PROPOSED BASEMENT CONSTRUCTION, EXTENSION, LOFT CONVERSION AND INTERNAL ALTERATIONS AT 73 CONSTANTINE ROAD, HAMPSTEAD, LONDON, NW3 2NG

STRUCTURAL ENGINEERS REPORT / METHODOLGY STATEMENT ON PROPOSED BASEMENT DEVELOPMENT

SAT INC LIMITED
Structural Engineers

03 Shetland House, Pioneer Way, Watford, Hertfordshire, WD18 6SF.

Tel: 01923441727 Fax: 01923441727 Email: info@satinc.co.uk

SAT INC LIMITED

Contents

1. THE SITE AND PROPOSED DEVELOPMENT
2. EXISTING STRUCTURE
3. SOIL CONDITIONS, FOUNDATIONS
4. WATER
5. HEAVE AND SETTLEMENT
6. EFFECTS ON ADJACENT STRUCTURES
7. DESIGN PRINCIPLES
9. DESIGN CRITERIA
10. DESIGNERS RISK ASSESSMENT
11. SEQUENCE OF OPERATION
12. SPECIFICATION FOR EARTHWORKS
13. SPECIFICATION FOR UNDERPINNING
14. SPECIFICATION FOR CONCRETE

APPENDICES:

A).Typical underpinning section and details

B). Typical section through light well

C). Architectural plans

D) Summary of Site Investigation Report

Contract Title: *Structural Engineers Report/ Methodology Statement on Proposed Basement Development*

Job Ref: *CG-13-01*

Client: **CG Contractors**

Issued By:
SAT INC LTD
03 Shetland House,
Pioneer Way,
Watford,
Hertfordshire,
WD18 6SF

Document: *Structural Report*

Issue Date: *24th January 2014*

Document Production / Approval Record

Issue No. : 01	**Name**	**Position**
Prepared by	**Anfas Thowfeek** MPhil BSc(Eng)	**Principle Structural Engineer**
Reviewed by	**Mathan Coomaraswamy** BSc(Hon) CEng MIStructE MIE(SL)	**Consulting Structural Engineer**

THE SITE AND THE PROPOSED DEVELOPMENT

The existing property at No.73 Constantine Road, Hampstead, London, NW3 2NG, consists of a two storey terraced house over ground floor level. The property occupies a sloping site, down toward the right when viewed from the road and also down from the rear toward the front. The property is linked both side and shares party wall with No. 71 and No 75 Constantine Road, to the left and right when viewed from the street.

It is proposed to carry out an extensive refurbishment of the property including forming a new single-storey basement below the existing structure footprint, internal alteration, in fill side extension and loft conversion.

EXISTING STRUCTURE

The existing structure is a linked terraced residential property comprising two storeys building and roof consist of tile covered pitched roof.

The external and party walls are of masonry which likely extend down to a corbelled brick and/or concrete footing; the internal load bearing walls are also of masonry except at first uppermost floor where they are of timber studwork.

The entire first floor and most part of ground floor are of suspended timber whilst it is appear only existing kitchen at ground floor comprises of ground bearing concrete slab.

The property is generally in it's original structural form and plans showing the existing structural layout are attached.

The building supports the internal dead (self-weight) and imposed live loads by transfer of these loads via the suspended timber floors to the load-bearing walls which in turn transfer the loads to the strip foundations below. To date it has not been possible to carry out site excavation works / trial holes to expose the wall foundations, however it is expected that the foundations are standard brick corbel in nature with the top of the foundation located at a minimum depth of between 800mm and 1200mm below existing external ground level. Lateral loads applied to the building, such as notional horizontal loads and wind loads are currently supported by the diaphragm action of the internal timber floors which restrain the perimeter walls. The building form then acts as a rigid "box" in turn transferring the lateral loads to the foundations of the perimeter walls.

SOIL CONDITIONS & FOUNDATIONS

Ground & Water were commissioned to carry out borehole investigations. The locations of the boreholes, boreholes logs and preliminary summary report of soil investigation (from Ground & Water) are attached in appendices (Appendix D).

Made Ground
The Made Ground consisted of dark brown sandy gravelly clay. Sand is fine grained. Gravel is rare to occasional, fine to coarse, sub-angular to sub-rounded brick, concrete and flint. The Made Ground extended to respective depths of 1.40m and 2.40m in Boreholes WS1 and WS2.
London Clay Formation
The underlying material comprised of Dark brown to brown and grey mottled silty clay with rare to occasional isolated pockets of fine selenite. These materials are extended down to the full depths of investigation of 8.30m below ground level (bgl) in Borehole WS1 and 6.0m below ground level in Borehole WS2.

