kg	TM173		1690
Aliphatics >C16-C21	<100 µg/kg	TM173		1080
Aliphatics >C21-C35	<100 µg/kg	TM173		6890
Aliphatics >C35-C44	<100 µg/kg	TM173		1000
Total Aliphatics >C12-C44	<100 µg/kg	TM173		10700
Aromatics >EC5-EC7	<10 µg/kg	TM089		<10
Aromatics >EC7-EC8	<10 µg/kg	TM089		<10
Aromatics >EC8-EC10	<10 µg/kg	TM089		<10
Aromatics >EC10-EC12	<10 µg/kg	TM089		<10
Aromatics >EC12-EC16	<100 µg/kg	TM173		<100
Aromatics >EC16-EC21	<100 µg/kg	TM173		<100
Aromatics >EC21-EC35	<100 µg/kg	TM173		965
Aromatics >EC35-EC44	<100 µg/kg	TM173		<100
Aromatics >EC40-EC44	<100 µg/kg	TM173		<100
Total Aromatics >EC12-EC44	<100 µg/kg	TM173		965
Total Aliphatics & Aromatics >C5-C44	<100 µg/kg	TM173		11600
GRO >C5-C10	<10 µg/kg	TM089		<10

Validated

CERTIFICATE OF ANALYSIS

SDG:	171201-7	**Client Reference:**		**Report Number:**	436484
Location:	53 Platt's Lane	**Order Number:**		**Superseded Report:**	

Asbestos Identification - Solid Samples

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	BH01 0.70 - 0.70 SOLID 24/11/2017 00:00:00 01/12/2017 13:53:49 171201-7 16668253 TM048	07/12/2017	Eva Guerra	n	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

Validated

CERTIFICATE OF ANALYSIS

SDG:	171201-7	**Client Reference:**		**Report Number:**	436484
Location:	53 Platt's Lane	**Order Number:**		**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	53 Platt's Lane
Mass Sample taken (kg)	0.109	**Natural Moisture Content (%)**	20.5
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	83
Particle Size <4mm	>95%		

Case	
SDG	171201-7
Lab Sample Number(s)	16668253
Sampled Date	24-Nov-2017
Customer Sample Ref.	BH01
Depth (m)	0.70 - 0.70

Solid Waste Analysis	**Result**	**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	0.811	3	5	6
Loss on Ignition (%)	3.46	-	-	10
Sum of BTEX (mg/kg)	<0.024	6	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg)	12.4	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	7.46	-	>6	-
ANC to pH 6 (mol/kg)	<0.03	-	-	-
ANC to pH 4 (mol/kg)	0.047	-	-	-

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Arsenic	0.00318	<0.0005	0.0318	<0.005	0.5	2	25
Barium	0.0214	<0.0002	0.214	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	0.00327	<0.001	0.0327	<0.01	0.5	10	70
Copper	0.0166	<0.0003	0.166	<0.003	2	50	100
Mercury Dissolved (CVAF)	0.0000885	<0.00001	0.000885	<0.0001	0.01	0.2	2
Molybdenum	0.00173	<0.0005	0.0173	<0.005	0.5	10	30
Nickel	0.00288	<0.0004	0.0288	<0.004	0.4	10	40
Lead	0.0444	<0.0002	0.444	<0.002	0.5	10	50
Antimony	0.00049	<0.0001	0.0049	<0.001	0.06	0.7	5
Selenium	<0.0005	<0.0005	<0.005	<0.005	0.1	0.5	7
Zinc	0.00999	<0.001	0.0999	<0.01	4	50	200
Chloride	8.3	<2	83	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	48.6	<5	486	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	6.71	<3	67.1	<30	500	800	1000

Leach Test Information

Date Prepared	06-Dec-2017
pH (pH Units)	7.75
Conductivity (µS/cm)	58.30
Temperature (°C)	18.60
Volume Leachant (Litres)	0.882

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
12/12/2017 15:28:58

15:28:46 12/12/2017

Validated

CERTIFICATE OF ANALYSIS

SDG:	171201-7	**Client Reference:**		**Report Number:**	436484
Location:	53 Platt's Lane	**Order Number:**		**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	53 Platt's Lane
Mass Sample taken (kg)	0.101	**Natural Moisture Content (%)**	12.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	89
Particle Size <4mm	>95%		

Case	
SDG	171201-7
Lab Sample Number(s)	16668254
Sampled Date	24-Nov-2017
Customer Sample Ref.	BH01
Depth (m)	2.00 - 2.00

Solid Waste Analysis	**Result**	**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	0.241	3	5	6
Loss on Ignition (%)	6.38	-	-	10
Sum of BTEX (mg/kg)	<0.024	6	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg)	7.36	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	7.44	-	>6	-
ANC to pH 6 (mol/kg)	<0.03	-	-	-
ANC to pH 4 (mol/kg)	0.0558	-	-	-

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Arsenic	0.000779	<0.0005	0.00779	<0.005	0.5	2	25
Barium	0.00622	<0.0002	0.0622	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	0.00277	<0.001	0.0277	<0.01	0.5	10	70
Copper	0.00344	<0.0003	0.0344	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.00115	<0.0005	0.0115	<0.005	0.5	10	30
Nickel	0.00147	<0.0004	0.0147	<0.004	0.4	10	40
Lead	0.000839	<0.0002	0.00839	<0.002	0.5	10	50
Antimony	<0.0001	<0.0001	<0.001	<0.001	0.06	0.7	5
Selenium	<0.0005	<0.0005	<0.005	<0.005	0.1	0.5	7
Zinc	0.00808	<0.001	0.0808	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	4.1	<2	41	<20	1000	20000	50000
Total Dissolved Solids	26.8	<5	268	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	3.69	<3	36.9	<30	500	800	1000

