Chelmer
Consultancy Services
'Groundbreaking Services'

Geo-environmental Interpretative Report

Site	13-15 John's Mews London WC1N 2PA
Client	Wandsworth Sand and Stone Ltd
Date	September 2014 Revised May 2016
Our Ref	GENV/4507 Rev 2

Chelmer Site Investigation Laboratories Ltd
Unit 15 East Hanningfield Industrial Estate, Old Church Road, East Hanningfield, Essex CM3 8AB
Essex: 01245 400930 | London: 0203 6409136 | info@siteinvestigations.co.uk | www.siteinvestigations.com

CONTENTS

APPENDICES

1.0 EXECUTIVE SUMMARY

Site	13-15 John's Mews London WC1N 2PA
Ground Conditions	The current work encountered Made Ground to a maximum depth of 5.90m below existing ground level (bgl). In BH5 the Made Ground was underlain by a stratum of Reworked Ground to 3.50m bgl. The Reworked Ground was underlain by Alluvium to 4.00m bgl and then River Terrace Deposits, assumed to be of the Lynch Hill Gravel Member, to a maximum depth of 5.70m bgl. The River Terrace Deposits were not encountered in BH1B. The Made Ground in BH1B and River Terrace Deposits in BH5 were underlain by Weathered London Clay to a maximum depth of 7.50m bgl, which in turn was underlain by the 'fresh' grey London Clay stratum which was not penetrated at the maximum borehole termination depth of 12.00m bgl.
Swelling/ Shrinking	The Weathered London Clay/London Clay strata encountered beneath the site has been confirmed to possess a 'high' volume change potential in accordance with the National House Building Councils (NHBC) classification system given in Part 4 of their Standards. The River Terrace Deposits would be classed as 'non shrinkable' and the Alluvium would likely be classed as having 'medium' volume change potential, although this has not been confirmed. Therefore, it is possible that precautions against foundation sides and beneath any ground beams will be required in order to accommodate potential seasonal swelling and shrinkage.
Root Activity	No root activity was noted during the current investigation.
Groundwater	A groundwater 'seepage' was observed within borehole BH1B at a depth of 5.90m bgl. Standing groundwater was observed within borehole BH1B at a depth of 9.50m bgl. A groundwater strike was observed at a depth of 4.50m bgl in BH5 which rose to 4.20m bgl; however the borehole was dry on completion. On the return gas/groundwater monitoring visits to the installations fitted within borehole BH1B and BH5 groundwater levels were recorded between 2.92m bgl and 3.80m bgl.
Landborne Gas	Based on the results the site would be classified as 'Characteristic Situation 1' and therefore no land borne gas remedial measures would be required at this site. this should be agreed with the local environmental health officer and/or building control officer.
Soil Chemical Analysis	Three lead concentrations of 736mg/kg, 503mg/kg and 739mg/kg from BH1A, BH1B and BH1B respectively exceeded the ATRISK Contaminated Land Screening Values (SSVs) of 444mg/kg. However, due to the lack of proposed soft landscaping areas or garden areas, and the removal of near surface soils during the proposed basement development, the risks to future residents, neighbouring properties and the wider environment are considered to be '**low**'. We would however recommend that standard Health and Safety precautions be taken with regard to ground workers at this site. These should include PPE equipment such as gloves, overalls etc. to prevent dermal contact with the soils. Washing facilities should be made available on-site to reduce extended contact with site soils. During the construction phase, dust suppression measures may be required to minimise potential inhalation of dust by neighbours or ground workers.
WAC Tests	The results of the WAC test indicate that the sample would probably be classified as suitable for disposal at a site which accepts "Hazardous" material. It is recommended that further testing is undertaken to assist in classifying for waste disposal purposes.
Foundations	At the proposed founding depths the basement's underpins as currently proposed will be founded partly in the Made Ground and partly in the dense sandy gravels of the River Terrace Deposits, and possibly partly in the alluvial clays. Made Ground is not normally considered to be a suitable founding stratum owing to its inherent variability and therefore it was recommended that the whole basement should be supported on a piled slab, with the piles bearing into the London Clay, which has now been implemented. Appropriate design parameters have been suggested, together with an indication of design capacity.
Buried Concrete	The results of the chemical analyses indicate that the samples tested would fall into Class DS-2 of the Building Research Establishments (BRE) classification system Special Digest Part 1:2005 "Concrete in aggressive ground".
Collapse of Excavations	From the evidence of the borehole, the excavations may require support against collapse of sides and a contingency for this should be allowed for at this stage.
Additional Work	No further works are considered necessary with regards to contaminated land.

2.0 INTRODUCTION & SCOPE OF WORKS

2.1 This report has been prepared by Chelmer Site Investigation Laboratories Limited (CSI) to the instructions of the Architects for the project, FT Architects Ltd.

2.2 The Client for the project was Wandsworth Sand and Stone Limited.

2.3 This report is a revision of the original Geo-environmental Interpretative Report ref. GENV/4507, dated September 2014, following further works at the site comprising an additional borehole and trial pits as well as further groundwater and ground gas monitoring.

2.4 The site under consideration consisted of a two storey detached building, with a former engineering workshop and garage within the ground floor and offices within the first floor. The footprint of the building covered the whole site, with a concrete hard standing floor present across the ground floor. At the time of the second phase of works some of the internal layout had been demolished and most of the concrete floor had been removed leaving a surface of Made Ground. *Existing Site Plans* have been appended to this report.

2.5 The approximate six-figure grid reference for the site is 530790, 182060.

2.6 It is understood that the proposed development will include the 'Change of use from garage/workshop/offices (Class B1) to residential use (Class C3) to provide 2 dwelling houses, including excavation works to create a new basement floor level, creation of 2 new courtyards, mansard roof extensions and elevational alterations to front and rear'. From the findings of the original site investigation the proposed basement will be supported on piled foundations. *Proposed Development Plans* have been appended to this report.

2.7 The Phase I *Non-intrusive* investigation undertaken by CSI ref. DTS/4507 comprised a 'Desk Study' and included a Walkover Survey, an Environmental Disclosure Report and a Historical Map Search.

2.8 The Phase I Desk Top Study identified that the site was occupied by the same two buildings since at least 1877-1878, however the use of the buildings has likely changed over the years. The surrounding area has largely remained the same since 1877-1878, apart from a school constructed adjacent to the site during 1963-1974.

2.9 This Phase II *Intrusive* site investigation was then commissioned to provide initial information on the sub-soil conditions at the location of the proposed new development together with laboratory testing and reporting, in order to enable future foundations to be designed.

2.10 In addition, a groundwater/gas monitoring survey was also carried out within the standpipes installed in original borehole BH1B and the additional borehole BH5, together with a ***preliminary contamination assessment***.

2.11 This revised report presents the work carried out and discusses the findings of both the original investigation and the additional works.

3.0 FIELDWORK & FINDINGS

3.1 All fieldwork was generally executed in accordance with the recommendations given in British Standard BS 5930:1999+A2:2010, "Code of Practice for Site Investigations". Contamination sampling was undertaken in accordance with BS 10175 : 2011, "Code of Practice for the Investigation of Potentially Contaminated Sites".

3.2 The borehole and trial pit locations are indicated on the appended *Sketch Fieldwork Location Plan*.

3.3 Fieldwork was undertaken in two phases, the first between 22nd May, 3rd July and 18th July 2014, the second between 4th and 18th August 2015. The original scope of works involved the drilling of four c.f.a. boreholes (BH1-BH4) and the excavation of four trial pits (TP1-TP4). Due to hitting refusal two trial pits (TP2 & TP3) were not excavated and three additional c.f.a. boreholes were undertaken on 3rd July 2014, however these also encountered refusal so a final borehole was undertaken on 18th July 2014. In the second phase of works five additional trial pits (TP2, TP3 & TP5-TP7), which were undertaken by others, were logged by CSI and an additional borehole (BH5) was drilled using a 'cut-down' cable percussive drill rig.

Phase 1

C.f.a. Boreholes

3.4 Six c.f.a. boreholes (BH1, BH1A, BH1B & BH2-BH4) were drilled across the site at the positions indicated on the *Sketch Fieldwork Location Plan*. Two additional boreholes were undertaken at the locations of trial pits TP1 & TP2, however, as the geology was the same as within borehole BH1A these were not logged. Boreholes BH1 & BH2-BH4 hit refusal at a depth of 0.90m below existing ground level (bgl) thought to be due to a concrete obstruction. Borehole BH1A hit refusal at a depth of 2.00m bgl thought to be due to Made Ground. Borehole BH1B was advanced to a depth of 10.00m bgl.

3.5 Disturbed samples were taken from all boreholes and within borehole BH1B at regular depth intervals within each stratum and when a change of strata was encountered.

3.6 Standard Penetration Tests (SPTs & CPTs) and Mackintosh Probes provided additional information on the consistency of the material encountered. A *Penetration vs Depth Profile* has been appended to this report.

3.7 Upon completion of borehole BH1B a combined groundwater/gas-monitoring standpipe was installed to a depth of 8.00m bgl.

3.8 Full details of the borehole findings are given on the appended borehole record sheets.

Hand Excavated Trial Pits

3.9 Two internal trial pits (TP1 & TP4) were excavated at the locations indicated on the *Sketch Fieldwork Location Plan.* Trial pits TP2 & TP3 were not excavated.

3.10 Trial pit TP1 was undertaken adjacent to the northern party wall with No. 11. Two sections of trial pit TP1 were logged, section A and section B. Section A found the existing brick wall to be corbelled onto a concrete foundation at a depth of 750mm bgl. The corbels were found to extend out a distance of 225mm from the brick wall. The underside of the concrete foundation was unable to be established due an obstruction and the trial pit was terminated at a depth of 1.25m bgl.

3.11 Within trial pit TP1, section B found the existing brick wall to be corbelled onto a concrete foundation at a depth of 675mm bgl. The corbels were found to extend out a distance of 150mm from the brick wall. The underside of the concrete foundation was unable to be established due an obstruction and the trial pit was terminated at a depth of 1.25m bgl.

3.12 Trial pit TP4 was undertaken adjacent to the southern party wall with No. 17 and the external front wall. Two sections of trial pit TP4 were logged, section A and section B. Section A found the existing brick wall to be corbelled out 150mm from the wall. The underside of the foundation was unable to be established due an obstruction from the mains services and large rubble and section A was terminated at a depth of 1.25m bgl.

3.13 Within trial pit TP4, section B found the existing brick wall to rest onto a concrete foundation at a depth of 200mm bgl. The underside of the concrete foundation was unable to be established due an obstruction from mains services and large rubble and section B was therefore terminated at a depth of 1.00m bgl.

3.14 Full details of the trial pit findings are given on the appended trial pit record sheets.

Phase 2

'Cut-down' Cable Percussive Borehole

3.15 A single cable percussive borehole (BH5) was drilled close to party wall with No.17 John's Mews and advanced to a depth of 12.00m bgl.

3.16 Bulk disturbed samples were taken throughout the top 3.00m of the borehole and at intervals to a maximum depth of 6.50m bgl. Small disturbed samples were taken from 4.00m bgl at regular depth intervals as the borehole was advanced. In addition, undisturbed (U100) samples were taken at depths of 6.00m and 9.00m bgl.

3.17 In-situ Standard Penetration Tests (SPT) and Cone Penetration Tests (CPTs) were also undertaken throughout the borehole in order to provide additional information on

the in-situ consistency of the soils encountered. A *Penetration vs Depth Profile* has been appended to this report.

3.18 Upon completion of borehole BH5 a combined groundwater/ground gas monitoring standpipe was installed to a depth of 12.00m below existing ground level.

3.19 Full details of the borehole findings are given on the appended borehole record sheets.

Hand Excavated Trial Pits

3.20 Five internal trial pits (TP2, TP3 & TP5-TP7) were logged by CSI. Their locations are indicated on the *Sketch Fieldwork Location Plan.* In addition, in-situ Mackintosh Probe testing was undertaken and small disturbed samples were taken.

3.21 Trial pit TP2 was undertaken alongside an internal wall (section A) and the party wall with No.11 John's Mews (section B). Section A found the brick wall set onto corbels at a depth of 600mm bgl. The corbels were found to be 250mm thick and were set onto Made Ground at a depth of 850mm bgl. Section B found the brick wall to be set onto corbels at a depth of 450mm bgl. The corbels were found to be 150mm thick and were set onto a brick/concrete foundation at a depth of 600mm bgl. The brick/concrete foundation was found to be 200mm thick and was set onto Made Ground at a depth of 800mm bgl.

3.22 Trial pit TP3 was undertaken alongside the party wall with No.11 John's Mews, towards the rear of the site, in one of the WCs. TP3 found the brick wall set onto brick corbels at a depth of 500mm bgl. The brick corbels were found to be 225mm thick and were set onto a concrete foundation at a depth of 725mm bgl. The concrete foundation was found to be 200mm thick and was set onto Made Ground at a depth of 925mm bgl.

3.23 Trial pit TP5 was undertaken in the northern corner of the site and detailed two sections (A & B). Section A detailed the party wall with No.11 John's Mews and section B detailed the rear wall of the site. Both sections were the same and found the brick wall to be set onto brick corbels at a depth of 475mm bgl. The corbels were found to be 120mm think and were set onto a concrete foundation at a depth of 595mm bgl. The concrete foundation was 200mm thick and was set onto Made Ground at a depth of 795mm bgl.

3.24 Trial pit TP6 was undertaken alongside the rear wall of the site and found foundations similar to those in TP5.

3.25 Trial pit TP7 was undertaken in the eastern corner of the site and detailed two sections (A & B). Section A detailed the rear wall of the site and section B detailed the party wall with No.17 John's Mews. Both sections were the same and found the brick wall set onto brick corbels at a depth of 600mm bgl. The brick corbels were found to be 225mm thick and were set onto a brick/concrete foundation at a depth of 825mm

bgl. The brick/concrete foundation was found to be 250mm thick and was set onto Made Ground at a depth of 1075mm bgl.

3.26 Full details of the trial pit findings are given on the appended trial pit record sheets.

Groundwater and Ground Gas Monitoring

3.27 Following the first phase of site work two return gas/groundwater monitoring visits were undertaken to the installation fitted within borehole BH1B on the 30th July and 10th August 2014. Following the second phase of site work two return gas/groundwater monitoring visits were undertaken to the installation fitted within borehole BH5 on the 2nd and 9th September 2015. A further five visits have been undertaken to both boreholes on 14th & 22nd September 2015, 20th January 2016 and 3rd & 10th March 2016.

3.28 The barometric pressure was recorded together with the level of Carbon Dioxide, Oxygen and Methane within the borehole. In addition, gas flow measurements were taken and the depth to groundwater recorded.

3.29 Full details of the readings are included on the appended Gas/Groundwater Monitoring Record Sheet.

4.0 GROUND CONDITIONS

4.1 According to information published by the British Geological Survey the underlying geology at this site is shown as being superficial River Terrace Deposits of the Lynch Hill Gravel Member, with the Hackney Gravel Member outcropping nearby, overlying the London Clay Formation.

Lynch Hill Gravel Member

4.2 The Lynch Hill Gravel Member is a sand and gravel, with local lenses of silt, clay or peat from the parent material, the Maindenhead Formation. The Lynch Hill Gravel can be described as being coarse to fine subgranualr gravel with coarse to fine brown sand. The Wolstonian age gravel rests unconformably on the bedrock geology and with an average thickness of 7m with a range typically 1-12m. It is geographically limited to the Thames Valley and associated tributaries. The Lynch Hill Gravel Member was previously known as the Lynch Hill Gravel Formation.

Hackney Gravel Member

4.3 This Wolstonian aged sand and gravel typically has locally with lenses of silt, clay or peat. It rests with unconformity on bedrock geology and averages in thickness at about 6m but can be up to 10m thick. This member is geographically limited to the Thames Valley and its associated tributaries.

London Clay

4.4 It is thought that the London Clay Formation was deposited during a period of sea inundation in the area up to 200m in depth. The London Clay can be up to 150m thick beneath south Essex thinning across London to about 90m near Reading. The formation consists of mainly dark blue-grey to brown-grey clay containing variable amounts of fine-grained sand and silt. London Clay generally weathers to an orange-brown colour with pockets of silty fine sand. The formation is particularly susceptible to swelling and shrinking when subjected to moisture content changes and is commonly intensely fissured. In addition, gypsum (selenite) crystals and pyrite nodules are commonly found throughout the formation.

When exposed to the weathering process the upper regions of the London Clay oxidise to brown in colour. It usually contains selenite crystals, often grouped in bands or layers, which are thought to have originated from the decomposition of shell fragments. London Clay contains clay minerals in the form of illite, kaolinite and smectite. The presence of smectite renders the London Clay particularly susceptible to heave caused by alternate wetting and drying near the surface. In addition, weathering and possible slight transportation of semi-frozen material “en-masse” in glacial or peri-glacial regions can occur. This action often completely destroys the structure of the material and can involve a serious loss of strength. As the materials

are based on local constituents, the lithology of the deposit is often similar to that of the parent strata.

4.5 Full details of the ground conditions encountered within boreholes BH1B & BH5 can be summarised as follows:

Depth To Top of Strata (m bgl)	Depth To Bottom of Strata (m bgl)	Stratum
0.00	0.075	Concrete
0.00/0.075	3.50/5.90	Made Ground/Reworked Ground
3.50	4.00	Alluvium: *firm brown/grey gravelly silty CLAY (BH5)*
4.00	5.00	Lynch Hill Gravel Member (?): *dense brown silty very sandy fine to coarse GRAVEL (BH1)*
5.00	5.70	Lynch Hill Gravel Member (?): *medium dense yellow brown medium GRAVEL (BH1)*
5.70/5.90	7.00/7.50	Weathered London Clay: *firm to stiff brown/grey slightly sandy silty CLAY with selenite crystals, mica and partings of silt and fine sand*
7.00/7.50	10.00/12.00+	London Clay: *stiff grey slightly sandy silty CLAY with selenite crystals, mica and partings of silt and fine sand*

4.6 It should be noted that the Made Ground depths recorded above are those encountered within boreholes BH1B & BH5 during the current work. However, owing to the variable nature and unknown provenance of Made Ground it is possible that deeper or more extensive areas of Made Ground may exist at this site which have not been revealed by the current work.

4.7 The granular material of the River Terrace Deposits is assumed to be Lynch Hill Gravel Member. The River Terrace Deposits were not recorded in BH1B.

4.8 A groundwater 'seepage' was observed within borehole BH1B at a depth of 5.90m bgl. Standing groundwater was observed within borehole BH1B at a depth of 9.50m bgl. A groundwater strike was observed at a depth of 4.50m bgl in BH5 which rose to 4.20m bgl; however the borehole was dry on completion. On the return gas/groundwater monitoring visits to the installations fitted within borehole BH1B and BH5 groundwater levels were recorded between 2.92m bgl and 3.80m bgl.

4.9 No root activity was noted during the current investigation.

5.0 LABORATORY TESTING

5.1 The following geotechnical and contamination tests have been carried out on samples recovered from boreholes and trial pits undertaken at this site.

5.2 Unless otherwise stated, the geotechnical tests have generally been carried out in accordance with the recommendations given in British Standard 1377:1990, "Methods of Test for Soils for Civil Engineering Purposes".

5.3 The chemical testing was carried out in accordance with standard industry methods in a UKAS approved laboratory which is also currently accredited in accordance with MCERTS for the majority of its testing. Further information regarding this accreditation is available on request together with a full list of test methods if required.

5.4 Laboratory testing from the first phase of work included three Atterberg Limits and moisture content tests, two pH and sulphate tests, three suites of chemical analysis and a single Waste Acceptance Criteria (WAC) suite. For the second phase laboratory testing included two particle size distributions and three BRE Special Digest 1 tests.

5.5 *Atterberg Limits and Moisture Content Tests*

The Atterberg Limit and moisture contents have been determined for a single sample of Weathered London Clay and two London Clay samples collected and tested from the underlying strata.

Weathered London Clay

The liquid limit (LL) was found to be 80%, the plastic limit (PL) 18%, and the modified plasticity index (PI) 62%. The moisture content of this sample was found to be 33%.

These results indicate that the sample tested would be classified as Clay of 'very high' (CV) plasticity in accordance with the Casagrande Geotechnical classification system.

In addition, the sample would fall into the "high" volume change potential category of the National House Building Council's (NHBC) classification system given in Part 4 of their Standards.

London Clay

The liquid limit (LL) was found to range between 67% and 68%, the plastic limit (PL) between 14% and 16%, and the modified plasticity index (PI) between 51% and 54%. The moisture content of these two samples was found to be 28%.

These results indicate that the samples tested would be classified as Clay of 'high' (CH) plasticity in accordance with the Casagrande Geotechnical classification system.

In addition, the samples would fall into the "high" volume change potential category of the National House Building Council's (NHBC) classification system given in Part 4 of their Standards.

5.6 *pH and Sulphate Tests*

The pH and sulphate content has been determined for two samples recovered at various depths from the borehole drilled at this site.

The pH values were found to vary between 7.9 and 8.1 with the sulphate content, on a 2:1 water:soil extract was found to vary between 0.79 and 0.99 g/l.

5.7 *BRE Special Digest 1 Tests*

The pH and sulphate content has been determined for three samples of Made Ground recovered from the site.

The pH value was found range between 6.2 and 6.4 with the sulphate content, on a 2:1 water:soil extract found to vary between 0.14 and 0.54 g/l.

5.8 *Particle Size Distributions*

The particle size distribution has been determined for two samples of the Lynch Hill Gravel Member encountered beneath the site.

The results are presented as a grading curves appended to this report.

5.9 *Chemical Analysis*

Three representative samples of the Made Ground encountered across the site were selected and tested for a range of commonly occurring contaminants and indicators of contamination including those given by the Contaminated Land Exposure Assessment (CLEA).

A contamination suite was undertaken on samples from each of the boreholes and window sample locations, which included heavy metals, speciated PolyAromatic Hydrocarbon (PAH) and speciated Total Petroleum Hydrocarbon (TPH).

5.10 *Waste Classification Tests*

A sample collected from borehole BH1B was selected and tested for Waste Acceptance Criteria (WAC) in accordance with BS EN 12457 Part 3.

The sample was selected from the Made Ground from borehole BH1B at a depth of 1.5m below existing ground level.

Full details of the results are given on the appended results sheets.

6.0 DISCUSSION

PROPOSED DEVELOPMENT

6.1 As discussed in Section 2 above, it is understood that the proposed development will include the 'Change of use from garage/workshop/offices (Class B1) to residential use (Class C3) to provide 2 dwelling houses, including excavation works to create a new basement floor level, creation of 2 new courtyards, mansard roof extensions and elevational alterations to front and rear'. From the findings of the original site investigation the proposed basement will be supported on piled foundations. *Proposed Development Plans* have been appended to this report.

6.2 At the time of the current investigation, as no detailed information is available regarding the precise loadings associated with proposed new development, the foundation design discussed below is, by necessity, general in nature.

6.3 It should be noted that should ground conditions differing significantly from those described in our report be encountered during foundation excavation, then Chelmer Site Investigation Laboratories Limited should be contacted immediately and that the below noted allowable bearing pressures or recommended foundation type may need to be altered accordingly.

FOUNDATION DESIGN

6.4 The current work encountered Made Ground to a maximum depth of 5.90m below existing ground level (bgl). In BH5 the Made Ground was underlain by a stratum of Reworked Ground to 3.50m bgl. The Reworked Ground was underlain by Alluvium to 4.00m bgl and then River Terrace Deposits, assumed to be of the Lynch Hill Gravel Member, to a maximum depth of 5.70m bgl. The River Terrace Deposits were not encountered in BH1B. The Made Ground in BH1B and River Terrace Deposits in BH5 were underlain by Weathered London Clay to a maximum depth of 7.50m bgl, which in turn was underlain by the 'fresh' grey London Clay stratum which was not penetrated at the maximum borehole termination depth of 12.00m bgl.

6.5 A groundwater 'seepage' was observed within borehole BH1B at a depth of 5.90m bgl. Standing groundwater was observed within borehole BH1B at a depth of 9.50m bgl. A groundwater strike was observed at a depth of 4.50m bgl in BH5 which rose to 4.20m bgl; however the borehole was dry on completion. On the return gas/groundwater monitoring visits to the installations fitted within borehole BH1B and BH5 groundwater levels were recorded between 2.92m bgl and 3.80m bgl.

6.6 The Weathered London Clay/London Clay strata encountered beneath the site has been confirmed to possess a 'high' volume change potential in accordance with the National House Building Councils (NHBC) classification system given in Part 4 of their Standards. The River Terrace Deposits would be classed as 'non shrinkable' and the

Alluvium would likely be classed as having 'medium' volume change potential, although this has not been confirmed.

6.7 Therefore, it is likely that precautions against foundation sides and beneath any ground beams will be required in order to accommodate potential seasonal swelling and shrinkage. Solutions can be deployed in terms of structural design and/or compressible materials, these measures should be assessed by the appointed Structural Engineer.

BASEMENT CONSTRUCTION

6.8 The proposed founding depth for this basement slab (including blinding) is approximately 3.8m below the internal floor level where the boreholes were drilled, while the underpins will be founded at approximately 4.05m below internal floor level (equivalent to 3.9m below the external ground level at the front of No.15, and 4.9m below the ground level in the gardens to the rear of the building). Thus, the basement's underpins as currently proposed will be founded partly in the Made Ground and partly in the dense sandy gravels of the River Terrace Deposits, and possibly partly in the alluvial clays. Made Ground is not normally considered to be a suitable founding stratum owing to its inherent variability and therefore it was recommended that the whole basement should be supported on a piled slab, with the piles bearing into the London Clay, which has now been implemented.

6.9 The construction would also be required to resist pressures arising from the assumed groundwater regime, which is likely to be more onerous than those indicated during the current investigation.

6.10 This means that de-watering may be required during construction; see 'Foundation and Service Excavations' below. The basement must also be designed to accommodate the related uplift pressure. For the provisional groundwater level at 1.0m bgl (recommended as a 'worst credible' approach – see BIA/4507 Rev 5), the uplift pressure would be up to 28 kPa below the basement slab and 31kPa below the underpins (both un-factored).

6.11 Once the basement construction has been completed, there is always a possibility that this will act as a local "sump" for surface groundwater and run-off. Therefore, we would recommend that the basement construction is designed to minimise any ingress of groundwater. Detailed recommendations for the waterproofing system are beyond the scope of this report although it is noted that, as a minimum, it would be prudent for the system to be designed in compliance with the requirements of BS8102:2009.

PILED FOUNDATIONS

6.12 As discussed above the proposed basement is now proposed to be supported on piled foundations bearing into the London Clay.

6.13 At this site the piles could be bored or driven to support foundation loads mainly in adhesion within the cohesive elements of the underlying London Clay Formation. Given the nature of the ground conditions encountered, and the proximity to adjacent residential buildings, a bored pile solution would appear the most appropriate. However, we do not recommend c.f.a. solid auger piles at this site as these would leave piles sides unsupported prior to placing of concrete.

6.14 It is beyond our brief to provide a full and detailed pile design and the advice of a specialist piling contractor should be sought in this respect. All pile design is of course the responsibility of the selected piling contractor, and thus the soil parameters/assumptions listed below are given for guidance purposes only. These soil parameters/assumptions relate to "static design" for vertically loaded single and contiguous bored/C.F.A. piles:-

Made Ground

Bulk unit weight, γ_b –	17kN/m^3
Effective angle of internal friction, φ' -	Zero
Undrained shear strength, Su/Cu -	Zero

Reworked Ground & Alluvial Clays

Bulk unit weight, γ_b -	18 kN/m^3
Undrained shear strength, Su/Cu -	20-40 kN/m^2
Effective angle of internal friction, φ' -	25º

River Terrace Deposits (sandy gravels)

Bulk unit weight, γ_b -	19 kN/m^3
Undrained shear strength, Su/Cu, -	Zero
Effective angle of internal friction, φ' -	32º

London Clay

Bulk unit weight, γ_b -	20 kN/m^3
Undrained shear strength, Su/Cu	Approximately 90-200 kN/m^2 (interpreted from SPT results)
Effective angle of internal friction, φ'	22°

6.15 The following table gives typical working loads for isolated bored piles to 8.00m and 10.00m below existing ground level.

Pile Type	Depth below existing GL (m)	Diameter (m)	Working Load (tonnes)
Bored	8.00	0.30	5-10
Bored	8.00	0.45	10-15
Bored	8.00	0.60	20-25
Bored	10.00	0.30	10-15
Bored	10.00	0.45	20-25
Bored	10.00	0.60	35-40

6.16 Again, it is recommended that the advice of a competent piling contractor be sought as to the most suitable pile type at this site and for confirmation of the order of working load achievable given the ground conditions encountered and the proprietary pile type selected.

6.17 In addition, we have assumed that the top 2 to 3 metres of each pile is 'sleeved' to prevent 'heave' forces developing on the shaft.

6.18 Settlements of such piles can be expected to be small, typically less than 5-10mm.

6.19 Depending on pile spacing, the ultimate capacity of a pile group may be less than the sum of the ultimate capacities for the individual piles.

6.20 Due to the presence of buried obstructions at the site we would recommend pre boring be undertaken in case other undetected obstructions are present beneath the site.

6.21 With regard to the possible downward migration of contaminants the recommendations given in the Environment Agency Document *"Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination : Guidance on Pollution Prevention"* National Groundwater and Contaminated Land Centre Report NC/99/73, May 2001, or similar updated guidance, should be followed when assessing pile design at this site.

RETAINING STRUCTURES

6.22 The full design of temporary and permanent retaining structures is beyond the scope of this report. The calculation of permanent lateral pressures against the sides should relate to long-term (effective) stress analysis using critical state soil parameters. However, the following preliminary guidelines are accordingly considered appropriate:

Made Ground

Bulk unit weight, γ_b -	19 kN/m^3
Effective cohesion, c' -	Zero
Effective angle of internal friction, φ' -	25º

Reworked Ground & Alluvial Clays

Bulk unit weight, γ_b -	18 kN/m^3
Undrained cohesion, c' -	20-40 kPa
Effective cohesion, c' -	Zero
Effective angle of internal friction, φ' -	25º

River Terrace Deposits (sandy gravels)

Bulk unit weight, γ_b -	19 kN/m^3
Effective cohesion, c' -	Zero
Effective angle of internal friction, φ' -	32º

6.23 For Surcharge loading it is necessary that the analyses take account of all lateral loadings arising from potential vehicle loading and any adjacent existing foundations.

6.24 Soil strengths and loads/actions should be factored in accordance with design code adopted.

FOUNDATION AND SERVICE EXCAVATIONS

6.25 From the evidence of the borehole, the excavations may require support against collapse of sides and a contingency for this should be allowed for at this stage.

6.26 Foundation and service excavations will be within Made Ground and normal health and safety considerations need to be met with regard to the contamination test results obtained during the current work.

6.27 A groundwater 'seepage' was observed within borehole BH1B at a depth of 5.90m bgl. Standing groundwater was observed within borehole BH1B at a depth of 9.50m bgl. A groundwater strike was observed at a depth of 4.50m bgl in BH5 which rose to 4.20m bgl; however the borehole was dry on completion. On the return gas/groundwater monitoring visits to the installations fitted within borehole BH1B and BH5 groundwater levels were recorded between 2.92m bgl and 3.80m bgl.

6.28 Therefore, it is likely that groundwater will be encountered during shallow foundation or service excavations. A suitable dewatering system will need to be employed during the construction of the basement. Advice of a specialist dewatering contractor should be sought to confirm whether well-pointing will be adequate or whether other techniques will be required. It is very important that the base of foundation

excavations is kept dry, the foundation base is kept square and that any soft spots are replaced and compacted prior to pouring foundation concrete. The associated Basement Impact Assessment (ref. BIA/4507 Rev 5) provides further guidance on this matter.

6.29 Furthermore, we recommend that where groundwater or surface water flows into foundation excavations, 'blinding' concrete is used at the base of the foundation excavations and that foundation concrete is poured as soon as possible thereafter.

BURIED CONCRETE

6.30 The results of the chemical analyses indicate that the samples tested would fall into Class DS-2 of the Building Research Establishments (BRE) classification system Special Digest Part 1:2005 "Concrete in aggressive ground".

6.31 Owing to the presence of selenite crystals found within the natural Clay material, we would recommend that a minimum of Class DS-2 conditions are adopted for any concrete mix design and that consideration is given to using "sulphate resisting cement" in concrete mix at this site.

PRELIMINARY CONTAMINATION ASSESSMENT

6.32 BACKGROUND AND TERMS OF REFERENCE

6.33 In the UK, contaminated land is assessed and managed through a number of integrated policies and guidance. Contaminated land is defined in legislation enacted under Part IIA of the Environmental Protection Act 1990 and guidance issued by DEFRA under CLR11 and sister documentation published in 2012 advises on how the legislative framework dealing with contaminated land should be implemented.

6.34 Distinct from the strict and onerous legal definition and classification of "statutory contaminated land" but a corollary to the legislation and associated statutory guidance, the National Planning Policy Framework (NPPF) makes provision or assessing and managing contaminated land in the context of redevelopment which is subject to planning control. Earlier published guidance (PPS23) identified contamination as being a material consideration within any planning application and current policy under NPPF states that land which *"is affected by contamination or land stability issues" must be correctly assessed such that planning decisions should ensure that "the site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation".*

6.35 The assessment process requires that *"adequate site investigation information, prepared by a competent person, is presented."* The guidance provided in NPPF also

states that *"all investigations of land potentially affected by contamination should be carried out in accordance with established procedures, such as BS10175 (2001)."*

6.36 The NPPF and statutory provisions for dealing with contaminated land are clear in ensuring that where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the *"developer and/or landowner."*

6.37 Fundamental to the assessment of contaminated land is the development of a Conceptual Site Model (CSM). This is an evaluation of the site conditions and its particular characteristics with respect to so called Source-Pathway-Receptor relationships, or plausible pollutant linkages. The CSM can then be used to assess and define risk and in turn it provides a basis for determining the condition of the land in the context of the proposed development and what, if any, action needs to be taken to allow the proposed development to proceed safely and without detrimental impact to the site itself or the wider environment.

6.38 A plausible pollutant linkage is defined by three elements;

Source A hazard which exists within the site or its environs which has the potential to cause harm (e.g. contaminated soil, ground gas, unstable ground, etc.)

Receptor Something associated with the site (e.g. end-user, building, off-site feature, etc.) which can be harmed.

Pathway A plausible linkage between the Source and Receptor such that harm can be realised (e.g. end-user coming into direct contact with contaminated soil, mobile contamination adversely impacting groundwater, etc.).

6.39 By definition a pollutant linkage can only exist where the three elements, source-pathway-receptor, are present and co-exist. If one of the elements that make up the pollutant linkage are not present then it follows that there can be no related risk. The breaking of pollutant linkages is a fundamental principal in the management of contaminated land risk and where the risk is identified and deemed to be unacceptable the appropriate action taken be "breaking" the pollutant linkage in some way.

6.40 Risk in the context of contaminated land is considered in terms of its significance and this is qualitatively assessed on the basis of magnitude of harm that may occur and likelihood of that harm occurring. The risk assessment follows the general principles as set out within BS10175:2001 and CIRIA C552.

6.41 The CSM is used to provide both a context and framework for undertaking any intrusive site investigation which may be deemed necessary to characterise the site with respect to contamination. Where a pollutant linkage is identified further

investigation may be needed to confirm or quantify specific conditions, validate the existence of the pollutant linkage and thereby confirm and quantify the degree of risk. This is an important element of the assessment process and under the principles of risk assessment constitutes "*hazard identification*" and "*hazard assessment*".

Hazards

6.42 Made Ground was identified during the current investigation to a maximum depth of 5.90m bgl. Made Ground should always be viewed as being a potential source of contamination which may have adverse impacts to a number of different receptors. From the historical information obtained during the desk top study investigation, the site appears to have been occupied by the same two buildings since at least 1877-1878, which has been in recent use by an electrical engineering company, which may present potential contaminants.

6.43 Ground gas (carbon dioxide, methane, and possibly other related gases and vapours) are ubiquitous within the subsoil environment. Low concentration of either, or both, carbon dioxide and methane may not be problematic. However, elevated concentrations of ground gas and/or conditions where ground gas is being actively generated (e.g. filled ground, landfill, organic rich natural soils, etc.) may present a significant hazard to the site development or the wider environment. Ground gas may be present from sources either within the site itself or maybe being generated from an off-site source and migrating on to the site.

6.44 Groundwater present within a site may itself be contaminated or may liberate and be a source of (and pathway for) mobile contamination. Contaminated groundwater can impact on various receptors but most notably controlled waters either on the site or offsite.

Receptors

6.45 From the intended end site use the following potential receptors have been identified.

- *Construction workers on the site during development.*
- *Neighbouring sites and site users*
- *Controlled Waters both within the site and off-site*
- *Future residents/users of the proposed development, including young children.*
- *Vegetation within proposed development (landscaping).*
- *Building fabric for the proposed development.*

Pathways

6.46 Contamination within the soil could reach receptors by direct contact with the soils where there is a potential for contamination to be ingested by some means (direct ingestion, inhalation, dermal contact). This is most acute during site development, as

due to the proposed end-use with no soft landscaping proposed, the risk to future residents from exposure pathways will be low.

6.47 Mobile contamination, present either within the groundwater or otherwise liberated by contact with groundwater (leachable contaminants), may exist, especially given the identified permeable underlying geology.

6.48 Ground gas may migrate through or on/offsite through preferential pathways most likely in the superficial Made Ground.

6.49 Elements of the building fabric for the proposed development may be in direct contact with contamination which may have adverse impacts. Plastic potable water supply pipelines may be susceptible to certain organic contamination if present.

SOIL CONTAMINATION EVALUATION

6.50 In accordance with current good practice (DEFRA guidance and CLR11) a Tier 1 assessment has been undertaken to determine the significance of the contamination present within the site in the context of the CSM. In this regard the contamination present within the soils sampled and determined from the program of chemical testing (see Section 5) has been compared to published guidance either UK Soil Guideline Values (SGV) as derived from current CLEA publications or other generic assessment criteria (GAC) derived from other applicable and relevant sources.

6.51 It should be noted SGV criteria is derived from a risk-based modelling software which has limited functionality, is based on assumptions and contains algorithms which the DEFRA and Environment Agency (EA) has publicly expressed its intention to update. As a consequence of this, some of the screening values generated by the CLEA software may not adequately reflect specific site conditions and in some instances are unduly conservative. In addition, it should also be noted that the figures given in the appended table are based on a 6% soil organic matter content.

6.52 DEFRA/EA previously published a number of Soil Guideline Values (SGVs) for certain determinands, (common toxic metals) for assessing the risks to human health from chronic exposure to soil contamination for standard land-use functions. However, these were withdrawn in late 2008 and DEFRA/EA have now issued a new set of guidance documents. Currently SGV figures have only been issued for Arsenic, Cadmium, Mercury, Nickel, Phenols and Selenium.

6.53 In the absence of currently published SGV values for the remaining contaminants, GAC screening values have been used. In this regard W. S. Atkins have derived ATRISKsoil Soil Screening Values (SSVs) based on the new 2009 guidance (SC050021/SR3 (the CLEA Report) and SC050021/SR2 (the TOX report)) for a commercial/industrial, residential without homegrown produce, residential with homegrown produce and allotment land uses. These have been based on the default assumptions provided in the CLEA report which it is understand will be used in the development of future Soil Guideline Values by DEFRA and the Environment Agency.