Roots:
Fresh root penetration noted to ~2.0m in WS1 and ~2.4 bgl within WS2. The base of foundation excavations must extend at least 300mm into non-root penetrated soils.

Foundation:
The detail site investigation will be carried out prior to commencement to confirm the details of the existing footings. Hence the following parameters will be adopted from site investigation report.

The anticipated minimum foundation depths onsite would range between 2.30 – 2.70m bgl. It is considered the proposed basement will be constructed with load bearing concrete retaining walls with semi-ground bearing concrete floors. The following bearing capacities could be adopted for 5.0m long by 1.0m foundations constructed at the anticipated basement depth of 3.00m and 3.50m bgl.

Bearing Capacity (5.0m long by 1.0m wide) at 3.00m bgl. Load applied 90kN/m^2 – Settlement <20mm.
Bearing Capacity (5.0m long by 1.0m wide) at 3.50m bgl. Load applied 110kN/m^2 – Settlement <25mm.
Heave of the underlying soils may occur if a bearing pressure of less than 50 kN/m^2 is applied at 3.0m bgl and 55kN/m^2 at 3.50m bgl.

WATER

According to summary of soil investigation report, no groundwater noted within WS1 and groundwater strike noted at 1.80m bgl within WS2 in Made Ground, possible associated with perched water. The clay has a relatively low permeability to water and in essence presents an almost complete barrier but there can be some permeation albeit extremely slowly and there is also the possibility of some faster flow through fissures or localised zones of more granular material which could cause an occasional build up against the new basement wall.

It is for these reasons that water will be assumed with the level being 0.75 x the retained depth or at 1m below GL, whichever is the worst condition but taking the lowest ground level immediately adjacent to the property. It is commonly accepted that increasing the size of an existing cellar as we are proposing has little or no effect on the flow of local water in relation to adjoining properties. In fact even if mobile water was forced to find an alternative route as a consequence of the basement construction, any increase in the level of that water is likely to be significantly less than the natural variations associated with seasonal changes and rises in levels from extreme rainfall events. We concur with these views.

Based on this data it will be necessary to control water during the construction period originating from the Made Ground and upper permeable deposits. Consideration could be given to sheet piling in the temporary case to exclude water and to facilitate basement construction. Conventional internal pumping methods from open sumps could also be employed.

Guidance of structural waterproofing and how to relieve any hydrostatic pressure below the proposed basement is provided by British Standard Institute in their document BS 8102 ‘Code of Practice for protection of below ground structures against water from the ground’.

HEAVE & SETTLEMENT

The soil investigation suggested that the anticipated volume change potential on London clay formation is assume to be high (BRE240 & NHBC Standards Chapter 4.2).
The underpinning process involves transferring the foundation loads to a lower level and inevitably this leads to some settlement. Some movement will also be caused by the sequential transfer of load between different parts of the structure but the careful control of the underpinning process and sequence will keep such movements to a practicable minimum. Particular care will be taken in the vicinity of the more vulnerable parts of the existing fabric.

The depth to the London Clay and the modest dimensions of the site are such that the heave of the Clay is unlikely to exceed a few millimetres or to have any discernible effect outside the site boundaries. Any movement that does occur will be further mitigated by the necessarily slow rate of the excavation and construction.

At the lower level of course, the basement floor slab will be used to resist these heave forces and by supporting the slab with the deeper underpinning and the internal column foundations, the resulting upward movement is used to counteract the increased settlements expected due to the increased dig depth.

EFFECTS ON ADJACENT STRUCTURES

There is no evidence of any of the adjacent buildings has basement. Therefore proposed work requires underpinning of the both party wall between No.71 and No 75 to a depth of approximately 3.5m. It is expected that the building consists of load-bearing masonry with internal timber floors and roof. It is also assumed the wall foundations are brick-corbelled, most likely at a depth of 1.2-1.5m below ground level.

Outside of the basement area the change of vertical stresses in the ground may result in limited upward movements but the underpinning of the party walls may also cause some very minor settlements and horizontal movements towards the new basement.

In addition the underpinning operations may cause localised settlements of the party walls only which might result in cracks forming at the junctions of the walls of the adjacent properties where they about the party walls. It should be stressed however that any anticipated movements are expected to be minimal as they are generally suppressed by the stiffness of the structures above and those adjoining.