Leach Test Information

Date Prepared	06-Dec-2017
pH (pH Units)	7.72
Conductivity (µS/cm)	27.40
Temperature (°C)	17.70
Volume Leachant (Litres)	0.889

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
12/12/2017 15:28:58

15:28:46 12/12/2017

Table of Results - Appendix

Method No	Reference	Description
PM001		Preparation of Samples for Metals Analysis
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID
TM180	Sulphide in waters and waste waters 1991 ISBN 01 175 7186 SCA rec. 2007 (unpublished)'	The Determination Of Easily Liberated Sulphide In Soil Samples by Ion Selective Electrode Technique
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM182	CEN/TC 292 - WI 292046-chacterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Determination of PAH by GCMS Microwave extraction	The determination of PAH in soil samples by microwave extraction and GC-MS
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS

SDG:	171201-7	**Client Reference:**		**Report Number:**	436484
Location:	53 Platt's Lane	**Order Number:**		**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	16668253	16668254
Customer Sample Ref.	BH01	BH01
AGS Ref.		
Depth	0.70 - 0.70	2.00 - 2.00
Type	Soil/Solid (S)	Soil/Solid (S)
ANC at pH4 and ANC at pH 6	05-Dec-2017	04-Dec-2017
Anions by Kone (soil)	06-Dec-2017	
Anions by Kone (w)	08-Dec-2017	08-Dec-2017
Asbestos ID in Solid Samples	07-Dec-2017	
Boron Water Soluble	07-Dec-2017	
CEN 10:1 Leachate (1 Stage)	06-Dec-2017	06-Dec-2017
CEN Readings	08-Dec-2017	08-Dec-2017
Cyanide Comp/Free/Total/Thiocyanate	06-Dec-2017	
Dissolved Metals by ICP-MS	12-Dec-2017	12-Dec-2017
Dissolved Organic/Inorganic Carbon	11-Dec-2017	11-Dec-2017
Easily Liberated Sulphide	05-Dec-2017	
EPH	07-Dec-2017	
EPH by FID	07-Dec-2017	
EPH CWG (Aliphatic) GC (S)	06-Dec-2017	
EPH CWG (Aromatic) GC (S)	06-Dec-2017	
Fluoride	09-Dec-2017	09-Dec-2017
GRO by GC-FID (S)	07-Dec-2017	07-Dec-2017
Hexavalent Chromium (s)	05-Dec-2017	
Loss on Ignition in soils	07-Dec-2017	05-Dec-2017
Mercury Dissolved	11-Dec-2017	11-Dec-2017
Metals in solid samples by OES	08-Dec-2017	
Mineral Oil	07-Dec-2017	05-Dec-2017
PAH by GCMS	05-Dec-2017	05-Dec-2017
PCBs by GCMS	07-Dec-2017	05-Dec-2017
pH	05-Dec-2017	05-Dec-2017
Phenols by HPLC (S)	05-Dec-2017	
Phenols by HPLC (W)	11-Dec-2017	11-Dec-2017
Sample description	01-Dec-2017	01-Dec-2017
Total Dissolved Solids	11-Dec-2017	11-Dec-2017
Total Organic Carbon	05-Dec-2017	04-Dec-2017
Total Sulphate	07-Dec-2017	
TPH CWG GC (S)	07-Dec-2017	

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
5	**Samples exceeded holding time before presevation was performed**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

53 Platt's Lane

Structural Methodology Report

Brief

This document is the structural methodology report carried out for the purposes of the Planning Application for the proposals at no. 53 Platt's Lane. It should be noted that this report outlines and suggests the assumed construction at this stage. It should also be noted that, as is standard for works of this type, the main contractor will be fully responsible for the design and erection of all temporary works.
The purpose of the report, with the Basement Impact Assessment prepared by LBH Wembley, is to demonstrate that a subterranean development can be constructed on the particular site having regard to the sites existing structural conditions and geology.
The Basement Impact Assessment prepared by LBH Wembley references to the stages set out in the CPG4 Basement & Lightwells planning document.

Richard Tant Associates

Richard Tant Associates are consulting Civil and Structural Engineers comprising a number of chartered engineers. We have experience in post basement construction and have successfully carried out a number of basements in the Borough Camden from the Basement Impact Assessment stage through to construction on site.

Description of Proposed Basement and Internal Works

53 Platt's Lane is a terraced brick, Victorian, two storey house (excluding the existing basement) comprising timber floors and load bearing masonry walls. There is a basement under the property approximately 2.5m deep. There are no signs of significant differential movement and the property appears to be in sound structural condition.

The proposal is to extend the basement slightly to create a lightwell at the front of the property and to form new openings for windows / doors into the lightwell.

Please refer to the drawings prepared by the Architect, ROH Architects: 16019 P-100 P2 and P-101 P2.

New Lightwell

The proposal is to form a small lightwell to the same depth as the existing basement at the front of the property.

Please refer to the Architects drawings for the proposed layout and existing survey plans.