Atkins SSVs have been derived in line with the new guidance using CLEA model v1.04. As the inhalation of vapour pathway contributes less than ten percent of total exposure, this is unlikely to significantly affect the combined assessment criterion and the SSV values used are the combined assessment criterion given by CLEA if free product is not observed.

6.54 Neither CLEA or ATRISK currently publish values for Hexavalent Chromium. Therefore, both Total Chromium and Hexavalent Chromium values have been compared against the Land Quality Management/Chartered Institute of Environmental Health (LQM/CIEH) Generic Assessment Criteria published in 2009 and based on CLEA v1.04 with Total Chromium values based on Chromium III.

6.55 The SGV and SSV levels represent "intervention" levels above which the levels of contamination may pose an unacceptable risk to the health of site-users such that further investigation and/or remediation is required.

6.56 Total Petroleum Hydrocarbons are considered in accordance with the fractions proposed by The Environment Agency, drawing on the TPHCWG methodology. These are contained in Table 4.2 – Petroleum hydrocarbon fractions for use in UK human health risk assessment, based on Equivalent Carbon (EC) number, contained in Science Report P5-080/TR3, The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils.

6.57 Considering the end usage of the site, the chemical results would generally be compared against the ***Residential without Plant Uptake*** criteria, due to the proposed end use and lack of gardens/soft landscaping.

ASSESSMENT OF RESULTS

Soils

6.58 Three lead concentrations of 736mg/kg, 503mg/kg and 739mg/kg from BH1A, BH1B and BH1B respectively exceeded the ATRISK Contaminated Land Screening Values (SSVs) for *Residential without Plant Uptake* criteria of 310mg/kg.

6.59 A single concentration of benzo(a)pyrene (BaP) (1.8mg/kg) from BH1A also exceeded the exceeded the ATRISK Contaminated Land Screening Values (SSVs) of 0.998mg/kg for *Residential without Plant Uptake* criteria of 1.04mg/kg.

6.60 No other constituents within the soil exceed the criteria set out by the ATRISK Contaminated Land Screening Values (SSVs), the CLEA Soil Guideline Values (SGVs) and the LQM/CIEH Generic Assessment Criteria (GAC) for *Residential without plant uptake* criteria.

6.61 Although elevated concentrations of lead and BaP were identified within the underlying Made Ground, due to the lack of proposed soft landscaping areas or garden areas, and the removal of near surface soils during the proposed basement development, the risks to future residents, neighbouring properties and the wider environment are considered to be '**low**'. No further works are therefore considered necessary with regards to contaminated land.

Ground Gas

6.62 During the return gas/groundwater monitoring visit, the maximum concentration of methane was recorded at 0.1%v/v and the maximum carbon dioxide concentration was recorded at 4.2v/v. A maximum flow rate of 0.6l/hr was recorded.

6.63 The full land-borne gas assessment details are appended.

6.64 Due to the concentrations and associated low flow rates identified during the monitoring visits, it was decided to assess whether further visits would be required. This was undertaken using guidance from BS 8576:2013 Annex F to assess the sufficiency of the data.

6.65 From the results obtained to date, the likely risk associated with ground gas is Characteristic Situation 1, taking worst case as:

1.1%v/v x 0.6 l/hr = 0.0066 l/hr (maximum limit is 0.07 l/hr)

- Keeping the flow rate at 0.6 l/hr, the gas concentration would have to increase to 11.7%v/v, 11 times as much as previously recorded, to move into CS 2.

- Keeping the same concentration, worst case recorded 1.1%v/v, the flow would have to increase to 6.4 l/hr, 11 times greater than the worst case identified.

6.66 It should also be noted that the second monitoring visit was undertaken during a period of low pressure and thus the results may represent 'worst case'. The above required large increases in flow rates and gas concentrations that would be required to increase the risk from ground gases are not considered to be feasible. Therefore the site would thus be classified as **Characteristic Situation 1** (following modified Wilson & Card Methodology). On this basis no special precautions are deemed necessary to safeguard against ground gas, however this is should be agreed with the applicable Local Authority Building Control Officer.

WASTE ACCEPTANCE CRITERIA

6.67 A single EN 14473/02 Waste Acceptance Criteria (WAC) test was undertaken from the Made Ground from BH1B at a depth of 1.50m bgl and the certificate pertaining to this has been appended to this report.

6.68 The results of the WAC test indicate that the sample would probably be classified as suitable for disposal at a site which accepts "Hazardous" material. It is recommended that further testing is undertaken to assist in classifying for waste disposal purposes. Full details of the results are given on the appended results sheets.

6.69 However, it should be noted that Chelmer Site Investigation Laboratories Ltd are not a licensed landfill operator and we therefore strongly recommend that the WAC data should be presented to potential Waste Management Companies in order for them to confirm the waste classification of surplus soils to be removed from this site and to determine its acceptability at appropriate landfill sites for disposal/treatment.

UPDATED CONCEPTUAL MODEL

6.70 The following diagram summaries the potential pollution linkages identified for this site in the form of an updated diagrammatic Conceptual Model.

CIRIA Contaminated Land Risk Assessment Table

		Consequence			
		Severe	**Medium**	**Mild**	**Minor**
Probability	**High Likelihood**	Very High Risk	High Risk	Moderate Risk	Moderate/Low Risk
	Likely	High Risk	Moderate Risk	Moderate/Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate/Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate/Low Risk	Low Risk	Very Low Risk	Very Low Risk

*Extracted from CIRIA Publication C552 Contaminated Land Risk Assessment

Source	Potential Contaminants	Receptors	Pathways	Associated Hazard (Severity)	Likelihood of occurrence	Potential Risk	Notes
On-site -MADE GROUND -Historic uses	Heavy Metals TPHs PAHs Ground Gases	Sites Users Neighbours	Direct contact, ingestion	Medium	Unlikely	Low	No proposed soft landscaping and removal of underlying soil during basement development reduces exposure to future site residents.
			Inhalation of vapours (acute)	Severe	Unlikely	Low	Possible risk present.
			Inhalation of vapours (chronic)	Medium	Unlikely	Low	Possible risk present.
			Ingestion of contaminated water through water main pipework	Medium	Unlikely	Low	No proposed soft landscaping and removal of underlying soil during basement development reduces exposure to future site residents.
		Construction Workers	Direct contact, ingestion	Medium	Low Likelihood	Moderate/Low	Possible risk present.
		Surface Water	Leaching, lateral migration of shallow groundwater	Medium	Unlikely	Low	Low risk due to no nearby surface water.
		Groundwater	Leaching, migration through granular material	Medium	Unlikely	Low	Removal of underlying soil during basement development reduces risk
		Services	Direct contact	Medium	Unlikely	Low	No proposed soft landscaping and removal of underlying soil during basement development reduces exposure to future site residents.

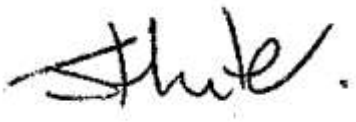
Additional Comments

6.71 Due to the elevated concentrations identified, any excavated material at this site may pose a '**moderate'** hazard to ground workers as far as Health and Safety is concerned. We would therefore recommend that standard Health and Safety precautions be taken with regard to ground workers at this site. These should include PPE equipment such as gloves, overalls etc. to prevent dermal contact with the soils. Washing facilities should be made available on-site to reduce extended contact with site soils. During the construction phase, dust suppression measures may be required to minimise potential inhalation of dust by neighbours or ground workers.

6.72 It is also recommended a Demolition or Refurbishment Asbestos Survey (previously known as a Type 3 Asbestos Survey) be undertaken prior to development.

6.73 As always, the above recommendations are based on a selected number of representative samples and further testing may be required if any other contamination is suspected or encountered during future ground works.

6.74 With regard to the installation of any future water supply pipe work, the current guidance on selection of materials for potable water supply pipes to be laid in contaminated land is contained in a document published jointly by Water UK and the Home Builders Federation (Water UK HBF (2014)). The protocols in that document are for guidance and are not subject to enforcement by Water UK or any agency, but have been adopted by Water UK and by HBF as best practice for their members. It is recommended that the results of the soil chemical analyses undertaken on the site should be provided to the potable water supply company in order to ensure that any pipe provided complies with their requirements.



Prepared By: Jack Hunter BSc (Hons)
Senior Geo-environmental Engineer

Prepared By: Alexandra Ash MEng (Hons)
Geotechnical Engineer

Reviewed By: M B Proctor BEng. (Hons), FGS, IAEG
Executive Director

END OF REPORT

a) This report has been prepared for the purpose of providing advice to the client pursuant to its appointment of Chelmer Site Investigation Laboratories Limited (CSI) to act as a consultant.
b) Save for the client no duty is undertaken or warranty or representation made to any party in respect of the opinions, advice, recommendations or conclusions herein set out.
c) All work carried out in preparing this report has used, and is based upon, our professional knowledge and understanding of the current relevant English and European Community standards, approved codes of practice, technology and legislation.
d) Changes in the above may cause the opinion, advice, recommendations or conclusions set out in this report to become inappropriate or incorrect. However, in giving its opinions, advice, recommendations and conclusions, CSI has considered pending changes to environmental legislation and regulations of which it is currently aware. Following delivery of this report, we will have no obligation to advise the client of any such changes, or of their repercussions.
e) CSI acknowledges that it is being retained, in part, because of its knowledge and experience with respect to environmental matters. CSI will consider and analyse all information provided to it in the context of our knowledge and experience and all other relevant information known to us. To the extent that the information provided to us is not inconsistent or incompatible therewith, CSI shall be entitled to rely upon and assume, without independent verification, the accuracy and completeness of such information.
f) The content of this report represents the professional opinion of experienced environmental consultants. CSI does not provide specialist legal advice and the advice of lawyers may be required.
g) In the Summary and Recommendations sections of this report, CSI has set out our key findings and provided a summary and overview of our advice, opinions and recommendations. However, other parts of this report will often indicate the limitations of the information obtained by CSI and therefore any advice, opinions or recommendations set out in the Executive Summary, Summary and Recommendations sections ought not to be relied upon unless they are considered in the context of the whole report.
h) The assessments made in this report are based on the ground conditions as revealed by walkover survey and/or intrusive investigations, together with the results of any field or laboratory testing or chemical analysis undertaken and other relevant data, which may have been obtained including previous site investigations. In any event, ground contamination often exists as small discrete areas of contamination (hot spots) and there can be no certainty that any or all such areas have been located and/or sampled.
i) There may be special conditions appertaining to the site, which have not been taken into account in the report. The assessment may be subject to amendment in light of additional information becoming available.
j) Where any data supplied by the client or from other sources, including that from previous site investigations, have been used it has been assumed that the information is correct. No responsibility can be accepted by CSI for inaccuracies within the data supplied by other parties.
k) Whilst the report may express an opinion on possible ground conditions between or beyond trial pit or borehole locations, or on the possible presence of features based on either visual, verbal or published evidence this is for guidance only and no liability can be accepted for the accuracy thereof.
l) Comments on groundwater conditions are based on observations made at the time of the investigation unless otherwise stated. Groundwater conditions may vary due to seasonal or other effects.
m) This report is prepared and written in the context of the agreed scope of work and should not be used in a different context. Furthermore, new information, improved practices and changes in legislation may necessitate a reinterpretation of the report in whole or part after its original submission.
n) The copyright in the written materials shall remain the property of the CSI but with a royalty-free perpetual license to the client deemed to be granted on payment in full to CSI by the client of the outstanding amounts.
o) These terms apply in addition to the CSI Standard Terms of Engagement (or in addition to another written contract which may be in place instead thereof) unless specifically agreed in writing. (In the event of a conflict between these terms and the said Standard Terms of Engagement the said Standard Terms of Engagement shall prevail). In the absence of such a written contract the Standard Terms of Engagement will apply.
p) This report is issued on the condition that CSI will under no circumstances be liable for any loss arising directly or indirectly from subsequent information arising but not presented or discussed within the current Report.
q) In addition CSI will not be liable for any loss whatsoever arising directly or indirectly from any opinion within this report.

Chelmer Site Investigations
Unit 15 East Hanningfield Industrial Estate
Old Church Road, East Hanningfield, Essex CM3 8AB
Telephone: 01245 400930 Fax: 01245 400933
Email: info@siteinvestigations.co.uk Website: www.siteinvestigations.co.uk

Chelmer Site Investigations

Client: Wandsworth Sand and Stone LTD	**Scale:** N.T.S.	**Sheet No:** 1 of 1	**Weather:** Internal	**Date:** 22.05.14
Site: 13-15 Johns Mews, London, WC1N 2PA	**Job No:** 4507	**Borehole No:** 1	**Boring method:** CFA 100mmØ Secondman	

Depth Mtrs.	Description of Strata	Thick-ness	Legend	Sample	Test Type	Test Result	Root Information	Depth to Water	Depth Mtrs
G.L.	CONCRETE	0.2					No roots observed.		
0.2	MADE GROUND: medium compact to compact, dark brown, sandy, very silty clay with brick and concrete rubble.	0.7		D					0.5
0.9	Borehole ends at 0.9 m obstruction. (Suspect concrete)Too dense for drill to penetrate.								

Drawn by: TP **Approved by:** ME

Remarks: *Borehole dry and open on completion.*

Key: T.D.T.D. Too Dense to Drive
D Small Disturbed Sample J Jar Sample
B Bulk Disturbed Sample V Pilcon Vane (kPa)
U Undisturbed Sample (U100) M Mackintosh Probe
W Water Sample N Standard Penetration Test Blow Count

Chelmer Site Investigations
Unit 15 East Hanningfield Industrial Estate
Old Church Road, East Hanningfield, Essex CM3 8AB
Telephone: 01245 400930 Fax: 01245 400933
Email: info@siteinvestigations.co.uk Website: www.siteinvestigations.co.uk

Client: Wandsworth Sand and Stone LTD	**Scale:** N.T.S.	**Sheet No:** 1 of 1	**Weather:** Internal	**Date:** 03.07.14
Site: 13-15 Johns Mews, London, WC1N 2PA	**Job No:** 4507	**Borehole No:** 1A	**Boring method:** CFA 100mm Secondman	

Depth Mtrs.	Description of Strata	Thick-ness	Legend	Sample	Test Type	Test Result	Root Information	Depth to Water	Depth Mtrs
F.L.	CONCRETE	0.15							
0.15	MADE GROUND: medium compact to compact, dark brown, gravelly silt with numerous pieces of brick.	0.85					No roots observed.		
0.5				D					0.5
	MADE GROUND: medium compact to compact, moist, dark brown, clayey gravelly silt with numerous brick fragments.	1.5		D	M	50(20) 50(10) TDTD			1.0
				D					1.5
2.0	Borehole abandoned at 2.0 m. Obstruction thought to be made ground. Too dense for drill to penetrate.			D	M	50(15) 50(10) TDTD			2.0

Drawn by: MM **Approved by:** ME

Remarks: *Borehole moist and open on completion.*

Key: T.D.T.D. Too Dense to Drive
D Small Disturbed Sample J Jar Sample
B Bulk Disturbed Sample V Pilcon Vane (kPa)
U Undisturbed Sample (U100) M Mackintosh Probe
W Water Sample N Standard Penetration Test Blow Count

Chelmer Site Investigations
Unit 15 East Hanningfield Industrial Estate
Old Church Road, East Hanningfield, Essex CM3 8AB
Telephone: 01245 400930 Fax: 01245 400933
Email: info@siteinvestigations.co.uk Website: www.siteinvestigations.co.uk

Client: Wandsworth Sand and Stone LTD	**Scale:** N.T.S.	**Sheet No:** 1 of 1	**Weather:** Internal	**Date:** 18.07.14
Site: 13-15 Johns Mews, London, WC1N 2PA	**Job No:** 4507	**Borehole No:** 1B	**Boring method:** GEO 205 150mmØ CFA	

Depth Mtrs.	Description of Strata	Thick-ness	Legend	Sample	Test Type	Test Result	Root Information	Depth to Water	Depth Mtrs
G.L.	CONCRETE	0.075							
0.075	MADE GROUND: medium compact to compact crushed and whole brick.	0.225		D			No roots observed.		0.5
0.3	MADE GROUND: medium compact to compact, mid brown, gravelly silty coarse sand with numerous brick rubble/fragments.	0.7		D					1.0
1.0	MADE GROUND: medium compact, moist, pungent, black gravelly, very silty clay with occasional brick fragments.	3.4		D	CPT	N = 18			1.5
				D					2.0
				D					2.5
				D	CPT	N = 17			3.0
				D					3.5
				D					4.0
4.4	MADE GROUND: medium compact to compact, dark grey gravelly silty clay with occasional brick fragments.	1.0		D	CPT	N = 35			4.5
				D					5.0
5.4	MADE GROUND: medium compact, mid grey silty clay with occasional brick fragments.	0.5		D					5.5
5.9	Stiff, mid brown, mottled grey silty CLAY with partings of brown and grey silt and fine sand and crystals.	1.6		D	SPT	N = 20		*5.9*	6.0
				D					7.0
7.5	Stiff, mid grey, silty CLAY with partings of grey silt and fine sand and crystals. Becoming stiff from 8.8m.	2.5			SPT	N = 26			7.5
				D					8.0
				D	SPT	N = 40			9.0
								9.5	
10.0	Borehole ends at 10.0m			D					10.0

Drawn by: MM **Approved by:** ME

Remarks: *Groundwater seepage at 5.9m.*
Groundwater standing at 9.5m on completion.
Borehole open on completion.
Standpipe installed to 8.0m.

Key: T.D.T.D. Too Dense to Drive
D Small Disturbed Sample J Jar Sample
B Bulk Disturbed Sample V Pilcon Vane (kPa)
U Undisturbed Sample (U100) M Mackintosh Probe
W Water Sample N Standard Penetration Test Blow Count

Chelmer Site Investigations
Unit 15 East Hanningfield Industrial Estate
Old Church Road, East Hanningfield, Essex CM3 8AB
Telephone: 01245 400930 Fax: 01245 400933
Email: info@siteinvestigations.co.uk Website: www.siteinvestigations.co.uk

Chelmer Site Investigations

Client: Wandsworth Sand and Stone LTD	**Scale:** N.T.S.	**Sheet No:** 1 of 1	**Weather:** Internal	**Date:** 22.05.14
Site: 13-15 Johns Mews, London, WC1N 2PA	**Job No:** 4507	**Borehole No:** 2	**Boring method:** CFA 100mmØ Secondman	

Depth Mtrs.	Description of Strata	Thick-ness	Legend	Sample	Test Type	Test Result	Root Information	Depth to Water	Depth Mtrs
G.L.	CONCRETE	0.2					No roots observed.		
0.2	MADE GROUND: medium compact to compact, dark brown, sandy, very silty clay with brick and concrete rubble.	0.7		D					0.5
0.9	Borehole ends at 0.9 m obstruction. (Suspect concrete)Too dense for drill to penetrate.								

Drawn by: TP **Approved by:** ME

Remarks: *Borehole dry and open on completion.*

Key: T.D.T.D. Too Dense to Drive
D Small Disturbed Sample J Jar Sample
B Bulk Disturbed Sample V Pilcon Vane (kPa)
U Undisturbed Sample (U100) M Mackintosh Probe
W Water Sample N Standard Penetration Test Blow Count

Chelmer Site Investigations
Unit 15 East Hanningfield Industrial Estate
Old Church Road, East Hanningfield, Essex CM3 8AB
Telephone: 01245 400930 Fax: 01245 400933
Email: info@siteinvestigations.co.uk Website: www.siteinvestigations.co.uk

Chelmer Site Investigations

Client: Wandsworth Sand and Stone LTD	**Scale:** N.T.S.	**Sheet No:** 1 of 1	**Weather:** Internal	**Date:** 22.05.14
Site: 13-15 Johns Mews, London, WC1N 2PA	**Job No:** 4507	**Borehole No:** 3	**Boring method:** CFA 100mmØ Secondman	

Depth Mtrs.	Description of Strata	Thick-ness	Legend	Sample	Test Type	Test Result	Root Information	Depth to Water	Depth Mtrs
G.L.	CONCRETE	0.2					No roots observed.		
0.2	MADE GROUND: medium compact to compact, dark brown, sandy, very silty clay with brick and concrete rubble.	0.7		D					0.5
0.9	Borehole ends at 0.9 m obstruction. (Suspect concrete)Too dense for drill to penetrate.								

Drawn by: TP **Approved by:** ME

Remarks: *Borehole dry and open on completion.*

Key: T.D.T.D. Too Dense to Drive
D Small Disturbed Sample J Jar Sample
B Bulk Disturbed Sample V Pilcon Vane (kPa)
U Undisturbed Sample (U100) M Mackintosh Probe
W Water Sample N Standard Penetration Test Blow Count

Chelmer Site Investigations
Unit 15 East Hanningfield Industrial Estate
Old Church Road, East Hanningfield, Essex CM3 8AB
Telephone: 01245 400930 Fax: 01245 400933
Email: info@siteinvestigations.co.uk Website: www.siteinvestigations.co.uk

Chelmer Site Investigations

Client: Wandsworth Sand and Stone LTD	**Scale:** N.T.S.	**Sheet No:** 1 of 1	**Weather:** Internal	**Date:** 22.05.14
Site: 13-15 Johns Mews, London, WC1N 2PA	**Job No:** 4507	**Borehole No:** 4	**Boring method:** CFA 100mmØ Secondman	

Depth Mtrs.	Description of Strata	Thick-ness	Legend	Sample	Test Type	Test Result	Root Information	Depth to Water	Depth Mtrs
G.L.	CONCRETE	0.2					No roots observed.		
0.2	MADE GROUND: medium compact to compact, dark brown, sandy, very silty clay with brick and concrete rubble.	0.7		D					0.5
0.9	Borehole ends at 0.9 m obstruction. (Suspect concrete)Too dense for drill to penetrate.								

Drawn by: TP **Approved by:** ME

Remarks: *Borehole dry and open on completion.*

Key: T.D.T.D. Too Dense to Drive
D Small Disturbed Sample J Jar Sample
B Bulk Disturbed Sample V Pilcon Vane (kPa)
U Undisturbed Sample (U100) M Mackintosh Probe
W Water Sample N Standard Penetration Test Blow Count

Chelmer Site Investigations 'Groundbreaking Services'

Client: JM13 Ltd	Scale: N.T.S.	Sheet No: 1 of 2	Weather: Showers	Date: 18.08.15
Site: 13 - 15 John Mews, London, WC1N 2PA	Job No: 4507D	Borehole No: BH5	Boring method: Cable Percussive Rig	

Depth Mtrs.	Description of Strata	Thick-ness	Legend	Sample	Test Type Result	Root Information	Depth to Water	Depth Mtrs
G.L.	MADE GROUND: loose, brown silty gravelly fine sand with brick, concrete and ash fragments.	1.2		B B B	SPT N = 9	No roots observed below 0.0m.	GL - 0.50 0.50 - 1.20 1.20 - 2.00	1.20
1.2	MADE GROUND: very loose, brown slightly clayey, silty gravelly fine sand with brick, concrete and ash fragments. Becoming loose from 2.5m.	1.8		B	SPT N = 0 SPT N = 7 SPT N = 7		2.00 - 3.00	2.00 2.50 3.00
3.0	REWORKED GROUND: soft, black, silty clay.	0.5						
3.5	Firm, brown/grey gravelly silty CLAY.	0.5		B	SPT N = 13		3.50 - 4.00	3.50
4.0	Dense, brown, silty very sandy fine to coarse GRAVEL.	1.0		D B	CPT N = 44		4.00 - 5.00 *4.50*	4.00
5.0	Medium dense, yellow brown medium GRAVEL.	0.7		D	CPT N = 28			5.00
5.7	Firm brown/grey slightly sandy slightly gravelly silty CLAY with selenite crystals and mica.	0.3			CPT N = 12			5.50
6.0	Firm, brown/grey slightly sandy silty CLAY with mica.	1.0		D B U			5.70 - 6.50 6.00 - 6.45	5.70
7.0	Stiff, grey slightly sandy silty CLAY with mica. Becoming stiff from 8.0.	5.0		D D D D D U D D D	SPT N = 23 CPT N = 40 SPT N = 38 CPT N = 52		9.00 - 9.45	6.50 7.00 7.50 7.80 8.00 8.50 9.50 10.00 11.00 11.50
12.0	Boreholes ends at 12.0m			D				12.00

Drawn by: JR **Approved by:** JH

Remarks:

Key: T.D.T.D. Too Dense to Drive
D Small Disturbed Sample J Jar Sample
B Bulk Disturbed Sample V Pilcon Vane (kPa)
U Undisturbed Sample (U100) M Mackintosh Probe
W Water Sample N Standard Penetration Test Blow Count

Client: JM13 Ltd		**Scale:** N.T.S.	**Sheet No:** 2 of 2	**Weather:** Showers	**Date:** 18.08.15
Site: 13 - 15 John Mews, London, WC1N 2PA		**Job No:** 4507D	**Borehole No:** BH5	**Boring method:** Cable Percussive Rig	

Groundwater Encountered

Depth strike: 4.5m

Casing depth: 4.5m

Rose to 4.2m

Sealed out at 6.0m

Water level at start of boring: dry

Water level of finished of boring: dry

Borehole cased to: 6m

Piezometer/Standpipe: Standpipe installed to 12m

Pit/Chiselling: Chiseled from ground level to 1.2m for 1 hour

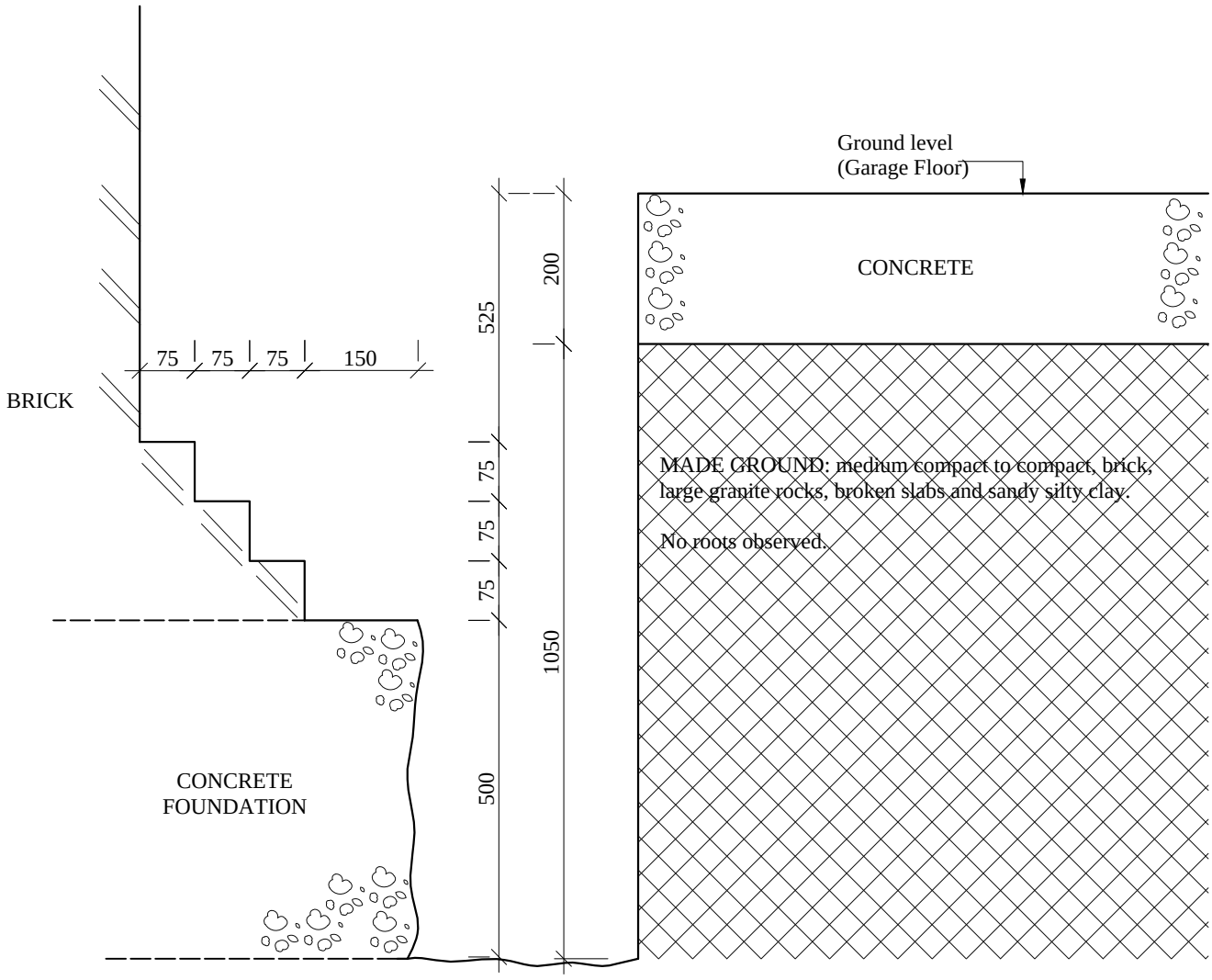
Water Added: 100 litres added from 4.0m to 5.7m

Notes:

Chelmer Site Investigations
Unit 15 East Hanningfield Industrial Estate
Old Church Road, East Hanningfield, Essex CM3 8AB
Telephone: 01245 400930 Fax: 01245 400933
Email: info@siteinvestigations.co.uk Website: www.siteinvestigations.co.uk

Client: Wandsworth Sand and Stone LTD	**Scale:** N.T.S.	**Sheet No:** 1 of 2	**Date:** 22.05.14
Location: 13-15 Johns Mews, London, WC1N 2PA	**Job No:** 4507	**Trial Pit No:** 1	**Weather:** Internal
Excavation Method: Hand Tools		**Drawn by:** MG	**Checked by:** ME

SECTION A



TP1A ABORTED AT 1250mm
DUE TO LARGE RUBBLE UNABLE TO ESTABLISH U/S FOUNDATION

Remarks:

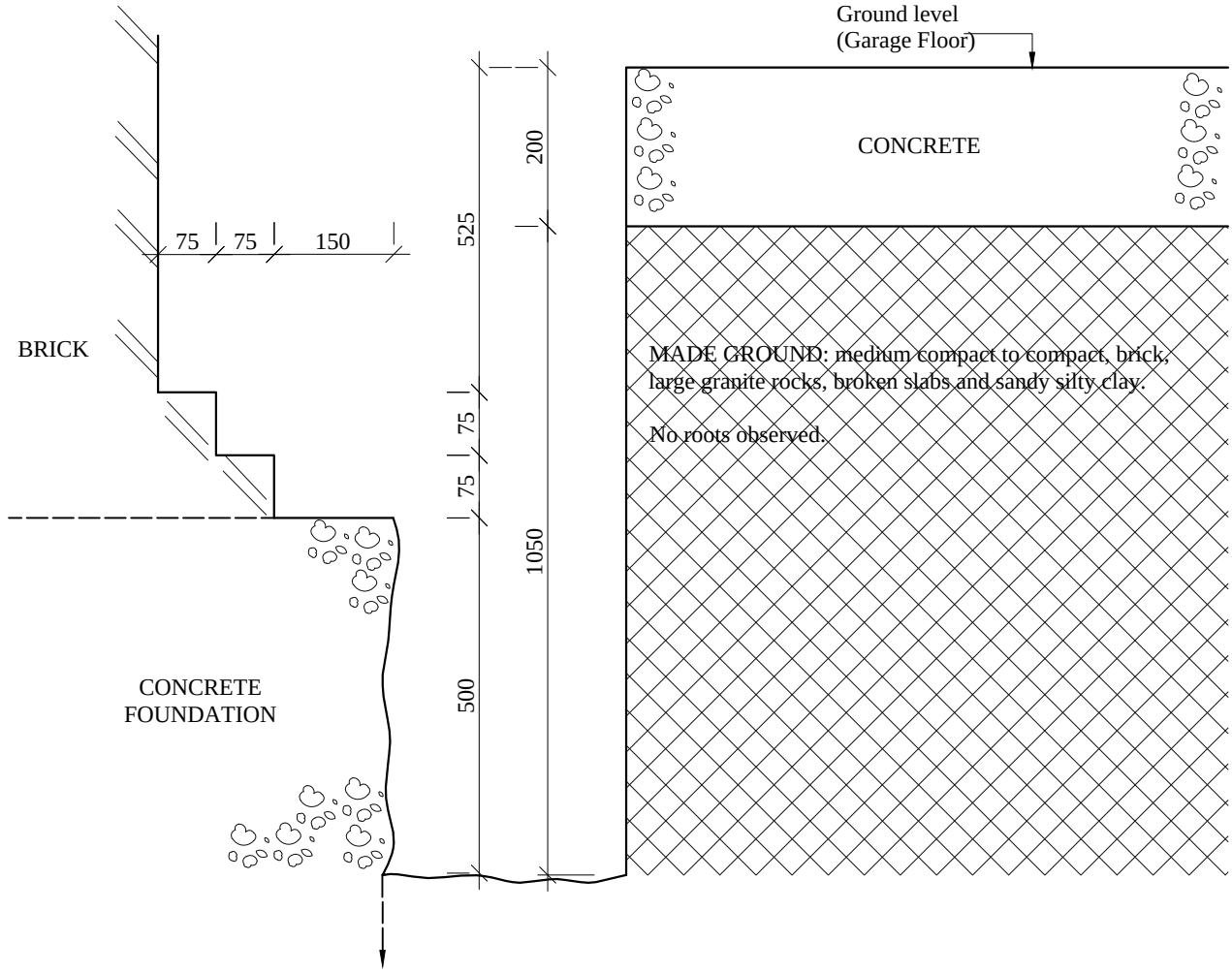
Key:

D Small disturbed sample	**J** Jar sample
B Bulk disturbed sample	**V** Pilcon Vane (kPa)
U Undisturbed sample (U100)	**M** Mackintosh Probe
N Standard Penetration Test Blow Count	**W** Water Sample

Chelmer Site Investigations
Unit 15 East Hanningfield Industrial Estate
Old Church Road, East Hanningfield, Essex CM3 8AB
Telephone: 01245 400930 Fax: 01245 400933
Email: info@siteinvestigations.co.uk Website: www.siteinvestigations.co.uk

Client: Wandsworth Sand and Stone LTD	**Scale:** N.T.S.	**Sheet No:** 2 of 2	**Date:** 22.05.14
Location: 13-15 Johns Mews, London, WC1N 2PA	**Job No:** 4507	**Trial Pit No:** 1	**Weather:** Internal
Excavation Method: Hand Tools		**Drawn by:** MG	**Checked by:** ME

SECTION B



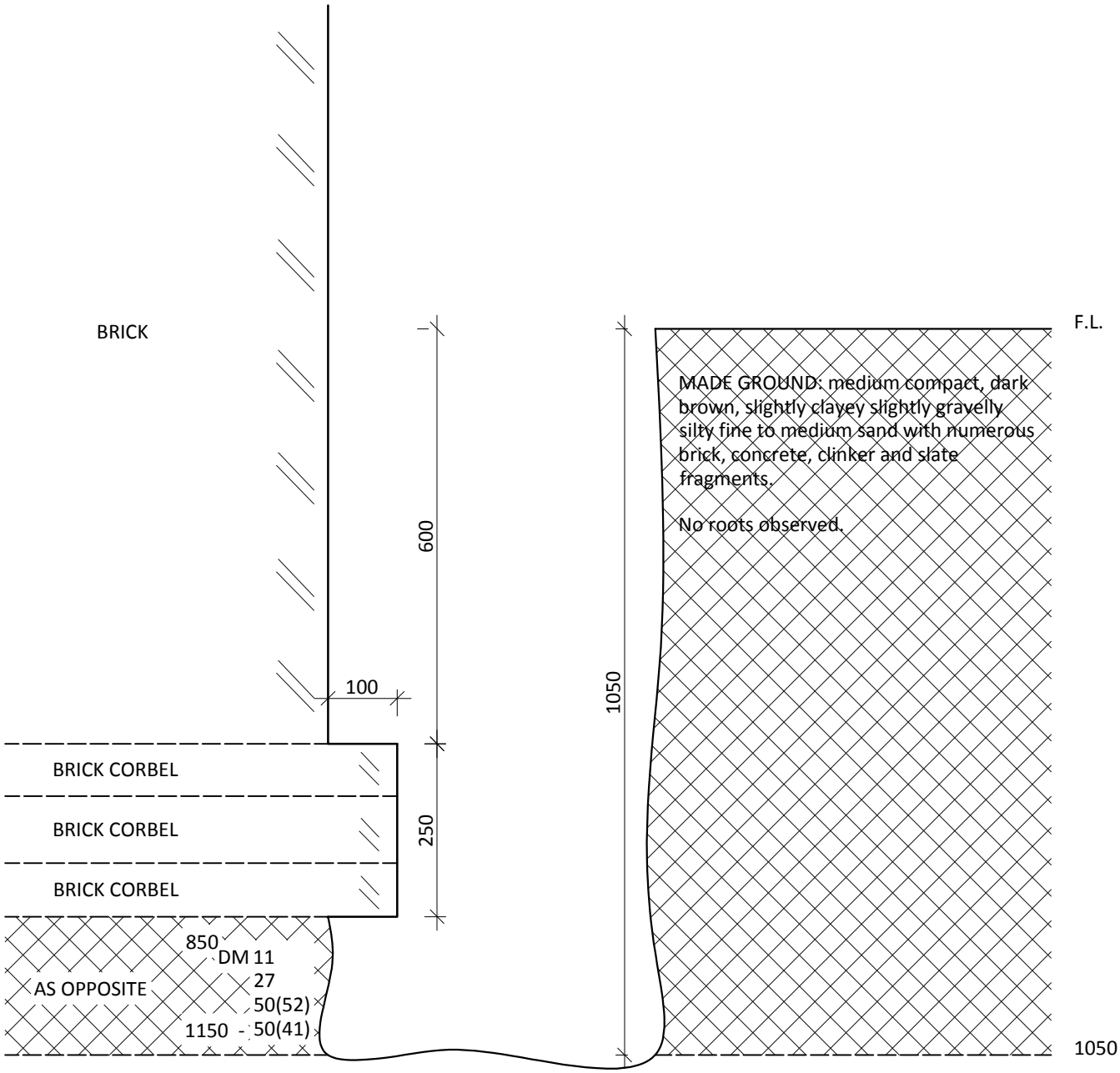
TP1 SECTION-B ABORTED AT 1250mm
DUE TO LARGE RUBBLE UNABLE TO ESTABLISH U/S FOUNDATION

Remarks:

Key:
D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample (U100)
N Standard Penetration Test Blow Count
J Jar sample
V Pilcon Vane (kPa)
M Mackintosh Probe
W Water Sample

Client: Wandsworth Sand and Stone LTD	**Scale:** N.T.S.	**Sheet No:** 1 of 2	**Date:** 04.08.15
Location: 13-15 Johns Mews, London, WC1N 2PA	**Job No:** 4507D	**Trial Pit No:** 2	**Weather:** Internal
Excavation Method: Hand Tools		**Drawn by:** DB	**Checked by:** JH

SECTION A



TP2 SECTION A ENDS AT 1050mm

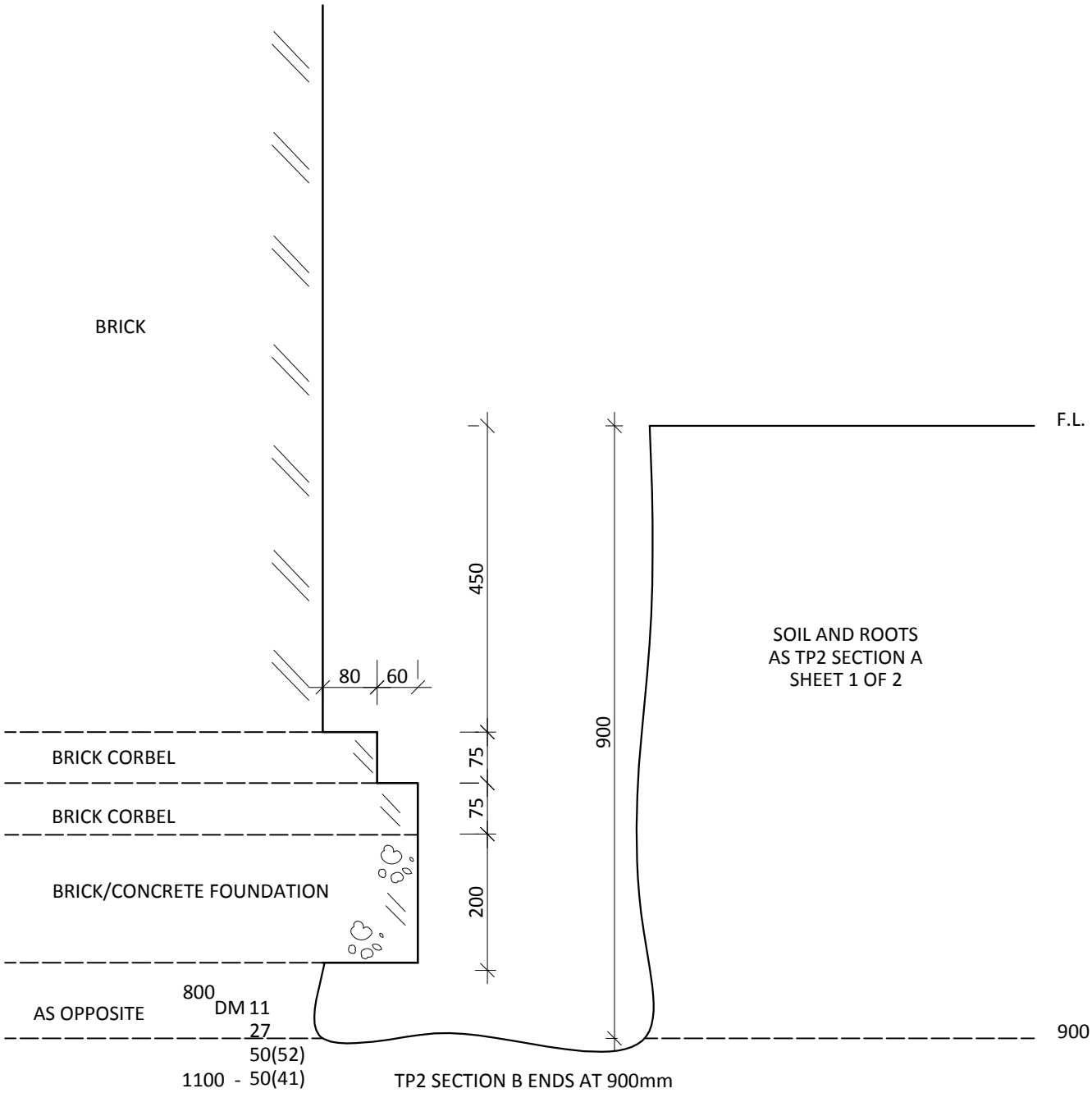
Remarks: Excavated by others.