It is our experience that the potential for damage will be limited to the party walls but this can be mitigated by appointing a suitably experience Contractor familiar with propping techniques and sequential operations and by the Designer giving the necessary consideration to the risk by specifying measures to ensure that significant damage is avoided. This would typically be in the form of transitional underpins where we consider the structure above to be particularly vulnerable but otherwise by ensuring that the foundation transitions occur at inherently strong intersections of the more robust load bearing walls.

As a result we anticipate that should any damage occur it will be classified as Category 0 in the Category of Damage Chart, CIRIA C580. Category 0 is Negligible; hairline cracks of less than 0.1mm.

However, there will always be some movement as it can never be completely avoided and there are occasions where unforeseen conditions beneath the property which were not or could not be detected by the pre-construction investigations will result in more extensive damage. From our experience of designing basement the chance of such an occurrence is less than 2% and even then the damage would be classified as Category 1 in the Category of Damage Chart. Category 1 is Very Slight, fine cracks less than 1mm that can be easily treated during normal decoration.

DESIGN PRINCIPLES

Ground Floor Structure

Where the existing internal below ground floor level load bearing structure is to be removed, replacement will be by the use of steel and/or timber beams supported by the existing load bearing walls or new load bearing brick piers and/or steel posts.

To ensure the continued stability of the structure without reliance from the adjoining properties, the existing and any new load bearing basement walls are strapped to the structural ground floor deck using 30mm x 5mm galvanised mild steel straps placed at 2m centres.

New beams are not considered 'restrained' unless there is a mechanical connection to the top flange (or within 75mm of it). Hence timber floor joists do not restrain the compression flange unless they are notched into the web or nailed/screwed to a timber flange plate. In order to restrict any possible damage to the existing structure, the deflection in the new beams is restricted to 1/360th of the overall span, under the total characteristic load condition.

Timber

The exact structural layout of any existing ground floor joists is often unknown although sometimes the general direction of the span of the joists is. There will almost certainly be a foundation under each load bearing and/or masonry ground floor level wall; it also likely that there are numerous sleeper walls supporting nominal floor joists and experience would suggest that these are likely to be only 50mm x 100mm joists spaced at little more than 400mm centres. The spacing of the sleeper walls is also likely to be little more than 2.0m.

The new ground floor support structure will therefore need to replicate this arrangement. However, since the exact location of the sleeper walls is unknown, the main beam layout will be created first with a beam provided under each load bearing and/or masonry wall. It will then be necessary to provide additional beams to replace each sleeper wall. Hence sleeper wall beams will be designed to span up to various lengths and support at least 2.0m width of floor and ceiling. All main beams will then be designed assuming the worst ground floor loading case.

Concrete

The exact structural detail of any existing concrete ground bearing ground floor is also unknown although the thickness has been assumed as 200mm (plus 50mm finishes) and the non load bearing masonry walls will likely have been built off the slab.

In such cases it will necessary to provide beams to support the slab; these will be spaced at approximately 600mm centres hence several floor support beams will be designed to span up to various lengths and support at least 0.6m width of floor and new ceiling. All main beams will then be designed assuming the worst ground floor loading case.

Basement

The remaining load bearing structure will be underpinned in a traditional 'hit and miss' method to achieve the increased headroom required. The underpins comprise a vertical stem which is immediately beneath the existing wall and a base which usually has a toe and a nominal heel. The heel size is determined by ignoring the earth pressure and considering the maximum vertical load on the wall only, using this to find a minimum foundation width based on the soil bearing capacity.

The toe of the base is then determined by considering the minimum vertical dead load on the wall along with the maximum pressure from the retained soil and with the wall assumed to be acting as a cantilever.

In calculating the toe size, the maximum allowable bearing pressure is not exceeded and a minimum factor of safety against overturning of 2.5 is achieved.

The toe and/or stem will only be reinforced when the underpin stem is subjected to tensile stresses due to the pressures from the retained material. This usually only occurs where the London Clays are present or where the retained depth of soil is large.

To check the stresses in the underpin stem, the overturning moment taken about the basement slab is used. However, the design of the toe and the overall stability is based on the overturning moment taken about the underside of the underpin base.

We assume the soil/stem interface to be friction free as ultimately this provides the most onerous design.

