

**42 NASSAU ROAD
LONDON SW13**

**STRUCTURAL ENGINEER'S
CONSTRUCTION METHOD STATEMENT**

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| Prepared by | Issued |
|--|---------------------------------|
| Andrzej Plocieniak - MSc CEng MIStructE andrzej@axiom-structures.co.uk m:07738096317 Axiom Structures Limited 170 Putney Bridge Road, Putney London SW15 2NG In association with Knowles Basements | P2 - 2015-02-25 For Planning |

1.0 INTRODUCTION

- 1.1 Axiom Structures Limited have been asked to consider structural issues surrounding the proposed basement extension and refurbishment works at the address.
- 1.2 The proposed development comprises construction of a new retrofit single-storey basement under the existing building and part of the rear garden, general refurbishment works to the existing structure in line with Stephen Reyburn Architects proposals.
- 1.3 A ground investigation survey and Thames Water searches have been carried out (boreholes, trial pits) by specialist ground investigation company. The preliminary ground investigation survey is attached to this report.
- 1.4 We have visited site to assess the existing structure for alteration works.
- 1.5 In addition to the borehole/soil test results, site specific drawings and scheme calculations this report addresses a series of requirements listed under Subterranean Development that has been developed for dense populated London Boroughs where hundreds of basements are constructed every year. These requirements are listed in section 2, the text following the statement either provides the information or refers to the relevant section elsewhere in the CMS.
- 1.6 Proposed Construction Team to be involved in the structural works comprises:

Structural Engineer:

Axiom Structures Limited are employed as consulting structural permanent and temporary works engineers for the project. We are chartered structural engineers involved in a number of subterranean developments across London. We look after about 15-20 basements projects a year either as a structural designers and/or advising engineers on safe and efficient methods of construction and temporary works.

Contractor:

Knowles Basements. One of the most experienced specialist basement contractor in London, ASUCplus member of Association of Specialist Underpinning Contractors.
<http://www.knowles.uk.com/>

2.0 BASEMENT IMPACT ASSESSMENT

- **Whether the geology is capable of supporting the loads and construction techniques to be imposed.**

Refer to section 4.6 below.

- **The impact of the subterranean development, and associated construction and temporary works, on the structural integrity and natural ability for movement of existing and surrounding structures, utilities, infrastructure and manmade cavities such as tunnels.**

There are no public utilities identified within the site and those within the pavement or road to the front will not be affected by the proposed development. The pavement and road are separated from the proposed development by substantial front garden. The new basement walls are to be designed to satisfy surcharges that may happen at adjacent sites and from existing buildings.

With respect to the adjacent structures natural ability to move this should not be affected by the proposed development. The borehole information indicates that the existing and perhaps adjacent buildings are founded on non-cohesive soils. These soils are non- or very low shrinkable and seasonal movement at foundation level is likely to be nominal, even more so significant depth off the water table.

The new underpins to form basement walls and existing foundations will be similarly supported off the same natural soils or designed to limit differential settlement. The effect of any heave movement will be controlled by stiff construction of a new basement and 'slow' method of construction which will release and dispense the heave effect during construction. The effect on the surrounding buildings should be negligible by adoption of proposed method of construction.

However, should there be on-going nominal movements experienced by the structure above and the adjacent buildings (due to variations in moisture content of the building fabric, temperature variations or nominal ground movements) then there will be insignificant impact on these movements from the proposed development.

- **Whether the development will initiate slope instability which may threaten its neighbours.**

The development will not initiate slope instability. The existing Party/ boundary/ flank walls are to be underpinned to create basement walls. The underpins will be propped with walings and cross props during bulk excavation. The piecemeal nature of the underpinning process and installation of cross site propping will not create a situation where slope instability could be an issue.

- **The impact of the subterranean development on drainage, sewage, surface water and ground water flows and levels.**

Refer to sections 4.2 and 4.4 of this report.

- **How any geological, hydrological and structural concerns have been satisfactorily addressed.**

The geology was confirmed as Dense Sands which is not unusual stratum along the Thames river. The above soil has been well recorded and analysed for basement excavations. The construction of similar semi-deep basements in highly populated areas in London proved to be successful when competent contractors were involved and fully engineered solutions provided.

There should not be a negative influence on hydrology from the development. The water table is under the surface. The proposed basement foundations are founded over the groundwater level. The underground water is therefore free to flow under the basement.

The issues associated with subterranean development such as support of adjacent structures, lateral earth pressures to be accommodated in the temporary and permanent conditions and support of the structures above during the excavation works, have been considered in sections 4.0 Permanent Design and section 5.0 Method statement.

- **The engineering details of the scheme, including proposals for the excavation and construction.**

Please refer to the scheme design drawings enclosed in the Appendix A. The proposals for the excavation and construction under the main house and in the rear garden have been addressed in section 5.0

- **The impact of the proposed subterranean development on the structural stability of the existing and adjoining buildings, especially listed buildings.**

It is not expected that there will be any impact on the stability of the existing building or adjacent buildings. This is of course subject to there being a fully developed structural design for the permanent works and an experienced contractor appointed to undertake the work with suitable experience and on-site management systems that ensure the works proceed properly sequenced.

- **The impact of the proposed subterranean development on existing and proposed trees.**

The proposed development is anticipated to be outside the tree root protection zone. The excavations are carried out in short sections and with controlled pours of concrete hence there is very limited risk for any trees. Please refer specialist reports for details of tree protection during construction.

- **The sequence for the temporary works, which mitigates the effects on the neighbours and the details and design of the preferred method of Temporary Works.**

Refer to section 5.0 - Method Statement

3.0 EXISTING CONSTRUCTION / GROUND CONDITIONS

3.1 The existing property is an early 20th century semi-detached house with a step ground towards rear garden. The property is two stories and consists of a ground floor and first floor. There is a little cellar under the stairs. The building is traditionally constructed with load-bearing masonry external and internal walls and suspended timber floors generally. The internal load-bearing walls are studwork and masonry.

3.2 The borehole site investigation was carried out in January 2015. Please refer to enclosed extract from the ground investigations with logs.

Following desk study of the Geological Maps and the borehole information the ground conditions are as follows (all depths referred to surface of Nassau Road):

- Medium dense MADE GROUND with occasional sands to depth of about 1.5m below Nassau Road
- SAND to depth of about 5.5m below ground level (medium dense to dense SAND).
- Strip of stiff brown/blue silty CLAY.
- London CLAY (very stiff mid grey silty CLAY).

3.3 The record maps and boreholes for the area indicate that there is unlikely to be any significant ground water flow within the depth of the proposed basement construction. Groundwater during monitoring reading in the standpipe was encountered at a depth of 4.8m below front garden level (i.e. about 0.8m above surface of Clays)

It is proposed that formation level of underpins to be above ground water table onto medium dense SANDS. Obstruction of below ground water courses is not considered an issue with this development.