Key:

D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample (U100)
N Standard Penetration Test Blow Count
J Jar sample
V Pilcon Vane (kPa)
M Mackintosh Probe
W Water Sample

Client: Wandsworth Sand and Stone LTD	**Scale:** N.T.S.	**Sheet No:** 2 of 2	**Date:** 04.08.15
Location: 13-15 Johns Mews, London, WC1N 2PA	**Job No:** 4507D	**Trial Pit No:** 2	**Weather:** Internal
Excavation Method: Hand Tools		**Drawn by:** DB	**Checked by:** JH

SECTION B

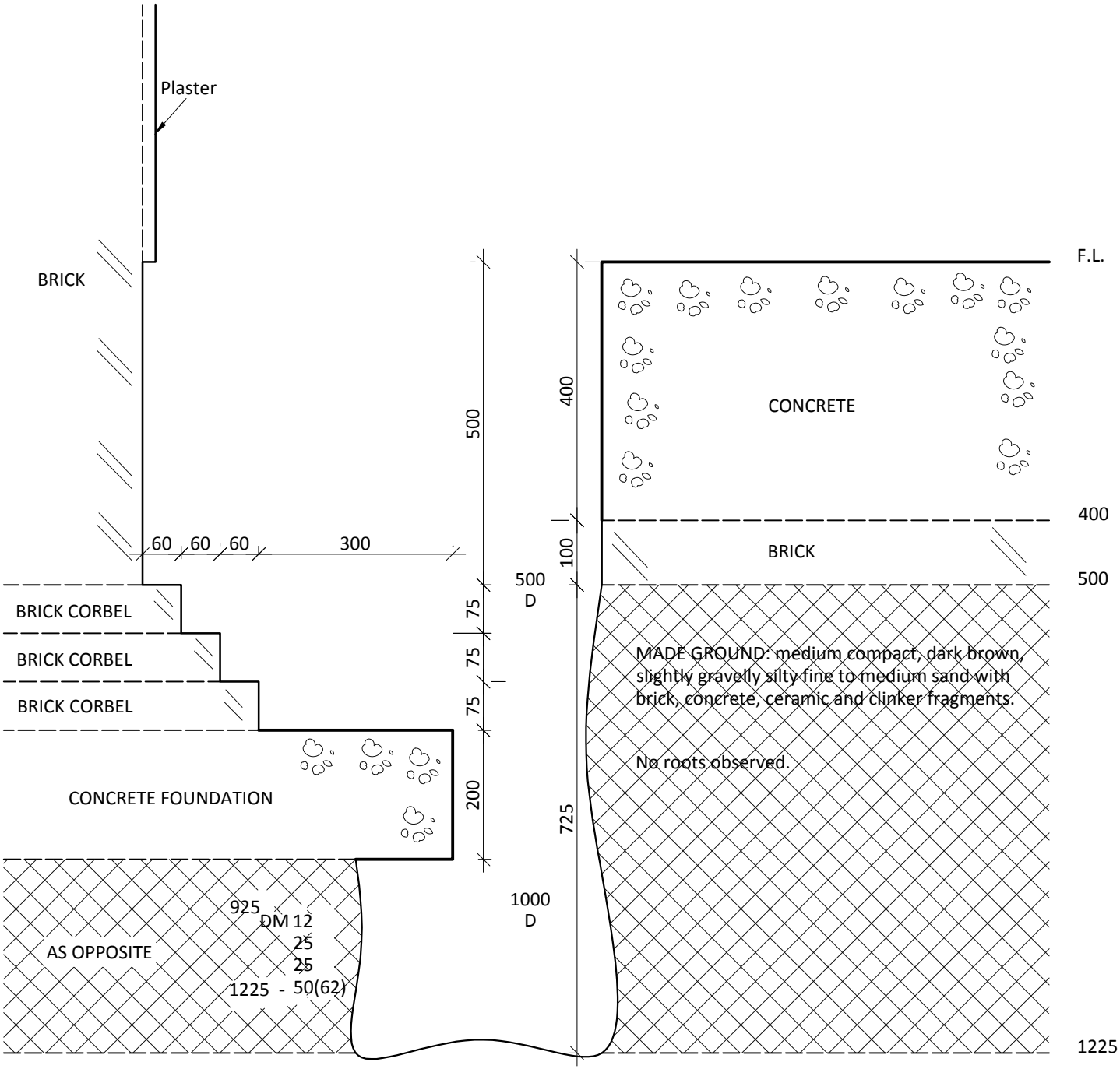


Remarks: Excavated by others.

Key:

D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample (U100)
N Standard Penetration Test Blow Count
J Jar sample
V Pilcon Vane (kPa)
M Mackintosh Probe
W Water Sample

Client: Wandsworth Sand and Stone LTD	**Scale:** N.T.S.	**Sheet No:** 1 of 1	**Date:** 04.08.15
Location: 13-15 Johns Mews, London, WC1N 2PA	**Job No:** 4507D	**Trial Pit No:** 3	**Weather:** Internal
Excavation Method: Hand Tools		**Drawn by:** DB	**Checked by:** JH



TP3 ENDS AT 1225mm

Remarks: Excavated by others.

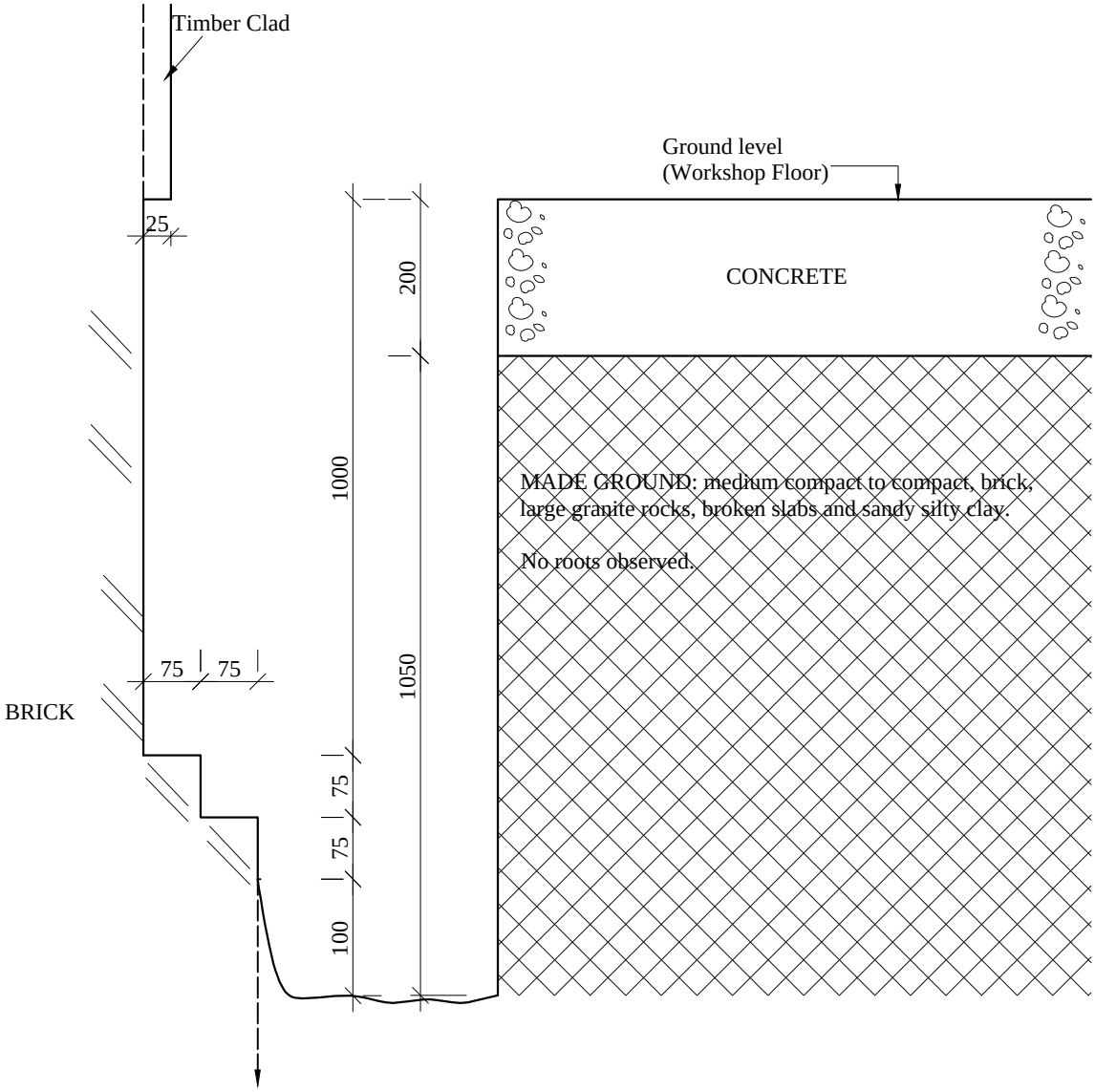
Key:

D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample (U100)
N Standard Penetration Test Blow Count
J Jar sample
V Pilcon Vane (kPa)
M Mackintosh Probe
W Water Sample

Chelmer Site Investigations
Unit 15 East Hanningfield Industrial Estate
Old Church Road, East Hanningfield, Essex CM3 8AB
Telephone: 01245 400930 Fax: 01245 400933
Email: info@siteinvestigations.co.uk Website: www.siteinvestigations.co.uk

Client: Wandsworth Sand and Stone LTD	**Scale:** N.T.S.	**Sheet No:** 1 of 2	**Date:** 22.05.14
Location: 13-15 Johns Mews, London, WC1N 2PA	**Job No:** 4507	**Trial Pit No:** 4	**Weather:** Internal
Excavation Method: Hand Tools		**Drawn by:** MG	**Checked by:** ME

SECTION A



TP4 SECTION-A ABORTED AT 1250mm
DUE TO MAINS SERVICES AND LARGE RUBBLE UNABLE TO ESTABLISH U/S FOUNDATION

Remarks:

Key:

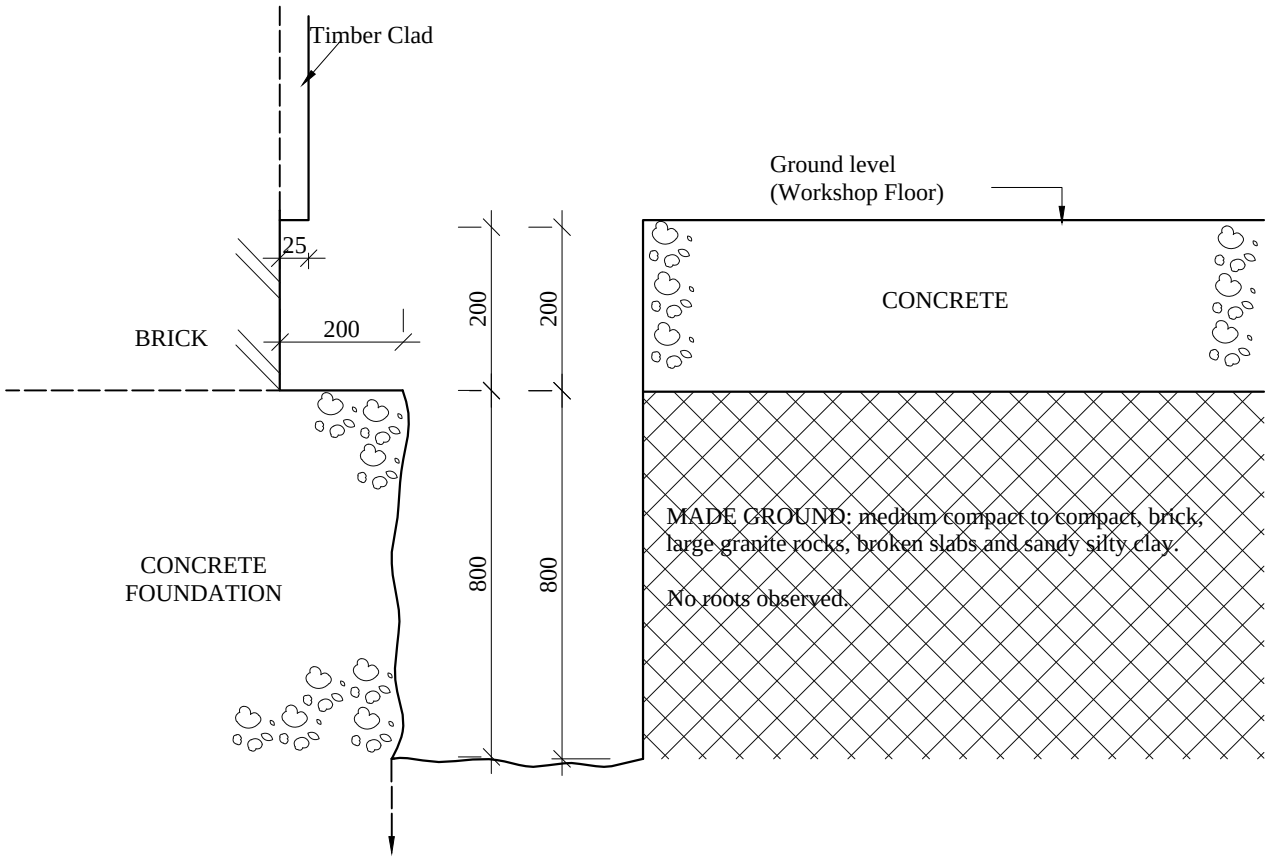
D Small disturbed sample	**J** Jar sample
B Bulk disturbed sample	**V** Pilcon Vane (kPa)
U Undisturbed sample (U100)	**M** Mackintosh Probe
N Standard Penetration Test Blow Count	**W** Water Sample

Chelmer Site Investigations
Unit 15 East Hanningfield Industrial Estate
Old Church Road, East Hanningfield, Essex CM3 8AB
Telephone: 01245 400930 Fax: 01245 400933
Email: info@siteinvestigations.co.uk Website: www.siteinvestigations.co.uk

Client: Wandsworth Sand and Stone LTD	**Scale:** N.T.S.	**Sheet No:** 2 of 2	**Date:** 22.05.14
Location: 13-15 Johns Mews, London, WC1N 2PA	**Job No:** 4507	**Trial Pit No:** 4	**Weather:** Internal
Excavation Method: Hand Tools		**Drawn by:** MG	**Checked by:** ME

SECTION B

FRONT WALL ELEVATION

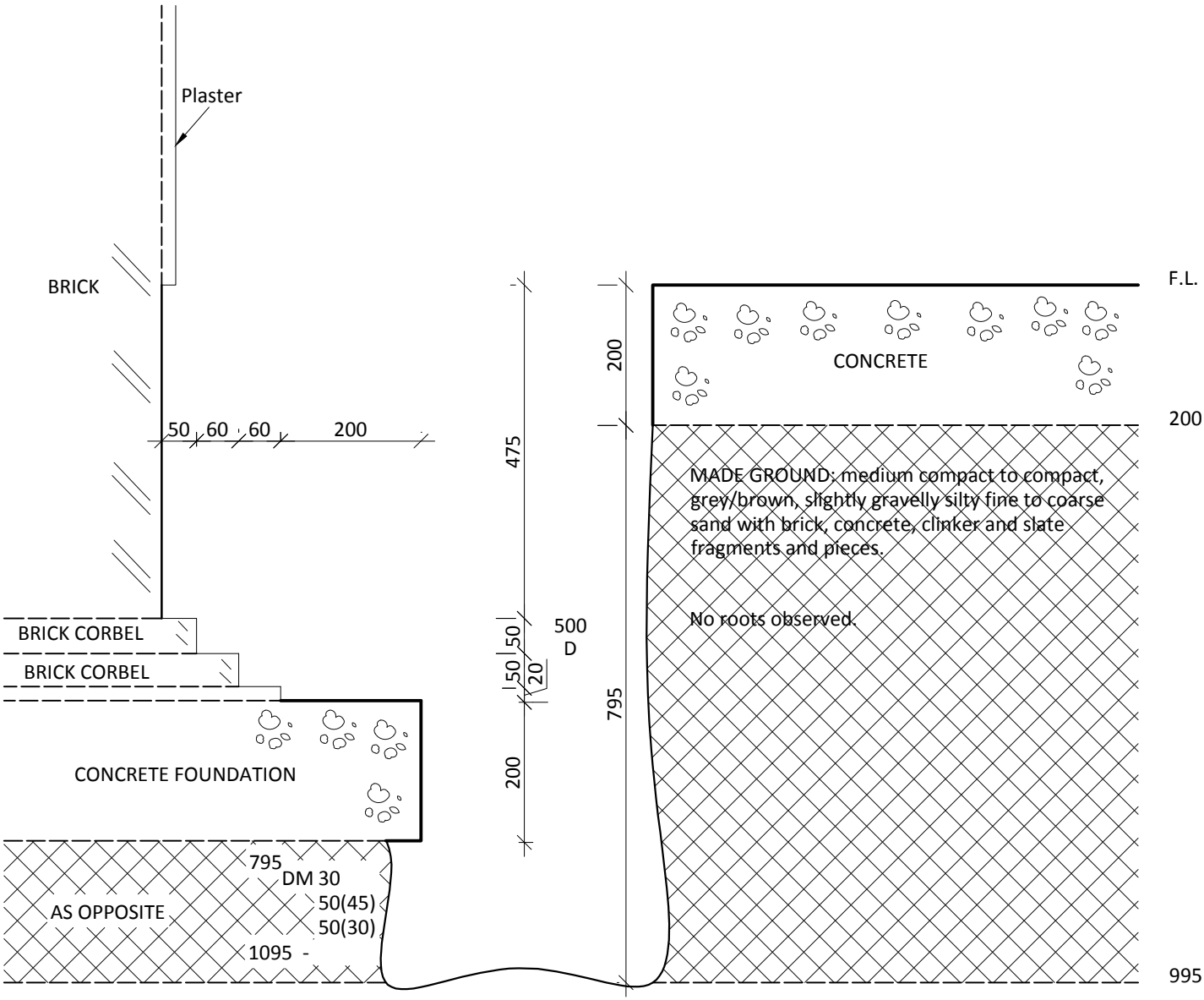


TP4 SECTION-B ABORTED AT 1000mm
DUE TO MAINS SERVICES AND LARGE RUBBLE UNABLE TO ESTABLISH U/S FOUNDATION

Remarks:

Key:
D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample (U100)
N Standard Penetration Test Blow Count
J Jar sample
V Pilcon Vane (kPa)
M Mackintosh Probe
W Water Sample

Client: Wandsworth Sand and Stone LTD	**Scale:** N.T.S.	**Sheet No:** 1 of 1	**Date:** 04.08.15
Location: 13-15 Johns Mews, London, WC1N 2PA	**Job No:** 4507D	**Trial Pit No:** 5	**Weather:** Internal
Excavation Method: Hand Tools		**Drawn by:** DB	**Checked by:** JH



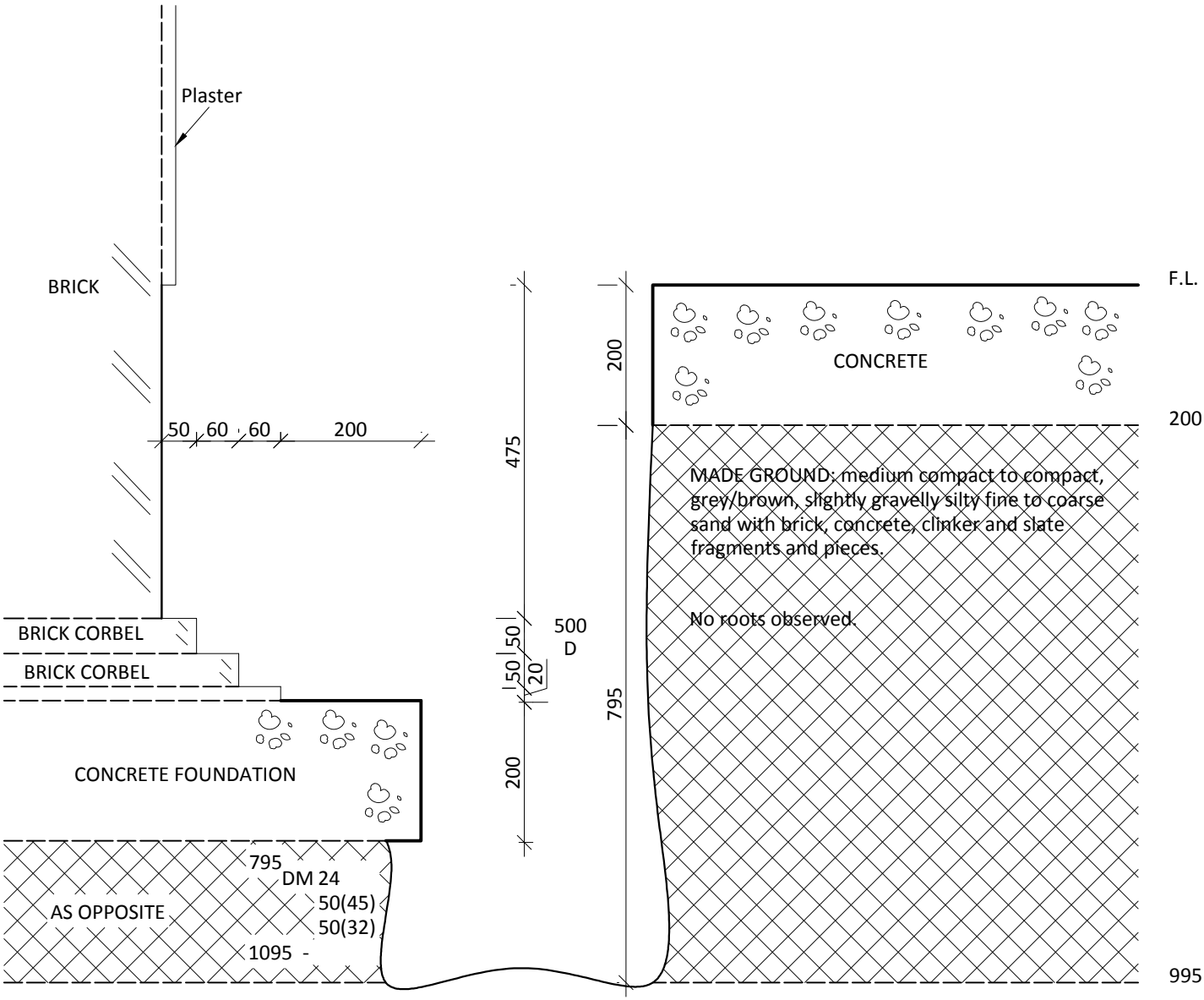
TP5 ENDS AT 995mm

Remarks: Excavated by others.
Sections A and B are the same.

Key:

D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample (U100)
N Standard Penetration Test Blow Count
J Jar sample
V Pilcon Vane (kPa)
M Mackintosh Probe
W Water Sample

Client: Wandsworth Sand and Stone LTD	**Scale:** N.T.S.	**Sheet No:** 1 of 1	**Date:** 04.08.15
Location: 13-15 Johns Mews, London, WC1N 2PA	**Job No:** 4507D	**Trial Pit No:** 6	**Weather:** Internal
Excavation Method: Hand Tools		**Drawn by:** DB	**Checked by:** JH



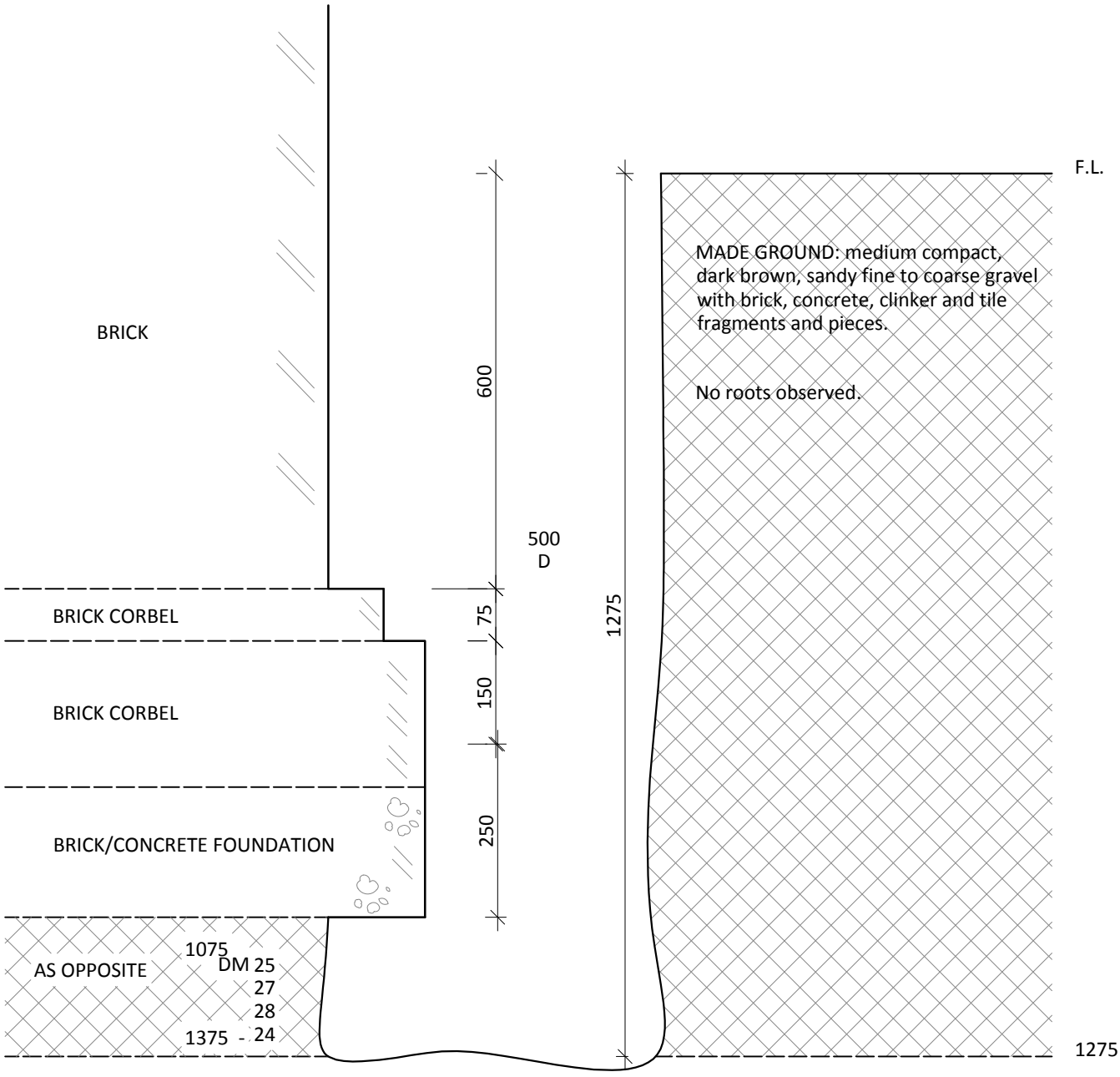
TP6 ENDS AT 995mm

Remarks: Excavated by others.

Key:

D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample (U100)
N Standard Penetration Test Blow Count
J Jar sample
V Pilcon Vane (kPa)
M Mackintosh Probe
W Water Sample

Client: Wandsworth Sand and Stone LTD	**Scale:** N.T.S.	**Sheet No:** 1 of 1	**Date:** 04.08.15
Location: 13-15 Johns Mews, London, WC1N 2PA	**Job No:** 4507D	**Trial Pit No:** 7	**Weather:** Internal
Excavation Method: Hand Tools		**Drawn by:** DB	**Checked by:** JH



TP7 ENDS AT 1275mm

Remarks: Excavated by others.
Sections A and B are the same.

Key:

D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample (U100)
N Standard Penetration Test Blow Count
J Jar sample
V Pilcon Vane (kPa)
M Mackintosh Probe
W Water Sample

Gas/Groundwater Monitoring Results Sheet

Site Ref: 4507F
Site Name: 13-15 John Mews, London, WC1N 2PA

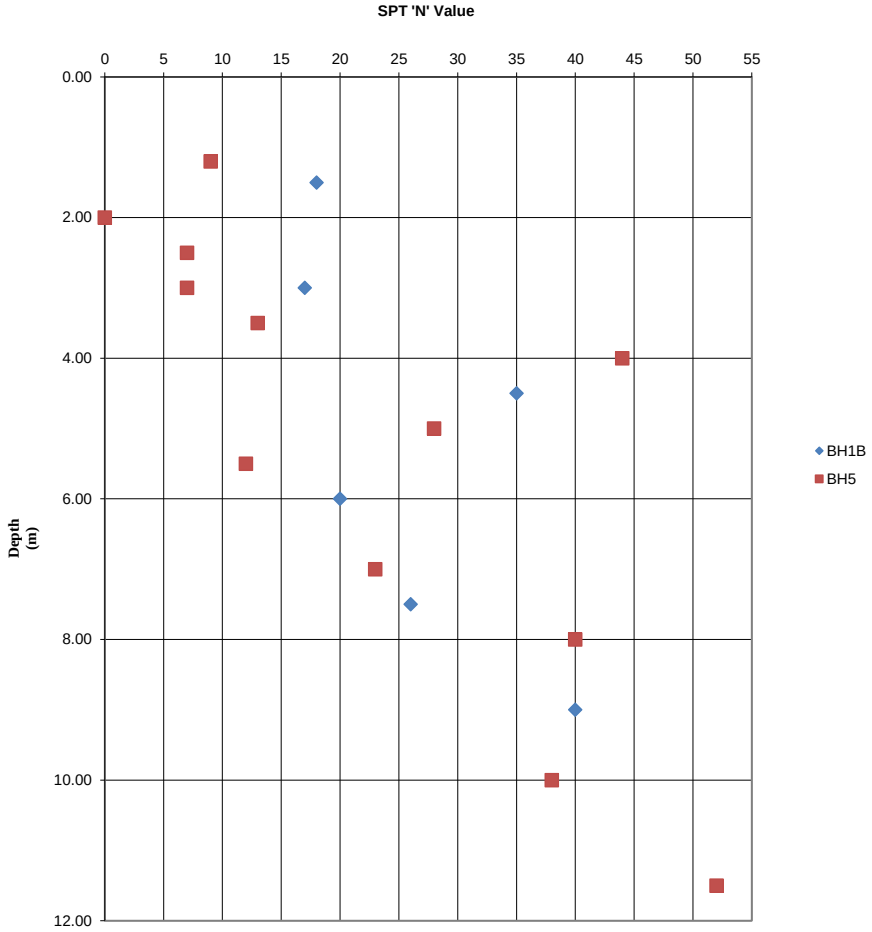
Well	Date	Methane Peak	Methane Steady	Methane GSV	Carbon Dioxide Peak	Carbon Dioxide Steady	Carbon Dioxide GSV	Oxygen	Atmos.	Flow	Response Zone	Depth to Water	CO	H2S
		%v/v	%v/v	l/hr	%v/v	%v/v	l/hr	%v/v	mbar	l/hr	m bgl	m bgl	ppm	ppm
BH5	02.09.15	-	-		-	-		-	-	-	1.00-12.00	3.80	-	-
	09.09.15	0.0	0.0	0.0000	4.2	3.9	0.0210	14.2	1020	0.5		3.60	0	0
	14.09.15	-	-		-	-		-	-	-		3.48	-	-
	22.09.15	-	-		-	-		-	-	-		3.35	-	-
	20.01.16	0.1	0.1	0.0002	2.0	2.0	0.0040	19.4	1021	0.2		2.95	0	0
	03.03.16	-	-		-	-		-	-	-		2.92	-	-
	10.03.16	-	-		-	-		-	-	-		3.00	-	-
BH1B	30.07.14	0.1	<0.1	0.0002	0.1	0.1	0.0040	20.5	1015	0.5	1.00-8.00	3.39	0	0
	10.08.14	0.1	0.1	0.0002	1.1	0.8	0.0040	18.8	997	0.6		3.27	0	0
	14.09.15	-	-		-	-		-	-	-		3.18	-	-
	22.09.15	-	-		-	-		-	-	-		3.13	-	-
	20.01.15	0.1	0.1	0.0003	0.1	0.1	0.0003	21.2	1021	0.3		3.00	0	0
	03.03.16	-	-		-	-		-	-	-		3.09	-	-
	10.03.16	-	-		-	-		-	-	-		3.20	-	-

CHELMER SITE INVESTIGATIONS	Penetration Test versus Depth Profile	Unit 15, East Hanningfield Industrial Estate, Old Church Road, East Hanningfield, Essex CM3 8AB Tel - (01245 400930) Fax - (01245 400933)

Project Name :	13-15 John's Mews, London WC1N 2PA	Job No. :	GENV 4507F
		Date :	May 2016

BH1B		BH5			
Depth (m)	CPT/SPT 'N' value	Depth (m)	CPT/SPT N' value	Depth (m)	CPT/SPT N' value
1.50	18	1.20	9		
3.00	17	2.00	0		
4.50	35	2.50	7		
6.00	20	3.00	7		
7.50	26	3.50	13		
9.00	40	4.00	44		
		5.00	28		
		5.50	12		
		7.00	23		
		8.00	40		
		10.00	38		
		11.50	52		

NB : 'N' values greater than 50 reported as 50 above



UKAS TESTING
8284

Chelmer Geotechnical Laboratories

Chelmer Geotechnical Laboratories

Unit 15, East Hanningfield Industrial Estate

Old Church Road, East Hanningfield, Essex CM3 8AB

Telephone: 01245 400 930 **Fax:** 01245 400 933

Email: info@siteinvestigations.co.uk **Website**: www.soillabs.co.uk

Geotechnical Testing

Client : Wandsworth Sand and Stone Ltd

Site Name : 13-15 Johns Mews, London WC1N 2PA

Client Reference : CSI4507

CGL Reference : CGL04289

Date of Completion : 13-Aug

UKAS TESTING
8284

Chelmer Geotechnical Laboratories

Content Summary

This report contains all test results indicated on the attached test instruction/summary (Q17).