Light well

These are invariably formed within the front garden of the property and are therefore adjacent to the public highway. Consequently surcharge loads are considered and are taken as either of the following, whichever produces the more onerous design conditions.

I... a uniformly distributed load of 2.5 kN/m^2, applied from within the garden and assuming private vehicle parking is possible,

II... a uniformly distributed load of 10 kN/m^2, applied from the highway and/or footpath,

III... a point load of 40 kN (a typical wheel load), applied over an area 0.3m x 0.3m and assumed to act at a point 0.6m from the property boundary, out toward the highway.

The light well walls comprise a vertical stem and a base with a toe and occasionally a heel. The stem utilises concrete blockwork only as a permanent shutter but in doing this it naturally provides additional resistance to the compressive forces generated. Nevertheless, the reinforced concrete wall behind provides all of the necessary resistance to the applied overturning forces and is cast against the soil. The size of the base toe is determined by considering only the self-weight of the wall along with the maximum pressure from the retained soil and any surcharge. In calculating the toe size, the maximum allowable bearing pressure is not exceeded and a minimum factor of safety against overturning of 1.5 is achieved. Since the base is usually cast up against the front wall of the basement, the design of the toe and the overall stability is based on the overturning moment taken about the top of the wall base.

DESIGN CRITERIA

Existing Brickwork

Assuming 7N bricks in lime mortar, from CP.111 the basic compressive strength = 0.49 N/mm^2
Hence under a concentrated load, bearing strength = 1.5 x 0.49, say 0.7 N/mm^2

Typical Underpinning Sequence (max 1.0m modules)

6	1	4	7	2	5	8	3	6	1	4	7

Figure 1: Typical underpinning sequence

General

Concrete is grade C35 N/mm2 using Sulphate Resisting cement unless otherwise directed.
Reinforcement is grade 500 N/mm2
Mortar is Class (iii).

DESIGNERS RISK ASSESSMENT

Excavations

Care must be taken to prevent sides of excavations from collapsing.

Masonry Walls

A 150mm minimum thickness is required for design load resistance and height to thickness ratios. However the blocks tend to be too heavy to manhandle and so load bearing blockwork walls will be specified as 215mm thick and formed from 100mm thick blocks laid on their side.

Steel Beams

Where possible, large span beams will be spliced to minimise manhandling. Other ways of minimising the weight of steel sections is to specify two channels bolted back to back in lieu of a single UB or UC section. However, there will be occasions where neither option will be practical and/or possible and the contractor will be made aware of such situations.

Hazards & Risks Which Cannot be Designed Out

Potential Hazards	Action Required	Risk Assessment
Falls from Height	Works being carried out - provide hand rails and access scaffolding to all openings.	Medium
Falling Debris	Works carried out above public access - provide toe boards, netting and protection fans.	High
Materials Storage	Existing roofs and floors are not to be used for storage of materials without reference to the Engineer or for supporting access scaffolding.	High
Lifting of Steelwork	Steel sections to be lifted using mechanical means where unable to be manually lifted	High
Erection of Steelwork	Contractor responsible for providing method statement for erection procedure, including any temporary bracing.	Medium
Lifting of Timber	Timber rafters and joists to be lifted using mechanical means where unable to be manually lifted.	High
Fixing of Timber	Timbers to be fixed in accordance with good building practice.	Medium

Reinstate Existing Roof Finishes	Method statement to allow for temporary waterproofing if required.	Low
Use of Cutting Equipment – Flame or Disc.	Fire risk - use suitable protective methods – remove inflammable materials.	High
Painting	Touch up steelwork with primer – take precautions against vapour inhalation, eye and skin contact and fire. Wear protective clothing	Low
Excavation	Take precaution against collapse of excavation and hazards of persons falling in.	High
Insitu Concrete Construction	Take precautions to prevent skin/eye contact. Protect public and site staff from falling objects and spillage. Ensure adequate care when fixing reinforcement.	Medium
Formwork/Falsework	Design temporary works in a manner that makes allowances for all loadings, including accidental loads. Ensure adequate vertical and diagonal bracing. Supports not to be Medium removed until period specified.	Medium
Forming new Openings in Walls	Provide temporary works to support wall and loads above opening. Install new support lintel and reinstate prior to removal of temporary supports.	Medium

SEQUENCE OF OPERATION

- The typical underpinning sequence is shown on figure 1.
- Upon removal of the existing ground floor the external walls shall be fully propped using a proprietary system design and installed by an appointed specialist.
- The underpinning operations are to be carried out strictly in accordance with the sequence shown on the drawings and specifications.
- All concrete to be C35N/mm^2 @ 28 days. Below ground concrete shall be sulphate class DS-02.
- Each pin must not exceed 1200mm in length.
- A minimum of 24 hours must elapse after completion of dry-packing to one bay and the excavation of the next.
- At least the full width of the existing foundation must be replicated lower down and onto an acceptable bearing stratum.
- Excavations are to be kept free of water and the sides of excavations are to be supported as necessary.