A geotechnical and hydrological report has been carried out by LBH Wembley; the bore hole shows 1m of made ground underlain by 2.5m Downwash Deposits underlain by the Claygare Member. Water seepages were not encountered however subsequent monitoring indicated perched ground water seepage at a 3.5m depth. Trial holes have also been undertaken and recorded. Based on this geotechnical information, the new lightwell wall construction is to comprise a reinforced concrete strip footing then underpinned to form a reinforced retaining wall carried out in a hit and miss sequence. This will be described in more detail throughout this report. Please refer to our drawings 4591-SM01, SM02 and SM03.

Structural Stability of the Existing buildings

The proposed lightwell is adjacent to a small projection of the party wall. Transitional mass concrete underpinning is proposed to safeguard this section of wall by transferring loads down below the lightwell level. The light well wall will be constructed using reinforced concrete and constructed in a hit and miss sequence and will be designed to retain the ground pressures and possible accidental water pressures and distribute the vertical load down. The design height of the retaining wall to maintain the existing floor to ceiling of the existing basement is designed to be 3m. Refer to calculation sheets for justification of the retaining wall: 4591-P1 et seq. Refer to the damage assessment section of the LBH Wembley report confirming these works are not expected to create any significant differential settlement or have a detrimental effect on the structural stability of the existing building or neighbouring buildings with a Burland damage category of 0 'negligible'.

Supporting the Proposed Loads

The vertical loads from the proposed lightwell will be supported via reinforced concrete underpinning into a reinforced concrete slab. Refer to the calculation sheets for justification of the retaining walls: 4591-P1 et seq.

Structural Integrity of Surrounding Structures and Utilities

A clay pipe has been identified in the proposed excavation area. It is understood this pipe will be permanently diverted. We do not expect there to be any public utilities, tunnels or infrastructure within the area of influence of the proposed lightwell works and therefore we do not expect any impact regarding the structural integrity to these items.

Slope Instability

The proposal is to construct the walls in stages that will be temporarily propped until the final base is constructed and cured. No battering back is proposed. We refer to the LBH Wembley Basement Impact Assessment where the risk of slope instability is addressed and discharged.

Impact on Drainage and Surface Water

With regards to surface water the lightwell is below existing hard standing. Refer to the Surface Flow Assessment in the LBH Wembley Basement Impact Assessment.

Geological & Hydrological Concerns

The application is informed and supplemented by the hydrological section and geological section of the LBH Wembley Basement Impact Assessment.

Impact on Trees

There are no significant trees in the area of influence of the proposed lightwell, however there is a hedge that will be removed.

Temporary Works

Please refer to the proposed drawings: 4591-SM01, 02 and 03 enclosed, for details of the temporary works. When the contractor is appointed he will be fully responsible for the temporary works including the design and erection.

Richard Tant BEng(Hons) CEng MIStructE for Richard Tant Associates Ltd.

Richard Tant Associates
Consulting Civil & Structural Engineers
54 Lisson Street London NW1 5DF
T: 020 7724 1002 F: 020 7224 8883
E: info@richardtantassociates.com

Job No.	Sheet No.	Rev.
4591	P1	

Member/Location

Job Title: 53 PLATTS LANE

Drg. Ref. RETAINING WALL CALCS

Made by PT Date DEC 2017 Chd. JM

RETAINING / UNDERPIN DESIGN

BEARING PRESSURE CHK

APPROX 3m OF 350 R.C. WALL & SAY 1m OF 400 SLAB + RAILINGS

∴ DEAD LOAD kN/m

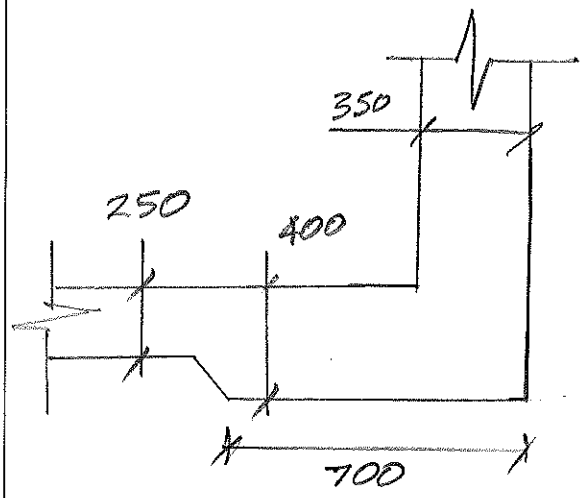
29.5 × 0.35 × 3 = 26
1 × 0.4 × 24.5 = 9.8
1.5 = 1.5

38 kN/m

LIVE LOAD kN/m

1 × 2.5 = 2.5

2.5 kN/m



$\sigma = 41 / 0.7 = 60 kN/m^2$

FROM LBH REPORT SAFE BEARING CAP. = $120 kN/m^2$

∴ BEARING STRESS O.K. ✓

Richard Tant Associates
Consulting Civil & Structural Engineers
54 Lisson Street London NW1 5DF
T: 020 7724 1002 F: 020 7224 8883
E: info@richardtantassociates.com