CGL Reference :	CGL04289
Client Reference :	CSI4507
For the attention of :	Wandsworth Sand and Stone Ltd
This report comprises of the following :	1 Page of Results
	1 Moisture/Shear Strength Chart
	1 Plasticity Chart

Notes :

General

Please refer to report summary notes for details pertaining to methods undertaken and their subsequent accreditations

Samples were supplied by Chelmer Site Investigations

All tests performed in-house unless otherwise stated

Deviant Samples

Samples were received in suitable containers	Yes
A date and time of sampling was provided	Yes
Arrived damaged and/or denatured	No

Laboratory Testing Results

BS 1377 : 1990

Chelmer Geotechnical Laboratories

Job Number : CGL04289
Client : Wandsworth Sand and Stone Ltd
Client Reference : CSI4507
Site Name : 13-15 Johns Mews, London WC1N 2PA

Date Received : 30/07/2014
Date Testing Started : 08/08/2014
Date Testing Completed : 13/08/2014
Laboratory Used : Chelmer Geotechnical, CM3 8AB

Sample Ref				Moisture Content (%) [1]	Soil Faction > 0.425mm (%) [2]	Liquid Limit (%) [3]	Plastic Limit (%) [4]	Plasticity Index (%) [5]	Liquidity Index (%) [5]	Modified Plasticity Index (%) [6]	Soil Class [7]	Filter Paper Contact Time (h) [8]	Soil Sample Suction (kPa)	Insitu Shear Vane Strength (kPa) [9]	Organic Content (%) [10]	pH Value [11]	Sulphate Content		
BH/TP/WS	Depth	UID	Sample Type														SO_3 [12]	SO_4 [13]	Class [14]
1B	7.0	55860	D	33	<5	80	18	62	0.24	62	CV								
1B	8.0	55862	D	28	<5	68	14	54	0.26	54	CH					7.9	0.82	0.99	DS-2
1B	9.0	55863	D	28	<5	67	16	51	0.22	51	CH								
1B	10.0	55864	D													8.1	0.66	0.79	DS-2

Notes :-

[1] BS 1377 : Part 2 : 1990, Test No 3.2
[2] Estimated if <5%, otherwise measured
[3] BS 1377 : Part 2 : 1990, Test No 4.4
[4] BS 1377 : Part 2 : 1990, Test No 5.3
[5] BS 1377 : Part 2 : 1990, Test No 5.4
[6] BRE Digest 240 : 1993
[7] BS 5930 : 1981 : Figure 31 - Plasticity Chart for the classification of fine soils
[8] In-house method S9a adapted from BRE IP 4/93
[9] Values of shear strength were determined in situ by Chelmer Site Investigations using a Pilcon hand vane or Geonor vane (GV).
[10] BS 1377 : Part 3 : 1990, Test No 4
[11] BS 1377 : Part 2 : 1990, Test No 9
[12] BS 1377 : Part 3 : 1990, Test No 5.6
[13] $SO_4 = 1.2 \times SO_3$
[14] BRE Special Digest One (Concrete in Aggressive Ground) 2005

Note that if the SO_4 content falls into the DS-4 or DS-5 class, it would be prudent to consider the sample as falling into the DS-4m or DS-5m class respectively unless water soluble magnesium testing is undertaken to prove otherwise

Key

D	Disturbed sample
B	Bulk sample
U	U100 (undisturbed sample)
W	Water sample
ENP	Essentially Non-Plastic
U/S	Underside Foundation

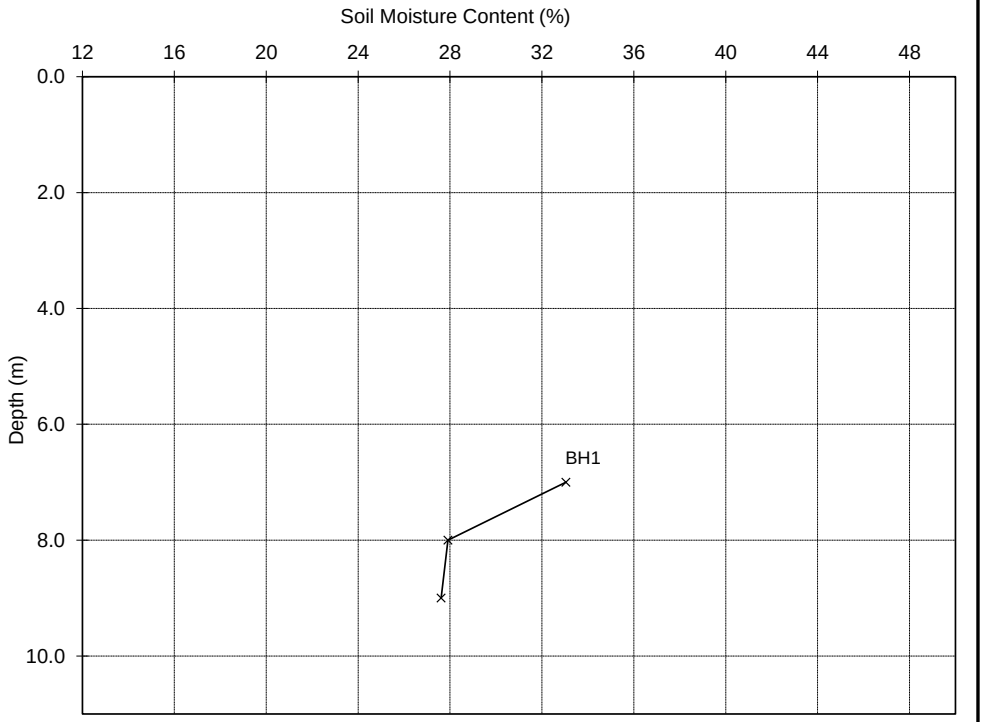
Comments :-

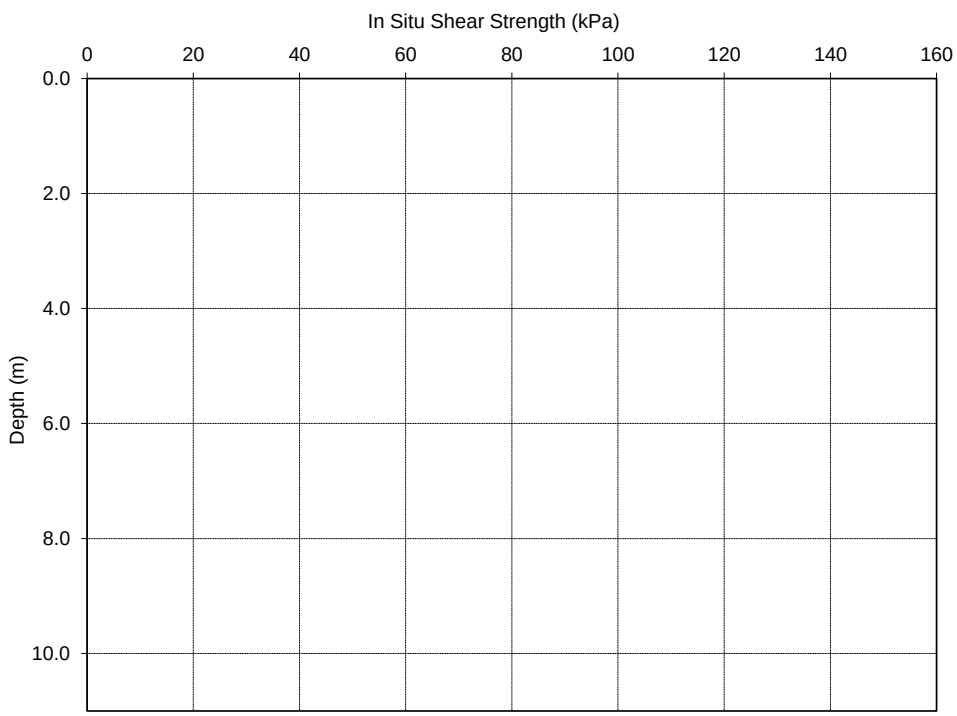
Technician :- MT
Checked By :- ME
Date Checked :- 13-Aug-14

Laboratory Testing Results

Moisture Content/Shear Strength Profile

Job Number :	CGL04289	Date Received :	30/07/2014
Client :	Wandsworth Sand and Stone Ltd	Date Testing Started :	08/08/2014
Client Reference :	CSI4507	Date Testing Completed :	13/08/2014
Site Name :	13-15 Johns Mews, London WC1N 2PA	Laboratory :	Chelmer Geotechnical Laboratories, CM3 8AB





Notes :-

1. If the Soil Fraction > 0.425mm exceeds 5% the Equivalent Moisture Content of the remainder (calculated in accordance with BS 1377: Part 2 : 1990, cl.3.2.4 note 1) is also plotted and the alternative profile additionally shown as an appropriately coloured broken line.
2. If plotted, 0.4 LL and PL+2 (after Driscoll, 1983) should only be applied to London Clay (and similarly over consolidated clays) at shallow depths.

Unless otherwise stated, values of Shear Strength were determined in situ by Chelmer Site Investigations using a Pilcon Hand Vane the calibration of which is limited to a maximum reading of 140 kPa.

Comments :-

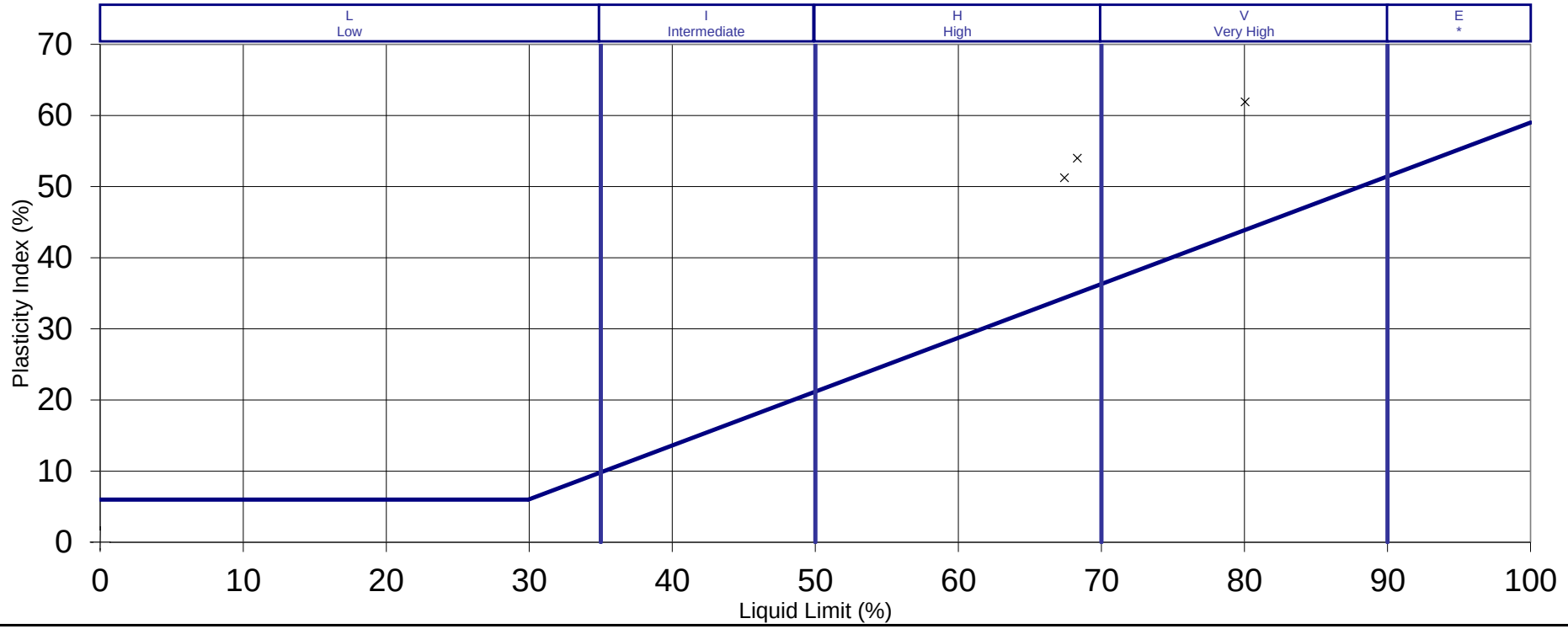
Checked By :- ME Date Checked :- 13-Aug-14

Laboratory Testing Results

Plasticity Chart for the classification of fine soils and the finer part of coarse soils
In Compliance with BS5930 : 1999

Chelmer Geotechnical Laboratories

Job Number :	CGL04289	Date Received :	30/07/2014
Client :	Wandsworth Sand and Stone Ltd	Date Testing Started :	08/08/2014
Client Reference :	CSI4507	Date Testing Completed :	13/08/2014
Site Name :	13-15 Johns Mews, London WC1N 2PA	Laboratory :	Chelmer Geotechnical Laboratories, CM3 8AB



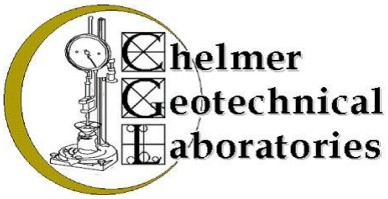
Notes :-

SILT (M-SOIL), M, plots below A-Line
CLAY, C, plots above A-Line }M and C may be combined as FINE SOIL, F.

Key :- BH1

Comments :-

Checked By :- ME Date Checked :- 13-Aug-14



Where our involvement consists exclusively of testing samples, the results and comments (if provided) relate only to the samples tested.

Any samples that are deemed to be subject to deviation will be recorded as such within the test summary.

Nicholls Colton Analytical
7 - 11 Harding Street
Leicester
LE1 4DH

Chelmer Site Investigations
Unit 15
East Hanningfield Industrial Estate
CM3 8AB

Analytical Test Report: L14/1556/CSI/001 - Amendment A

Your Project Reference:	**Johns Mews**	Samples Received on:	01.08.2014
Your Order Number:	CSI4507	Testing Instruction Received:	01.08.2014
Report Issue Number:	1	Sample Tested :	01 to 12.08.2014
Samples Analysed	4 Soils	Report issued:	13.08.2014

Signed

James Gane
Manager - Data Logistics
Nicholls Colton Analytical

Notes:

General

Please refer to Methodologies tab for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report .

Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep, oven dried at <30˚C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

With the exception of Sulphate, Sulpur and LoI which are crushed over the 2mm test sieve, concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve. As received samples have been corrected for moisture content but not stone content.

Samples were supplied by customer.

Deviant Samples

Samples were received in suitable containers	**Yes**
A date and time of sampling was provided	**Yes**
Some sample handling times were exceeded prior to analysis of determinants	**Yes**

Where samples do not meet one or more of the above criteria they will be classed as deviant, this means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

WAC Testing

Samples were leached in accordance with BS EN 12457-2: 2002.

Eluate Results are reported as L/S 10. These results have been calculated in accordance with BS EN 12457-2:2002.

Comparative values are taken from the Environment Agency document “Guidance for waste destined for disposal in landfills”, Version 2, June 2006.

Nicholls Colton Analytical
7 - 11 Harding Street
Leicester
LE1 4DH

L14/1556/CSI/001 - Amendment A

Project Reference - Johns Mews

Analytical Test Results - Env Suite 1

NCA Reference			14-26209	14-26210	14-26211
Client Sample Reference			BH1A	BH1B	BH1B
Client Sample Location			BH1A	BH1B	BH1B
Depth (m)			0.50	0.50	1.00
Date of Sampling			30.07.2014	30.07.2014	30.07.2014
Time of Sampling			AM	AM	AM
Sample Matrix			Sand	Sand	Clay
Determinant	**Units**	**Accreditation**			
Arsenic	(mg/kg)	MCERTS	20.0	13.0	19.5
Cadmium	(mg/kg)	MCERTS	0.6	0.4	0.6
Chromium (Total)	(mg/kg)	MCERTS	1.5	4.3	6.2
Copper	(mg/kg)	MCERTS	185	76.7	134
Lead	(mg/kg)	MCERTS	736	503	739
Mercury	(mg/kg)	UKAS	5.2	< 2.5	4.7
Nickel	(mg/kg)	MCERTS	21.1	14.6	22.9
Selenium	(mg/kg)	None	< 8	< 8	< 8
Zinc	(mg/kg)	MCERTS	122	66.8	124
Total Phenols	(mg/kg)	MCERTS	<1.2	<1.3	<1.3
Cyanide (Total)	(mg/kg)	MCERTS	<1.2	<1.3	<1.3
pH	pH Units	MCERTS	8.0	10.7	7.5
Sulphate	(mg/l)	None	1400	610	510
Sulphur	(%)	None	0.19	0.13	0.26
Sulphide	(mg/kg)	None	<4.0	<4.0	34.1
Acenaphthene	(mg/kg)	MCERTS	<0.1	<0.1	<0.1
Acenaphthylene	(mg/kg)	UKAS	<0.1	<0.1	<0.1
Anthracene	(mg/kg)	UKAS	0.1	<0.1	<0.1
Benzo (a) anthracene	(mg/kg)	MCERTS	1.7	<0.1	<0.1
Benzo (a) pyrene	(mg/kg)	MCERTS	1.8	<0.1	<0.1
Benzo (b) fluoranthene	(mg/kg)	MCERTS	2.2	<0.1	<0.1
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	1.2	<0.1	<0.1
Benzo (k) fluoranthene	(mg/kg)	MCERTS	0.6	<0.1	<0.1
Chrysene	(mg/kg)	MCERTS	1.5	<0.1	<0.1
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	0.1	<0.1	<0.1
Fluoranthene	(mg/kg)	MCERTS	3.0	0.1	<0.1
Fluorene	(mg/kg)	MCERTS	<0.1	<0.1	<0.1
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	MCERTS	1.1	<0.1	<0.1
Naphthalene	(mg/kg)	MCERTS	<0.1	<0.1	<0.1
Phenanthrene	(mg/kg)	MCERTS	1.0	0.2	0.3
Pyrene	(mg/kg)	MCERTS	3.0	0.1	<0.1
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	17.7	1.7	1.8

Nicholls Colton Analytical
7 - 11 Harding Street
Leicester
LE1 4DH

L14/1556/CSI/001 - Amendment A

Project Reference - Johns Mews

Analytical Test Results - TPH CWG

NCA Reference			14-26209	14-26210	14-26211
Client Sample Reference			BH1A	BH1B	BH1B
Client Sample Location			BH1A	BH1B	BH1B
Depth (m)			0.50	0.50	1.00
Date of Sampling			30.07.2014	30.07.2014	30.07.2014
Time of Sampling			AM	AM	AM
Sample Matrix			Sand	Sand	Clay
Determinant	**Units**	**Accreditation**			
Aliphatics					
$>C_5$ to C_6	(mg/kg)	None	<0.03	<0.03	0.08
$>C_6$ to C_8	(mg/kg)	None	<0.03	<0.03	0.25
$>C_8$ to C_{10}	(mg/kg)	None	<0.03	<0.03	<0.03
$>C_{10}$ to C_{12}	(mg/kg)	None	<11	<12	<13
$>C_{12}$ to C_{16}	(mg/kg)	None	<11	<12	<13
$>C_{16}$ to C_{21}	(mg/kg)	None	<11	<12	<13
$>C_{21}$ to C_{35}	(mg/kg)	None	42	<12	17
Aromatics					
$>C_5$ to C_7	(mg/kg)	None	<0.03	<0.03	<0.03
$>C_7$ to C_8	(mg/kg)	None	<0.03	<0.03	<0.03
$>C_8$ to C_{10}	(mg/kg)	None	<0.03	<0.03	<0.03
$>C_{10}$ to C_{12}	(mg/kg)	None	<11	<12	<13
$>C_{12}$ to C_{16}	(mg/kg)	None	<11	<12	<13
$>C_{16}$ to C_{21}	(mg/kg)	None	15	<12	<13
$>C_{21}$ to C_{35}	(mg/kg)	None	130	13	31

Nicholls Colton Analytical
7 - 11 Harding Street
Leicester
LE1 4DH

L14/1556/CSI/001 - Amendment A

Project Reference - Johns Mews

Certificate Of Analysis - WAC Suite

NCA Reference	14-26212
Client Sample Reference	BH1B
Sample Description	Dark brown slightly sandy clay.
Depth (m)	1.5
Date of Sampling	30.07.2014
Time of Sampling	AM
Sample Matrix	Clay
Moisture Content (%)	28
Stone content (%)	0

			Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
Solid Analysis						
Total Organic Carbon	%	MCERTS	6.4	3.0	5.0	6.0
Loss on Ignition	%	UKAS	11.0	-	-	10.0
BTEX	mg/kg	MCERTS	<0.3	6.00	-	-
PCB's (7 Congeners)	mg/kg	-	0.04	1.00	-	-
Mineral Oil ($>C_{10}$ to C_{40})	mg/kg	-	111	500	-	-
PAH	mg/kg	-	1.9	100	-	-
pH	units	MCERTS	7.6	-	> 6	-
Eluate Analysis						
Arsenic	mg/kg	-	0.07	0.50	2	25
Barium	mg/kg	-	0.26	20	100	300
Cadmium	mg/kg	-	< 0.03	0.04	1	5
Chromium (total)	mg/kg	-	< 0.03	0.5	10	70
Copper	mg/kg	-	< 0.10	2.0	50	100
Mercury	mg/kg	-	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	-	0.40	0.5	10.0	30
Nickel	mg/kg	-	< 0.03	0.4	10.0	40
Lead	mg/kg	-	< 0.10	0.5	10.0	50
Antimony	mg/kg	-	0.81	0.06	0.7	5
Selenium	mg/kg	-	< 0.10	0.1	0.5	7
Zinc	mg/kg	-	< 0.10	4	50	200
Chloride	mg/kg	-	20	800	15000	25000
Fluoride	mg/kg	-	1.0	10	150	500
Sulphate (as SO_4)	mg/kg	-	1293	1000	20000	50000
Phenol Index	mg/kg	-	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	-	80	500	800	1000

Nicholls Colton Analytical
7 - 11 Harding Street
Leicester
LE1 4DH

L14/1556/CSI/001 - Amendment A

Project Reference - Johns Mews

Sample Descriptions

NCA Reference	Client Sample Reference	Sample Depth (m)	Description	Moisture Content (%)	Stone Content (%)
14-26209	BH1A	0.50	Dark brown gravelly sand with carbonish material and brick fragments. (Fill)	7.8	57
14-26210	BH1B	0.50	Brown slightly gravelly sand with crushed rock.	15	6.0
14-26211	BH1B	1.00	Dark brown slightly sandy clay.	27	7.9

Nicholls Colton Analytical
7 - 11 Harding Street
Leicester
LE1 4DH

L14/1556/CSI/001 - Amendment A

Project Reference - Johns Mews

Analysis Methodologies

Matrix	Determinant	Sample condition for analysis	Test Method used
Soil	Metals	Air Dried	In house method statement - MS - CL - ICP metals
Soil	PAH	Air Dried	In house method statement - MS - CL - PAH
Soil	Phenols	As Received	In house method statement - MS - CL - Phenols (Skalar)
Soil	Cyanide	As Received	In house method statement - MS - CL - Cyanide by Skalar
Soil	pH	As Received	In house method statement - MS - CL - pH (Soil)
Soil	Sulphate	Air Dried	In house method statement - MS - CL - Anions (Aquakem)
Soil	Total Sulphur	Air Dried	In house method statement - MS - CL - BRE
Soil	Sulphide	-	Subcontract Analysis
Soil	CWG	As Received	In house method statement - MS - CL - EPH and VPH

Nicholls Colton Analytical
7 - 11 Harding Street
Leicester
LE1 4DH

L14/1556/CSI/001 - Amendment A

Project Reference - Johns Mews

WAC Analysis Methodologies

Matrix	Determinant	Sample condition for analysis	Test Method used
Soil	TOC	Air Dried	In house method statement - MS - CL - TOC
Soil	LoI	Air Dried	BS 1377, Part 3, 1990
Soil	BTEX	As Received	In house method statement - MS - CL - VOC and BTEX
Soil	PCB	As Received	In house method statement - MS - CL - PCB
Soil	Mineral Oil	As Received	In house method statement - MS - CL - TPH
Soil	PAH	Air Dried	In house method statement - MS - CL - PAH
Soil	pH	Air Dried	In house method statement - MS - CL - pH (Soil)
Eluate	Metals	Leached	In house method statement - MS - CL - Water Metals
Eluate	Anions	Leached	In house method statement - MS - CL - Anions (Aquakem)
Eluate	Phenol Index	Leached	In house method statement - MS - CL - Phenols (Skalar)
Eluate	DOC	Leached	In house method statement - MS - CL - DOC

UKAS TESTING
8284

Chelmer
Geotechnical Laboratories
'Groundbreaking Services'

Laboratory Report

Site	**13-15 Johns Mews, London, WC1N 2PA**
Client	**JM13 Ltd**
Date	**05-Aug-15**
Our Ref	**CSI4507D**
CGL Ref	**CGL4507D**

Chelmer Site Investigation Laboratories Ltd
Unit 15 East Hanningfield Industrial Estate, Old Church Road, East Hanningfield, Essex CM3 8AB
Essex: 01245 400930 | London: 0203 6409136 |info@siteinvestigations.co.uk | www.siteinvestigations.com

UKAS TESTING
8284

Chelmer Geotechnical Laboratories
'Groundbreaking Services'

Content Summary

This report contains all test results as indicated on the test instruction/summary.

CGL Reference : CGL4507D

Client Reference : CSI4507D

For the attention of : JM13 Ltd

This report comprises of the following :

Notes :

General

Please refer to report summary notes for details pertaining to methods undertaken and their subsequent accreditations

Samples were supplied by Chelmer Site Investigations

All tests performed in-house unless otherwise stated

Deviant Samples

Samples were received in suitable containers	Yes
A date and time of sampling was provided	Yes
Arrived damaged and/or denatured	No

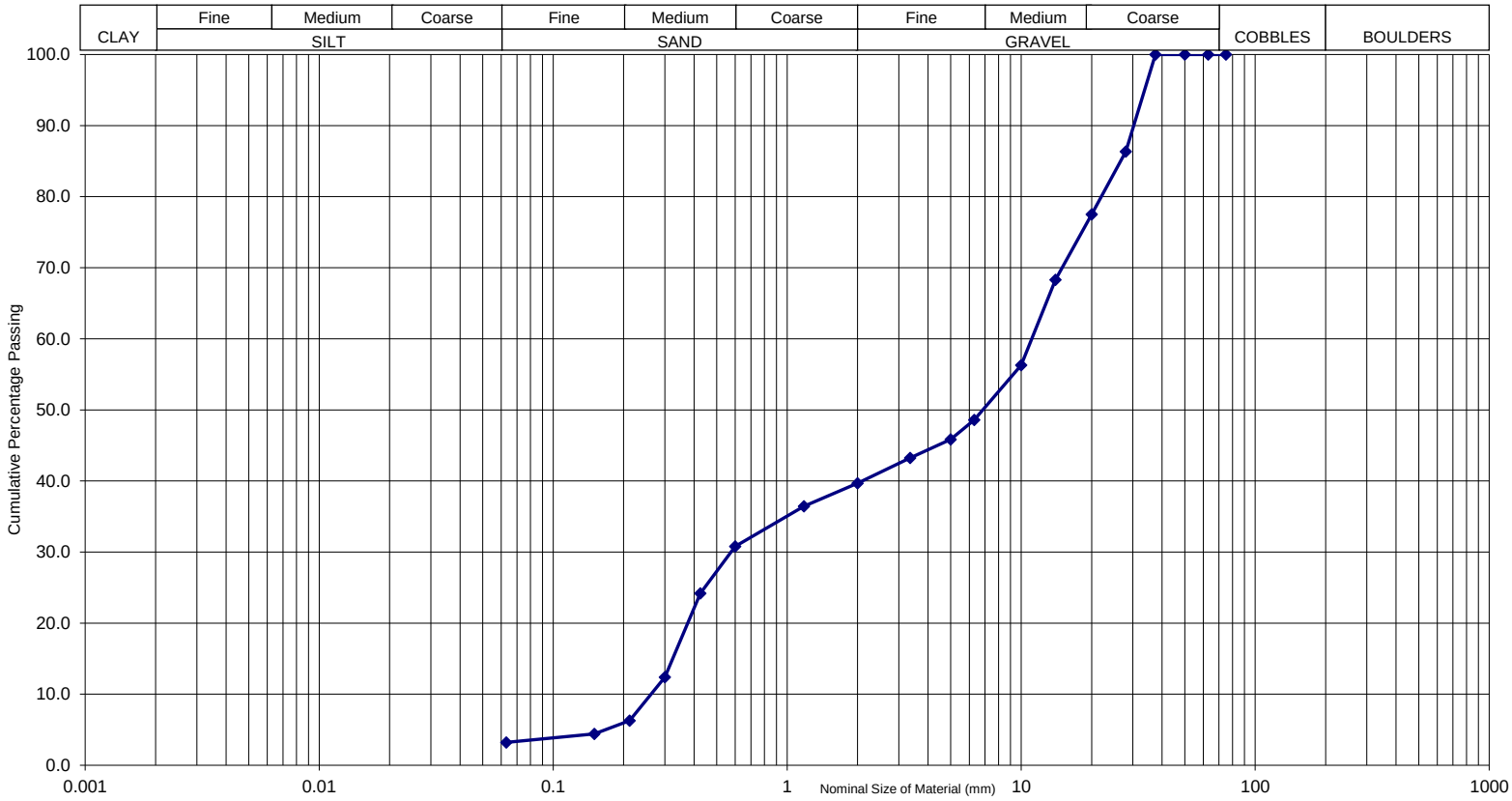
PARTICLE SIZE DISTRIBUTION

BS 1377-2:1990

Chelmer Geotechnical Laboratories "Groundbreaking Services"

Job Number :	CGL4507D	Site Name :	13-15 Johns Mews, London, WC1N 2PA
Sample Number :	BH5	Soil Description :	Brown, silty very sandy fine to coarse GRAVEL..
Depth (m) :	4.00		
Sample UID :	65448		

Type of Sieving :	Washed
Date :	25-Aug-15
Tested By :	HS
Laboratory :	Chelmer Geotechnical CM3 8AB



Sieve Size (mm)	% Passing
90.0	100.0
75.0	100.0
63.0	100.0
50.0	100.0
37.5	100.0
28.0	86.3
20.0	77.5
14.0	68.3
10.0	56.3
6.3	48.6
5.0	45.9
3.35	43.2
2.00	39.7
1.18	36.4
0.600	30.8
0.425	24.2
0.300	12.4
0.212	6.3
0.150	4.4
0.063	3.2

UKAS TESTING 8284

Calculations :-

$$f = \frac{(M_1 - M_2) + P}{M_1} \times 100$$

$f = 100P/M_1$ (dry sieving)

f = Percentage of fines passing 0.063mm
M_1 = Mass of dried test sample before washing (kg)
M_2 = Mass of dried residue retained on the 0.063m (kg)
P = Mass of screened material remaining in the pan (kg)

Comments :-

Checked By :- MC Date Checked :- 26-Aug-15

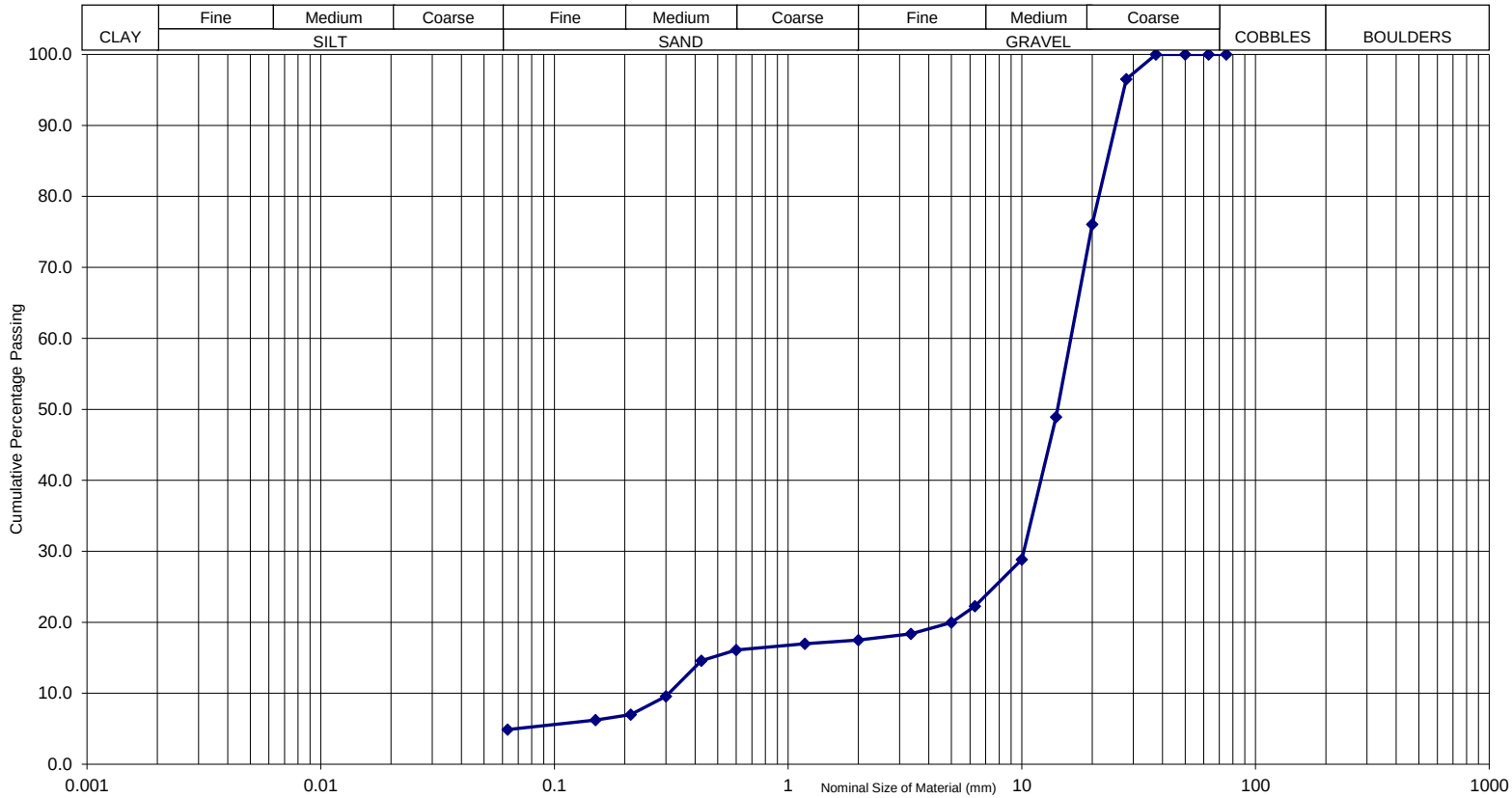
PARTICLE SIZE DISTRIBUTION

BS 1377-2:1990

Chelmer Geotechnical Laboratories
'Groundbreaking Services'

Job Number :	CGL4507D	Site Name :	13-15 Johns Mews, London, WC1N 2PA
Sample Number :	BH5	Soil Description :	Brown, silty sandy fine to coarse GRAVEL.
Depth (m) :	5.00		
Sample UID :	65449		

Type of Sieving :	Washed
Date :	25-Aug-15
Tested By :	HS
Laboratory :	Chelmer Geotechnical CM3 8AB



Sieve Size (mm)	% Passing
90.0	100.0
75.0	100.0
63.0	100.0
50.0	100.0
37.5	100.0
28.0	96.5
20.0	76.1
14.0	48.9
10.0	28.8
6.3	22.3
5.0	20.0
3.35	18.4
2.00	17.5
1.18	17.0
0.600	16.1
0.425	14.6
0.300	9.6
0.212	7.0
0.150	6.2
0.063	4.9

UKAS TESTING
8284

Calculations :-

$$f = \frac{(M_1 - M_2) + P}{M_1} \times 100$$

$f = 100P/M_1$ (dry sieving)

f = Percentage of fines passing 0.063mm
M_1 = Mass of dried test sample before washing (kg)
M_2 = Mass of dried residue retained on the 0.063m (kg)
P = Mass of screened material remaining in the pan (kg)

Comments :-

Checked By :- MC

Date Checked :- 26-Aug-15

Mark Collyer
Chelmer Site Investigation Laboratories Ltd
Unit 15
East Hanningfield Industrial Estate
Old Church Road
East Hanningfield
Essex
CM3 8AB

QTS Environmental Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 15-34350

Site Reference:	13-15 John Mews, London, WC1N 2PA
Project / Job Ref:	CGL4507D
Order No:	4881
Sample Receipt Date:	07/08/2015
Sample Scheduled Date:	07/08/2015
Report Issue Number:	1
Reporting Date:	12/08/2015

Authorised by:

Russell Jarvis
Director
On behalf of QTS Environmental Ltd

Authorised by:

Kevin Old
Director
On behalf of QTS Environmental Ltd

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

Soil Analysis Certificate							
QTS Environmental Report No: 15-34350	**Date Sampled**	04/08/15	04/08/15	04/08/15		
Chelmer Site Investigation Laboratories Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied		
Site Reference: 13-15 John Mews, London, WC1N 2PA	**TP / BH No**	64908	64911	64913		
Project / Job Ref: CGL4507D	**Additional Refs**	TP3	TP5	TP6		
Order No: 4881	**Depth (m)**	U/S 0.925	U/S 0.795	U/S 0.795		
Reporting Date: 12/08/2015	**QTSE Sample No**	161523	161524	161525		

Determinand	**Unit**	**RL**	**Accreditation**					
pH	pH Units	N/a	**MCERTS**	6.2	6.4	6.3		
Total Sulphate as SO_4	mg/kg	< 200	NONE	4934	3058	3702		
Total Sulphate as SO_4	%	< 0.02	NONE	0.49	0.31	0.37		
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	**MCERTS**	543	138	186		
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	**MCERTS**	0.54	0.14	0.19		
Total Sulphur	%	< 0.02	NONE	0.16	0.10	0.13		
Ammonium as NH_4	mg/kg	< 0.5	NONE	9.3	5.4	6.6		
W/S Chloride (2:1)	mg/kg	< 1	**MCERTS**	61	29	28		
Water Soluble Nitrate (2:1) as NO_3	mg/kg	< 3	**MCERTS**	1980	241	170		
W/S Magnesium	mg/l	< 0.1	NONE	1.4	1.4	1.8		

Analytical results are expressed on a dry weight basis where samples are dried at less than $30^{O}C$
Analysis carried out on the dried sample is corrected for the stone content
Subcontracted analysis $^{(S)}$

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

Soil Analysis Certificate - Sample Descriptions	
QTS Environmental Report No: 15-34350	
Chelmer Site Investigation Laboratories Ltd	
Site Reference: 13-15 John Mews, London, WC1N 2PA	
Project / Job Ref: CGL4507D	
Order No: 4881	
Reporting Date: 12/08/2015	

QTSE Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
161523	64908	TP3	U/S 0.925	13	Brown gravelly sand with rubble
161524	64911	TP5	U/S 0.795	4.4	Brown gravelly sand with brick and rubble
161525	64913	TP6	U/S 0.795	4.8	Brown gravelly sand with concrete

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample I/S

Unsuitable Sample U/S

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

Soil Analysis Certificate - Methodology & Miscellaneous Information
QTS Environmental Report No: 15-34350
Chelmer Site Investigation Laboratories Ltd
Site Reference: 13-15 John Mews, London, WC1N 2PA
Project / Job Ref: CGL4507D
Order No: 4881
Reporting Date: 12/08/2015

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

8284

This report is personal to the client, confidential and non assignable. It is issued with no admission of liability to any third party.

This report shall not be reproduced, except in full, without the written approval of Chelmer Site Investigations Laboratories Ltd.

Where our involvement consists exclusively of testing samples, the results and comments (if provided) relate only to the samples tested.

Any samples that are deemed to be subject to deviation will be recorded as such within the test summary.