3.4 As part of our walk round and visual investigation survey of the property, we have not recorded signs of ongoing or historical movement to suggest any subsidence or other foundation problems. There are a number of hedges, trees and other vegetations in the front and rear garden. There is unlikely impact on the new and existing foundations from the seasonal change of moisture in the soil due to water demand from the plants as thick layer of Sands underlying the made ground is a non-shrinkable stratum.

4.0 DETAILS OF PROPOSED CONSTRUCTION

- 4.1 The proposed development involves the construction of the basement under footprint of existing house and part of rear garden of the property. The sub-terrain works are part of the remodelling of the rear garden and major refurbishment to the existing property. Generally the excavation is to be up to about 4.0m below existing ground floor level under main house.
- 4.2 The record information indicated the ground water at depth of 4.8m below front garden level and thus proposed formation level is at least 0.8m above groundwater level under the main house. Obstruction of below ground water courses is not considered an issue with this development as the site is not within the line or close to underground rivers.
- 4.3 The site is located within flood risk zone, refer to specialist report by others for details.
- 4.4 The subterranean development is to extend to the rear garden, whilst it is likely that the existing drainage system will require upgrading or replacement possibly with the addition of pumps, the development will not impact on any public drainage or existing surface water drainage systems.
- 4.5 The underpinning works to the existing foundations will provide robust foundations on a denser natural soil than original. New structure will be supported on new foundations. Preliminary estimates suggest that the weight of the lowered basement will be less than the weight the soil removed. The stiff reinforced concrete box structure, designed with propped walls, would limit the horizontal movement and consequent impact to the adjacent structures.
- 4.6 The existing party wall will be founded on the dense soil (as they are at present) and minimal differential movement would be anticipated. The actual process of underpinning can cause some minor cracking in the wall being underpinned and intersecting walls, although if carried out in accordance with the specification and back-propped on completion to minimise the risk of horizontal movement, such movement normally goes undetected. Vertical movement joints to boundary walls would be introduced at junction – shallow footings with basement box to further limit any distress if any slight movement in the boundary walls occur.
- 4.7 The permanent structural works will involve the construction of reinforced concrete walls in short sections. New reinforced concrete walls will be monolithically connected to the new reinforced concrete basement slab to provide robust and watertight construction. The walls could be formed as the underpinning structure subject to Party Wall agreements. The underpinning will be constructed in a hit and miss sequence to minimise ground movements. The new basement is a naturally rigid structure and will be designed to accommodate the horizontal ground forces imposed via the underpins to the perimeter, potential for upwards and lateral water pressures as well as the vertical loads from above.
- 4.8 Reinforced concrete basement structure with sealed joints would provide barrier against moisture and water ingress. Secondary drain cavity system is proposed as belt and braces measure in case any nominal leak in the concrete joint would happen.
- 4.9 At the detailed design stage of the project, we may consider to specify the void former under the basement slab to release some of the long term heave pressures from unloading clays during excavations. This would reduce any residual risks for differential ground movements under garden and the main house.

5.0 METHOD STATEMENT

This method statement is to be read in conjunction with drawings 172/ and sequence of construction 172 / TW /.

SUPERSTRUCTURE WORKS:

1. Carry out soft strip out in the property. Review condition and load run downs of the existing structure to foundations.
2. Install steel beams and new floors in the existing main house. Carry out works in a piecemeal sequence, floor by floor and install all necessary restraint straps as works progress and in accordance with SE drawings. Works to follow from the roof and top floor to first floor structure.
3. Carry out enabling underpinning works to the critical areas where noted in the drawings (*) i.e. where new columns support existing. Use conventional needles and props to support structure over underpinning shaft to builders details. Place back props against as built underpins or backfill shaft excavation with compacted ground on completion to contractors choice.
4. Install ground and first floor transfer beams (columns and beams) to support side wall onto enabling foundation bases i.e. as built underpinning. Use conventional fully braced needles and props to support existing structure before permanent steels are in place. Support temporary props onto timber sleeper spreaders to existing ground bearing slabs or temporary bases to builders details.

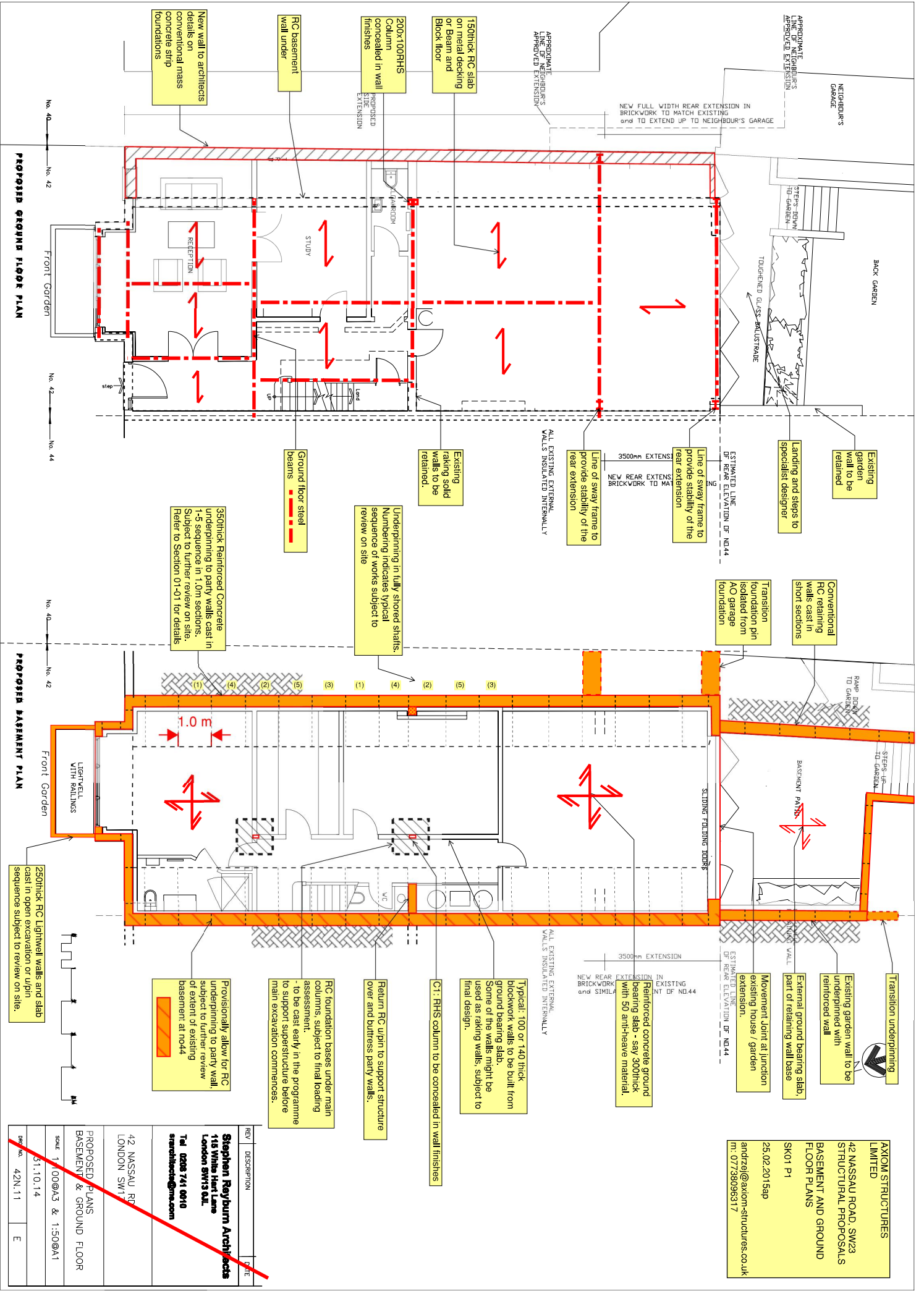
BASEMENT CONSTRUCTION:

5. Break remaining existing ground bearing slab and reduce ground level by about 1.0m as per Axiom 172-TW-200.
6. Underpin perimeter walls with reinforced concrete to formation level. Carry out works in 1-5 hit and miss sequence as per items below.
 - Underpinning to be carried out in maximum 1.0m sections in shaft excavations.
 - Install trench sheeting, struts and walings as excavation proceeds for underpins in shafts.
 - Cast underpinning base and then stem, dry pack on hardened concrete between new and existing foundations.
 - Back prop constructed pins with Acrow Jacks at 1.0m vertical centres
 - Continue the underpinning to the perimeter until all the underpinning is completed,
 - Cast remaining upstand to underside of ground floor slab.
7. Reduce earth to about 1.8m below high level props and install horizontal high level shores TW01 as works progressing from back to the front of the property.
8. Excavate to formation level. Install push pull props TW02 as works progressing from back to the front of the property. **TW01 and TW02 props have screw jacks to pre-load the props and they are to be periodically checked by the contractor and re-tightened as necessary.**
9. Blind the ground at formation level and control short term heave effects. Place compressible filler as necessary and cast low level slabs.
10. Cast remaining parts of basement slab and ground floor slab (on load-bearing walls as necessary); remove props (low and high level) when slabs gained strength.

APPENDIX A

SCHEME DRAWINGS

172 /



AXIOM STRUCTURES LIMITED
 42 NASSAU ROAD SW23
 STRUCTURAL PROPOSALS
 BASEMENT AND GROUND FLOOR PLANS
 SK01 P1
 25.02.2015ap
 andrzej@axiom-structures.co.uk
 m:07739396317

| REV | DESCRIPTION | DATE |
|-----|-------------|------|
| | | |
| | | |

Stephen Rayburn Architects
 115 White Hart Lane
 London SW13 9LE
 Tel: 0203 741 0410
 stephen@raa.com

42 NASSAU RD
 LONDON SW1

PROPOSED PLANS
 BASEMENT & GROUND FLOOR

SCALE: 1:100@A3 & 1:50@A1
 DATE: 31.10.14
 Dwg No: 42N.11 E

NOTES
AXIOM STRUCTURES LIMITED
 42 NASSAU ROAD, SW23
 STRUCTURAL PROPOSALS
 BASEMENT AND GROUND FLOOR PLANS
 SK-SE-10 P1
 25.02.2015ap
 andrzej@axiom-structures.co.uk
 m: 07736096317

| REV | DESCRIPTION | DATE |
|-----|-------------|----------|
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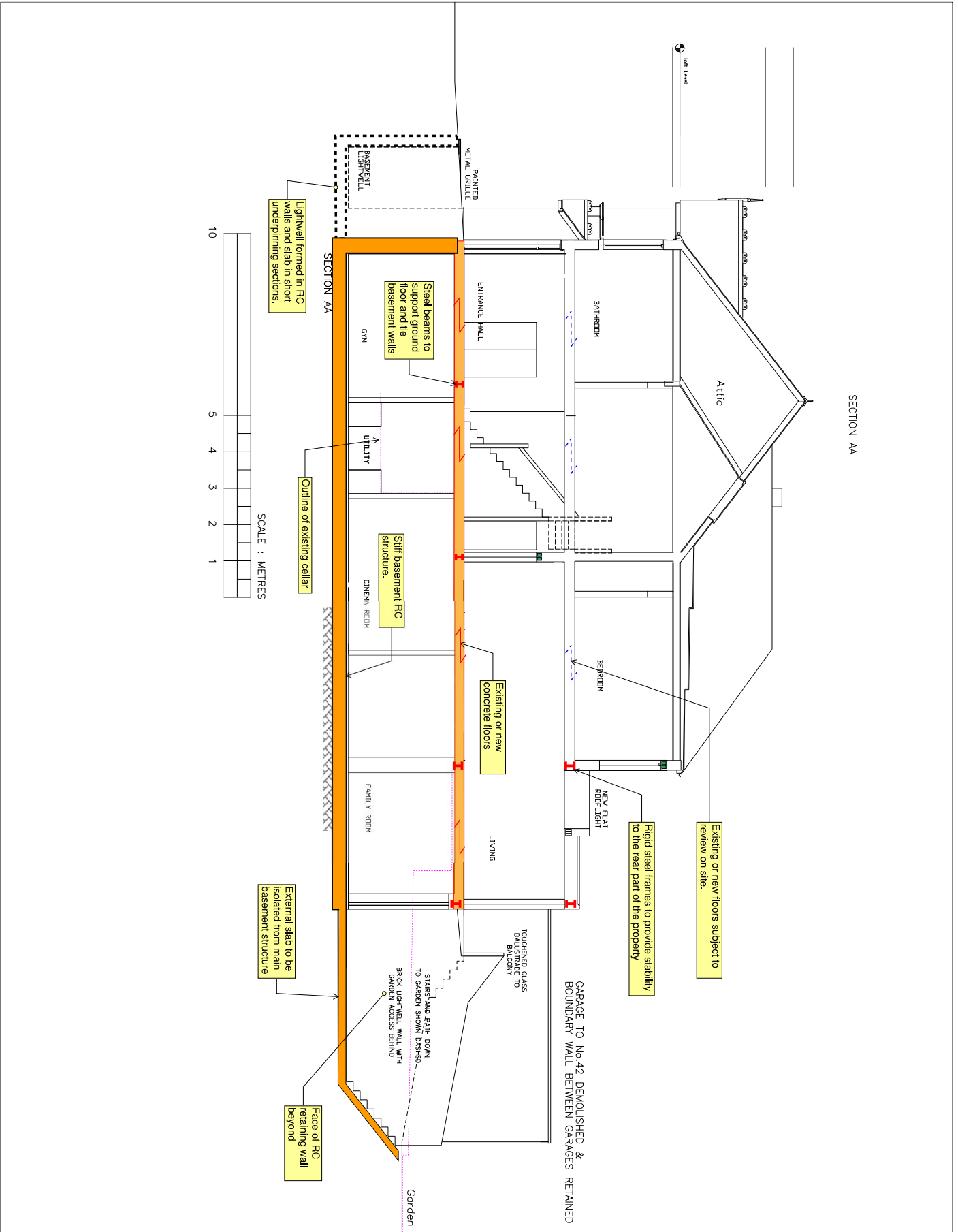
Stephen Reybun Architects
 115 Vines Hill Lane
 London SW13 6LL
 Tel 0208 741 0010
 srebun@stepha.com