Job No.	Sheet No.	Rev.
4591	P2	

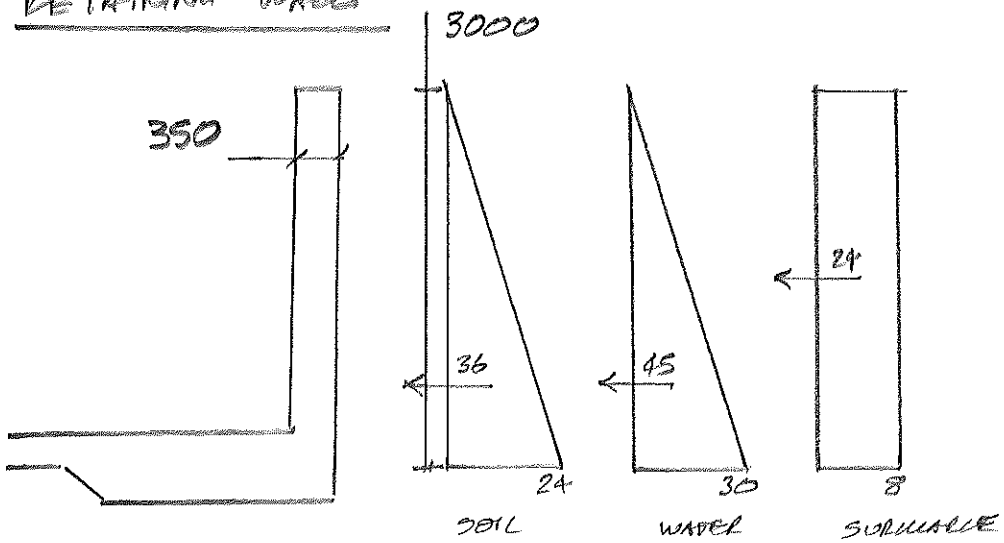
Member/Location

Job Title: 53 PLATTS LANE

Drg. Ref. RETAINING WALL CALCS

Made by [illegible] Date DEC 2017 Chd. [illegible]

RETAINING WALL



$K_o = 0.8$ ACTIVE/REST

SOIL = $3 \times 10 \times 0.8 = 24\ kN/m^2$
WATER = $3 \times 10 = 30\ kN/m^2$
SURCHARGE = $10 \times 0.8 = 8\ kN/m^2$

$\therefore$ MAX CANT B.M. = $(36+45)1 + (24 \times 1.5) = 117\ kNm/m$ CHAR

$\times 1.5 = 176\ kNm/m$ ULT

$K = 176 \times 10^6 / 1000 . 286^2 . 40 = 0.05$

$As = 176 \times 10^6 / 0.95 . 460 . 0.94 . 286 = 1499\ mm^2/m$

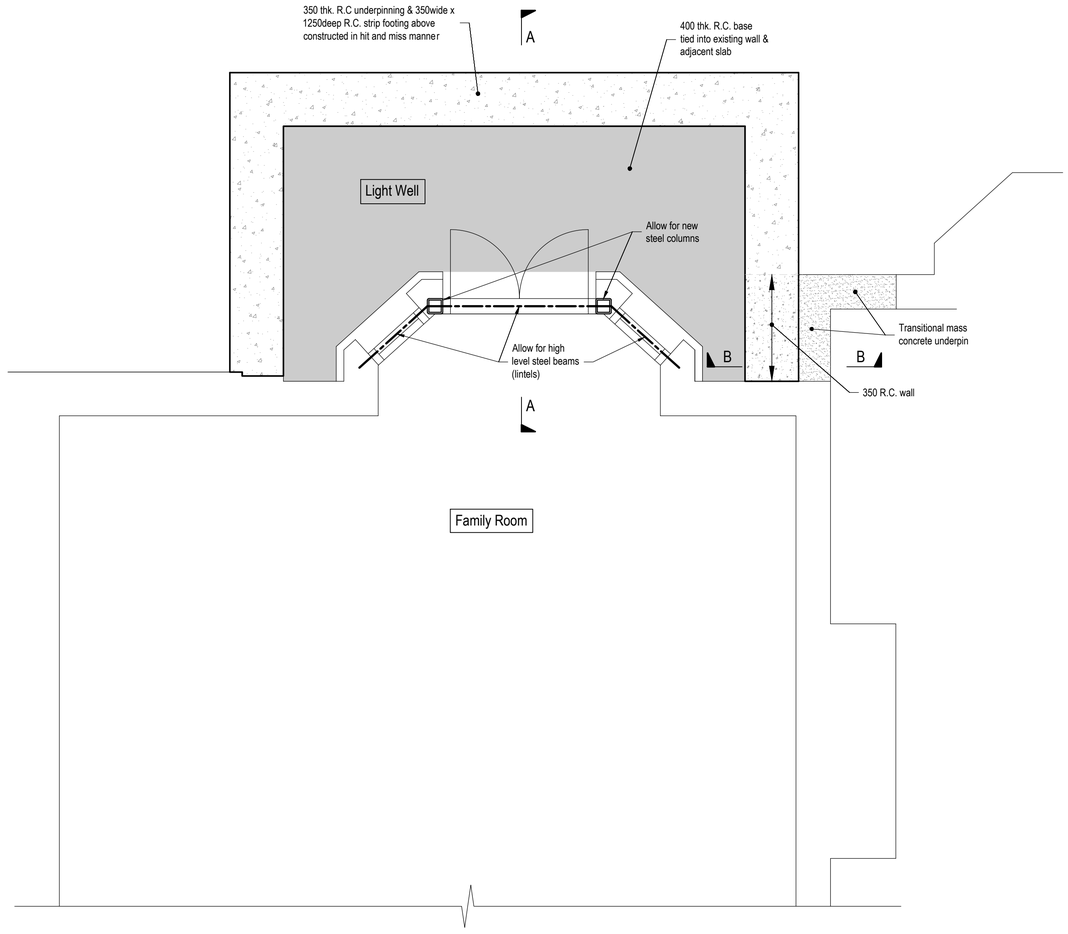
SPAN/d = 10.5 PROVIDE B25-150 BOTH FACES 3270 mm^2/m
$fs = 141\ N/mm^2$