Chelmer Consultancy Services
Unit 15, East Hanningfield Industrial Estate, Old Church Road
East Hanningfield, Essex CM3 8AB
Telephone: 01245 400 930 Fax: 01245 400 933
Email: info@siteinvestigations.co.uk Website:
www.siteinvestigations.co.uk

Contamination Test Results on Soil Samples

Location: 13-15 Johns Mews	Date : September 2014	Job No. : 4507	Sheet 1 of 1

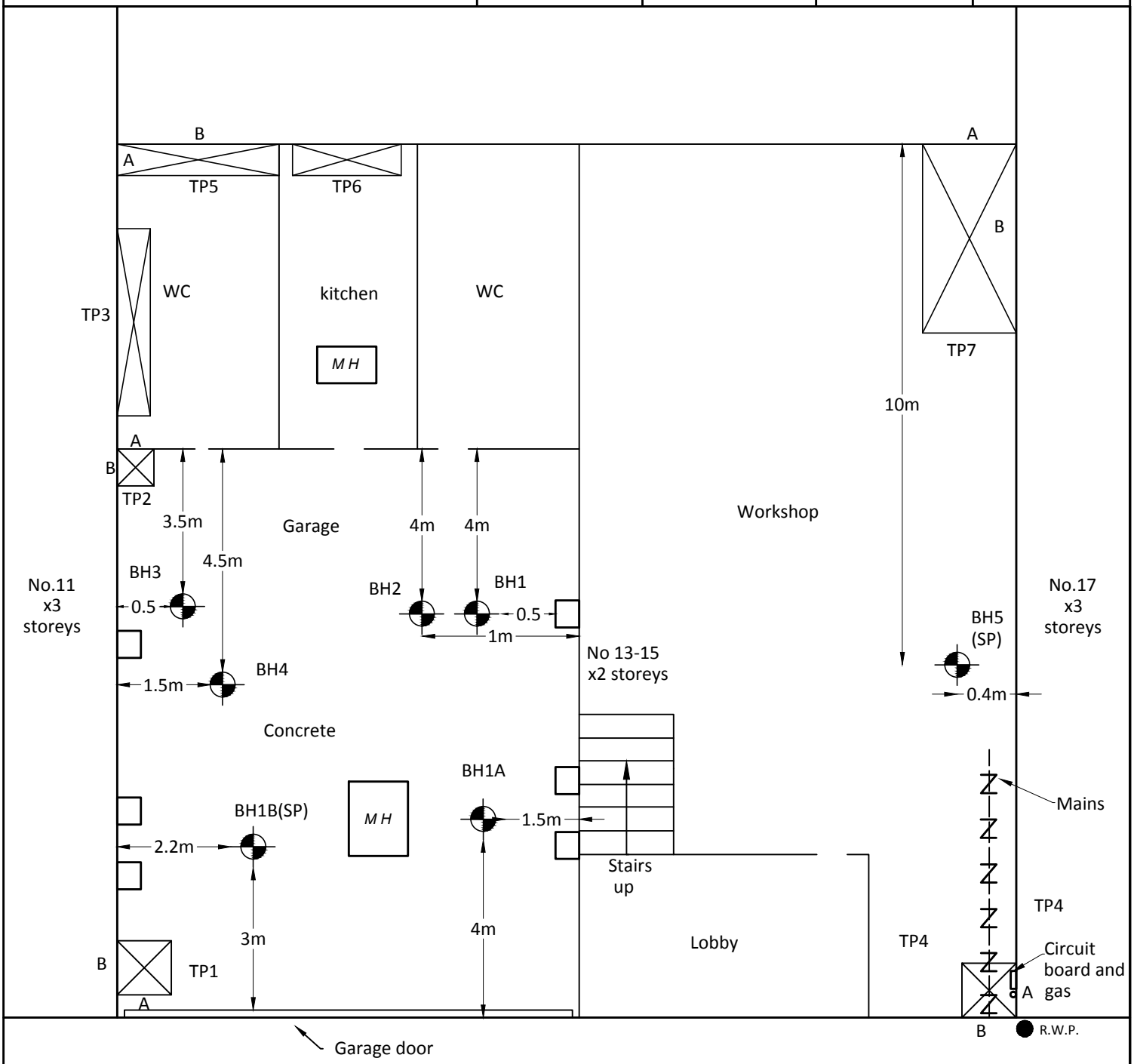
Borehole No.	Units	BH1A	BH1B	BH1B	ATRISK Contaminated Land Screening Values (SSV) derived using CLEA v1.04 for 6% SOM			
Sample No.		14-26209	14-26210	14-26211				
Depth (m)		0.50	0.50	1.00				
Material Type		MADE GROUND	MADE GROUND	MADE GROUND	Residential with plant uptake	Residential without plant uptake	Allotments	Commercial/ Industrial
Aromatic Hydrocarbons (mg/kg)	>C5-C7	<0.03	<0.03	<0.03	0.33	0.988	0.07	95
	>C7-C8	<0.03	<0.03	<0.03	610	2710	120	420000
	>C8-C10	<0.03	<0.03	<0.03	177	233	64.5	64100
	>C10-C12	<11	<12	<13	389	1080	86.4	68300
	>C12-C16	<11	<12	<13	687	2040	160	65600
	>C16-C21	15	<12	<13	804	1330	288	28400
	>C21-C35	130	13	21	1220	1330	1550	28400
Aliphatic Hydrocarbons (mg/kg)	>C5-C6	<0.03	<0.03	0.08	259	261	5120	>1000000
	>C6-C8	<0.03	<0.03	0.25	14700	49400	16600	>100000
	>C8-C10	<0.03	<0.03	<0.03	144	144	2130	170000
	>C10-C12	<11	<12	<13	4140	4340	8870	171000
	>C12-C16	<11	<12	<13	5260	5310	15900	171000
	>C16-C21	<11	<12	<13	88200	146000	462000	>1000000
	>C21-C35	42	<12	17	88200	146000	462000	>1000000
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	2130	4770	612	106000
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	-	-	-	-
Anthracene	mg/kg	0.1	<0.1	<0.1	18300	24000	10400	545000
Benz(a)anthracene	mg/kg	1.7	<0.1	<0.1	8.54	9.04	15.1	142
Benzo(a)pyrene	mg/kg	1.8	<0.1	<0.1	0.998	1.04	2.1	14.4
Benzo(b)fluoranthene	mg/kg	2.2	<0.1	<0.1	9.86	10.3	18.6	144
Benzo(ghi)perylene	mg/kg	1.2	<0.1	<0.1	103	104	342	1450
Benzo(k)fluoranthene	mg/kg	0.6	<0.1	<0.1	100	104	227	1440
Chrysene	mg/kg	1.5	<0.1	<0.1	927	1010	1170	14300
Dibenz(ah)anthracene	mg/kg	0.1	<0.1	<0.1	1.00	1.03	2.57	14.4
Fluoranthene	mg/kg	30.0	<0.1	<0.1	2160	3210	924	72700
Fluorene	mg/kg	<0.1	<0.1	<0.1	1930	3100	725	72100
Indeno(123-cd)pyrene	mg/kg	1.1	<0.1	<0.1	9.75	10.3	16.6	144
Naphthalene	mg/kg	<0.1	<0.1	<0.1	8.71	9.22	23.4	22700
Phenanthrene	mg/kg	1.0	0.2	0.3	-	-	-	-
Pyrene	mg/kg	3.0	0.1	<0.1	1550	2400	620	54500
TOTAL PAH	mg/kg	17.70	1.70	1.80				
Cyanide (Total)	mg/kg	<1.2	<1.3	<1.3	34	34	34	34
pH	unit	8.0	10.7	7.5	-	-	-	-
Copper (Total)	mg/kg	185	77	134	4020	8370	1110	109000
Lead (Total)	mg/kg	736	503	739	200	310	80	2330
Zinc (Total)	mg/kg	122	67	124	17200	46800	3990	917000
					LQM/CIEH Generic Assessment Criteria			
Chromium (Total)	mg/kg	1.5	4.3	6.2	3000	3000	34600	30400
					CLEA Soil Guideline Values (SGV)			
Arsenic (Total)	mg/kg	20.0	13.0	19.5	32	32	43	640
Cadmium (Total)	mg/kg	0.6	0.4	0.6	10	10	1.8	230
Mercury (Total)	mg/kg	5.2	<2.5	4.7	170	170	80	3600
Nickel (Total)	mg/kg	21.1	14.6	22.9	130	130	230	1800
Phenols (Total)	mg/kg	<1.2	<1.3	<1.3	420	420	280	3200
Selenium (Total)	mg/kg	<8	<8	<8	350	350	120	13000
Sulphate	(mg/l)	1400	610	510	-	-	-	-
Sulphur	(%)	0.19	0.13	0.26	-	-	-	-
Sulphide	(mg/kg)	<4.0	<4.0	34.1	-	-	-	-

Key

PAH - Polyaromatic Hydrocarbons
TPH - Total Petroleum Hydrocarbons
- Not determined

Result exceeds ATRISK screening value
Result exceeds EQS/CIEH generic assessment criteria
Result exceeds CLEA Soil Guideline Value (SGV)

Client:	Wandsworth Sand and Stone LTD	**Scale:** N.T.S.	**Sheet:** 1 of 1	**Date:** 04.08.15	
Location:	13-15 Johns Mews, London, WC1N 2PA	**Job No:** 4507D	**Weather:** Internal	**Drawn by: DB**	**Checked by: JH**



Notes:

Key:

Tree/Shrub | Borehole | Trial Pit | Gully | Tree Stump | Rain Water/ Soil Pipe | Manhole

SCALE

0m 10m 20m 40m

GENERAL NOTES:

DO NOT SCALE FROM THIS DRAWING.

ALL DIMENSIONS MUST BE CHECKED ON SITE AND ANY DISCREPANCIES VERIFIED WITH THE ARCHITECT.

CLIENT

MR AND MRS CLARKE

JOB TITLE

13/15 JOHN'S MEWS LONDON WC1N 2PA

DRAWING TITLE

SITE PLAN

SCALE

1:1250 @A4

DATE

26.07.13

FT ARCHITECTS LTD

Hamilton House
Mabledon Place
Bloomsbury
WC1H 9BB

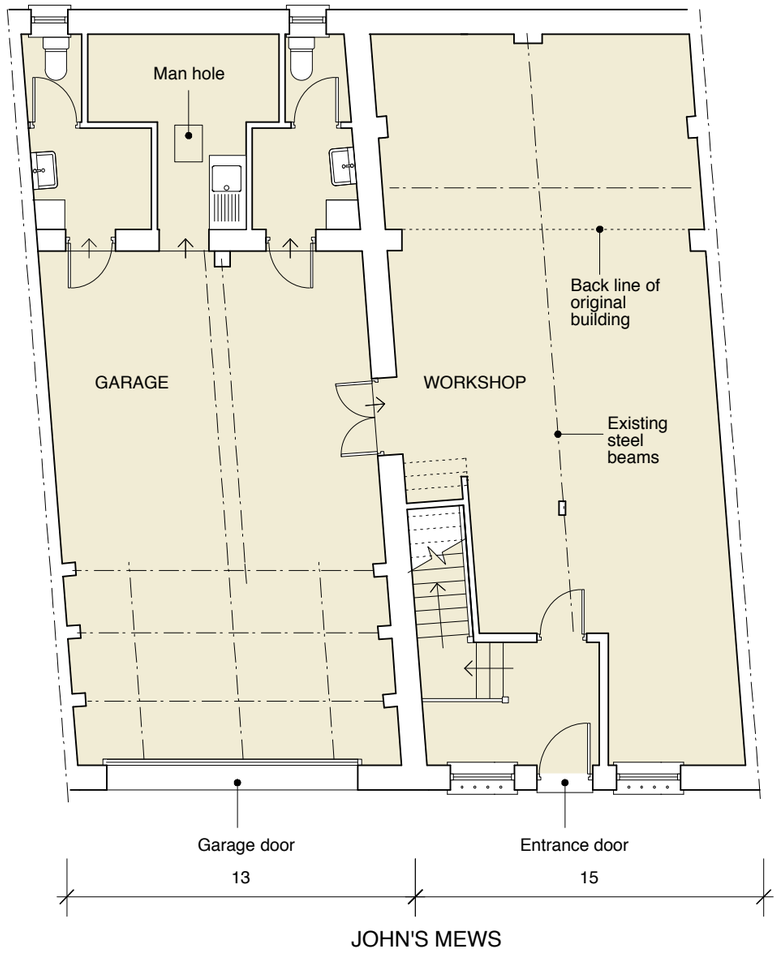
020 7953 0388

www.ftarchitects.co.uk

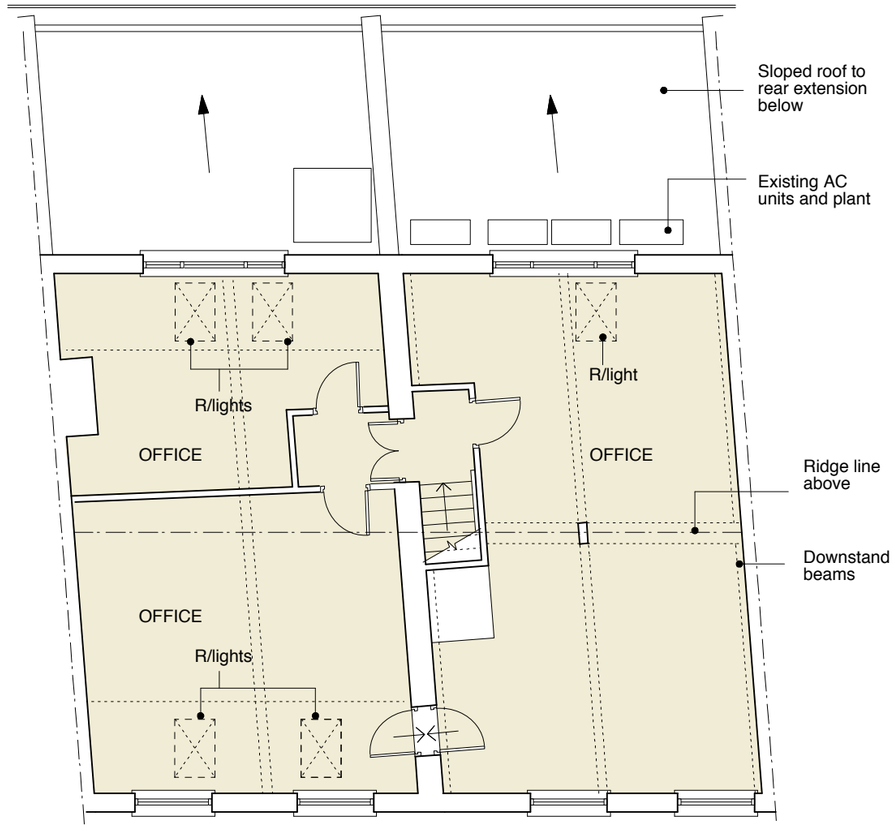
DRAWING No.

200_32_100

REVISION



EXISTING GROUND FLOOR PLAN



EXISTING FIRST FLOOR PLAN

SCALE
0 (metres) 5

GENERAL NOTES:

DO NOT SCALE FROM THIS DRAWING.

ALL DIMENSIONS MUST BE CHECKED ON SITE AND ANY DISCREPANCIES VERIFIED WITH THE ARCHITECT.

CLIENT
MR AND MRS CLARKE

JOB TITLE
13/15 JOHN'S MEWS LONDON WC1N 2PA

DRAWING TITLE
EXISTING GROUND AND 1ST FLOORS

SCALE
1:100@A3

DATE
26.07.13

FT ARCHITECTS LTD

Hamilton House
Mabledon Place
Bloomsbury
WC1H 9BB

020 7953 0388

www.ftarchitects.co.uk

DRAWING No.
200_32_01

REVISION

EXISTING ROOF PLAN

SCALE
0 (metres) 5

GENERAL NOTES:

DO NOT SCALE FROM THIS DRAWING.

ALL DIMENSIONS MUST BE CHECKED ON SITE AND ANY DISCREPANCIES VERIFIED WITH THE ARCHITECT.

CLIENT

MR AND MRS CLARKE

JOB TITLE

13/15 JOHN'S MEWS LONDON WC1N 2PA

DRAWING TITLE

EXISTING ROOF PLAN

SCALE **1:100@A3**

DATE **26.07.13**

FT ARCHITECTS LTD

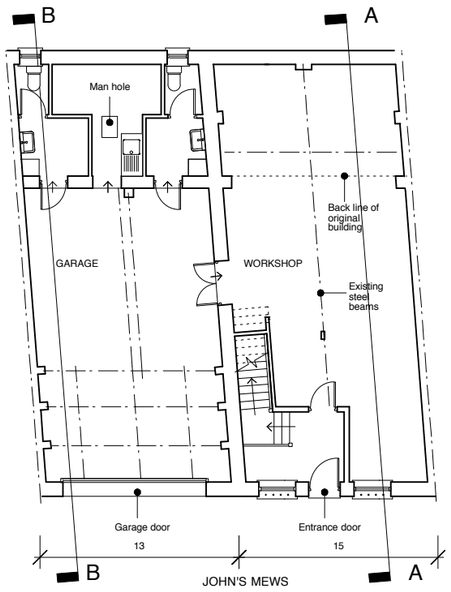
Hamilton House
Mabledon Place
Bloomsbury
WC1H 9BB

020 7953 0388

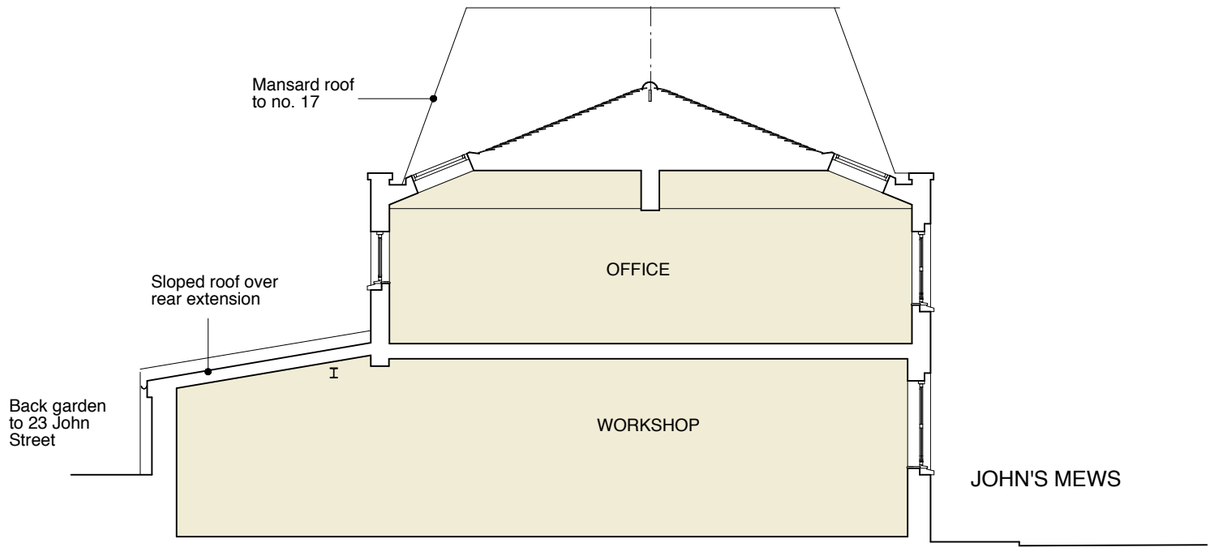
www.ftarchitects.co.uk

DRAWING No. **200_32_02**

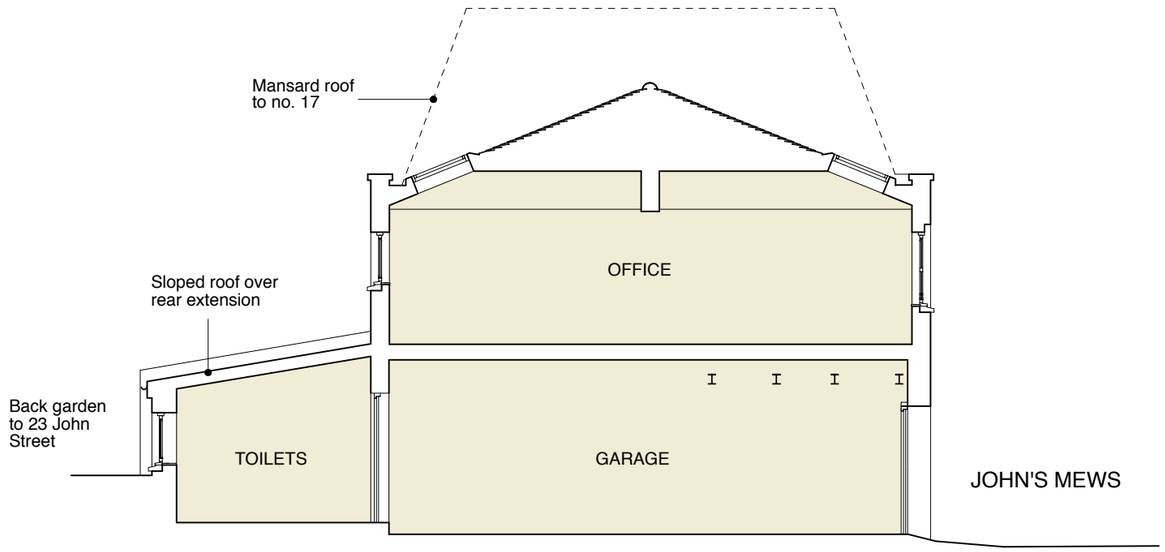
REVISION



REFERENCE PLAN



EXISTING SECTION AA THROUGH 15 JOHNS MEWS



EXISTING SECTION BB THROUGH 13 JOHNS MEWS

SCALE
0 (metres) 5

GENERAL NOTES:

DO NOT SCALE FROM THIS DRAWING.

ALL DIMENSIONS MUST BE CHECKED ON SITE AND ANY DISCREPANCIES VERIFIED WITH THE ARCHITECT.

CLIENT

MR AND MRS CLARKE

JOB TITLE

13/15 JOHN'S MEWS LONDON WC1N 2PA

DRAWING TITLE

EXISTING SECTIONS

SCALE **1:100@A3**

DATE **26.07.13**

FT ARCHITECTS LTD

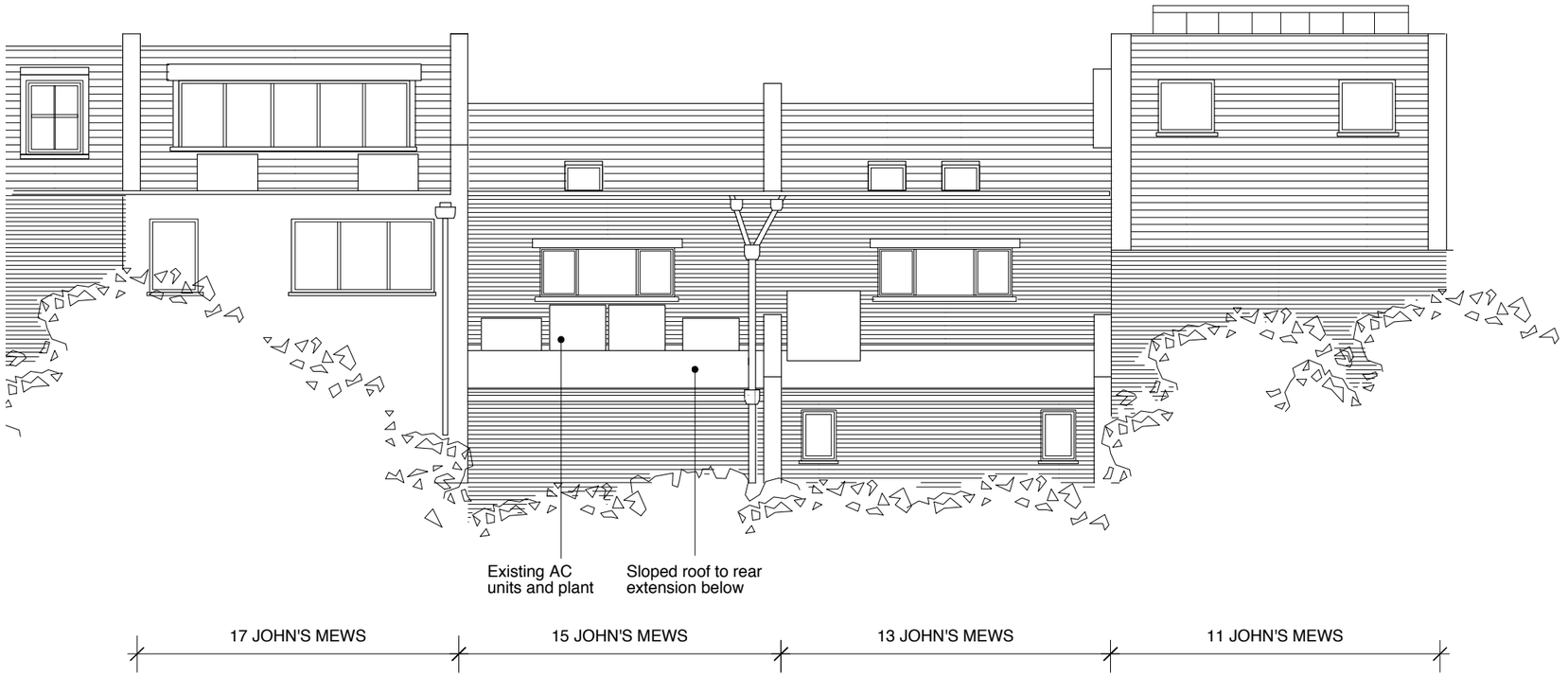
Hamilton House
Mabledon Place
Bloomsbury
WC1H 9BB

020 7953 0388

www.ftarchitects.co.uk

DRAWING No. **200_32_03**

REVISION



EXISTING REAR ELEVATION

EXISTING FRONT ELEVATION

SCALE
0 (metres) 5

GENERAL NOTES:

DO NOT SCALE FROM THIS DRAWING.

ALL DIMENSIONS MUST BE CHECKED ON SITE AND ANY DISCREPANCIES VERIFIED WITH THE ARCHITECT.

CLIENT
MR AND MRS CLARKE

JOB TITLE
13/15 JOHN'S MEWS LONDON WC1N 2PA

DRAWING TITLE
EXISTING ELEVATIONS

SCALE
1:100@A3

DATE
26.07.13

FT ARCHITECTS LTD

Hamilton House
Mabledon Place
Bloomsbury
WC1H 9BB

020 7953 0388

www.ftarchitects.co.uk

DRAWING No.
200_32_04

REVISION

1. STRUCTURAL LEGEND

1.1 BASIC LINETYPES

GRIDLINE

CENTRELINE

VISIBLE EDGE OF STRUCTURE

HIDDEN EDGE OF STRUCTURE

1.2 STRUCTURAL ELEMENTS ON PLAN

LOADBEARING BLOCK WALL

LOADBEARING BRICK WALL

LINE LOAD FROM WALL ON SUPPORTING STRUCTURE

NON-LOADBEARING WALL

LOADBEARING BLOCK WALL

EXISTING WALL

REINFORCED CONCRETE WALL

REINFORCED CONCRETE WALL BELOW

REINFORCED CONCRETE COLUMN

REINFORCED CONCRETE COLUMN BELOW

STEEL COLUMN

STRUCTURAL STUD PARTITION

CONCRETE BEAM

STEEL BEAM

STEEL TRUSS

COLD ROLLED PURLINS / SHEETING RAILS

CONCRETE PADSTONES ON MASONRY AT STEEL BEARINGS

TIMBER JOISTS / TRUSS @ NOTED SPACING

1.3 STRUCTURAL ELEMENTS IN SECTION

REINFORCED CONCRETE SLAB / BEAM

PRECAST CONCRETE UNITS

UNIVERSAL BEAM · UNIVERSAL COLUMN · TEE · ROLLED STEEL ANGLE · ROLLED STEEL CHANNEL

HOT ROLLED STEEL SECTIONS

RECTANGULAR HOLLOW SECTION · SQUARE HOLLOW SECTION · CIRCULAR HOLLOW SECTION

TUBULAR STEEL SECTIONS

STRUCTURAL TIMBER

1.4 DIMENSIONS

2000

DIMENSIONS IN MILLIMETRES

1.5 GRID REFERENCES

Horizontal Grid references to be a numerical

SUPPLEMENTARY GRIDS IF REQUIRED

HORIZONTAL GRID REFERENCE

Vertical Grid references to be a alphabetic

SUPPLEMENTARY GRIDS IF REQUIRED

VERTICAL GRID REFERENCE

1.5 CALLUPS

Section references are numerical. Indicates where section is cut. Indicates where section is drawn.

TYPICAL SECTION CUT MARK

SECTION SCALE:– 1:100 @ A1 & 1:50 @ A3. Indicates where section is cut. Indicates where section is drawn.

TYPICAL SECTION TITLE

Size to suit. Detail references to be letters. Indicates where detail is taken. Indicates where detail is drawn.

DETAIL LOCATOR

DETAIL SCALE:– 1:25 @ A1 & 1:50 @ A3. Indicates where detail is cut. Indicates where detail is drawn.

DETAIL TITLE

Elevation references to be prefixed by E. ie E1, E2 etc. Indicates where elevation is cut. Indicates where elevation is drawn.

TYPICAL ELEVATION VIEW LOCATOR

ELEVATION SCALE:– 1:50 @ A1 & 1:100 @ A3. Indicates where elevation is located. Indicates where elevation is drawn.

ELEVATION TITLE

S.S.L. = +22.40

FIRST FLOOR S.S.L. = +20.400

STRUCTURAL LEVEL CALLUP ON PLAN IN METRES, REFERRED TO ORDNANCE DATUM

STRUCTURAL LEVEL CALLUP ON SECTION IN METRES, REFERRED TO ORDNANCE DATUM

1:60

FALL (GRADIENT)

REVISION REFERENCE FOR CLOUDED ELEMENT

1.6 ABBREVIATIONS GENERAL

Crs.	CENTRE TO CENTRE	DRG. No.:	DRAWING NUMBER
COL.	COLUMN	N.T.S.	NOT TO SCALE
CONC.	CONCRETE	REINF.	REINFORCEMENT
D.P.M.	DAMP PROOF MEMBRANE	TYP.	TYPICAL
Dp.	DEEP	U/S	UNDERSIDE
ø	DIAMETER	U.N.O.	UNLESS NOTED OTHERWISE

1.7 ABBREVIATIONS FOR STRUCTURAL LEGENDS

P1	PILE MARK 1	UP1	CONCRETE UPSTAND MARK 1
BP1	BASE PAD MARK 1	PL1	CONCRETE PLINTH MARK 1
SF1	STRIP FOOTING MARK 1	SC1	STEEL COLUMN MARK 1
GB1	GROUND BEAM MARK 1	SB1	STEEL BEAM MARK 1
C1	CONCRETE COLUMN MARK 1		
B1	CONCRETE BEAM MARK 1		

1. GENERAL NOTES FOR CONSTRUCTION

1.1. Structural drawings are to be read in conjunction with all project specifications, architectural drawings, service engineer's drawings, and other relevant documents.

1.2. It is the contractor's responsibility to review and co-ordinate all project documents prior to commencement of work.In the event of a discrepancy or clash between drawings, BMCEUK should be informed before work proceeds.

1.3. Any details found on site that differ from those shown on the drawings shall be notified to BMCEUK immediately.

1.4. Figured dimensions only to be used. no scaling permitted. All dimensions to be checked on site.

1.5. All setting out and levels indicated on structural drawings to be used for construction/ fabrication only once they have been confirmed by the architect.

1.6. Refer to architect's drawings for the following information:
- 1.6.a. Setting out of gridlines on site.
- 1.6.b. Setting out of building envelope.
- 1.6.c. Details of required surface finishes, chases, and arises.
- 1.6.d. Above ground waterproofing and insulation details.

1.7. Refer to service builderswork drawings for the following information:
- 1.7.a. Setting out and dimensions of all service openings.
- 1.7.b. Cast in services, sleeves and frames.
- 1.7.c. Location and details of supports and plinths for plant, brackets for supporting services, access ladders and platforms.
- 1.7.d. Details and setting out of lightning protection.
- 1.7.e. Details and setting out of earthing pits.

1.8. Refer to contractor's drawings for the following information:
- 1.8.a. Temporary works required maintaining structural stability during construction.
- 1.8.b. Crane and hoist locations, together with associated access platforms and restraints.
- 1.8.c. Temporary access routes for site operatives and site vehicles.
- 1.8.d. Allocated storage areas for materials.
- 1.8.e. All brackets, inserts, and fixings for cladding, lifts, lifting installations etc.

1.9. Construction methods, procedures, and sequences are the contractor's responsibility and he shall take all necessary measures to protect the safety of site operatives and the public. The contractor shall maintain the structural integrity of all existing and new structures within or adjoining the works, at all stages. The contractor's temporary works details shall be submitted to BMCEUK for review at least 2 weeks prior to work commencing.

1.10. The structural members shown on drawings have been designed to carry in place design loads only. The contractor is responsible for the support of any additional loads imposed during construction.

1.11. All construction joints shown on the structural drawings shall be incorporated into the structure. Details of additional construction joints to facilitate construction shall be submitted to BMCEUK for review at least 2 weeks prior to works commencing.

1.12. The contractor shall submit all manufacturer's drawings and specifications for equipment support, anchorage etc. to BMCEUK for review at least 2 weeks prior to placing an order for equipment.

1.13. The contractor's proposed substitutions, if any, shall be submitted to BMCEUK for review at least 4 weeks prior to works commencing.

1.14. Where materials, products and workmanship are not fully detailed or specified they shall be of a standard appropriate to the works and in accordance with good building practice.

1.15. All articles, materials and goods shall be new and of good quality, suitable for the required purpose and shall conform to the appropriate British Standard, where such exists. Where references to the above are made, it shall be inferred that the latest edition applies, together with subsequent amendments, unless otherwise specified. All proprietary systems to be installed in accordance with manufacturer's recommendations.

1.16. Nothing included or omitted on these drawings shall relieve the contractor of his duty to carry out the works in accordance with current standards of safety and good building practice.

1.17. The contractor is to notify the building control officer to carry out his inspections prior to covering up of structural elements and concreting of new foundations, slabs etc.

2. EXCAVATIONS

2.1. The bottom of all excavations are to be taken down to the levels required by BMCEUK drawings, or other instructions, and shall be to the satisfaction of the architect, engineer and local authority.

2.2. All excavated material not required for backfilling shall be removed from site. To be provided for by contractor.

2.3. The side of excavations shall be properly supported and retained by good sound timbering or other suitable methods to contractor's design. The removal of support shall be done in such a manner as not to endanger the works and shall not relieve the contractor of the responsibility for ensuring the stability of the works.

2.4. The bottoms of all excavations shall be carefully trimmed and finished to the specified levels and all loose materials removed.

2.5. Should the excavated surface be cut up or softened under the action of ponded water or be broken up by any cause, the contractor shall at his own expense, excavate & remove soil down to solid formation and backfill with concrete or fill, as specified by BMCEUK, properly consolidated to the specified level.

2.6. If poor ground, cavities or soft spots are met within any part of the excavation, the contractor shall excavate to solid formation and fill up to the specified level with fill or concrete as directed by architect / engineer.

2.7. Should the contractor excavate anywhere to a greater size or depth shown on the working drawings or should the sides of the excavation cave in anywhere, the contractor shall at his own expense fill and tightly pack the excess space with concrete or other approved material.

2.8. The contractor shall ensure that the formations are not damaged by weathering. Concrete or fill shall be placed in the same day the excavation has taken place unless the foundation is blinded with concrete or otherwise protected from damage. A layer of 50 mm lean mix blinded concrete shall be laid on the bottom of prepared formations under concrete bases or strip footings when completion of foundation is not carried out on day of the excavation.

2.9. The engineer shall be informed before any concrete or hardcore is placed and shall be given the opportunity of inspecting and approving the bottom of all excavations.

2.10. The contractor shall make provision for and deal with all water which may find its way into the works from any source whatsoever and shall excavate sumps, cut drains, provide & work pumps and provide & work all necessary materials, plant and equipment for dealing with any water encountered.

2.11. The contractor shall not pump or otherwise put water directly into any drain.

2.12. Where reinforcement for concrete construction is to be placed, a blinded layer of C16/20 (50 mm thick) concrete shall be laid to receive the reinforcement.

3. UNDERPINNING

3.1. The contractor shall be responsible for ensuring that his operations do not in any way impair the safety or conditions of the existing structures. He shall provide any temporary supports required for this purpose in addition to any temporary supports shown on the BMCEUK drawings.

3.2. Underpinning to be carried out in a 1,3,5,2,4 sequence as indicated on the BMCEUK plans. In no case shall the width of sections excavated exceed 1000mm. The total sum of unsupported lengths shall not exceed one fifth of the wall length. In no case shall a section be excavated immediately adjacent to one which has been completed.

3.3. Underpinning greater than a depth of 1.5 m to be carried out in separate lifts. Each lift to be not greater than 1.5 m deep. The lower bays should be staggered with those immediately above and be tied to adjacent horizontal and vertical bays with 4 x H20 bars (600 mm long) per interface.

3.4. The underside of existing wall footings to be cleaned and hacked free of soil or loose material before casting of concrete commences.

3.5. Construct body of underpin using (C30/37, with AC-4 ACEC classification & DS-4 sulphate resisting cement, max 20 mm aggregate size) concrete. Underpinning to be cast in sections as indicated on BMCEUK drawings. As far as practically possible, excavation and underpinning to be carried out on the same day. Unconcreted sections shall be kept covered to prevent ingress of water.

3.6. New concrete underpin sections to be stopped 75 mm below underside of existing footings and final pinning up to wall carried out with 1:3 dry pack mortar well rammed in as soon as underpin has set hard.

3.7. Excavation of any section of underpinning shall not be commenced until at least 48 hrs after completion of any adjacent section of work. Adjacent underpin concrete section to have reached a min strength of 10 N/mm2.

3.8. The joint between adjacent sections of underpinning made by forming rough surface against which the first underpin section is cast, with H20 dowels at 300 ctrs hammered 300 mm into the excavation face. On construction of next underpin section, thoroughly clean exposed concrete face and projecting dowels before adjacent underpin is cast.

4. CAST IN-SITU CONCRETE

4.1. All concrete is to comply with the latest edition of the national structural Concrete Specification for Buildings (NSCS), published by the Concrete Society and modified by BMCEUK project specification.

4.2. Schedule of concrete strengths U.N.O. on drawings:-
- 4.2.a. For all reinforced concrete elements protects from weather & the ground: designated mix GEN 1 to BS EN 206 7 BS 8500-2 with DC-4 design class and AC-4 ACEC class.
- 4.2.b. Reinforced concrete 28 day strength
  - elements exposed to weather C32/40
  - other RC concrete elements C28/35
- 4.2.c. For external slabs with surface exposed to weather use: designated mix PAV2 air-entrained concrete mix to BS EN 206 & BS 8500-2.
- 4.2.d. All unprotected reinforced concrete in contact with the ground: designated mix C32/40 with DC-4 design class and AC-4 ACEC class.

4.3. Schedule of minimum cover
- 4.3.a. Unformed surfaces exposed to earth: 75mm
- 4.3.b. Unformed surfaces over vapor barrier: 50mm
- 4.3.c. Formed surfaces exposed to earth: 40mm
- 4.3.d. Formed surfaces exposed to weather: 50mm
- 4.3.e. Formed surfaces protected from weather / earth - beams, columns, slabs: 25mm u.n.o.

4.4. High yield bars (Fy = 500) deformed type 2 to BS 4449
Mild steel bars (Fy = 250) plain lap lengths to BS EN 1992-1-1:2004. Bars ≤ 32mm diameter. C28/35 concrete 'good' bond conditions

slabs:	43xbar diameter
beams:	39xbar diameter
columns:	51xbar diameter
walls:	56xbar diameter

NOTES:
1 If bar size = 40mm then reduce the lap length by 8%
2 For Grade 40 concrete reduce the lap length by 10%
3 For 'poor' bond conditions e.g. top mat rebar in beams / slabs > 250mm deep increase the lap length by 33% (beams) or 42% (slabs)

4.5. Cube testing requirements, formwork and curing times to be in accordance with the specification.

4.6. Concrete finishes
Unless noted otherwise on the drawings, concrete finishes shall be to BS EN 13670 where finishes are classed as basic, ordinary, plain & special. Finishes on this project shall be as follows:
- 4.6.a. Formed finish for visible (exposed) concrete - plain finish
- 4.6.b. Formed finish for not visible (unexposed) concrete - ordinary finish
- 4.6.c. Unformed finish to internal areas - plain finish (power trowelled finish to slabs).
- 4.6.d. Unformed finish to external areas - ordinary finish (light brush finish to slabs).