42 NASSAU RD
 LONDON SW23

PROPOSED SECTION AA
 LOOKING TOWARDS NO.40

SCALE 1:100@A3 & 1:50@A1
 22.12.14

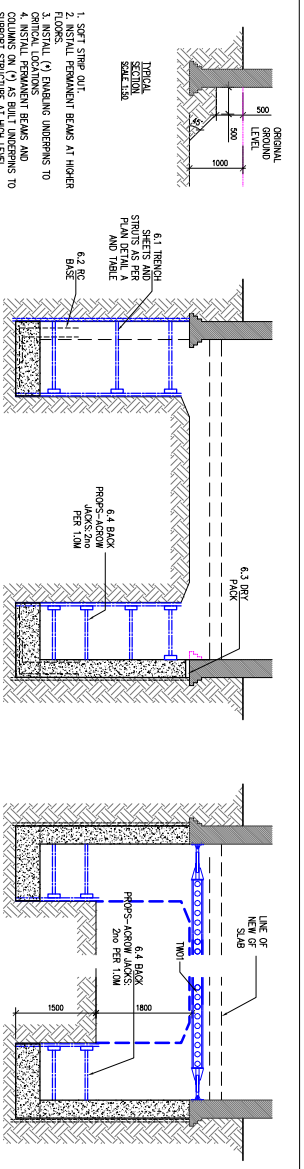
DATE NO. 42N.35 A



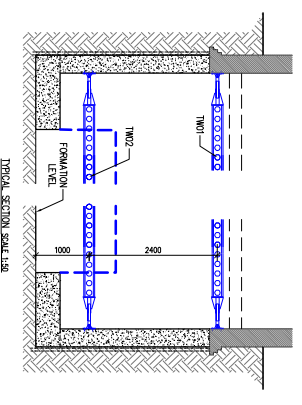
APPENDIX B

**SEQUENCE OF BASEMENT CONSTRUCTION AND BASEMENT
TEMPORARY WORKS**

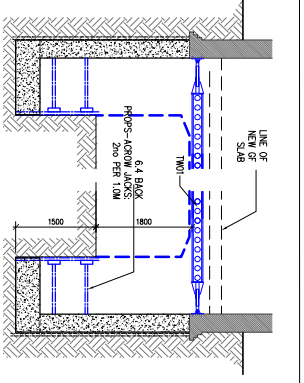
137 TW



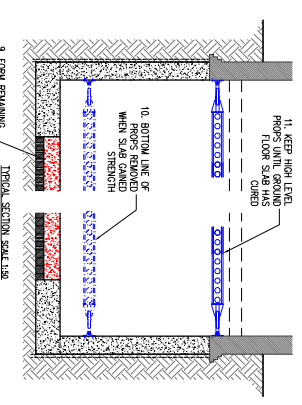
1. SET STRIPS OUT.
2. INSTALL PERMANENT BEAMS AT HIGHER FLOORS.
3. INSTALL (A) EXHIBING UNDERPIRS TO...
4. INSTALL PERMANENT BEAMS AND COLUMNS ON (C) AS BUILT UNDERPIRS TO...
5. REMOVE GROUND BEARING SLAB AND CARRY OUT GENERAL LEVEL REDUCTION AT 1:50 RATES.



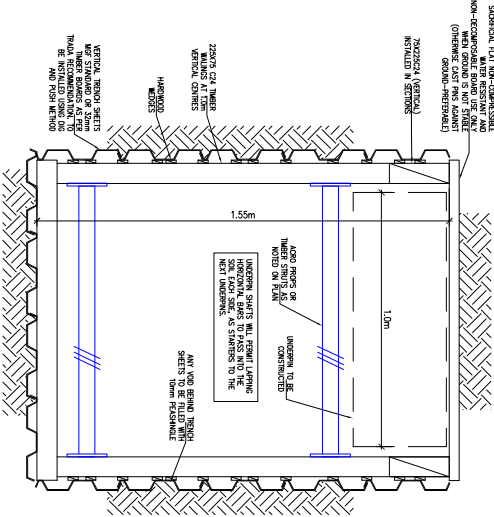
6. UNDERPINNING IN SHAFT EXCAVATION TO PERMETER WALLS IN 1.0m, 1 TO 5 M² AND MASS SEQUENCE AS PER SE DRAWINGS
- 6.1 INSTALL UNDERPINNING, STRIPS AND WALLS AS SHOWN
- 6.2 CAST RC BASE AND STEIN IN SECTIONS TO SUIT CONCRETE UNDERPINNING
- 6.3 INDIVIDUAL PINS TO BE BACK-PROPPED WITH AROUND JOBS ON COMPLETION, SHAFTS TO BE PROTECTED FROM FALLING INTO TRENCH