$\therefore$ M.F. = 1.25 & 1.37

$\therefore 7 \times 1.25 \times 1.37 = 12$

$\therefore$ O.K. ✓

PROVIDE B25-150 BOTH FACES ✓



Proposed Partly Lower Ground Floor

Scale 1:20

Notes.

REV.	AMENDMENTS	BY	DATE	CHECKED
-	-	-	-	-

PROJECT
53 Platt's Lane

TITLE
Indicative Front Ligth Well
Lower Ground Floor

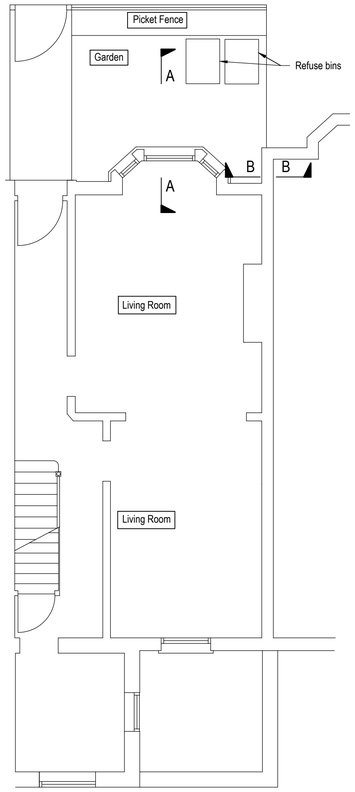
ARCHITECTS
ROH Architects

DRAWING No.
4591-SM01

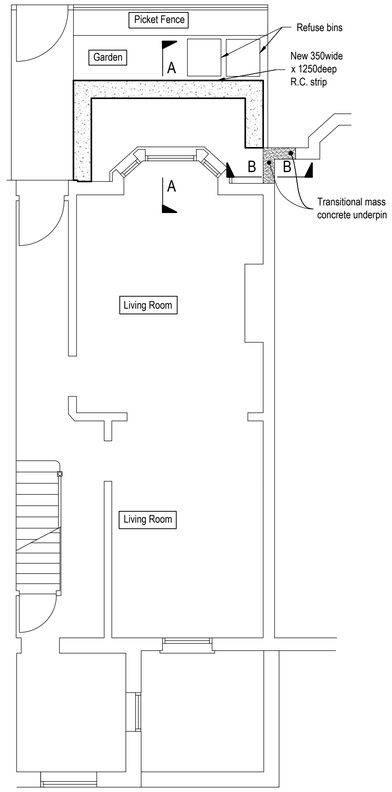
DATE	04.12.2017
SCALE	As shown @ A1
DRAWN	AR
CHECKED	RT
REVIEWED	-

Suggested structural proposal to be confirmed after full structural inspection. Not suitable for tender or construction.

TANT
Richard Tant Associates
Consulting Civil & Structural Engineers
54 LISSON STREET LONDON NW1 5DF
TEL: 020 7724 1002 FAX: 020 7224 8883
info@richardtantassociates.com



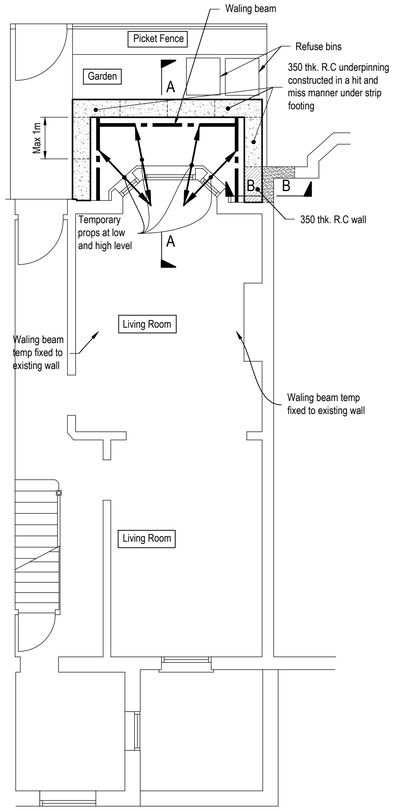
Existing Ground Floor Plan



Ground Floor Plan

Stage 1:

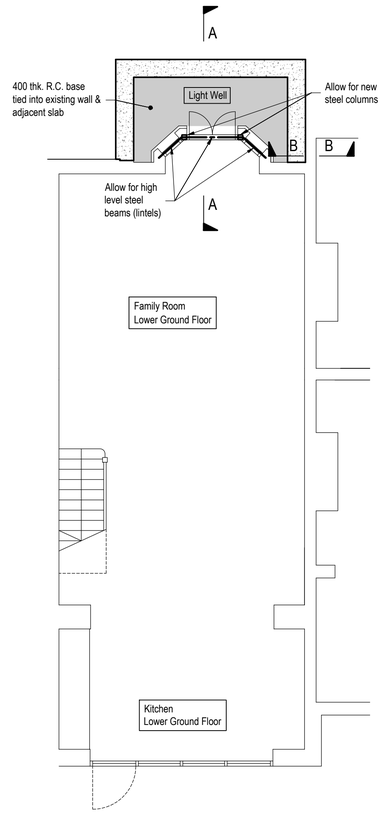
- Disconnect, make safe and remove any underground services.
- Cast new 350wide x 1250deep R.C. strip footing at Ground Floor Level.
- Install transitional mass concrete underpin under existing footing as shown.