4.7. The contractor shall provide information of their methods of controlling the curing of the concrete & shall detail these in a method statement for submission to the engineer/architect in accordance with the specification.

4.8. Exposed slabs not receiving any other treatment are to be surface sealed with BASF `FEBCLEAR SUPER' or similar approved applied in accordance with the manufacturers recommendations.

4.9. The contractor is to provide his proposed slab pouring sequence for approval at least 2 weeks prior to proposed 1st pour. This will include proposed construction joints; contractor is to check the requirements in the concrete specification. Typically, construction joints in suspended beams & slabs will only be accepted at 1/3 points of spans maximum. Maximum length of time before pouring against previously work is 4 days.

4.10. The contractor is to notify the engineer 2 days in advance of each concrete pour.

4.11. All concrete faces to be cast against formwork unless noted otherwise.

4.12. All holding down bolts, bolt boxes and cast-in plates to be detailed and supplied by steelwork sub-contractor and checked for position by steel contractor prior to being cast in place by concrete sub-contractor.

4.13. Reinforcement estimates are as follows:

Ground Beams	225kg/m³
Lower Ground Floor Slab	200kg/m³
Ground Floor Slab	150kg/m³
RC Walls	120kg/m³

4.14. Beam reinforcement based on overall beam volume (with beam depth measured from S.S.L. to beam soffit)

4.15. Slab reinforcement based on overall beam volume (with beam depth measured from S.S.L. to beam soffit)

4.16. The above rates make no allowance for support bars, chairs etc. to hold the rebar in place during concreting or shear links to slabs.

4.17. Contractor to check architects buildersworks drawings for detailed setting out of edges, openings and stairs.

4.18. For corrosion protection, top coats, fire proofing, fire stopping and waterproofing details refer to architect's drawings and specification.

5. STRUCTURAL STEEL

5.1. Structural steelwork shall be in accordance with the project specification and comply with the National Structural Steelwork Specification for building construction, latest edition, published by BCSA/SCI, as modified by the project notes and specifications.

5.2. Unless noted otherwise on the drawings steel to be Grade S355 weldable structural steel to BS EN 10025 & 10210 (latest edition). Bolts nuts etc. to be Grade 8.8 to BS 3692:2001.

5.3. Connections
The contractor is responsible for the design of all connections including base plates. Connections shown are indicative only. The connections shall be designed for the forces & moments shown on the drawings. Calculations & joint details to be submitted for the engineer for review 7 days prior to fabrication. Bolts in direct tension to be fitted with lock nuts. All connections to be designed for 75kN (+or-) axial & 75kN shear minimum (ultimate loads). Base plate connections to be designed for a lateral load equal to 2.5% of the axial column load. For large lateral load situations on the base plates the base plate is to be provided with a shear key or to be cast into a shallow pocket in the foundation. Where connections are detailed on the drawings the contractor is to confirm his acceptance of these details in writing prior to the start of fabrication.

5.4. Corrosion protection
- 5.4.1. Internal environment All internal steelwork shall be protected against corrosion as follows: (see also specification for further details):
  Shot blast to SA 2 1/2.
  - a - Within 2 hours of shot blasting apply 2 pack epoxy zinc phosphate prefabrication primer to 20 microns DFT.
  - b - Post fabrication clean down and spot prime all areas of bare metal with prefabrication primer.
  - c - Apply to the clean dry surface 1 coat of 2 pack epoxy high build zinc phosphate primer to a dry film thickness of 75 microns. Allow 7 days to achieve maximum hardness before dispatch to site.
  - d - After erection prepare and carefully spot prime all damaged areas and bolt heads etc. with primer.
  - e - Apply decorative paint finish where required by the architect. The decorative paint system used shall be compatible with the underlying paint system.
- 5.4.2. External steelwork
  - a - All external steelwork shall be protected against corrosion as follows (see specification for further details).
  - b - Blast clean to SA2 for roughness using chilled iron grit Grade G24.
  - c - Hot dip galvanise to BS EN ISO 1461:2009 to achieve 90 micron DFT. (Note: no further drilling/fabrication of steelwork to be carried out after galvanising.
  - d - Note: all bolts, fastenings etc. for galvanised steelwork to be galvanised and given the same paint build up as for galvanised members.

5.5. Shop drawings
The contractor shall submit full workshop drawings for all structural steelwork members for review by the engineer at least 4 weeks prior to fabrication.

5.6. Fire protection:
All structural steel except rooF beams, achieve fire protection as required in the fire certificate by 75mm concrete encasement, intumescent paint system or another approved durable system. Exact details of the fire protection system to be supplied to the design team 2 weeks prior to steelwork fabrication. Intumescent paint system to be compatible with the primer.

5.7. Fire protection:
Weld tests are required for all site / shop welds and shall be carried out in accordance with the steelwork specification.

5.8. Site welding or site cutting of steelwork will only be allowed with the express approval of the engineer. Site welded connections designated by the engineer should be subject to ultra-sonic weld testing. Refer to steelwork specification for details.

5.9. Non shrink grout beneath all steel beam bearings, steel base plates or precast elements to have a minimum compressive strength of 60N/mm² to the engineer's approval.

5.10. Where any stainless steel brickwork support angles, proprietary stainless steel masonry support systems or stainless steel fabricated elements are provided, these are to be insulated from all mild steel elements using non-conductive waterproof gaskets and nylon or Teflon washers & brushes.

5.11. The steel fabricator shall inspect the prepared foundations and holding down bolts for position and level not less than 7 days before erection of steelwork starts. He shall then inform the engineer if he finds any discrepancies which are outside the deviations specified in the National Structural Steelwork Specification (black book) requesting that remedial works be carried out before erection commences.

5.12. The contractor is to allow for coordination with other contractors whose work interfaces with the steel frame. Work specified by others is not shown on BMCEUK drawings.

5.13. All steelwork set out is to the centroid of the section (refer to blue book), u.n.o.

5.14. Column base plate assembly to be provided by steelworker to concrete subcontractor with required setting out plan to allow elements to be cast-in.

6. TIMBER

6.1. Structural timber shall meet the requirements of BS EN 338, BS EN 1912 and the project specification. The timber shall be stress graded and marked to BS 4978. It is the contractor's responsibility to to provide timber that meets the requirements of this specification.

6.2. Structural timber to be Grade C24, unless noted otherwise.

6.3. No timber showing signs of decay or insect attack shall be used. No timber which could have come into contact with such infected timbers shall be used.

6.4. Preservation work shall be carried out in accordance with BS 8417. double vacuum treatment with organic solvent preservatives to be used. all preservatives to architect's approval.

6.5. All materials and fixings shall be protected from the weather.

6.6. Nails, fixings and metal clips to be hot dipped galvanised, sheradised or electro-galvanised post-fabrication. The minimum thickness of metal shall be 1.8 mm. Nails, fixings and metal clips shall be in accordance with the latest British Standards.

6.7. Restraint straps to be provided at spacings and length indicated on drawings. all restraint straps shall be in accordance with BS EN 845.

6.8. Provide noggins min. 38 mm thick and at least three quarters of depth of joist along lines of support and midspans. For spans greater than 4500 mm, provide noggins at 1/3 and 2/3 points.

6.9. Double up joists under new partitions running parallel to the joist span and bolt together with M12 bolts at 600 mm ctrs with oversize washers.

6.10. For partitions running perpendicular to the joist span, provide solid noggins under new the partition base rail.

6.11. Trimmers to structural openings shall be jointed to the trimming joists with joist hangers to BS EN 845, unless noted otherwise.

6.12. No notching of joists shall occur without prior written approval from BMCEUK.

6.13. Timbers should be supported on an even bed at bearings. packing, if required, should be provided under the full area of the bearing and be approved by BMCEUK.

7. MASONRY

7.1. All masonry to be designed in accordance with BS EN 1996-1:2005 & BS EN 1996-2:2006 and the project specification.

7.2. All materials for masonry ancillary items to be galvanised or stainless steel in accordance with BS EN 1996-2.

7.3. Blockwork in accordance with BS EN 771-3:2011 and to have min compressive strength of 7.3N/mm2.

7.4. Brickwork in accordance with BS EN 771-3:2011 & to be standard format bricks with min compressive strength of 20.0N/mm2.

7.5. All walls shown on BMCEUK drawings to be load bearing u.n.o. blockwork densities subject to confirmation with BMCEUK, architect & acoustic consultant. Light weight blockwork shall not be used unless prior approval by design team.

7.6. U.N.O. wall setting out and thicknesses to be as shown on architectural drawings and must be read in conjunction with architects specification.

7.7. Wall ties to be Type 2 U.N.O. in accordance with PD 6697 & stainless steel in accordance with BS EN 845-1. Ties to have min 50mm embedment with min 800N tensile capacity & min 1300N compressive capacity. Ties spaced at 450mm crs vertically & 750mm crs staggered horizontally. At openings ties spaced at 225mm from opening edge and at 1 per 300mm vertically.

7.8. Ancon IHR - B Sliding head restraint ties to be provided at 450mm crs head of masonry walls. Vertical restraint to be Ancon ties at 450mm crs where masonry secured to vertical columns with debonded sleeves.

7.9. All new masonry and repair masonry to existing structure shall be matched in colour, texture and dimensions and laid in the same bond pattern as the remaining structure.

7.10. All new masonry and repair masonry and re-pointing to existing structure to be laid in a min 1:2:9 cement:lime:sand mortar.

7.11. Re-pointing: rake out and repoint joints to min depth of 40mm or until loose mortar is removed

7.12. New bricks below DPC are to be Class B engineering brick sets in 1:3 CEM sand mortar with SRPC mortar. Blockwork to be laid in grade (1:1:6) mortar above ground and grade (1:4) CEM sand mortar with SRPC mortar where buried.

7.13. Dry pack to be 1:3 cement: coarse sand and minimum of 35mm thick. Dry pack to be well rammed in where used at all locations.

7.14. Stainless steel bed joint reinforcement shall be provided in two courses above and below new openings in solid masonry min cross section area to be 49mm2 per m width.

7.15. Where new masonry construction abuts existing masonry construction, existing masonry to be plastered with a scud and fairing coat and stainless steel Staifix channels and dovetail slots at 450mm crs to be fixed to existing wall as starter for each new leaf of masonry.

7.16. Control joints in external masonry are generally located at 6m crs and extend from DPC to roof level. Exact location of joints to be agreed with architect. Ties to have one end debonded using debonding sleeve.

7.17. Lintels in masonry walls are to be proprietary pre-stressed concrete lintels or galvanised pressed steel lintels used strictly in accordance with manufacturers details and to manufacturers safe working loads. Lintel propping during construction & bearing to manufacturers details & recommendations.

7.18. The contractor shall ensure that all lintels provided match the required external wall finishes. e.g. - precast lintels shall not be provided in exposed brickwork external leaf.

8. TEMPORARY WORKS

8.1. The contractor is entirely responsible for maintaining the stability of all existing building and structures within and adjacent to the works and of all proposed works from the date of possession to practical completion of the works.

8.2. The contractor shall install and maintain all necessary temporary works for the duration of the project. Particular attention should be given to the bearing of temporary props.

NOT FOR CONSTRUCTION

ISSUE	DATE	DESCRIPTION	DRN. / ORIG.	P.E. / P.D.
T2	15.10.15	REISSUED FOR TENDER	MA / OC	OC / VB
T1	22.12.14	ISSUED FOR TENDER	MA / OC	OC / VB
P1	12.09.14	ISSUED FOR COMMENT	MA / OC	OC / VB

ISSUE STATUS ☐ PRELIMINARY (P1, P2, P3 etc.,) ☐ PLANNING (PL1, PL2, PL3 etc.,) ☒ TENDER (T1,T2, T3 etc.,) ☐ CONSTRUCTION (0, 1, 2 etc.,)

Barrett Mahony Consulting Engineers, Civil , Structural , Project Management.
E-mail: bmce@bmce.ie Web: www.bmce.ie

London Office: 10 Grey Coat Place, Westminster, London SW1P 1SB, United Kingdom. Tel: (0044) 207 960 6016 Fax: (0044) 207 960 6166

Dublin Office: Sandwith House, 52-54 Lower Sandwith Street, Dublin 2, Ireland. Tel: (01) 677 3200 Fax: (01) 677 3164

Athlone Office: Suite 15B, Irish Carrig Business Centre, Goldenisland, Athlone, Co. Westmeath, Ireland. Tel: (090) 644 9080 Fax: (090) 645 0585

CLIENT
WANDSWORTH SAND + STONE LTD.

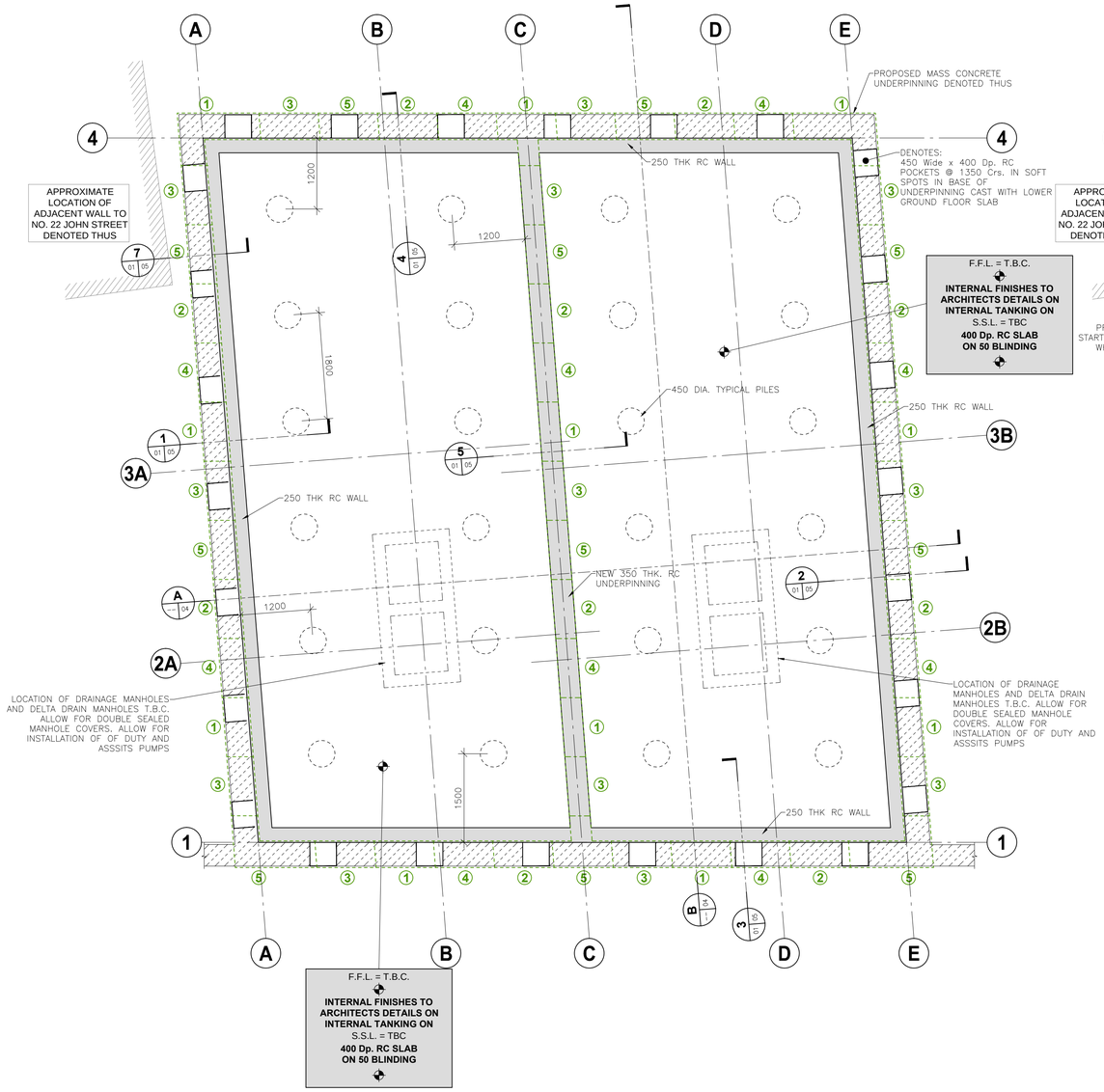
PROJECT TITLE
13 – 15 JOHN'S MEWS

DRAWING TITLE
GENERAL NOTES

SCALE @ A1	JOB NO.	DRAWING NO.	ISSUE
AS SHOWN	L14771	00	T2

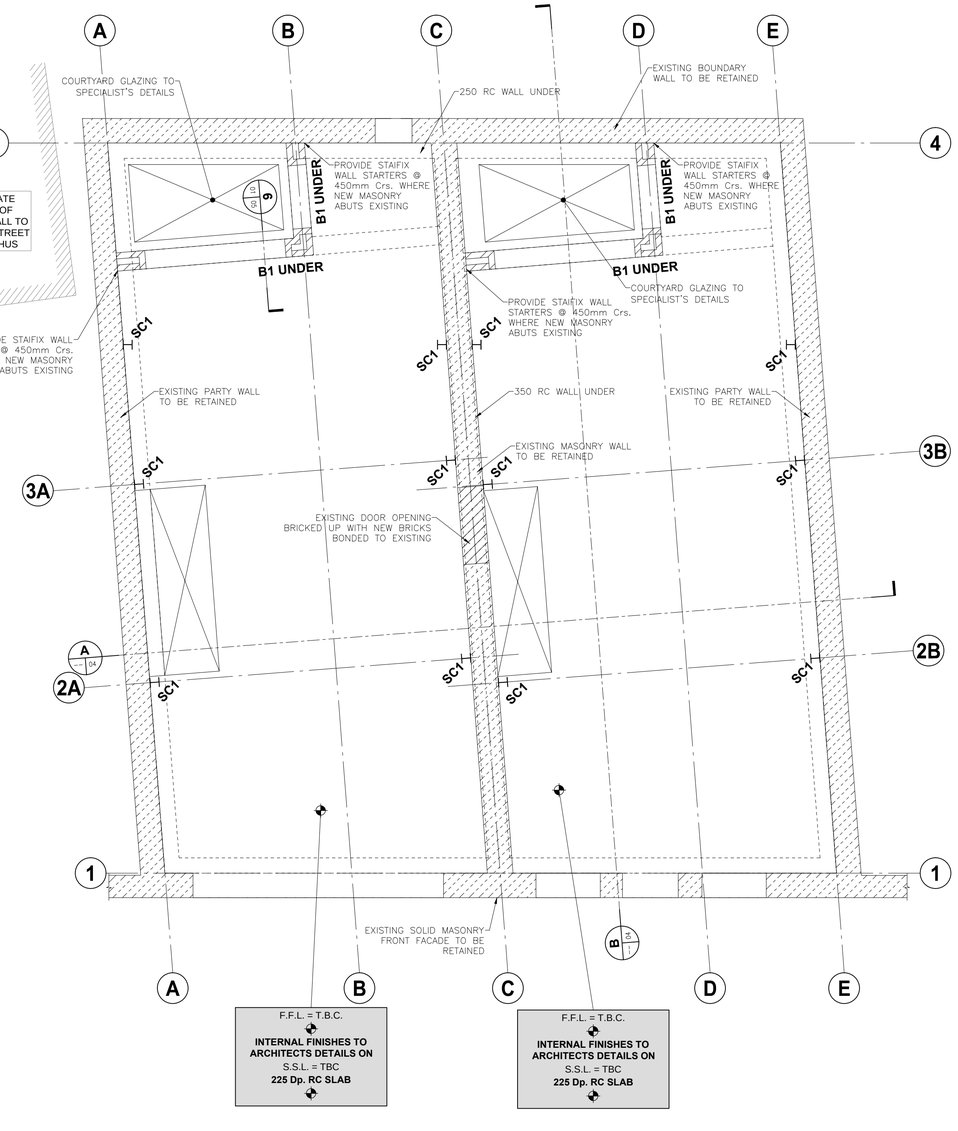
NOT FOR CONSTRUCTION

PILE SWL: (TYPICAL)
VERTICAL = 300 kN
HORIZONTAL = 25 kN



LOWER GROUND FLOOR PLAN

(SCALE 1:50 @ A1 & 1:100 @ A3)



GROUND FLOOR PLAN

(SCALE 1:50 @ A1 & 1:100 @ A3)

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEERS & ARCHITECT'S DRAWINGS.FIGURED DIMENSIONS ONLY (NOT SCALING) TO BE USED. WHERE A CONFLICT OF INFORMATION EXISTS OR IF IN ANY DOUBT – 'ASK'.
2. CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.

LEGEND

	NEW REINFORCED CONCRETE WALL
	NEW LOADBEARING BLOCKWORK WALL
	NEW NON–LOADBEARING WALL
	LOADBEARING TIMBER STUD WALL
	EXISTING MASONRY WALL
	EXISTING LOADBEARING WALLS BELOW
SB2	STEEL BEAM
SC1	STEEL COLUMN
B1	CONCRETE BEAM
C1	CONCRETE COLUMN
EX. J	DENOTES EXISTING JOISTS SPAN DIRECTION
Jx	DENOTES NEW JOISTS SPAN DIRECTION

SCHEDULE OF CONCRETE MEMBERS

BEARING PADS

REF.	SIZE	COMMENT
BP1	450 x 100 x 225mm Dp.	–

CONCRETE BEAMS

REF.	SIZE	COMMENT
B1	300W x 500 O/A Dp.	–

SCHEDULE OF STEELWORK MEMBERS

STEEL COLUMNS

REF.	SIZE	COMMENT
SC1	152 UC 23kg.	–
SC2	100 SHS 5.0	–

STEEL BEAMS

REF.	SIZE	COMMENT
SB1	203 UC 46kg.	–
SB2	203 UC 60kg.	–
SB3	152 UC 23kg.	–
SB4	100 EA 8.0	FIXED TO WALL
SB5	200 x 100 RHS 5.0	WITH 225 x 10 BOTTOM PLATE

SCHEDULE OF TIMBER MEMBERS

TIMBER FLOOR JOISTS

REF.	SIZE	COMMENT
TJ1	47 x 220 C24 JOISTS @ 400mm Crs.	–
TJ2	47 x 170 C24 JOISTS @ 400mm Crs.	–

ISSUE	DATE	DESCRIPTION	DRN. / ORIG.	P.E. / P.D.
PL1	07.01.16	ISSUED FOR PLANNING	MA / OC	OC / VB
T2	15.10.15	LOWER GROUND FLOOR PLAN REVISED	MA / OC	OC / VB
T1	22.12.14	GENERAL REVISION	MA / OC	OC / VB
P3	27.11.14	GENERAL REVISION	MA / OC	OC / VB
P2	09.10.14	ISSUED FOR COMMENT	MA / OC	OC / VB
P1	19.09.14	ISSUED FOR COMMENT	MA / OC	OC / VB

ISSUE STATUS ☐ **PRELIMINARY** (P1, P2, P3 etc.,) ☒ **PLANNING** (PL1, PL2, PL3 etc.,)
☐ **TENDER** (T1,T2, T3 etc.,) ☐ **CONSTRUCTION** (0, 1, 2 etc.,)

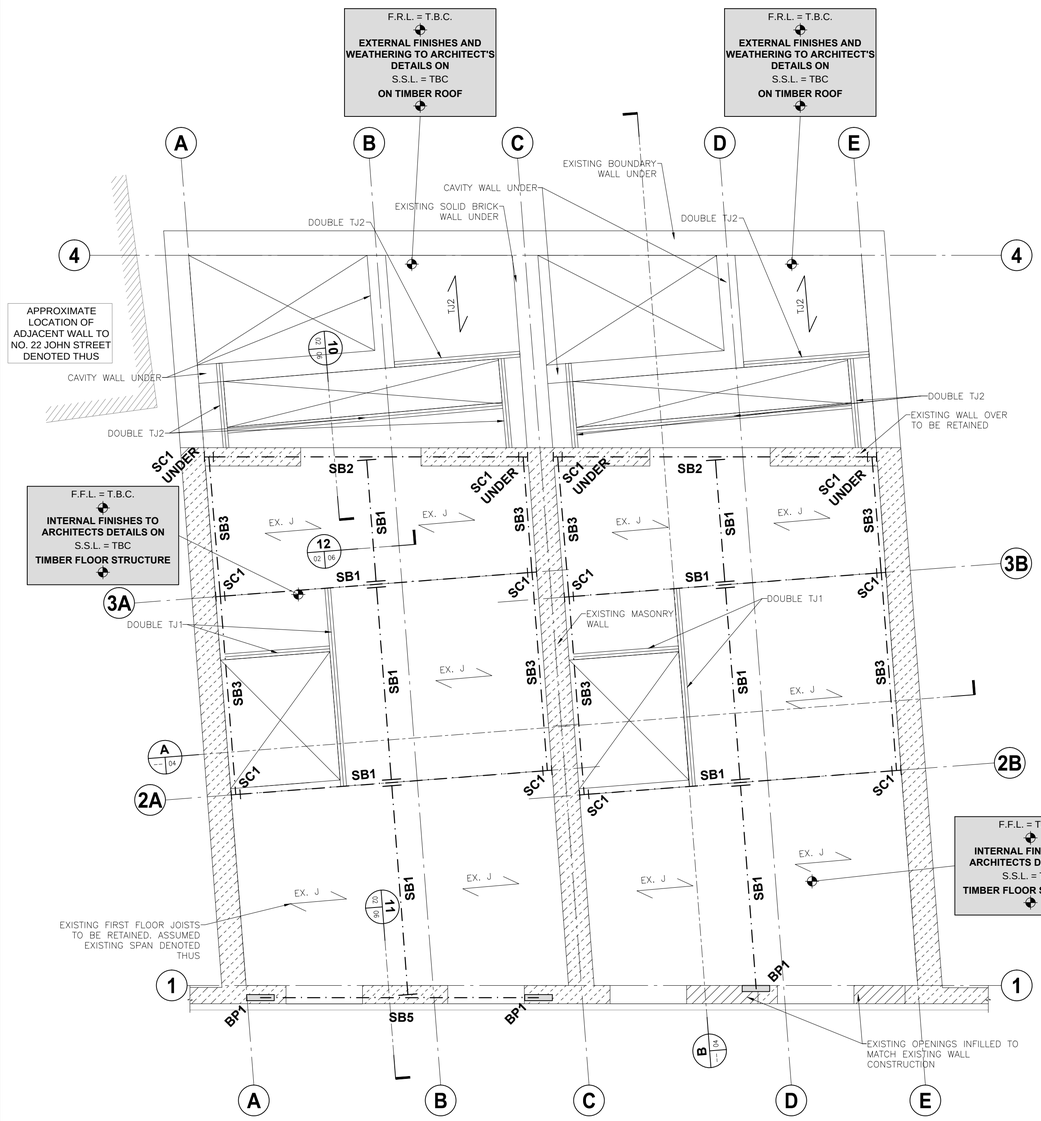
Barrett Mahony Consulting Engineers, Civil . Structural . Project Management.
E-mail: bmce@bmce.ie Web: www.bmce.ie
London Office: 95A Westminster Bridge Road, London SE1 7HR, United Kingdom. Tel: (0044) 207 922 1402 Email: bmce@bmceuk.com
Dublin Office: Sandwith House, 52-54 Lower Sandwith Street, Dublin 2, Ireland. Tel: (01) 677 3200 Fax: (01) 677 3164
Athlone Office: Suite 15B, Inish Carrig Business Centre, Goldenisland, Athlone, Co. Westmeath, Ireland. Tel: (090) 644 9080 Fax: (090) 645 0585

CLIENT
WANDSWORTH SAND + STONE LTD.

PROJECT TITLE
13–15 JOHN'S MEWS

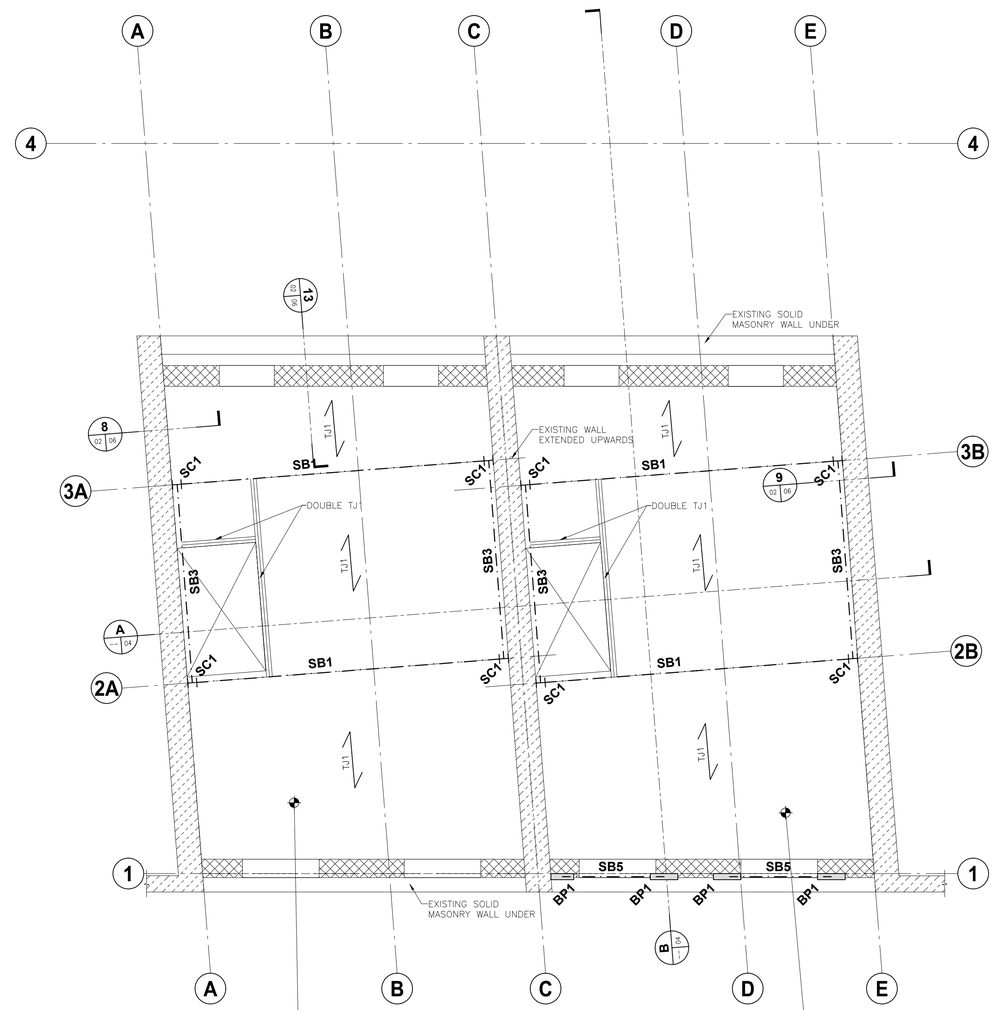
DRAWING TITLE
G.A.: LOWER GROUND FLOOR AND GROUND FLOOR PLANS

SCALE @ A1	JOB NO.	DRAWING NO.	ISSUE
AS SHOWN	L14771	01	PL1



FIRST FLOOR PLAN

(SCALE 1:50 @ A1 & 1:100 @ A3)



SECOND FLOOR PLAN

(SCALE 1:50 @ A1 & 1:100 @ A3)

NOT FOR CONSTRUCTION

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEERS & ARCHITECT'S DRAWINGS.FIGURED DIMENSIONS ONLY (NOT SCALING) TO BE USED. WHERE A CONFLICT OF INFORMATION EXISTS OR IF IN ANY DOUBT – 'ASK'.
2. CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.

LEGEND

	NEW REINFORCED CONCRETE WALL
	NEW LOADBEARING BLOCKWORK WALL
	NEW NON–LOADBEARING WALL
	LOADBEARING TIMBER STUD WALL
	EXISTING MASONRY WALL
	EXISTING LOADBEARING WALLS BELOW
SB2	STEEL BEAM
SC1	STEEL COLUMN
B1	CONCRETE BEAM
C1	CONCRETE COLUMN
EX. J	DENOTES EXISTING JOISTS SPAN DIRECTION
Jx	DENOTES NEW JOISTS SPAN DIRECTION

SCHEDULE OF CONCRETE MEMBERS

BEARING PADS

REF.	SIZE	COMMENT
BP1	450 x 100 x 225mm Dp.	–

CONCRETE BEAMS

REF.	SIZE	COMMENT
B1	300W x 500 O/A Dp.	–

SCHEDULE OF STEELWORK MEMBERS

STEEL COLUMNS

REF.	SIZE	COMMENT
SC1	152 UC 23kg.	–
SC2	100 SHS 5.0	–

STEEL BEAMS

REF.	SIZE	COMMENT
SB1	203 UC 46kg.	–
SB2	203 UC 60kg.	–
SB3	152 UC 23kg.	–
SB4	100 EA 8.0	FIXED TO WALL
SB5	200 x 100 RHS 5.0	WITH 225 x 10 BOTTOM PLATE

SCHEDULE OF TIMBER MEMBERS

TIMBER FLOOR JOISTS

REF.	SIZE	COMMENT
TJ1	47 x 220 C24 JOISTS @ 400mm Crs.	–
TJ2	47 x 170 C24 JOISTS @ 400mm Crs.	–

ISSUE	DATE	DESCRIPTION	DRN / ORIG	P.E. / P.D.
PL1	07.01.16	ISSUED FO PLANNING	MA / OC	OC / VB
T1	22.12.14	GENERAL REVISION	MA / OC	OC / VB
P3	27.11.14	GENERAL REVISION	MA / OC	OC / VB
P2	09.10.14	ISSUED FOR COMMENTS	MA / OC	OC / VB
P1	19.09.14	ISSUED FOR COMMENT	MA / OC	OC / VB

ISSUE STATUS ☐ **PRELIMINARY** (P1, P2, P3 etc.,) ☒ **PLANNING** (PL1, PL2, PL3 etc.,)
☐ **TENDER** (T1,T2, T3 etc.,) ☐ **CONSTRUCTION** (0, 1, 2 etc.,)

Barrett Mahony Consulting Engineers, Civil . Structural . Project Management.
E-mail: bmce@bmce.ie Web: www.bmce.ie

London Office: 95A Westminster Bridge Road, London SE1 7HR, United Kingdom.
Tel: (0044) 207 922 1402 Email: bmce@bmceuk.com

Dublin Office: Sandwith House, 52-54 Lower Sandwith Street, Dublin 2, Ireland.
Tel: (01) 677 3200 Fax: (01) 677 3164

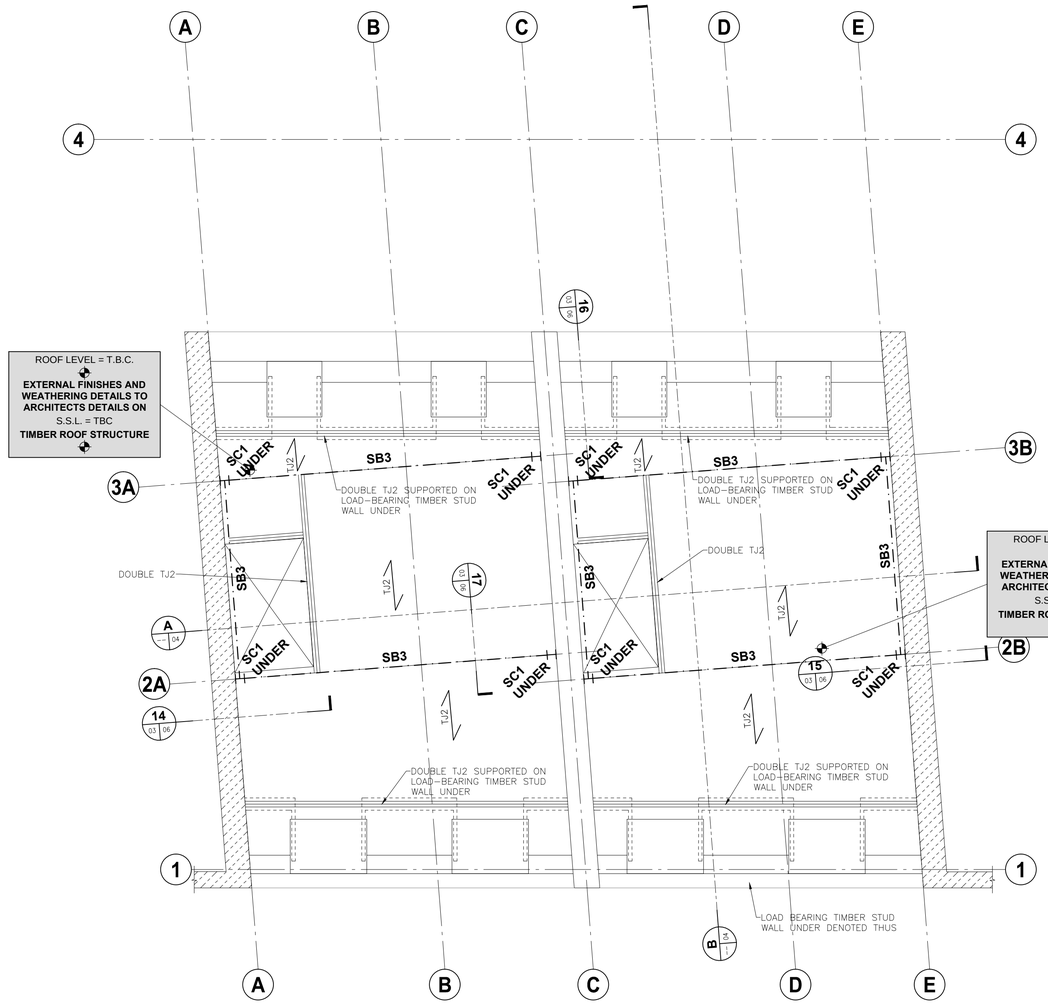
Athlone Office: Suite 15B, Inish Carrig Business Centre, Goldenisland,
Athlone, Co. Westmeath, Ireland.
Tel: (090) 644 9080 Fax: (090) 645 0585

CLIENT
WANDSWORTH SAND + STONE LTD.

PROJECT TITLE
13–15 JOHN'S MEWS

DRAWING TITLE
G.A.: FIRST FLOOR AND SECOND FLOOR PLAN

SCALE @ A1	JOB NO.	DRAWING NO.	ISSUE
AS SHOWN	L14771	02	PL1



ROOF PLAN

(SCALE 1:50 @ A1 & 1:100 @ A3)

NOT FOR CONSTRUCTION

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEERS & ARCHITECT'S DRAWINGS.FIGURED DIMENSIONS ONLY (NOT SCALING) TO BE USED. WHERE A CONFLICT OF INFORMATION EXISTS OR IF IN ANY DOUBT – 'ASK'.
2. CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.