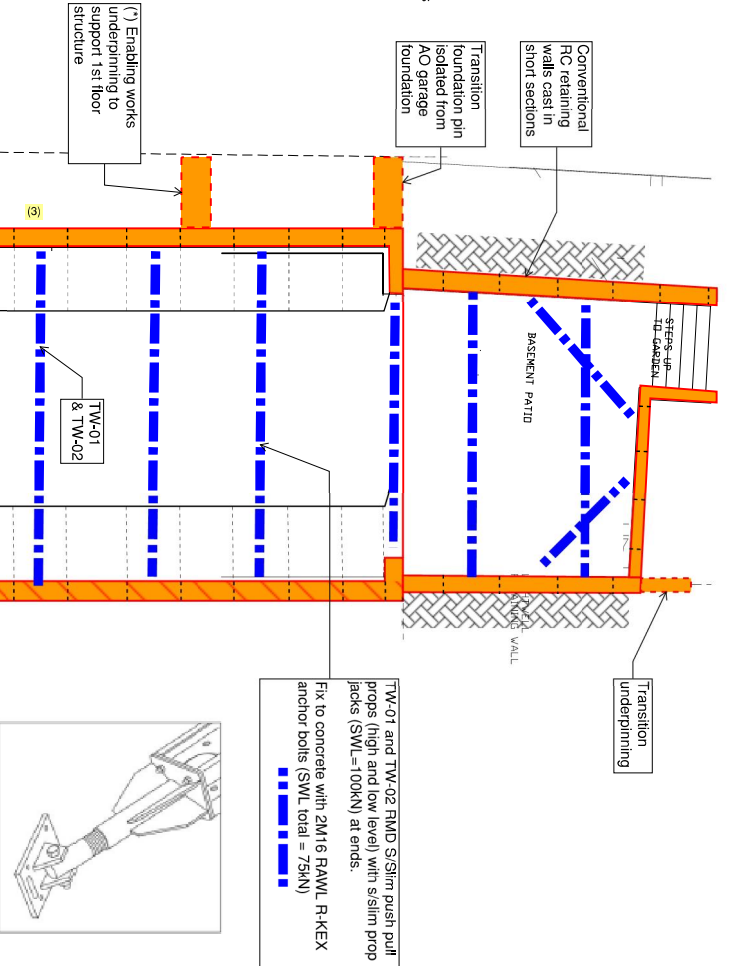
7. REMOVE CENTRAL LEATH MOUNT TO ABOUT 1.5M BEYOND HIGH LEVEL BEARS OF THE PROPERTY TO REIN (TOWARDS SHIP OR GARD LORRY)



11. KEEP HIGH LEVEL PROPS UNTIL GROUND FLOOR SLAB HAS CURED
10. BOTTOM LINE OF PROPS REMOVED WHEN SLAB GAINED WHEN SLAB STRENGTH
9. FROM REMAINING PARTS OF SLAB



8. CARRY OUT EXCAVATION TO FORMATION LEVEL IN SHORT STRIPS AND INSTALL LOW LEVEL PROPS AS EXCAVATION PROGRESS FROM REAR OF THE PROPERTY TO FRONT (TOWARDS SHIP OR GARD LORRY). TINS WILL BE INSTALLED BEFORE THE FINAL LIM OF EXCAVATION (IN LOCALISED TRANSVERSE SECTIONS), TO MAINTAIN RESISTANCE TO RETAINING WALL SLIDING IN TEMPORARY STATE



- (*) Enabling works underpinning to support 1st floor structure
- Transition underpinning
- Transition foundation pin isolated from AO garage foundation
- Conventional RC retaining walls cast in short sections
- Transition underpinning
- Fix to concrete with 2M16 RAWL R-KEY anchor bolts (SWL total = 75kN)
- TW-01 and TW-02 RMD S/Slim push pull props (high and low level) with slim prop jacks (SWL=100kN) at ends.
- C1: RHS columns cast on pad to support structure over at early stage of construction
- Return RC up/in to support structure over and buttress party walls.

Underpinning in fully shored shafts. Numbering indicates typical sequence of works subject to review on site.

Reinforced Concrete underpinning to party walls cast in 1-5 sections in 1.0m sections. Subject to further review on site. Refer to Section 01-01 for details.

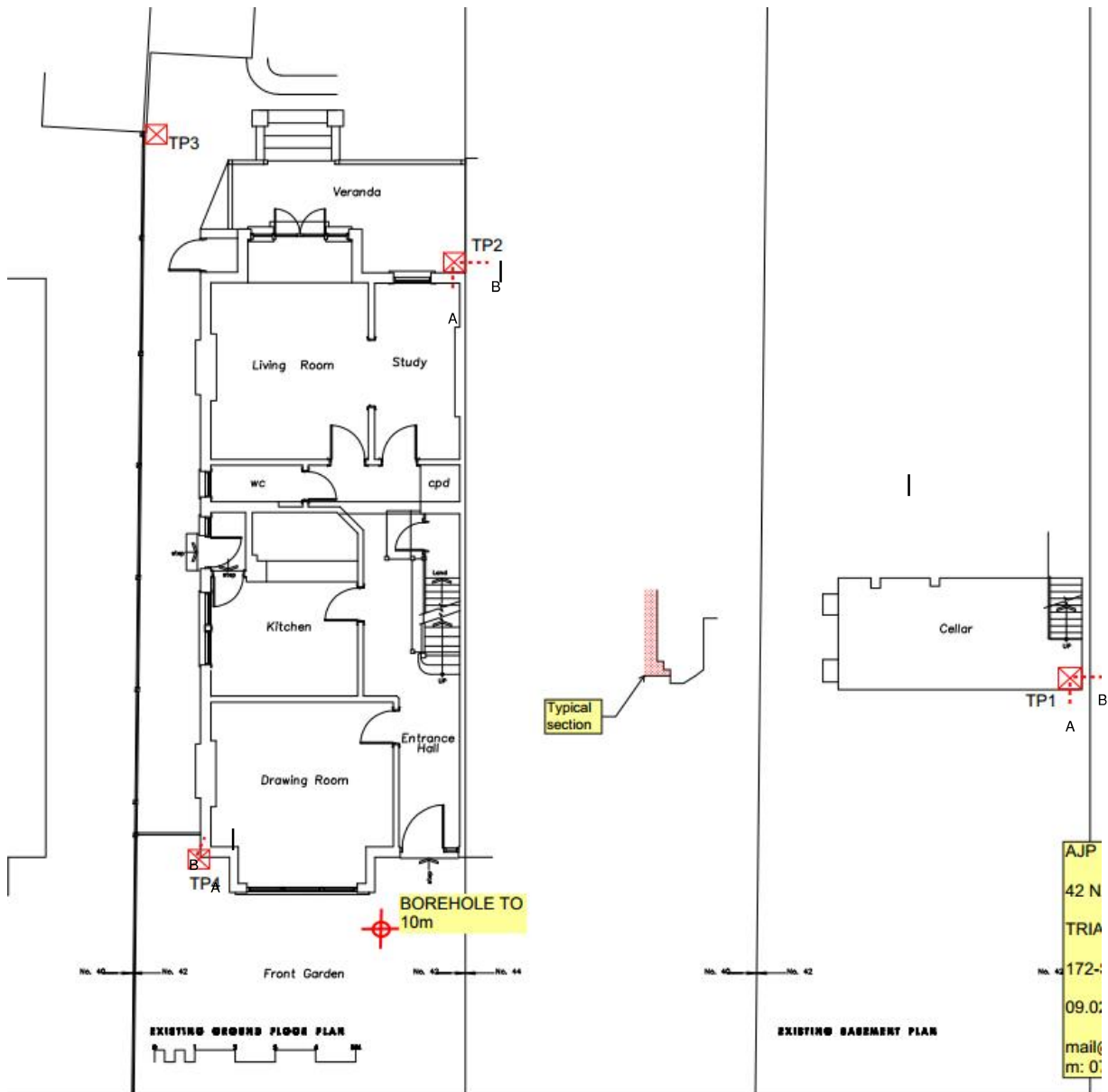
Lightwell walls and slab cast in open excavation or u/pjn sequence subject to review on site.