Ground Floor Plan (showing underpinning plan)

Stage 2 (underpin):

- Cast R.C. wall leaving pockets for props - next to mass concrete underpin.
- Underpin strip footing with R.C. underpin (hit & miss) and install temporary props.



Lower Ground Floor Plan

Stage 3:

- Excavate & cast Light Well R.C. base.
- After concrete has cured and achieved design strength carefully remove temporary works.
- Install temporary works and create openings to suit requirements through existing wall. Install steel beams (lintels) to support existing structure.
- Install finishes: insulation, waterproofing etc. - refer to Architects details.

Suggested Method of Works

This suggested method is a suggestion only and the contractor may submit alternative proposals. The method of works and all temporary works including design and erection are to be the full responsibility of the main contractor.

Suggested structural proposal to be confirmed after full structural inspection. Not suitable for tender or construction.

Notes.

REV.	AMENDMENTS	BY	DATE	CHECKED
-	-	-	-	-

PROJECT
53 Platt's Lane

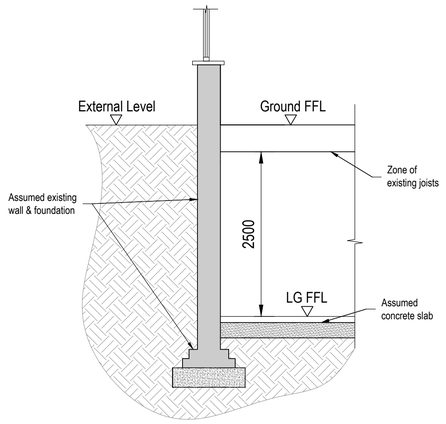
TITLE
Suggested Method of Works
Sheet 1/2

ARCHITECTS
ROH Architects

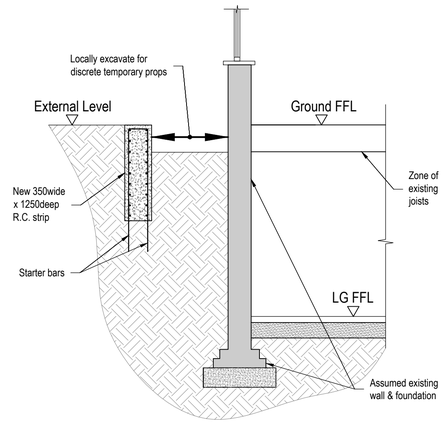
DRAWING No.
4591-SM02

DATE	05.12.2017
SCALE	As shown @ A1
DRAWN	AR
CHECKED	RT
REVIEWED	-

TANT
Richard Tant Associates
Consulting Civil & Structural Engineers
54 LOSON STREET LONDON NW1 5DF
TEL: 020 7724 1002 FAX: 020 7224 8883
info@richardtantassociates.com

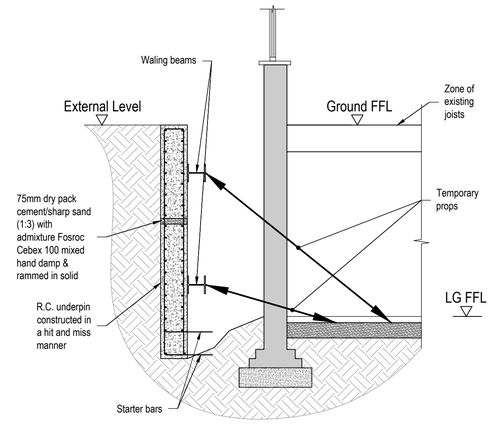


Section A-A (Existing)