LEGEND

	NEW REINFORCED CONCRETE WALL
	NEW LOADBEARING BLOCKWORK WALL
	NEW NON-LOADBEARING WALL
	LOADBEARING TIMBER STUD WALL
	EXISTING MASONRY WALL
	EXISTING LOADBEARING WALLS BELOW
SB2	STEEL BEAM
SC1	STEEL COLUMN
B1	CONCRETE BEAM
C1	CONCRETE COLUMN
EX. J	DENOTES EXISTING JOISTS SPAN DIRECTION
Jx	DENOTES NEW JOISTS SPAN DIRECTION

SCHEDULE OF CONCRETE MEMBERS

BEARING PADS

REF.	SIZE	COMMENT
BP1	450 x 100 x 225mm Dp.	–

CONCRETE BEAMS

REF.	SIZE	COMMENT
B1	300W x 500 O/A Dp.	–

SCHEDULE OF STEELWORK MEMBERS

STEEL COLUMNS

REF.	SIZE	COMMENT
SC1	152 UC 23kg.	–
SC2	100 SHS 5.0	–

STEEL BEAMS

REF.	SIZE	COMMENT
SB1	203 UC 46kg.	–
SB2	203 UC 60kg.	–
SB3	152 UC 23kg.	–
SB4	100 EA 8.0	FIXED TO WALL
SB5	200 x 100 RHS 5.0	WITH 225 x 10 BOTTOM PLATE

SCHEDULE OF TIMBER MEMBERS

TIMBER FLOOR JOISTS

REF.	SIZE	COMMENT
TJ1	47 x 220 C24 JOISTS @ 400mm Crs.	–
TJ2	47 x 170 C24 JOISTS @ 400mm Crs.	–

ISSUE	DATE	DESCRIPTION	DRN / ORIG	P.E. / P.D.
PL1	07.01.16	ISSUED FOR PLANNING	MA / OC	OC / VB
T1	22.12.14	GENERAL REVISION	MA / OC	OC / VB
P3	27.11.14	GENERAL REVISION	MA / OC	OC / VB
P2	09.10.14	ISSUED FOR COMMENT	MA / OC	OC / VB
P1	19.09.14	ISSUED FOR COMMENT	MA / OC	OC / VB

ISSUE STATUS ☐ **PRELIMINARY** (P1, P2, P3 etc.,) ☒ **PLANNING** (PL1, PL2, PL3 etc.,) ☐ **TENDER** (T1,T2, T3 etc.,) ☐ **CONSTRUCTION** (0, 1, 2 etc.,)

Barrett Mahony Consulting Engineers, Civil . Structural . Project Management.
E-mail: bmce@bmce.ie Web: www.bmce.ie

London Office: 95A Westminster Bridge Road, London SE1 7HR, United Kingdom.
Tel: (0044) 207 922 1402 Email: bmce@bmceuk.com

Dublin Office: Sandwith House, 52-54 Lower Sandwith Street, Dublin 2, Ireland.
Tel: (01) 677 3200 Fax: (01) 677 3164

Athlone Office: Suite 15B, Inish Carrig Business Centre, Goldenisland, Athlone, Co. Westmeath, Ireland.
Tel: (090) 644 9080 Fax: (090) 645 0585

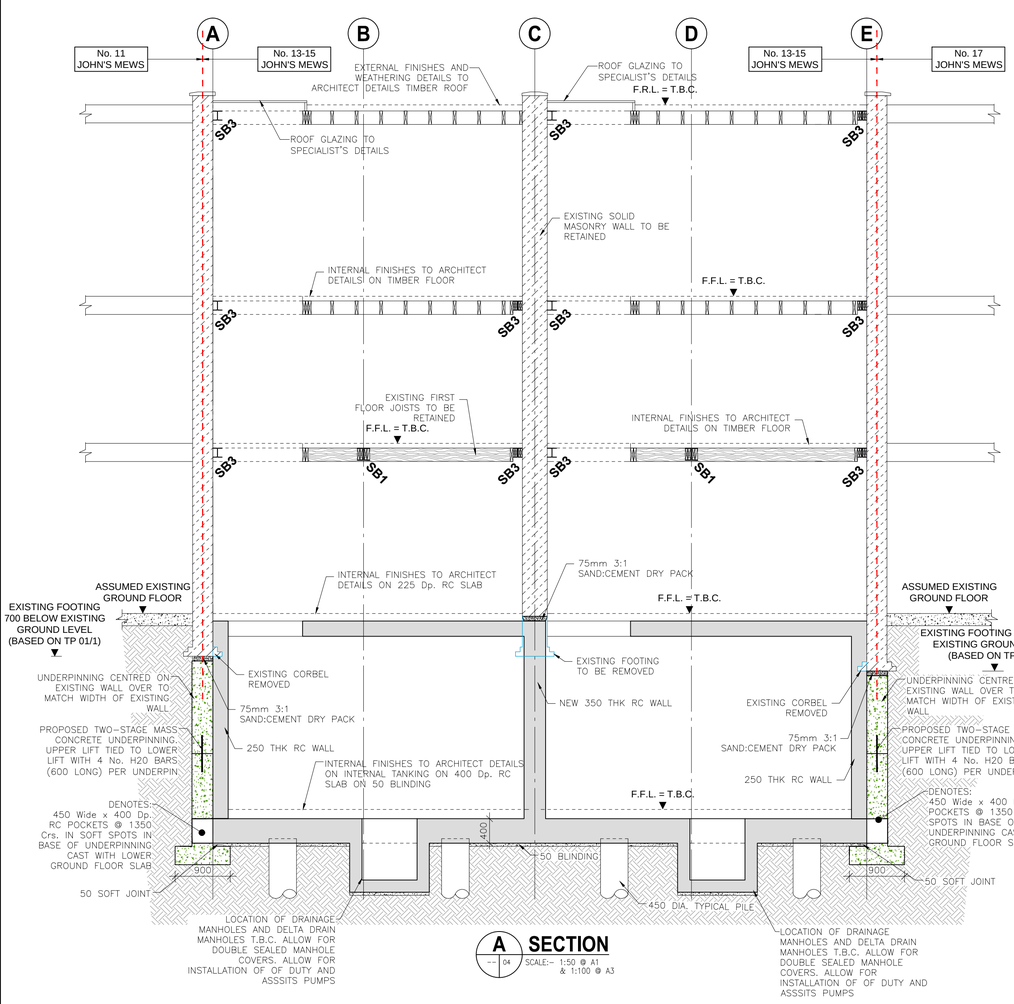
BM barrett **mahony**

CLIENT
WANDSWORTH SAND + STONE LTD.

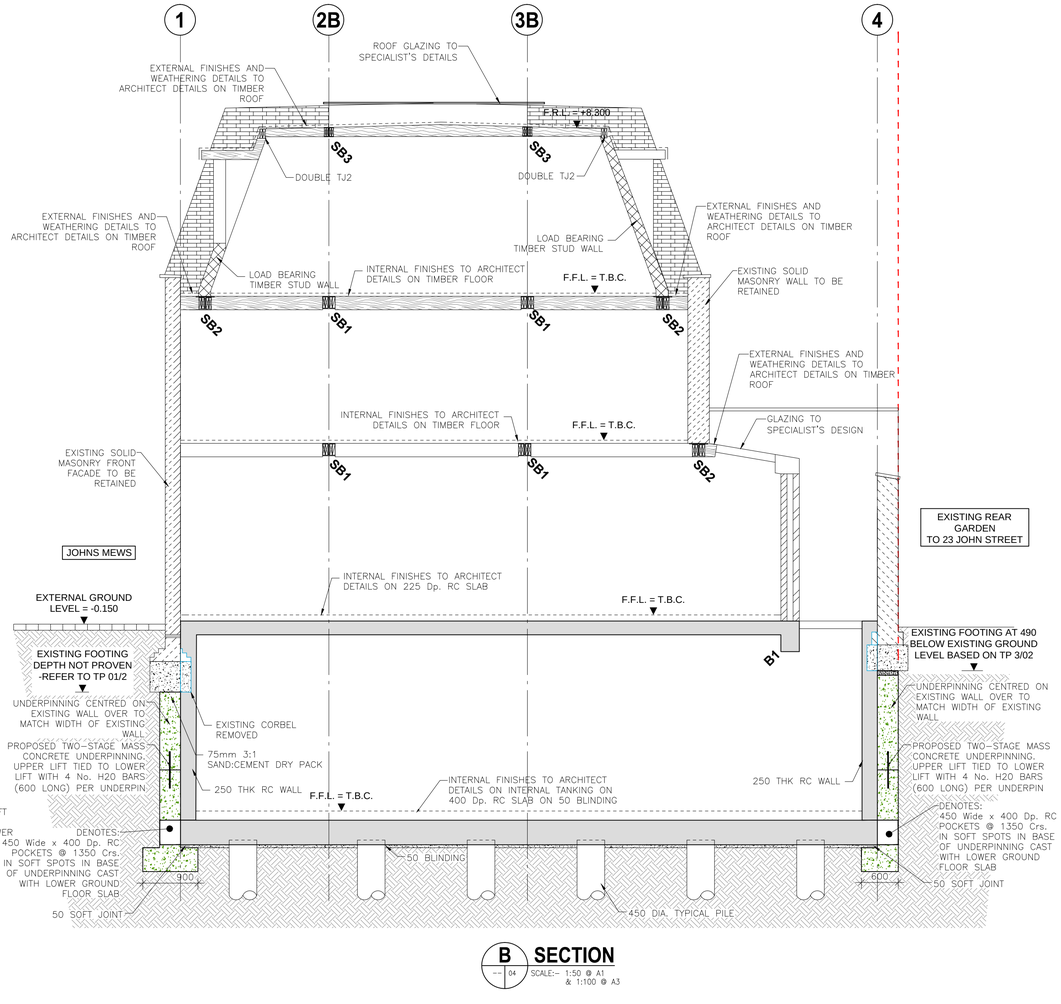
PROJECT TITLE
13–15 JOHN'S MEWS

DRAWING TITLE
G.A.: ROOF PLAN

SCALE @ A1	JOB NO.	DRAWING NO.	ISSUE
AS SHOWN	L14771	03	PL1



A SECTION
-- 04 SCALE:- 1:50 @ A1 & 1:100 @ A3



B SECTION
-- 04 SCALE:- 1:50 @ A1 & 1:100 @ A3

NOT FOR CONSTRUCTION

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEERS & ARCHITECT'S DRAWINGS.FIGURED DIMENSIONS ONLY (NOT SCALING) TO BE USED. WHERE A CONFLICT OF INFORMATION EXISTS OR IF IN ANY DOUBT – 'ASK'.
2. CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.

SCHEDULE OF CONCRETE MEMBERS

BEARING PADS

REF.	SIZE	COMMENT
BP1	450 x 100 x 225mm Dp.	–

CONCRETE BEAMS

REF.	SIZE	COMMENT
B1	300W x 500 O/A Dp.	–

SCHEDULE OF STEELWORK MEMBERS

STEEL COLUMNS

REF.	SIZE	COMMENT
SC1	152 UC 23kg.	–
SC2	100 SHS 5.0	–

STEEL BEAMS

REF.	SIZE	COMMENT
SB1	203 UC 46kg.	–
SB2	203 UC 60kg.	–
SB3	152 UC 23kg.	–
SB4	100 EA 8.0	FIXED TO WALL
SB5	200 x 100 RHS 5.0	WITH 225 x 10 BOTTOM PLATE

SCHEDULE OF TIMBER MEMBERS

TIMBER FLOOR JOISTS

REF.	SIZE	COMMENT
TJ1	47 x 220 C24 JOISTS @ 400mm Crs.	–
TJ2	47 x 170 C24 JOISTS @ 400mm Crs.	–

ISSUE	DATE	DESCRIPTION	DRN. / ORIG.	P.E. / P.D.
PL1	07.01.16	ISSUED FOR PLANNING	MA / OC	OC / VB
T2	15.10.15	REISSUED FOR TENDER	MA / OC	OC / VB
T1	22.12.14	ISSUED FOR TENDER	MA / OC	OC / VB
P3	27.11.14	GENERAL REVISION	MA / OC	OC / VB
P2	09.10.14	ISSUED FOR COMMENT	MA / OC	OC / VB
P1	19.09.14	ISSUED FOR COMMENT	MA / OC	OC / VB

ISSUE STATUS ☐ **PRELIMINARY** (P1, P2, P3 etc.,) ☒ **PLANNING** (PL1, PL2, PL3 etc.,)
☐ **TENDER** (T1,T2, T3 etc.,) ☐ **CONSTRUCTION** (0, 1, 2 etc.,)

Barrett Mahony Consulting Engineers, Civil . Structural . Project Management.
E-mail: bmce@bmce.ie Web: www.bmce.ie

London Office: 95A Westminster Bridge Road, London SE1 7HR, United Kingdom.
Tel: (0044) 207 922 1402 Email: bmce@bmceuk.com

Dublin Office: Sandwith House, 52-54 Lower Sandwith Street, Dublin 2, Ireland.
Tel: (01) 677 3200 Fax: (01) 677 3164

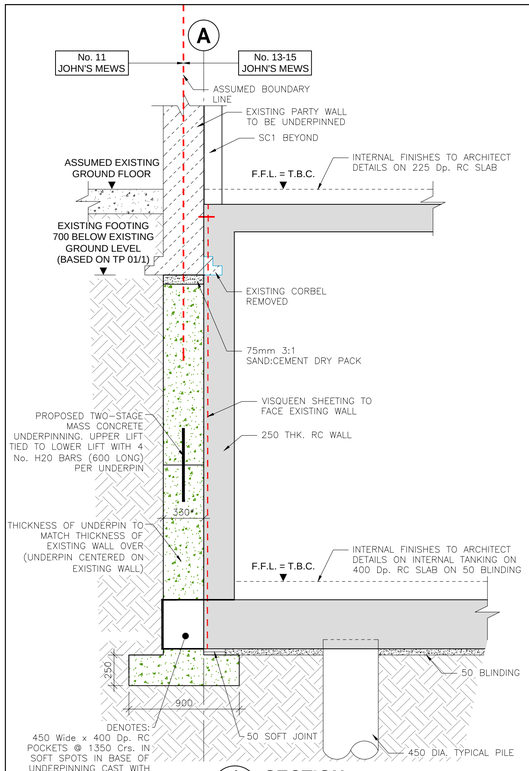
Athlone Office: Suite 15B, Inish Carrig Business Centre, Goldenisland,
Athlone, Co. Westmeath, Ireland.
Tel: (090) 644 9080 Fax: (090) 645 0585

CLIENT
WANDSWORTH SAND + STONE LTD.

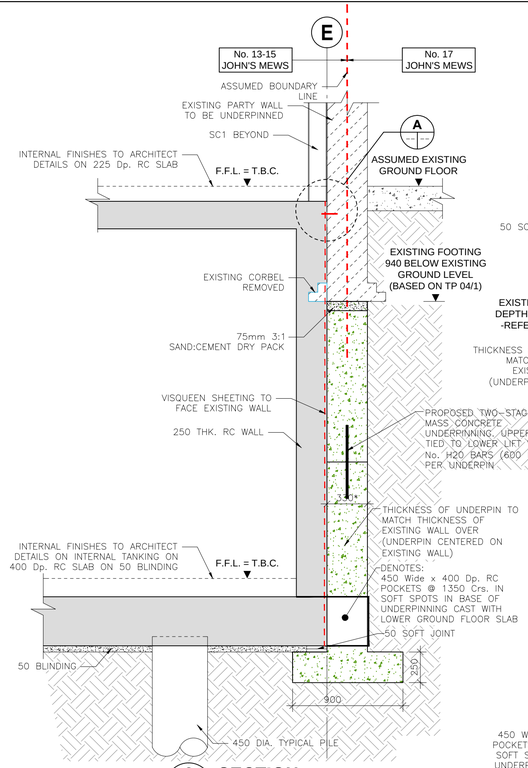
PROJECT TITLE
13–15 JOHN'S MEWS

DRAWING TITLE
G.A.: SECTIONS A AND B

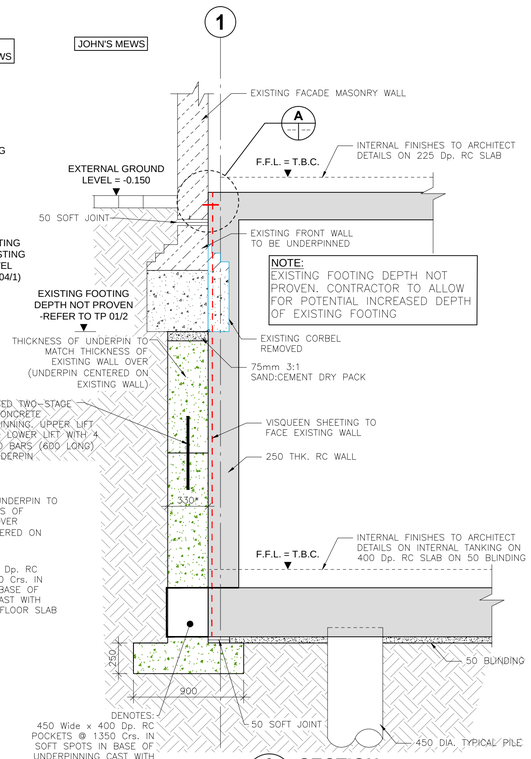
SCALE @ A1	JOB NO.	DRAWING NO.	ISSUE
AS SHOWN	L14771	04	PL1



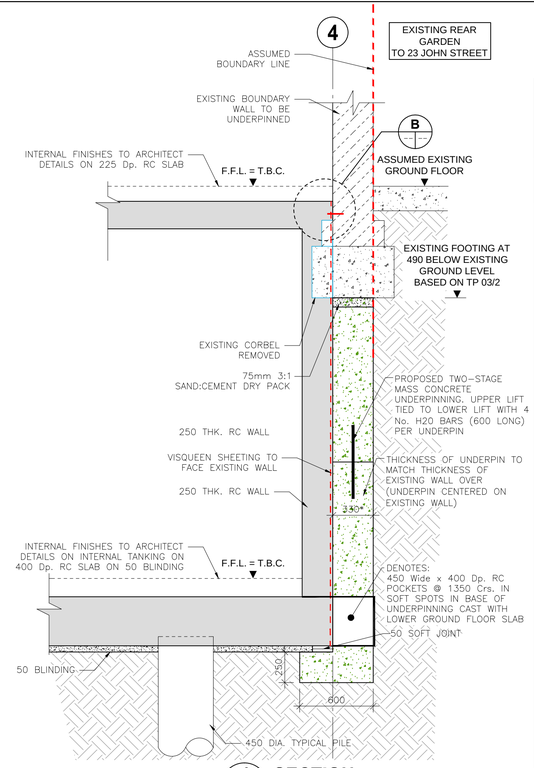
1 SECTION
01 05 SCALE:- 1:25 @ A1 & 1:50 @ A3



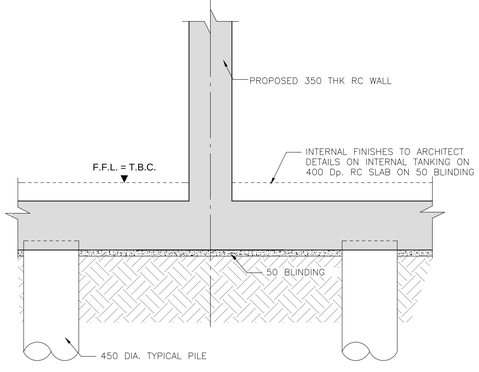
2 SECTION
01 05 SCALE:- 1:25 @ A1 & 1:50 @ A3



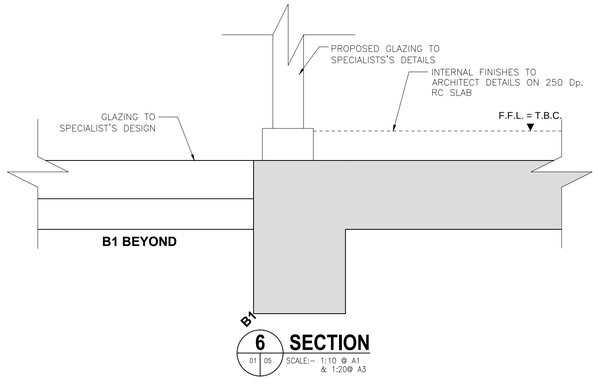
3 SECTION
01 05 SCALE:- 1:25 @ A1 & 1:50 @ A3



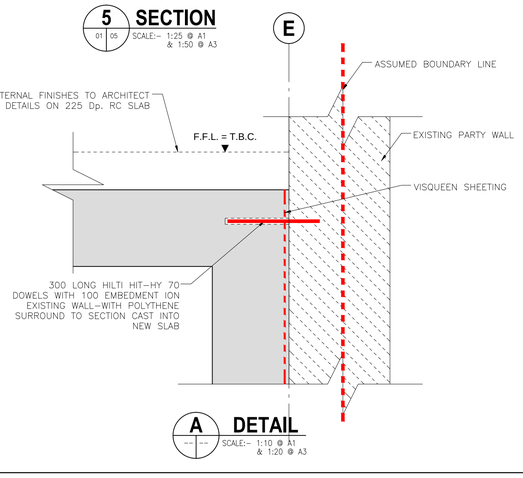
4 SECTION
01 05 SCALE:- 1:25 @ A1 & 1:50 @ A3



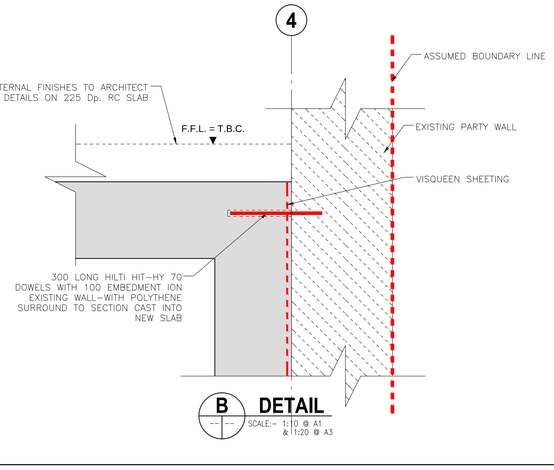
5 SECTION
01 05 SCALE:- 1:25 @ A1 & 1:50 @ A3



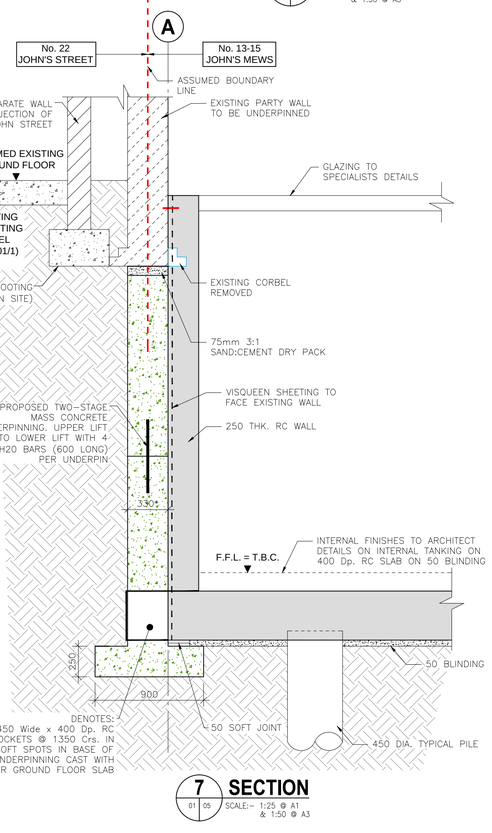
6 SECTION
01 05 SCALE:- 1:10 @ A1 & 1:20@ A3



A DETAIL
-- -- SCALE:- 1:10 @ A1 & 1:20 @ A3



B DETAIL
-- -- SCALE:- 1:10 @ A1 & 1:20 @ A3



7 SECTION
01 05 SCALE:- 1:25 @ A1 & 1:50 @ A3

NOT FOR CONSTRUCTION

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEERS & ARCHITECT'S DRAWINGS.FIGURED DIMENSIONS ONLY (NOT SCALING) TO BE USED. WHERE A CONFLICT OF INFORMATION EXISTS OR IF IN ANY DOUBT – 'ASK'.
2. CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.

SCHEDULE OF CONCRETE MEMBERS

BEARING PADS

REF.	SIZE	COMMENT
BP1	450 x 100 x 225mm Dp.	–

CONCRETE BEAMS

REF.	SIZE	COMMENT
B1	300W x 500 O/A Dp.	–

SCHEDULE OF STEELWORK MEMBERS

STEEL COLUMNS

REF.	SIZE	COMMENT
SC1	152 UC 23kg.	–
SC2	100 SHS 5.0	–

STEEL BEAMS

REF.	SIZE	COMMENT
SB1	203 UC 46kg.	–
SB2	203 UC 60kg.	–
SB3	152 UC 23kg.	–
SB4	100 EA 8.0	FIXED TO WALL
SB5	200 x 100 RHS 5.0	WITH 225 x 10 BOTTOM PLATE

SCHEDULE OF TIMBER MEMBERS

TIMBER FLOOR JOISTS

REF.	SIZE	COMMENT
TJ1	47 x 220 C24 JOISTS @ 400mm Crs.	–
TJ2	47 x 170 C24 JOISTS @ 400mm Crs.	–

ISSUE	DATE	DESCRIPTION	DRN / CHKD
PL1	07.01.15	ISSUED FOR PLANNING	MA / OC
T2	15.10.15	GENERAL REVISION	MA / OC
T1	22.12.14	GENERAL REVISION	MA / OC
P4	05.12.14	GENERAL REVISION	MA / OC
P3	27.11.14	GENERAL REVISION	MA / OC
P2	09.10.14	ISSUED FOR COMMENTS	MA / OC
P1	19.09.14	ISSUED FOR COMMENT	MA / OC

P.E. / P.D. : VB / VB

ISSUE STATUS ☐ **PRELIMINARY** (P1, P2, P3 etc.,) ☐ **PLANNING** (PL1, PL2, PL3 etc.,)
☒ **TENDER** (T1,T2, T3 etc.,) ☐ **CONSTRUCTION** (0, 1, 2 etc.,)

Barrett Mahony Consulting Engineers, Civil . Structural . Project Management.
E-mail: bmce@bmce.ie Web: www.bmce.ie
London Office: 95A Westminster Bridge Road, London SE1 7HR, United Kingdom. Tel: (0044) 207 922 1402 Email: bmce@bmceuk.com
Dublin Office: Sandwith House, 52-54 Lower Sandwith Street, Dublin 2, Ireland. Tel: (01) 677 3200 Fax: (01) 677 3164
Athlone Office: Suite 15B, Inish Carrig Business Centre, Goldenisland, Athlone, Co. Westmeath, Ireland. Tel: (090) 644 9080 Fax: (090) 645 0585

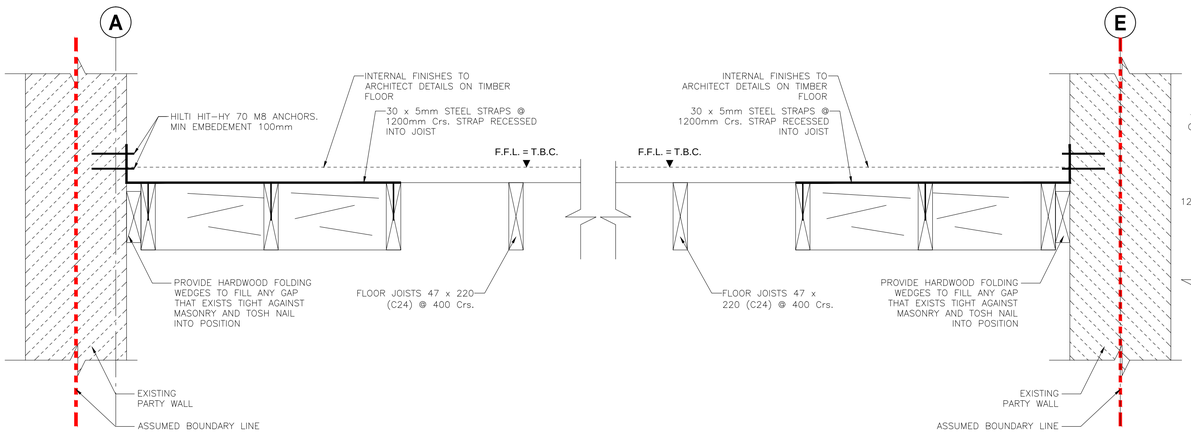
BM barrett mahony

CLIENT
WANDSWORTH SAND + STONE LTD.

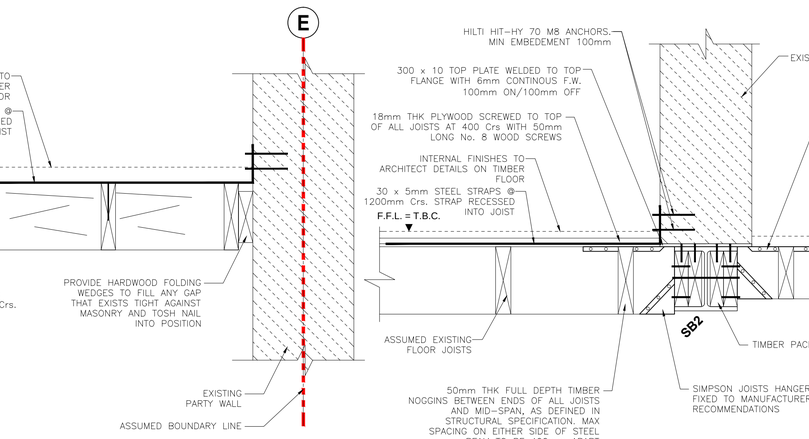
PROJECT TITLE
13–15 JOHN'S MEWS

DRAWING TITLE
G.A.: SECTIONS 1–7 AND DETAILS

SCALE @ A1	JOB NO.	DRAWING NO.	ISSUE
AS SHOWN	L14771	05	PL1

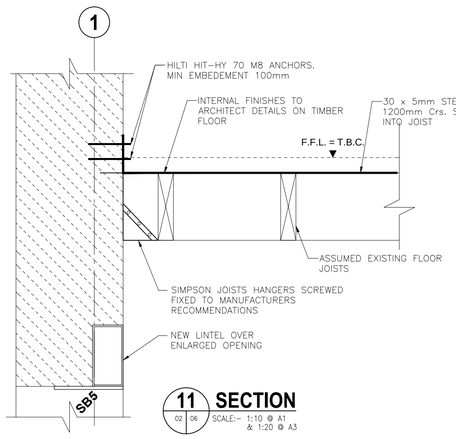


8 SECTION 02 | 06 SCALE:– 1:10 @ A1 & 1:20 @ A3

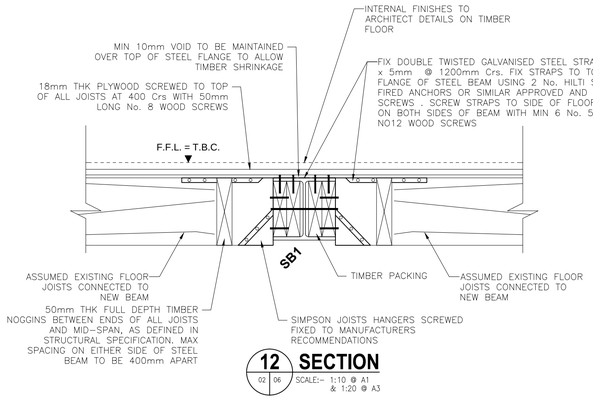


9 SECTION 02 | 06 SCALE:– 1:10 @ A1 & 1:20 @ A3

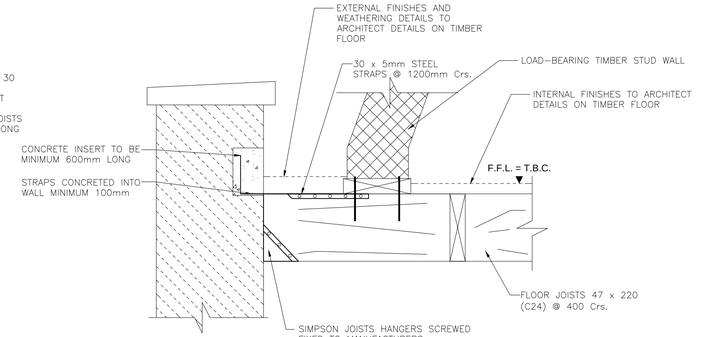
10 SECTION 02 | 06 SCALE:– 1:10 @ A1 & 1:20 @ A3



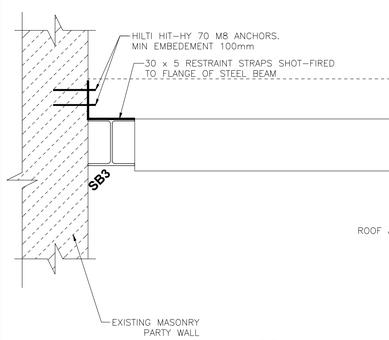
11 SECTION 02 | 06 SCALE:– 1:10 @ A1 & 1:20 @ A3



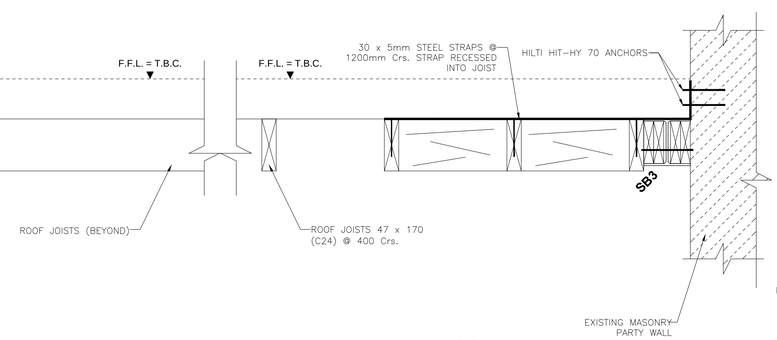
12 SECTION 02 | 06 SCALE:– 1:10 @ A1 & 1:20 @ A3



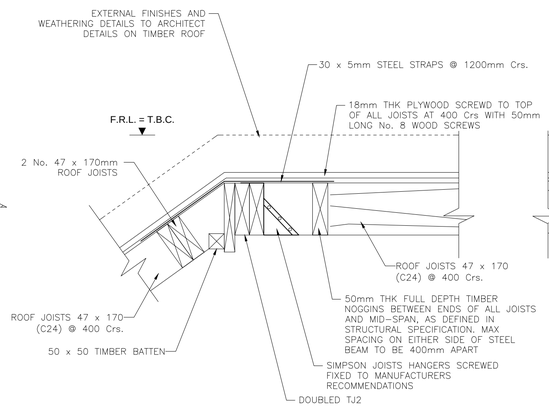
13 SECTION 02 | 06 SCALE:– 1:10 @ A1 & 1:20 @ A3



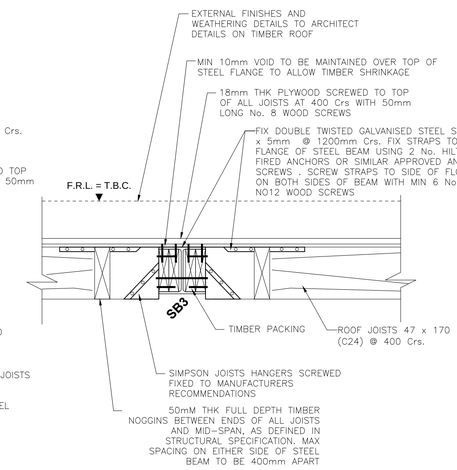
14 SECTION 03 | 06 SCALE:– 1:10 @ A1 & 1:20 @ A3



15 SECTION 03 | 06 SCALE:– 1:10 @ A1 & 1:20 @ A3



16 SECTION 03 | 06 SCALE:– 1:10 @ A1 & 1:20 @ A3



17 SECTION 03 | 06 SCALE:– 1:10 @ A1 & 1:20 @ A3

NOT FOR CONSTRUCTION

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEERS & ARCHITECT'S DRAWINGS.FIGURED DIMENSIONS ONLY (NOT SCALING) TO BE USED. WHERE A CONFLICT OF INFORMATION EXISTS OR IF IN ANY DOUBT – 'ASK'.
2. CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.

SCHEDULE OF CONCRETE MEMBERS

BEARING PADS		
REF.	SIZE	COMMENT
BP1	450 x 100 x 225mm Dp.	–
CONCRETE BEAMS		
REF.	SIZE	COMMENT
B1	300W x 500 O/A Dp.	–

SCHEDULE OF STEELWORK MEMBERS

STEEL COLUMNS		
REF.	SIZE	COMMENT
SC1	152 UC 23kg.	–
SC2	100 SHS 5.0	–
STEEL BEAMS		
REF.	SIZE	COMMENT
SB1	203 UC 46kg.	–
SB2	203 UC 60kg.	–
SB3	152 UC 23kg.	–
SB4	100 EA 8.0	FIXED TO WALL
SB5	200 x 100 RHS 5.0	WITH 225 x 10 BOTTOM PLATE

SCHEDULE OF TIMBER MEMBERS

TIMBER FLOOR JOISTS		
REF.	SIZE	COMMENT
TJ1	47 x 220 C24 JOISTS @ 400mm Crs.	–
TJ2	47 x 170 C24 JOISTS @ 400mm Crs.	–

ISSUE	DATE	DESCRIPTION	ORIG.	P.E.	P.D.
PL1	07.01.16	ISSUED FOR PLANNING	MA	OC	OC VB
T1	22.12.14	GENERAL REVISION	MA	OC	OC VB
P3	27.11.14	GENERAL REVISOIN	MA	OC	OC VB
P2	09.10.14	ISSUED FOR COMMENT	MA	OC	OC VB
P1	19.09.14	ISSUED FOR COMMENT	MA	OC	OC VB

ISSUE STATUS ☐ **PRELIMINARY** (P1, P2, P3 etc.,) ☒ **PLANNING** (PL1, PL2, PL3 etc.,)
☐ **TENDER** (T1,T2, T3 etc.,) ☐ **CONSTRUCTION** (0, 1, 2 etc.,)

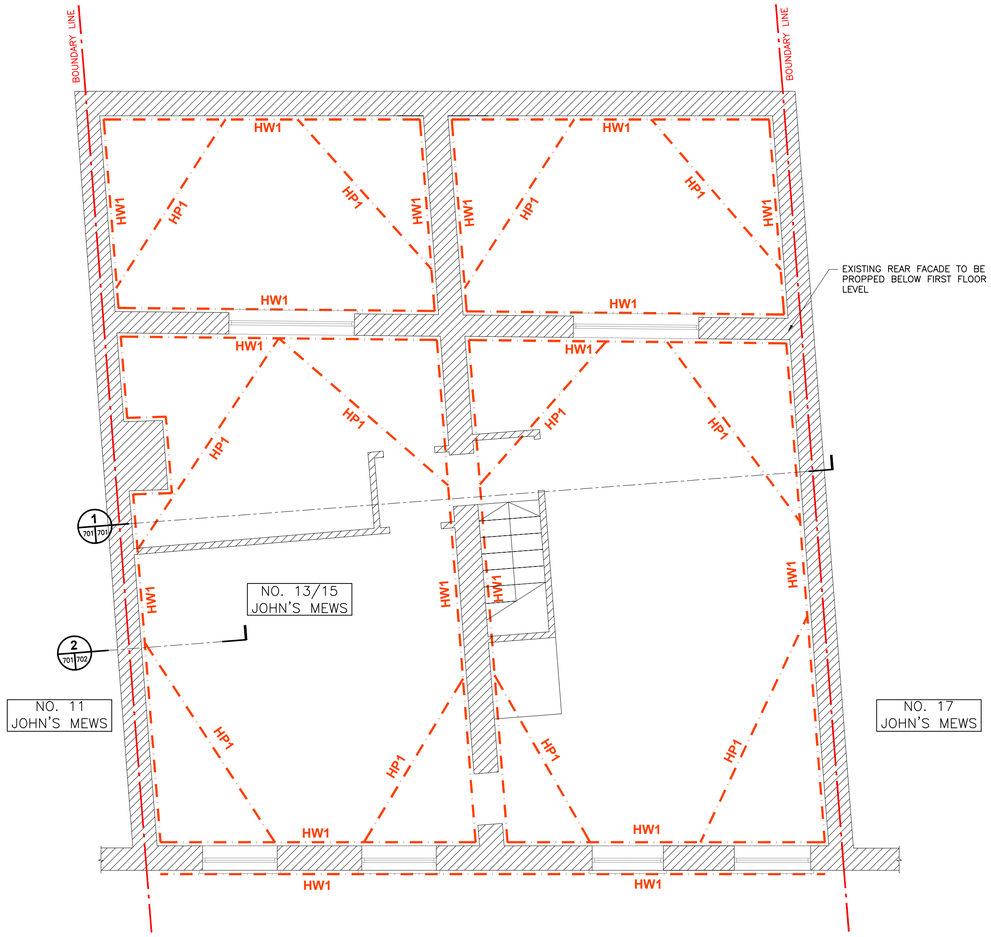
Barrett Mahony Consulting Engineers, Civil . Structural . Project Management.
E-mail: bmce@bmce.ie Web: www.bmce.ie
London Office: 95A Westminster Bridge Road, London SE1 7HR, United Kingdom. Tel: (0044) 207 922 1402 Email: bmce@bmceuk.com
Dublin Office: Sandwith House, 52-54 Lower Sandwith Street, Dublin 2, Ireland. Tel: (01) 677 3200 Fax: (01) 677 3164
Athlone Office: Suite 15B, Inish Carrig Business Centre, Goldenisland, Athlone, Co. Westmeath, Ireland. Tel: (090) 644 9080 Fax: (090) 645 0585

CLIENT
WANDSWORTH SAND + STONE LTD.