Lightwell WITH RAILINGS

Front Garden

APPENDIX C

SITE SPECIFIC BOREHOLE LOGS
(BH1 LOCATED IN THE FRONT GARDEN)



Site Analytical Services Ltd.

| | |
|---|-------------------------------|
| Site 42 NASSAU ROAD, LONDON, SW13 9QE | Borehole Number BH1 |
| Client MR JEREMY RUDGE | Job Number 1523176 |
| Engineer AJP ENGINEERS | Sheet 1/1 |

| | | |
|---|--|----------------------------|
| Boring Method CONTINUOUS FLIGHT AUGER | Casing Diameter 100mm cased to 0.00m | Ground Level (mOD) |
| | Location TQ 217 765 | Dates 10/02/2015 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|-----------|----------------|------------------|-----------------|----------------------|-------------|-----------------------|---|--------|-------|
| 0.25 | D1 | | | | | (0.15) | MADE GROUND : Grass surface over topsoil | | |
| 0.50 | D2 | | | | | (0.65) | MADE GROUND : Medium dense dark brown silty fine to coarse sand with brick and concrete fragments | | |
| 0.75 | D3 | | | | | 0.80 | | | |
| 1.00 | D4 | | | | | (0.70) | MADE GROUND : Medium dense brown silty clayey gravelly fine to coarse sand with brick fragments. Gravel is fine to coarse of sub rounded to sub angular flint | | |
| 1.00-1.30 | M1 138/300 | | | | | | | | |
| 1.50 | D5 | | | | | 1.50 | | | |
| 1.50-1.64 | M2 100/140 | | | | | | Medium dense becoming dense yellow brown silty gravelly fine to coarse SAND. Gravel is fine to coarse of sub rounded to sub angular flint | | |
| 2.00 | D6 | | | | | | | | |
| 2.00-2.09 | M3 100/90 | | | | | | | | |
| 2.50 | D7 | | | | | | | | |
| 2.50-2.58 | M4 100/80 | | | | | | | | |
| 3.00 | D8 | | | | | | | | |
| 3.00-3.08 | M5 100/80 | | | | | | | | |
| 3.50 | D9 | | | | | (4.00) | | | |
| 3.50-3.58 | M6 100/80 | | | | | | | | |
| 4.00 | D10 | | | | | | | | |
| 4.00-4.06 | M7 100/60 | | | | | | | | |
| 4.50 | D11 | | | | | | | | |
| 4.50-4.54 | M8 100/40 | | | | | | | | |
| 5.00 | D12 | | | | | | | | |
| 5.00-5.04 | M9 100/40 | | | | | | | | |
| | | | | SEEPAGE(1) at 4.80m. | | | | | |
| | | | | | | 5.50 | | | |
| | | | | | | (0.30) | Stiff brown and mottled orange brown veined blue grey silty CLAY with occasional partings of light brown silty fine sand | | |
| | | | | | | 5.80 | | | |
| 6.00 | D13 | | | | | | Stiff becoming very stiff high strength dark grey brown fissured silty CLAY with occasional partings of light brown silty fine sand and scattered small gypsum crystals | | |
| 6.00 | V1 140+ | | | | | | | | |
| 7.00 | D14 | | | | | | | | |
| 7.00 | V2 140+ | | | | | | | | |
| 8.00 | D15 | | | | | (4.20) | | | |
| 8.00 | V3 140+ | | | | | | | | |
| 9.00 | D16 | | | | | | | | |
| 9.00 | V4 140+ | | | | | | | | |
| 10.00 | D17 | | | | | 10.00 | | | |
| 10.00 | V5 140+ | | | | | | | | |

PRELIMINARY

Remarks
D = Disturbed Sample
M = Mackintosh Probe - Blows/Penetration (mm)
V = Vane Test - Result in kPa

10/02/2015: DRY

Scale (approx)
1:50

Logged By
APS

Figure No.
1523176.BH1

Site Analytical Services Ltd.

Site
42 NASSAU ROAD, LONDON, SW13 9QE

Trial Pit Number
TP1A

| | | | | |
|---|--------------------------------|----------------------------|----------------------------------|------------------------------|
| Excavation Method HAND EXCAVATION | Dimensions 300 x 300 | Ground Level (mOD) | Client MR JEREMY RUDGE | Job Number 1523176 |
| | Location TQ 217 765 | Dates 10/02/2015 | Engineer AJP ENGINEERS | Sheet 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---------------------------|------------------------|-----------------|----------------|-------------|--------------------------------|---|--------|-------|
| 0.25 0.30 0.30-0.44 | D1 D2 M1 100/140 | | 10/02/2015:DRY | | 0.06 0.15 (0.29) 0.44 | MADE GROUND : Concrete MADE GROUND : Brick rubble and flint gravel Medium dense yellow brown silty very gravelly fine to coarse SAND. Gravel is fine to coarse of sub rounded to sub angular flint Complete at 0.44m | | |

PRELIMINARY

| | | | |
|---|---|-----------------------------------|-------------------------|
| Plan . | Remarks D = Disturbed Sample M = Mackintosh Probe - Blows/Penetration (mm) Groundwater was not encountered during the excavation For details of foundations exposed - see sketch | | |
| | <table border="1"> <tr> <td>Scale (approx) 1:50</td> <td>Logged By APS</td> <td>Figure No. 1523176.TP1A</td> </tr> </table> | Scale (approx) 1:50 | Logged By APS |
| Scale (approx) 1:50 | Logged By APS | Figure No. 1523176.TP1A | |

Site Analytical Services Ltd.