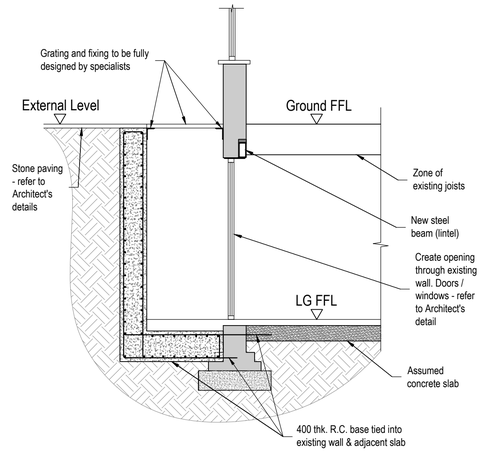
Section A-A

Stage 1*



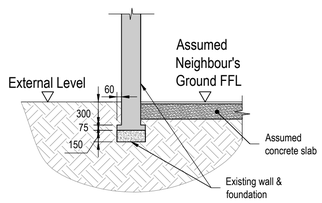
Section A-A

Stage 2 (underpin)*

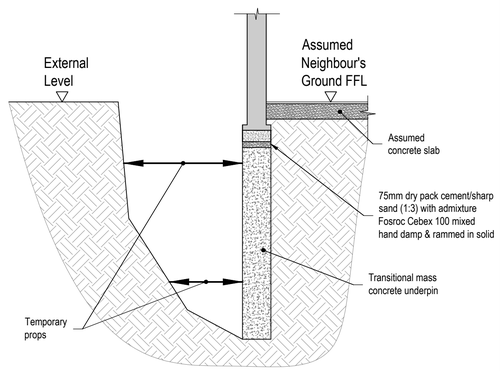


Section A-A

Stage 3*

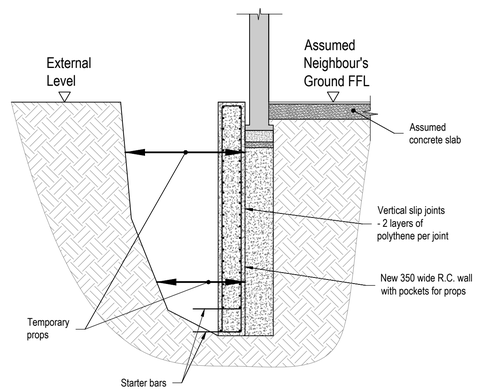


Section B-B (Existing)



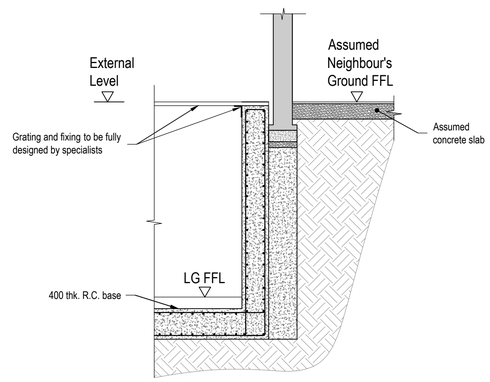
Section B-B

Stage 1*



Section B-B

Stage 2 (underpin)*



Section B-B

Stage 3*

*: refer to notes in plan sequence, drg. 4591-SM02.

Suggested Method of Works

This suggested method is a suggestion only and the contractor may submit alternative proposals. The method of works and all temporary works including design and erection are to be the full responsibility of the main contractor.

Suggested structural proposal to be confirmed after full structural inspection. Not suitable for tender or construction.

Notes.

REV.	AMENDMENTS	BY	DATE	CHECKED
-	-	-	-	-

PROJECT
53 Platt's Lane

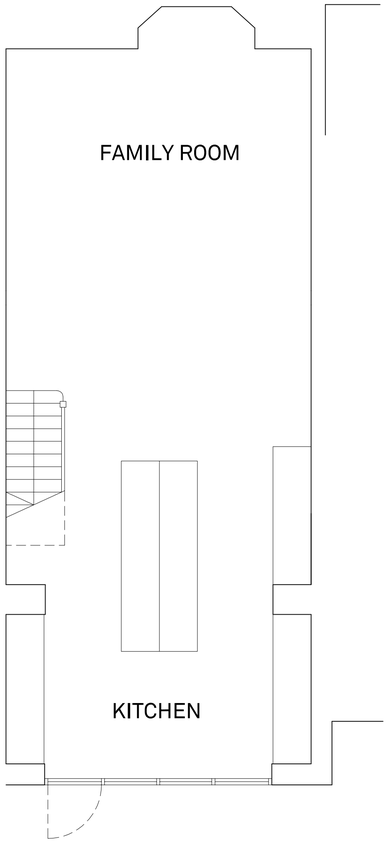
TITLE
Suggested Method of Works
Sheet 2/2

ARCHITECTS
ROH Architects

DRAWING No.
4591-SM03

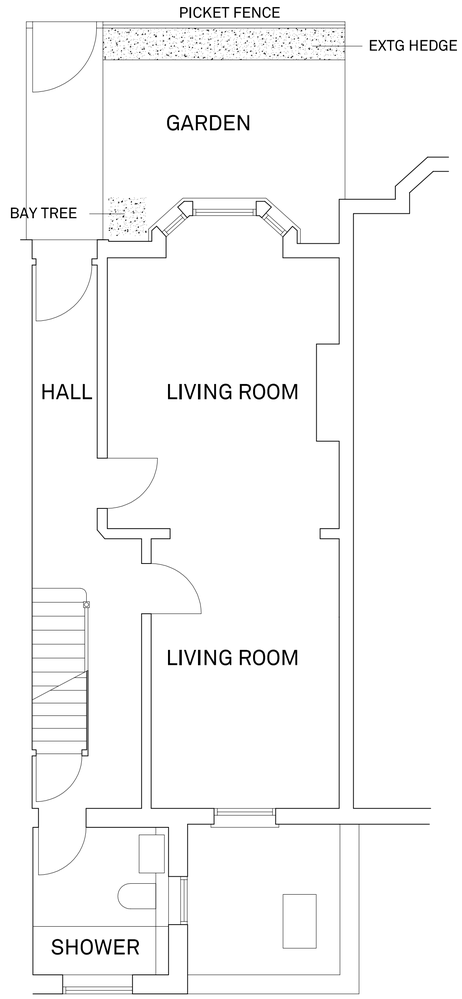
DATE	05.12.2017
SCALE	As shown @ A1
DRAWN	AR
CHECKED	RT
REVIEWED	-