PROJECT TITLE
13–15 JOHN'S MEWS

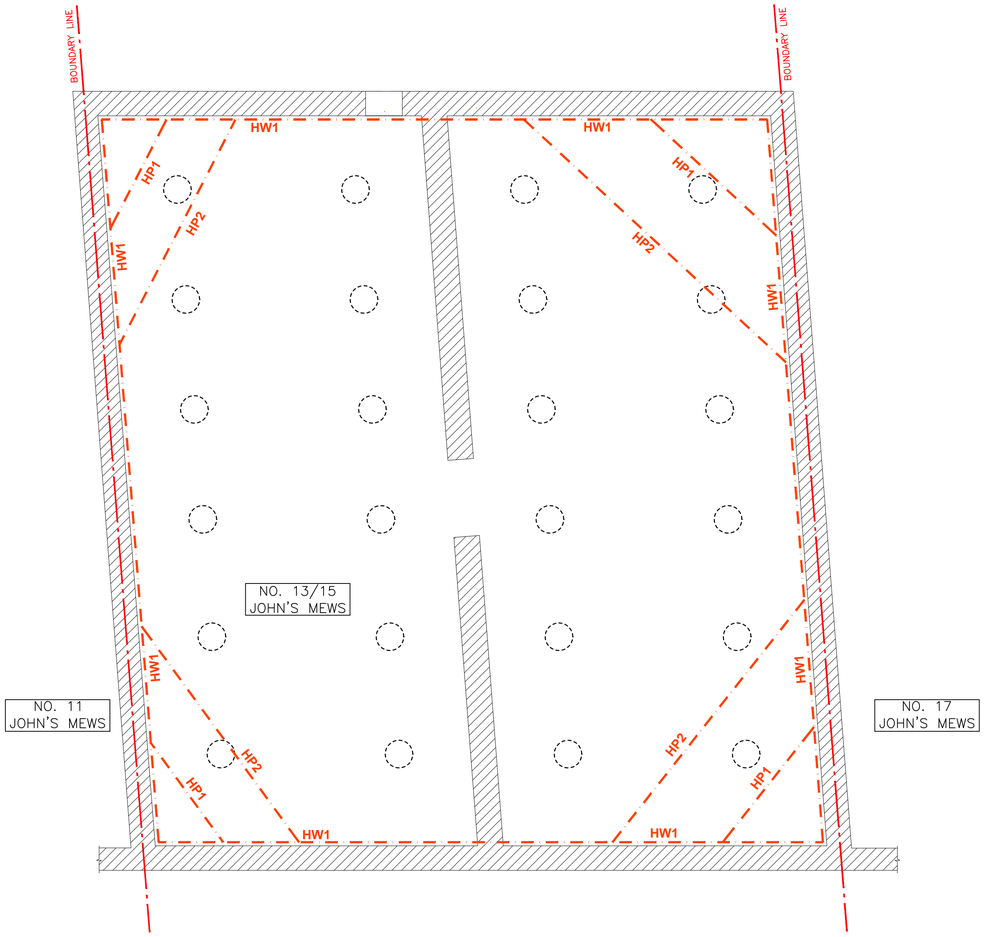
DRAWING TITLE
G.A.: SECTIONS 8–19

SCALE @ A1	JOB NO.	DRAWING NO.	ISSUE
AS SHOWN	L14771	06	PL1



SUPERSTURCTURE T.W. PLAN (2 No. LEVELS THUS)

(SCALE 1:50 @ A1 & 1:100 @ A3)



SUBSTURCTURE T.W. PLAN (2 No. LEVELS THUS)

(SCALE 1:50 @ A1 & 1:100 @ A3)

METHOD STATEMENT

FOR BASEMENT CONSTRUCTION AT No. 13-15 JOHN'S MEWS.

1. PHASE I: SUPERSTRUCTURE TEMPORARY WORKS & DEMOLITION OF EXISTING STRUCTURE

1.1. ERECT HOARDING TO SECURE THE SITE.

1.2. CARRY OUT SOFT STRIP OF EXISTING STRUCTURE. REMOVE FINISHES, PLASTERBOARD, NON-LOADBEARING STUD WALL ETC. ALL FLOORBOARDS + JOISTS TO REMAIN IN POSITION UNTIL TEMPORARY WORKS HAVE BEEN INSTALLED.

1.3. IDENTIFY EXISTING SERVICES ON THE SITE, THROUGH APPROPRIATE SCANNING AND TRIAL EXCAVATIONS. ENSURE THAT ALL SERVICES ARE DISCONNECTED AND CERTIFIED AS SUCH BY A SUITABLY QUALIFIED PROFESSIONAL.

1.4. BREAK OUT EXISTING GROUND FLOOR STRUCTURE AND REMOVE FROM SITE.

1.5. NO FURTHER EXCAVATION SHALL TAKE PLACE UNTIL UNDERPINNING OF THE EXISTING WALLS HAS BEEN EXECUTED.

1.6. INSTALL MOVEMENT MONITORS AT THE LOCATIONS INDICATED ON DRAWINGS AND RECORD BASELINE READINGS. READINGS SHALL BE RECORDED AT REGULAR INTERVALS DURING THE WORKS AS SPECIFIED ON THE DRAWINGS.

1.7. CARRY OUT REPAIRS TO EXISTING MASONRY WALLS USING HELICAL BARS (HELIFIX CRACK STITCHING SYSTEM OR SIMILAR) TO REPAIR EXISTING CRACKING.

1.8. CARRY OUT PROPOSED INFILLS TO EXISTING OPENINGS IN MASONRY WALLS, WITH NEW BRICKWORK FULLY BONDED TO EXISTING WALLS.

1.9. INSTALL TEMPORARY HORIZONTAL WALERS TO EXISTING LOAD BEARING MASONRY WALLS JUST BELOW EXISTING SECOND FLOOR (LOFT) LEVEL.

1.10. INSTALL TEMPORARY HORIZONTAL PROPS JUST BELOW EXISTING SECOND FLOOR (LOFT) LEVEL.

1.11. INSTALL TEMPORARY HORIZONTAL WALERS TO EXISTING LOAD BEARING MASONRY JUST ABOVE EXISTING FIRST FLOOR LEVEL.

1.12. INSTALL TEMPORARY HORIZONTAL PROPS JUST ABOVE EXISTING FIRST FLOOR LEVEL.

1.13. INSTALL HORIZONTAL WALER AND ASSOCIATED PROPPING TO TOP OF REAR BOUNDARY WALL TO BE RETAINED.

1.14. INSTALL TEMPORARY NEEDLES AND VERTICAL PROPPING BELOW FIRST FLOOR LEVEL TO REAR WALL OF TWO-STOREY PORTION OF EXISTING BUILDING.

1.15. INSTALL PROPOSED TEMPORARY WEATHERING TO PARTY WALLS.

1.16. DEMOLISH EXISTING ROOF STRUCTURE.

1.17. DEMOLISH EXISTING WALLS (EXCEPT PRINCIPAL WALLS TO BE RETAINED) FROM EXISTING LOFT LEVEL TO FIRST FLOOR LEVEL. REFER TO ARCHITECT'S PLAN FOR PROPOSED DEMOLITIONS.

1.18. DEMOLISH EXISTING WALLS (EXCEPT PRINCIPAL WALLS TO BE RETAINED) FROM FIRST FLOOR LEVEL TO GROUND FLOOR LEVEL. REFER TO ARCHITECT'S PLAN FOR PROPOSED DEMOLITIONS.

1.19 CLEAR ALL DEBRIS FROM SITE AND LEVEL THE GROUND.

2. PHASE II: SUBSTRUCTURE TEMPORARY WORKS & EXCAVATION FOR PROPOSED BASEMENT

2.1. INSTALL PILING MAT AT EXISTING GROUND LEVEL.

2.2. INSTALL PILES FROM EXISTING GROUND LEVEL. SHOULD OBSTRUCTIONS BE ENCOUNTERED ABOVE FOUNDING LEVEL OF THE EXISTING FOOTINGS, REMOVE WITH AN EXCAVATOR AND BACKFILL IN COMPACTED LAYERS BEFORE THE PILE IS REBORED.

2.3. FORM TEMPORARY REINFORCED CONCRETE GROUND BEAMS BELOW EXISTING GROUND LEVEL. THE GROUND BEAMS SHALL BE CAST INTO POCKETS IN THE EXISTING MASONRY WALLS AND SUPPORTED OFF PAIRS OF PILES. GROUND BEAMS SHOULD BE FORMED IN SEQUENCE INDICATED ON DRAWINGS, WITH BEAMS DENOTED "1" CAST INITIALLY FOLLOWED BY BEAMS DENOTED "2".

2.4. UNDERPIN EXISTING WALL AS PER SEQUENCE INDICATED ON DRAWING L14771-01, IN ACCORDANCE WITH UNDERPINNING SPECIFICATION ON DRAWING L14771-00. AT THIS STAGE, THE UPPER LIFT UNDERPINNING ONLY SHALL BE CARRIED OUT. EACH BAY SHOULD BE BACKFILLED FOLLOWING FORMATION OF UNDERPIN, PRIOR TO PROCEEDING WITH THE NEXT UNDERPIN IN SEQUENCE.

2.5. MONITOR, CONTROL AND PUMP OUT ANY WATER ENCOUNTERED IN THE EXCAVATION. WATER SHOULD BE CONTROLLED BY THE CONTRACTOR DURING ALL STAGES OF THE WORKS.

2.6. EXCAVATE TO 300 MM ABOVE UNDERSIDE OF UPPER LIFT OF UNDERPINS.

2.7. INSTALL TEMPORARY HORIZONTAL WALERS TO EXISTING WALLS JUST ABOVE INITIAL EXCAVATION LEVEL.

2.8. INSTALL TEMPORARY HORIZONTAL PROPS TO TEMPORARY WALERS JUST ABOVE INITIAL EXCAVATION LEVEL.

2.9. PROCEED WITH FORMATION OF LOWER LIFT OF UNDERPINS, DOWELLED TO UPPER LIFT OF UNDERPINS AS PER UNDERPINNING SPECIFICATION ON DRAWING L14771-00. EACH BAY SHOULD BE BACKFILLED FOLLOWING FORMATION OF UNDERPIN, PRIOR TO PROCEEDING WITH THE NEXT UNDERPIN IN SEQUENCE.

2.10. EXCAVATE TO 750 MM ABOVE FORMATION LEVEL FOR PROPOSED BASEMENT SLAB.

2.11. INSTALL TEMPORARY HORIZONTAL WALERS TO EXISTING WALLS JUST ABOVE SECOND EXCAVATION LEVEL.

2.12. INSTALL TEMPORARY HORIZONTAL PROPS TO TEMPORARY WALERS JUST ABOVE SECOND EXCAVATION LEVEL.

2.13. EXCAVATE TO PROPOSED FORMATION LEVEL FOR BASEMENT SLAB.

2.14. DEMOLISH TEMPORARY GROUND BEAMS DENOTED "1".
PROTECT TEMPORARY GROUND BEAMS DENOTED "2".

2.15. BREAK DOWN PILES UNDER GROUND BEAMS "1" TO THEIR REQUIRED CUT-OFF LEVEL. PROTECT PILES UNDER GROUND BEAMS "2".

3. PHASE III: CONSTRUCTION & TEMPORARY WORKS REMOVAL

3.1. PLACE BLINDING FOR PROPOSED BASEMENT SLAB.

3.2. INSTALL BELOW GROUND DRAINAGE ELEMENTS.

3.3. FIX REINFORCEMENT FOR BASEMENT SLAB.

3.4. CAST PROPOSED BASEMENT SLAB, LEAVING CUT-OUTS AROUND PILES UNDER GROUND BEAMS "2".

3.5. WHEN NEW BASEMENT SLAB HAS ATTAINED A STRENGTH OF 12 N/MM2, REMOVE LOW LEVEL TEMPORARY PROPS TO UNDERPINS. DEMOLISH GROUND BEAMS "2", BREAK DOWN REMAINING PILES TO REQUIRED CUT OFF LEVELS AND INFILL CUT-OUTS ABOVE PILES.

3.6. FIX REINFORCEMENT FOR PROPOSED RISING ELEMENTS FROM BASEMENT TO GROUND FLOOR.

3.7. CAST PROPOSED RETAINING WALL TO 1500 MM ABOVE BASEMENT SSL.

3.8. WHEN NEW RETAINING WALLS HAVE ATTAINED A STRENGTH OF 24 N/MM2, REMOVE HIGH LEVEL TEMPORARY PROPS TO UNDERPINS.

3.9. CAST RETAINING WALLS UP TO GROUND FLOOR LEVEL.

3.10. FIX REINFORCEMENT FOR GROUND FLOOR SLAB AND CAST SLAB.

3.11. CONSTRUCT RISING ELEMENTS FROM GROUND FLOOR LEVEL TO FIRST FLOOR LEVEL.

3.12. MODIFY EXISTING FIRST FLOOR STRUCTURE TO SUIT PROPOSED LAYOUT.

3.13. REMOVE TEMPORARY PROPPING JUST ABOVE FIRST FLOOR LEVEL.

3.14. CONSTRUCT RISING ELEMENTS FROM FIRST FLOOR LEVEL TO SECOND FLOOR LEVEL.

3.15. CONSTRUCT PROPOSED SECOND FLOOR.

3.16. REMOVE REMAINING TEMPORARY WORKS.

3.17. CONSTRUCT RISING ELEMENTS TO ROOF LEVEL.

3.18. CONSTRUCT PROPOSED ROOF STRUCTURE AND WEATHERING.

3.19. REMOVE TEMPORARY WEATHERING

3.20. PRIMARY STRUCTURAL WORKS ARE NOW COMPLETE. CARRY OUT FIT-OUT WORKS TO ARCHITECT'S SPECIFICATION.

NOT FOR CONSTRUCTION

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEERS & ARCHITECT'S DRAWINGS.FIGURED DIMENSIONS ONLY (NOT SCALING) TO BE USED. WHERE A CONFLICT OF INFORMATION EXISTS OR IF IN ANY DOUBT – 'ASK'.
2. CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.
3. ANY DISCREPANCY BETWEEN DETAILS INDICATED ON THIS DRAWING AND THOSE CONDITIONS ACTUALLY ENCOUNTERED ON SITE SHOULD BE HIGHLIGHTED BY THE CONTRACTORS SITE SUPERVISORY PERSONNEL
4. STEELWORK

4.1 ALL STEELWORK TO BE GRADE 275 WITH FULLY WELDED CONNECTIONS THROUGHOUT

SCHEDULE OF STEEL MEMBERS

REF.	SIZE	COMMENTS
HP1	150 UC 23 kg.	–
HP2	203 UC 46 kg.	–
HW1	230 x 90 PFC 32 kg.	–

SCHEDULE OF CONCRETE MEMBERS

REF.	SIZE	COMMENTS
GB1	600 Wide x 450 Dp.	TEMPORARY RC BEAM

NOTE:
ALL TEMPORARY WORKS TO CONTRACTOR'S DESIGN AND DETAIL. THE CONTRACTOR IS RESPONSIBLE FOR TEMPORARY STABILITY OF ALL EXISTING AND ADJOINING STRUCTURES FOR THE DURATION OF THE WORKS. ALL TEMPORARY WORKS SHOWN IN DRAWING ARE INDICATIVELY ONLY.

ISSUE	DATE	DESCRIPTION	DRN. / ORIG.	P.E. / P.D.
PL3	02.02.16	MINOR REVISION	CM / OC	OC / VB
PL2	14.01.16	MINOR REVISION	MA / OC	OC / VB
PL1	07.01.16	ISSUED FOR PLANNING	MA / OC	OC / VB
T2	15.10.15	METHOD STATEMENT REVISED	MA / OC	OC / VB
T1	22.12.14	ISSUED FOR TENDER	MA / OC	OC / VB
P4	27.11.14	GENERAL REVISION	MA / OC	OC / VB
P3	09.10.14	GENERALLY REVISED	MA / OC	OC / VB
P2	01.10.14	ISSUED FOR COMMENT	MA / OC	OC / VB
P1	20.08.14	ISSUED FOR COMMENT	ARM / OC	OC / VB

ISSUE STATUS ☐ **PRELIMINARY** (P1, P2, P3 etc.,) ☒ **PLANNING** (PL1, PL2, PL3 etc.,)
☐ **TENDER** (T1,T2, T3 etc.,) ☐ **CONSTRUCTION** (0, 1, 2 etc.,)

Barrett Mahony Consulting Engineers, Civil . Structural . Project Management.
E-mail: bmce@bmce.ie Web: www.bmce.ie

London Office: 95A Westminster Bridge Road, London SE1 7HR, United Kingdom.
Tel: (0044) 207 922 1402 Email: bmce@bmceuk.com

Dublin Office: Sandwith House, 52-54 Lower Sandwith Street, Dublin 2, Ireland.
Tel: (01) 677 3200 Fax: (01) 677 3164

Athlone Office: Suite 15B, Inish Carrig Business Centre, Goldenisland, Athlone, Co. Westmeath, Ireland.
Tel: (090) 644 9080 Fax: (090) 645 0585

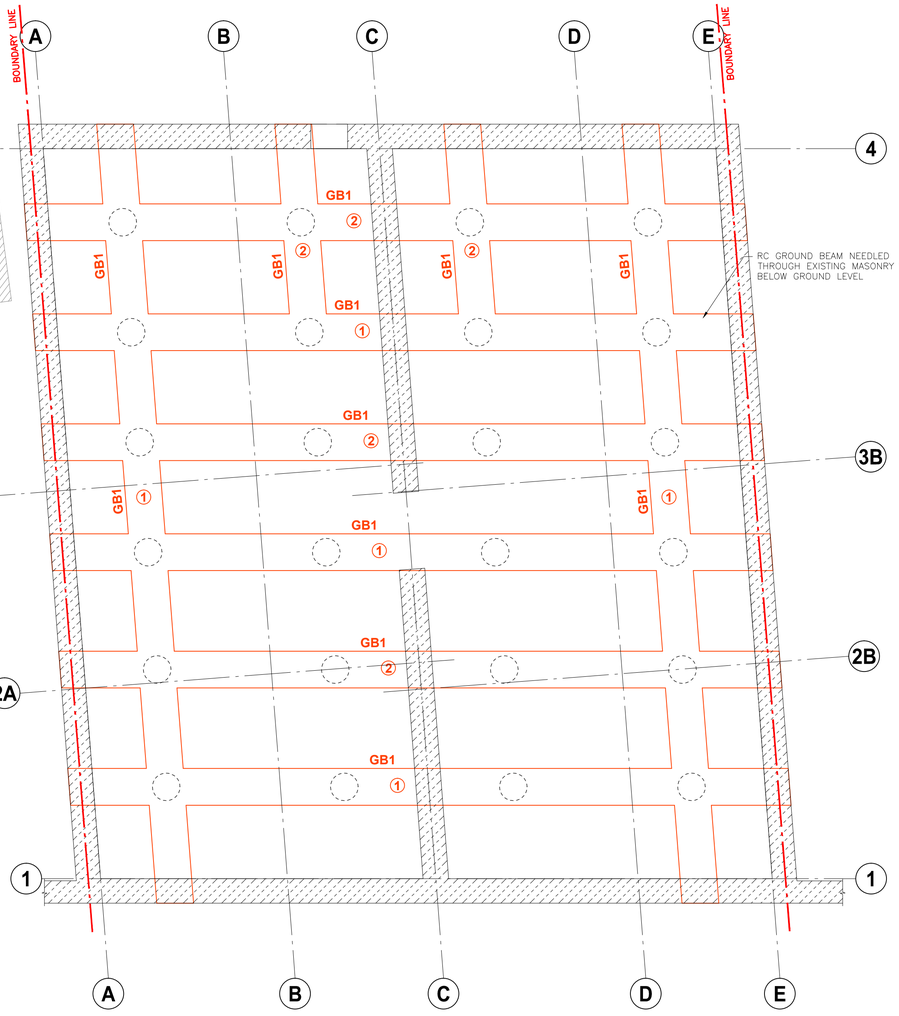
BM barrett mahony

CLIENT
WESTGATE + KEELE

PROJECT TITLE
No. 13–15 JOHN'S MEWS, LONDON, WC1N 2PA

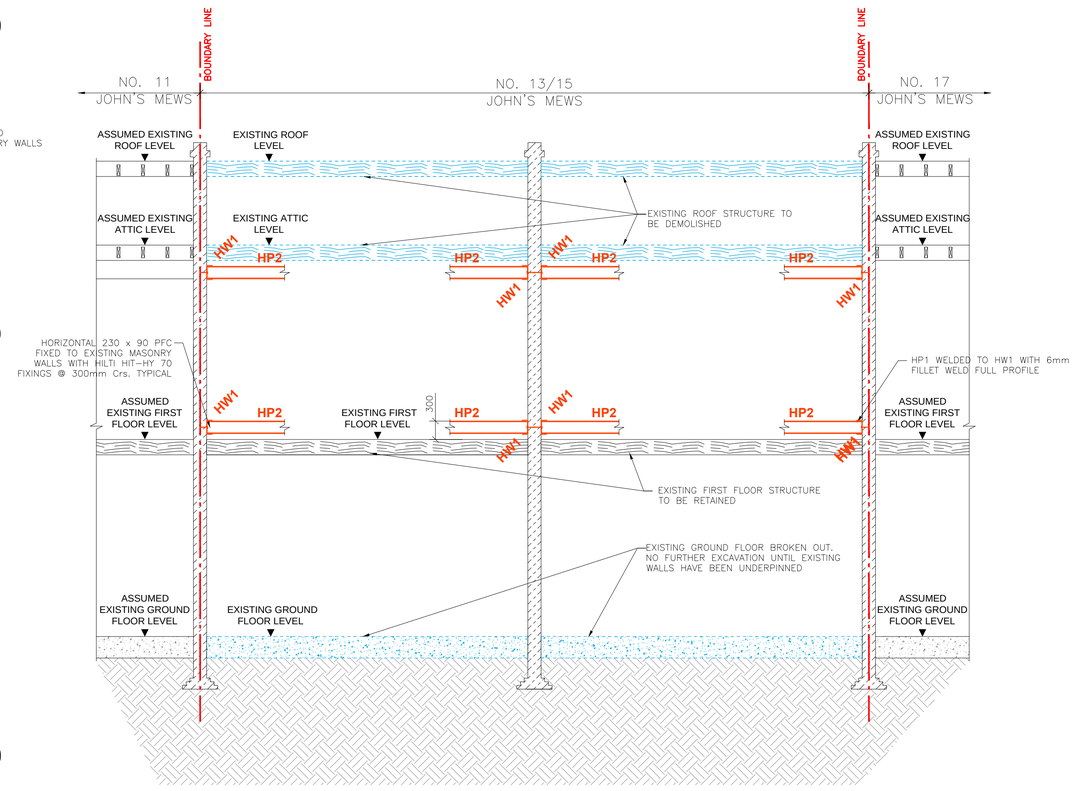
DRAWING TITLE
TEMPORARY WORKS: METHOD STATEMENT AMD TEMPORARY PROPPING PLANS

SCALE @ A1	JOB NO.	DRAWING NO.	ISSUE
AS SHOWN	L14771	701	PL3



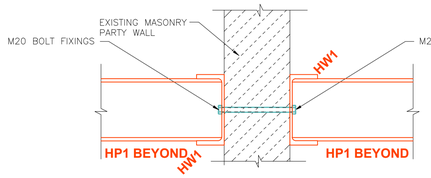
SUBSTRUCTURE TEMPORARY GROUND BEAM PLAN

(SCALE 1:50 @ A1 & 1:100 @ A3)



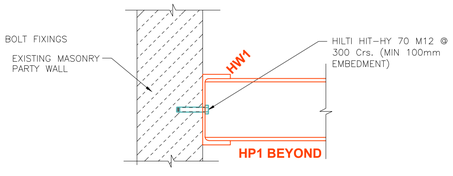
1 SECTION - STAGE 1

701 | 702 SCALE:- 1:50 @ A1 & 1:100 @ A3



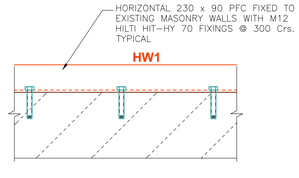
1 SECTION

701 | 701 SCALE:- 1:10 @ A1 & 1:20 @ A3



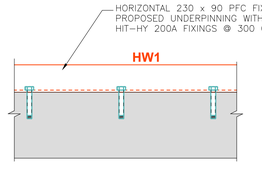
2 SECTION

701 | 702 SCALE:- 1:10 @ A1 & 1:20 @ A3



TYPICAL HW1 FIXING DETAIL

SCALE 1:10@A1
1:20@A3



TYPICAL HW2 FIXING DETAIL

SCALE 1:10@A1
1:20@A3

NOT FOR CONSTRUCTION

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEERS & ARCHITECT'S DRAWINGS.FIGURED DIMENSIONS ONLY (NOT SCALING) TO BE USED. WHERE A CONFLICT OF INFORMATION EXISTS OR IF IN ANY DOUBT – 'ASK'.
2. CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.
3. ANY DISCREPANCY BETWEEN DETAILS INDICATED ON THIS DRAWING AND THOSE CONDITIONS ACTUALLY ENCOUNTERED ON SITE SHOULD BE HIGHLIGHTED BY THE CONTRACTORS SITE SUPERVISORY PERSONNEL
4. STEELWORK

4.1 ALL STEELWORK TO BE GRADE 275 WITH FULLY WELDED CONNECTIONS THROUGHOUT

SCHEDULE OF STEEL MEMBERS

REF.	SIZE	COMMENTS
HP1	150 UC 23 kg.	–
HP2	203 UC 46 kg.	–
HW1	230 x 90 PFC 32 kg.	–

SCHEDULE OF CONCRETE MEMBERS

REF.	SIZE	COMMENTS
GB1	600 Wide x 450 Dp.	TEMPORARY RC BEAM

NOTE:
ALL TEMPORARY WORKS TO CONTRACTOR'S DESIGN AND DETAIL. THE CONTRACTOR IS RESPONSIBLE FOR TEMPORARY STABILITY OF ALL EXISTING AND ADJOINING STRUCTURES FOR THE DURATION OF THE WORKS. ALL TEMPORARY WORKS SHOWN IN DRAWING ARE INDICATIVELY ONLY.

ISSUE	DATE	DESCRIPTION	DRN / ORIG	P.E. / P.D.
PL1	07.01.16	ISSUED FOR PLANNING	MA / OC	OC / VB
T2	15.10.15	REISSUED FOR TENDER	MA / OC	OC / VB
T1	22.12.14	ISSUED FOR TENDER	MA / OC	OC / VB
P3	27.11.14	GENERAL REVISION	MA / OC	OC / VB
P2	09.10.14	ISSUED FOR COMMENT	MA / OC	OC / VB
P1	01.10.14	ISSUED FOR COMMENT	MA / OC	OC / VB

ISSUE STATUS ☐ **PRELIMINARY** (P1, P2, P3 etc.,) ☒ **PLANNING** (PL1, PL2, PL3 etc.,)
☐ **TENDER** (T1,T2, T3 etc.,) ☐ **CONSTRUCTION** (0, 1, 2 etc.,)

Barrett Mahony Consulting Engineers, Civil . Structural . Project Management.
E-mail: bmce@bmce.ie Web: www.bmce.ie

London Office: 95A Westminster Bridge Road, London SE1 7HR, United Kingdom.
Tel: (0044) 207 922 1402 Email: bmce@bmceuk.com

Dublin Office: Sandwith House, 52-54 Lower Sandwith Street, Dublin 2, Ireland.
Tel: (01) 677 3200 Fax: (01) 677 3164

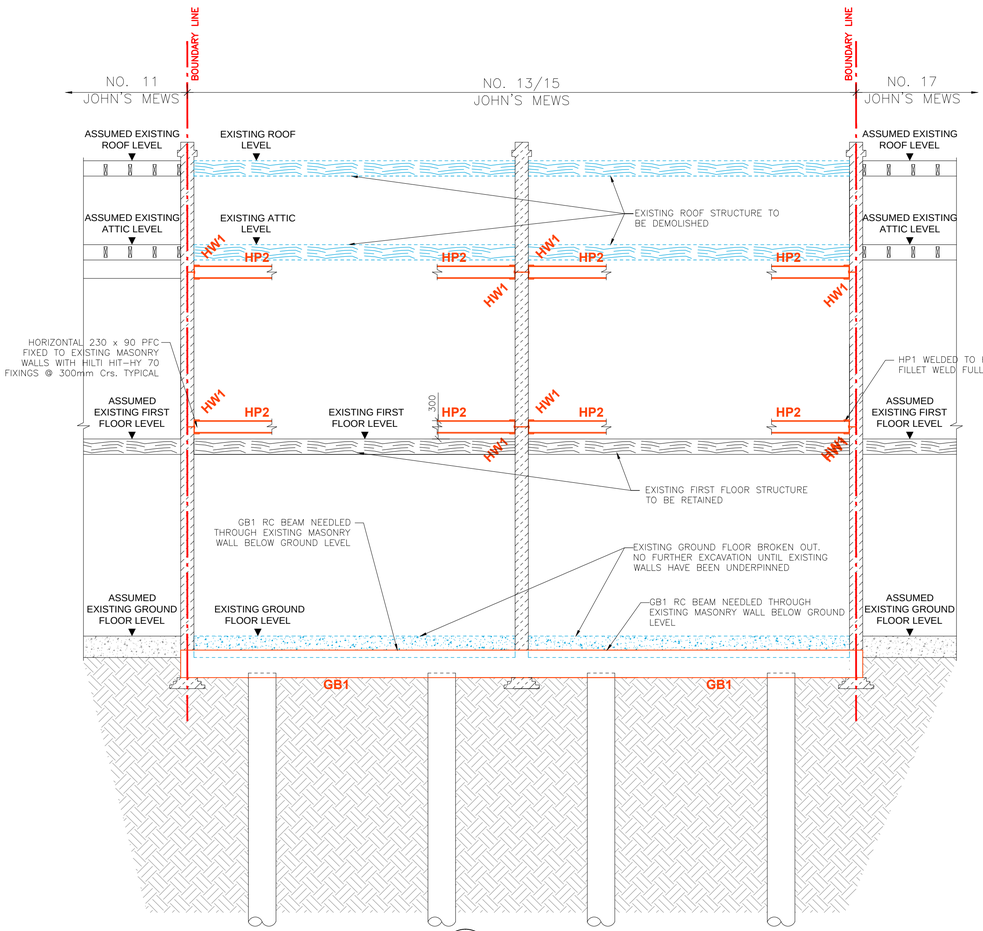
Athlone Office: Suite 15B, Inish Carrig Business Centre, Goldenisland, Athlone, Co. Westmeath, Ireland.
Tel: (090) 644 9080 Fax: (090) 645 0585

CLIENT
WESTGATE + KEELE

PROJECT TITLE
No. 13–15 JOHN'S MEWS, LONDON, WC1N 2PA

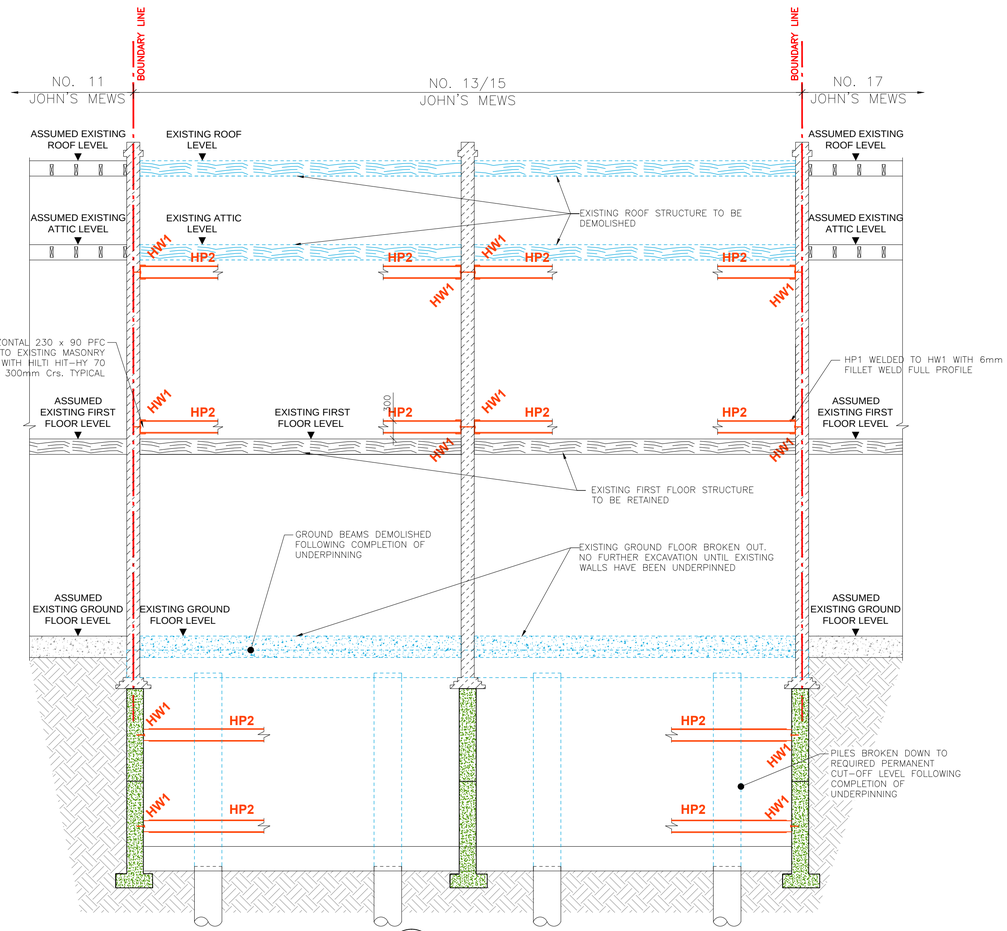
DRAWING TITLE
TEMPORARY WORKS: GROUND BEAM PLAN AND STAGE 1 SECTION

SCALE @ A1	JOB NO.	DRAWING NO.	ISSUE
AS SHOWN	L14771	702	PL1



1 701 703 **SECTION - STAGE 2**

SCALE:- 1:50 @ A1 & 1:100 @ A3



1 701 703 **SECTION - STAGE 3**

SCALE:- 1:50 @ A1 & 1:100 @ A3

NOT FOR CONSTRUCTION

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEERS & ARCHITECT'S DRAWINGS.FIGURED DIMENSIONS ONLY (NOT SCALING) TO BE USED. WHERE A CONFLICT OF INFORMATION EXISTS OR IF IN ANY DOUBT – 'ASK'.
2. CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.
3. ANY DISCREPANCY BETWEEN DETAILS INDICATED ON THIS DRAWING AND THOSE CONDITIONS ACTUALLY ENCOUNTERED ON SITE SHOULD BE HIGHLIGHTED BY THE CONTRACTORS SITE SUPERVISORY PERSONNEL
4. STEELWORK

4.1 ALL STEELWORK TO BE GRADE 275 WITH FULLY WELDED CONNECTIONS THROUGHOUT

SCHEDULE OF STEEL MEMBERS

REF.	SIZE	COMMENTS
HP1	150 UC 23 kg.	–
HP2	203 UC 46 kg.	–
HW1	230 x 90 PFC 32 kg.	–

NOTE:
ALL TEMPORARY WORKS TO CONTRACTOR'S DESIGN AND DETAIL. THE CONTRACTOR IS RESPONSIBLE FOR TEMPORARY STABILITY OF ALL EXISTING AND ADJOINING STRUCTURES FOR THE DURATION OF THE WORKS. ALL TEMPORARY WORKS SHOWN IN DRAWING ARE INDICATIVELY ONLY.

ISSUE	DATE	DESCRIPTION	DRN. / ORIG	P.E. / P.D.
PL2	14.01.16	MINOR REVISION	MA / OC	OC / VB
PL1	07.01.16	ISSUED FOR PLANNING	MA / OC	OC / VB
T1	15.10.15	ISSUED FOR TENDER	MA / OC	OC / VB

ISSUE STATUS ☐ **PRELIMINARY** (P1, P2, P3 etc.,) ☒ **PLANNING** (PL1, PL2, PL3 etc.,) ☐ **TENDER** (T1,T2, T3 etc.,) ☐ **CONSTRUCTION** (0, 1, 2 etc.,)

Barrett Mahony Consulting Engineers, Civil . Structural . Project Management.
E-mail: bmce@bmce.ie Web: www.bmce.ie
London Office: 95A Westminster Bridge Road, London SE1 7HR, United Kingdom. Tel: (0044) 207 922 1402 Email: bmce@bmceuk.com
Dublin Office: Sandwith House, 52-54 Lower Sandwith Street, Dublin 2, Ireland. Tel: (01) 677 3200 Fax: (01) 677 3164
Athlone Office: Suite 15B, Inish Carrig Business Centre, Goldenisland, Athlone, Co. Westmeath, Ireland. Tel: (090) 644 9080 Fax: (090) 645 0585

CLIENT
WESTGATE + KEELE

PROJECT TITLE
No. 13–15 JOHN'S MEWS, LONDON, WC1N 2PA

DRAWING TITLE
TEMPORARY WORKS: STAGE 2 AND STAGE 3 SECTION

SCALE @ A1	JOB NO.	DRAWING NO.	ISSUE
AS SHOWN	L14771	703	PL2