Site
42 NASSAU ROAD, LONDON, SW13 9QE

Trial Pit Number
TP1B

| | | | | |
|---|--------------------------------|----------------------------|----------------------------------|------------------------------|
| Excavation Method HAND EXCAVATION | Dimensions 300 x 300 | Ground Level (mOD) | Client MR JEREMY RUDGE | Job Number 1523176 |
| | Location TQ 217 765 | Dates 10/02/2015 | Engineer AJP ENGINEERS | Sheet 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---------------------------|------------------------|-----------------|----------------|-------------|--------------------------------|---|--------|-------|
| 0.25 0.30 0.30-0.44 | D1 D2 M1 100/140 | | 10/02/2015:DRY | | 0.06 0.15 (0.29) 0.44 | MADE GROUND : Concrete MADE GROUND : Brick rubble and flint gravel Medium dense yellow brown silty very gravelly fine to coarse SAND. Gravel is fine to coarse of sub rounded to sub angular flint Complete at 0.44m | | |

PRELIMINARY




| | | | |
|---|---|-----------------------------------|-------------------------|
| Plan . | Remarks D = Disturbed Sample M = Mackintosh Probe - Blows/Penetration (mm) Groundwater was not encountered during the excavation For details of foundations exposed - see sketch | | |
| | <table border="1"> <tr> <td>Scale (approx) 1:50</td> <td>Logged By APS</td> <td>Figure No. 1523176.TP1B</td> </tr> </table> | Scale (approx) 1:50 | Logged By APS |
| Scale (approx) 1:50 | Logged By APS | Figure No. 1523176.TP1B | |

Site Analytical Services Ltd.

Site
42 NASSAU ROAD, LONDON, SW13 9QE

Trial Pit Number
TP2A

| | | | | |
|---|--------------------------------|----------------------------|----------------------------------|------------------------------|
| Excavation Method HAND EXCAVATION | Dimensions 300 x 300 | Ground Level (mOD) | Client MR JEREMY RUDGE | Job Number 1523176 |
| | Location TQ 217 765 | Dates 10/02/2015 | Engineer AJP ENGINEERS | Sheet 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|-----------|----------------|-----------------|----------------|-------------|-----------------------|--|---|-------|
| 0.25 | D1 | | | | 0.05 | MADE GROUND : Concrete |  | |
| 0.50 | D2 | | | | (0.75) | MADE GROUND : Loose brown silty gravelly sand with brick and concrete fragments. Gravel is fine to medium of angular flint |  | |
| 0.75 | D3 | | | | 0.80 (0.20) | MADE GROUND : Crushed brick |  | |
| 1.00 | D4 | | 10/02/2015:DRY | | 1.00 | Complete at 1.00m | | |

PRELIMINARY




| | | | |
|---|---|-----------------------------------|-------------------------|
| Plan . | Remarks D = Disturbed Sample M = Mackintosh Probe - Blows/Penetration (mm) Groundwater was not encountered during the excavation For details of foundations exposed - see sketch | | |
| | <table border="1" style="width: 100%;"> <tr> <td>Scale (approx) 1:50</td> <td>Logged By APS</td> <td>Figure No. 1523176.TP2A</td> </tr> </table> | Scale (approx) 1:50 | Logged By APS |
| Scale (approx) 1:50 | Logged By APS | Figure No. 1523176.TP2A | |

Site Analytical Services Ltd.

Site
42 NASSAU ROAD, LONDON, SW13 9QE

Trial Pit Number
TP2B

| | | | | |
|---|--------------------------------|----------------------------|----------------------------------|------------------------------|
| Excavation Method HAND EXCAVATION | Dimensions 300 x 300 | Ground Level (mOD) | Client MR JEREMY RUDGE | Job Number 1523176 |
| | Location TQ 217 765 | Dates 10/02/2015 | Engineer AJP ENGINEERS | Sheet 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|-----------|----------------|-----------------|----------------|-------------|-----------------------|--|---|-------|
| 0.25 | D1 | | | | 0.05 | MADE GROUND : Concrete |  | |
| 0.50 | D2 | | | | (0.75) | MADE GROUND : Loose brown silty gravelly sand with brick and concrete fragments. Gravel is fine to medium of angular flint |  | |
| 0.75 | D3 | | | | 0.80 (0.20) | MADE GROUND : Crushed brick |  | |
| 1.00 | D4 | | 10/02/2015:DRY | | 1.00 | Complete at 1.00m | | |

PRELIMINARY


| | | | |
|---|---|-----------------------------------|-------------------------|
| Plan . | Remarks D = Disturbed Sample M = Mackintosh Probe - Blows/Penetration (mm) Groundwater was not encountered during the excavation For details of foundations exposed - see sketch | | |
| | <table border="1" style="width: 100%;"> <tr> <td>Scale (approx) 1:50</td> <td>Logged By APS</td> <td>Figure No. 1523176.TP2B</td> </tr> </table> | Scale (approx) 1:50 | Logged By APS |
| Scale (approx) 1:50 | Logged By APS | Figure No. 1523176.TP2B | |

Site Analytical Services Ltd.

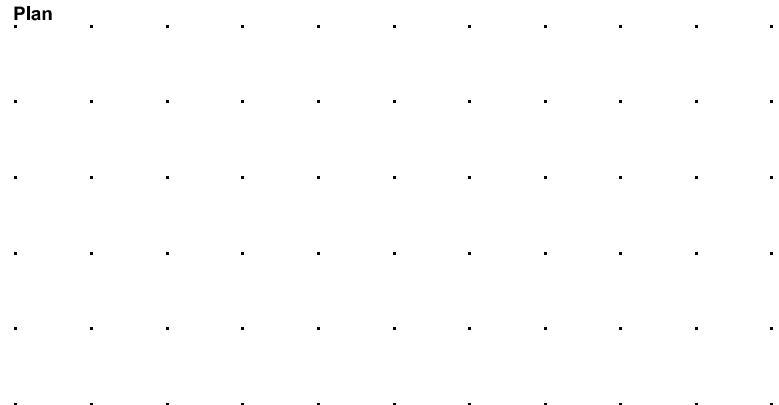
Site
42 NASSAU ROAD, LONDON, SW13 9QE

Trial Pit Number
TP3

| | | | | |
|---|--------------------------------|----------------------------|----------------------------------|------------------------------|
| Excavation Method HAND EXCAVATION | Dimensions 300 x 300 | Ground Level (mOD) | Client MR JEREMY RUDGE | Job Number 1523176 |
| | Location TQ 217 765 | Dates 10/02/2015 | Engineer AJP ENGINEERS | Sheet 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|-----------|----------------|-----------------|----------------|-------------|-----------------------|--|---|-------------------|
| 0.25 | D1 | | | | | MADE GROUND : Loose brown silty gravelly sand with brick and concrete fragments. Gravel is fine to medium of angular flint |  | |
| 0.50 | D2 | | | | (1.00) | | | |
| 0.70 | D3 | | | | 1.00 | | | |
| 0.70-1.00 | M1 72/300 | | 10/02/2015:DRY | | | | | Complete at 1.00m |

PRELIMINARY



| | | | |
|---|---|-------------------------|----------------------------------|
| Plan  | Remarks D = Disturbed Sample M = Mackintosh Probe - Blows/Penetration (mm) Groundwater was not encountered during the excavation For details of foundations exposed - see sketch | | |
| | Scale (approx) 1:50 | Logged By APS | Figure No. 1523176.TP3 |

Site Analytical Services Ltd.