Richard Tant Associates
Consulting Civil & Structural Engineers
54 LOSON STREET LONDON NW1 5DF
TEL: 020 7724 1002 FAX: 020 7224 8883
info@richardtantassociates.com



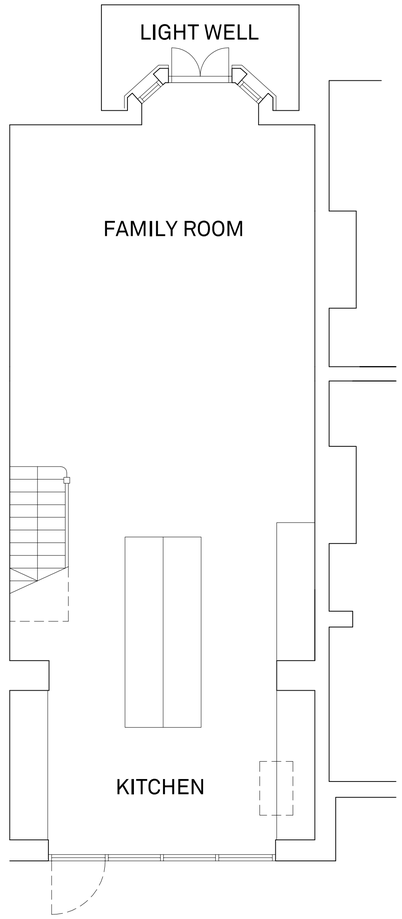
LOWER GROUND FLOOR PLAN

AS EXISTS



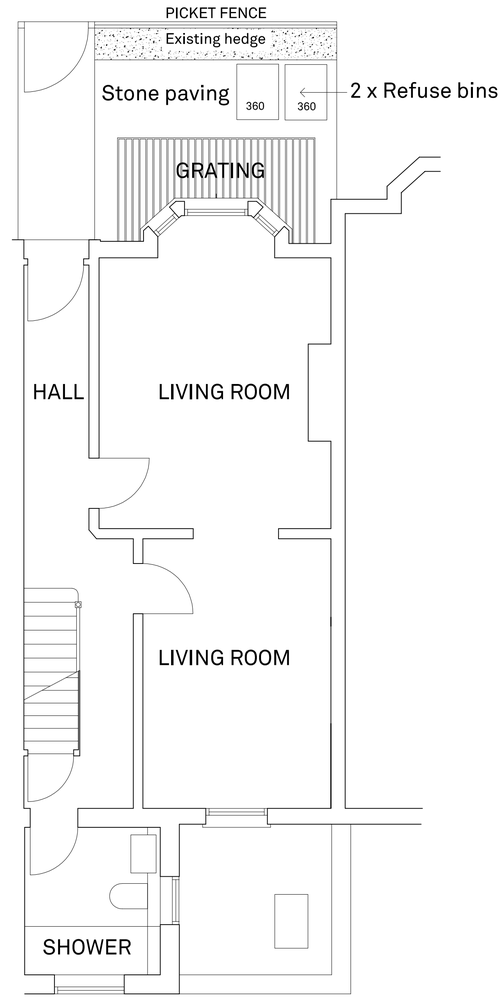
GROUND FLOOR PLAN

AS EXISTS



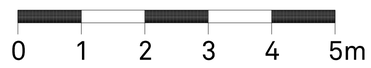
LOWER GROUND FLOOR PLAN

AS PROPOSED



GROUND FLOOR PLAN

AS PROPOSED



FOR CONSTRUCTION

Notes:

1. This drawing to be read in conjunction with all other relevant architectural structural and consultants drawings and specifications.
2. Any discrepancies between this and any other relevant drawing must be brought to the attention of the architect immediately.
3. Note to Builder: Only written dimensions are to be used. Do not scale from any part of this drawing.
4. This drawing remains the property of R O H Architects Limited and is protected by copyright.

Rev	Date	Description
-	-	-

Client
Hasan Hameed
2 South Hill Park
London NW3

Project
53 Platts Lane
LONDON NW3 7NL

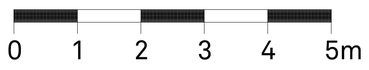
Title
Plans as Existing and Proposed

Job No	Dwg No	Rev	Stage
16019	P-100	P3	-
Date	Scale	Drwn	Chkd
June 17	1:50 @ A1	ROH	-

R O H ARCHITECTS
25 Lonsdale Road
London NW6 6RA
Tel +44 (0)20 7372 7576
Fax +44 (0)20 7372 0078
info@roh-architects.com
www.roh-architects.com

FRONT ELEVATION
AS EXISTING

FRONT ELEVATION
AS PROPOSED



FOR CONSTRUCTION

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Do not scale from any part of this drawing.

Rev	Date	Description
-	-	-

Client
Hasan Hameed
2 South Hill Park
London NW3

Project
53 Platts Lane
LONDON NW3 7NL

Title
Front Elevation as Existing and as Proposed

Job No	Dwg No	Rev	Stage
16019	P-101	P3	-
Date	Scale	Drwn	Chkd
June 17	1:50 @ A1	ROH	-

R O H ARCHITECTS
25 Lonsdale Road
London NW6 6RA
Tel +44 [0]20 7372 7576
Fax +44 [0]20 7372 0078
info@roh-architects.com
www.roh-architects.com