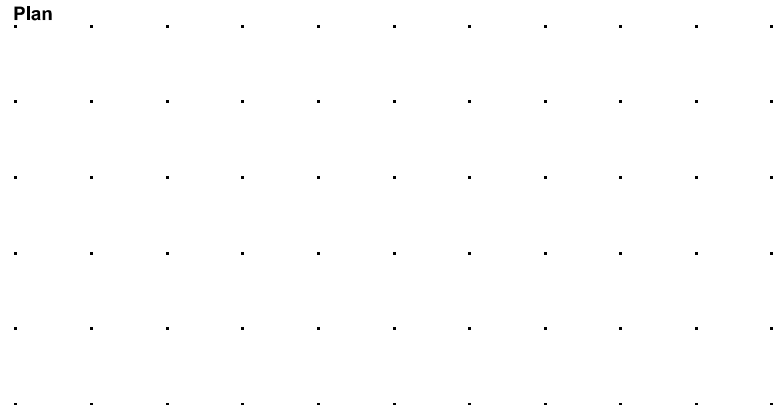
Site
42 NASSAU ROAD, LONDON, SW13 9QE

Trial Pit Number
TP4A

| | | | | |
|---|--------------------------------|----------------------------|----------------------------------|------------------------------|
| Excavation Method HAND EXCAVATION | Dimensions 300 x 300 | Ground Level (mOD) | Client MR JEREMY RUDGE | Job Number 1523176 |
| | Location TQ 217 765 | Dates 10/02/2015 | Engineer AJP ENGINEERS | Sheet 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|-------------------|------------------|-----------------|----------------|-------------|-----------------------|--|---|-------|
| 0.25 | D1 | | | | | MADE GROUND : Loose becoming medium dense brown silty gravelly sand with brick and concrete fragments. Gravel is fine to medium of angular flint |  | |
| 0.50 | D2 | | | | (1.20) | | | |
| 0.75 0.75-1.05 | D3 M1 117/300 | | | | | | | |
| 1.20 | D4 | | 10/02/2015:DRY | | 1.20 1.30 | Medium dense yellow brown silty very gravelly fine to coarse SAND. Gravel is fine to coarse of sub rounded to sub angular flint Complete at 1.30m |  | |

PRELIMINARY



| | | | |
|---|---|-------------------------|-----------------------------------|
| Plan  | Remarks D = Disturbed Sample M = Mackintosh Probe - Blows/Penetration (mm) Groundwater was not encountered during the excavation For details of foundations exposed - see sketch | | |
| | Scale (approx) 1:50 | Logged By APS | Figure No. 1523176.TP4A |

Site Analytical Services Ltd.

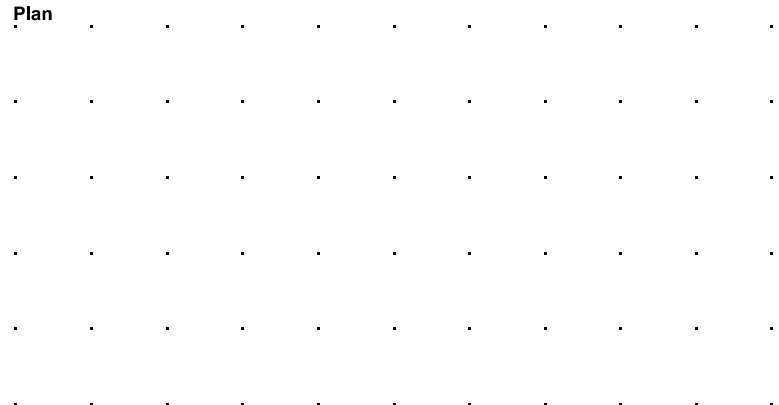
Site
42 NASSAU ROAD, LONDON, SW13 9QE

Trial Pit Number
TP4B

| | | | | |
|---|--------------------------------|----------------------------|----------------------------------|------------------------------|
| Excavation Method HAND EXCAVATION | Dimensions 300 x 300 | Ground Level (mOD) | Client MR JEREMY RUDGE | Job Number 1523176 |
| | Location TQ 217 765 | Dates 10/02/2015 | Engineer AJP ENGINEERS | Sheet 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|-------------------|------------------|-----------------|----------------|-------------|-----------------------|--|---|-------|
| 0.25 | D1 | | | | | MADE GROUND : Loose becoming medium dense brown silty gravelly sand with brick and concrete fragments. Gravel is fine to medium of angular flint |  | |
| 0.50 | D2 | | | | (1.20) | | | |
| 0.75 0.75-1.05 | D3 M1 117/300 | | | | | | | |
| 1.20 | D4 | | 10/02/2015:DRY | | 1.20 1.30 | Medium dense yellow brown silty very gravelly fine to coarse SAND. Gravel is fine to coarse of sub rounded to sub angular flint Complete at 1.30m |  | |

PRELIMINARY


| | | | |
|---|---|-------------------------|-----------------------------------|
| Plan  | Remarks D = Disturbed Sample M = Mackintosh Probe - Blows/Penetration (mm) Groundwater was not encountered during the excavation For details of foundations exposed - see sketch | | |
| | Scale (approx) 1:50 | Logged By APS | Figure No. 1523176.TP4B |

Site Analytical Services Ltd.

Site
42 NASSAU ROAD, LONDON, SW13 9QE

Trial Pit Number
TP5

| | | | | |
|---|--------------------------------|----------------------------|----------------------------------|------------------------------|
| Excavation Method HAND EXCAVATION | Dimensions 300 x 300 | Ground Level (mOD) | Client MR JEREMY RUDGE | Job Number 1523176 |
| | Location TQ 217 765 | Dates 10/02/2015 | Engineer AJP ENGINEERS | Sheet 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|-----------|----------------|-----------------|----------------|-------------|-----------------------|---|---|-------|
| 0.25 | D1 | | | | | MADE GROUND : Loose brown silty gravelly sand with brick and concrete fragments. Gravel is fine to medium of angular flint ...at 1.50m depth brick / flint obstruction |  | |
| 0.50 | D2 | | | | | | | |
| 0.75 | D3 | | | | | | | |
| 1.00 | D4 | | | | | | | |
| 1.50 | D5 | | 10/02/2015:DRY | | | | | |
| | | | | | 1.50 | Complete at 1.50m | | |

PRELIMINARY

| | | | | |
|---|--|-----------------------|------------------|-------------------|
| Plan . | Remarks D = Disturbed Sample M = Mackintosh Probe - Blows/Penetration (mm) Groundwater was not encountered during the excavation For details of foundations exposed - see sketch Trial Pit terminated at 1.50m depth on a brick / flint obstruction. Unable to find underside. | Scale (approx) | Logged By | Figure No. |
| | | 1:50 | APS | 1523176.TP5 |