- Underpinning in each section should commence as soon as possible after an agreed formation depth has been achieved.

- Building Control will be given 24 hours' notice to inspect and approve the required formation level and suitable bearing strata of the first pin. Any variations in the nature of the sub-strata will be notified immediately.

- The soffit of the exposed foundations is to be cleaned off prior to concreting.

- As indicated on the attached drawing the concrete is to be poured to a level approximately 75mm below the existing footings and allowed to cure for a minimum period of 24 hours. The void is then to be filled using a semi-dry cement and sand mix (in a 1:1 proportion) and rammed home to ensure a uniform transfer of load.

- As underpinning work is carried out against already completed bays, the concrete surface of the adjacent section should be hacked off and keyed to form a good key prior to the new concrete being cast. Starter bars will be drilled and inserted.

- Any supports to the excavations are to be removed progressively as concrete operations proceed so that no voids exist.

- All workmanship and materials must be approved by the BCO.

SPECIFICATION FOR EARTHWORKS - EXCAVATION AND FILLING

MATERIALS

Suitable Fill Materials

Class I: General Cohesive fill shall include clays with not more than 20% of gravel or any larger sized particles and having a moisture content within -4% to + 2% of the plastic limit unless otherwise stated in Part C.

Class II: Well Graded Granular fill which shall include sands and gravel with a uniformity coefficient greater than 10.

Class III: Dry Cohesive fills which shall include clays containing more than 20% of gravel or any larger sized particles, and with a moisture content less than 4% below the plastic limit.

Class IV: Uniformly Graded fill which shall include sands and gravels with a uniformity coefficient of 10 or less.

Classification of Imported Filling Material

Imported material for filling shall be classified as follows:-

Class A - filling material shall consist of Crushed rock, Hoggin, Well burnt colliery shale and/or Sand and gravel.

Class B - filling material shall consist of hardcore.

Class C - filling material shall consist of Quarry Stone, Concrete or stone rubble.

Class D - filling material shall consist of well graded crushed rock, crushed slag, crushed concrete or well burnt non-plastic shale.

Hardcore shall consist of any combination of broken or crushed concrete, clean hard brick, coarse gravel or had stone capable of passing in every direction a ring of diameter not greater than two

thirds the thickness of the placed layer subject to a maximum diameter of 150mm. It shall be free from dust, rubbish and any other deleterious matter.

WORKMANSHIP

All earthworks shall be adequately supported or formed to ensure stability of the sides and to prevent any damage to the surrounding ground or structures.

The Contractor shall submit for approval when required method statements for his temporary support arrangements.

Surplus excavated materials and excavated material not approved for re-use shall be removed from site to a tip provided by the Contractor unless stated otherwise.

Where excavation reveals a combination of suitable and unsuitable materials, the Contractor shall carry out the excavation such that the suitable materials are excavated separately for use in the Works without contamination by the unsuitable materials.

Dealing with Water

The Contractor shall not permit water to accumulate in any excavation unless otherwise instructed. Any water whether arising from the excavation or draining into it shall be drained or pumped to an approved location via adequate settlement arrangements or other means to prevent the deposition of solids or other pollution into the receiving watercourse.

The Contractor shall take adequate steps to prevent adjacent ground from being adversely affected by loss of fines through natural drainage or any dewatering process and shall submit his proposals for dealing with water.

Excavation

For excavations in cohesive materials the final 150mm of material above formation level shall only be removed immediately prior to placing the blinding protection concrete when the work can be programmed to be carried out during the same day.

Unsuitable hard or soft material encountered at formation levels shall be removed and made good.

The Contractor shall make good at his own expense any parts of the formation and sides of excavations made unsuitable by his working methods.

The Contractor shall take care when excavating adjacent to existing structures to ensure undermining of existing foundations does not occur.

Contractor shall design and install temporary earthwork supports where necessary – the design shall take account of all possible loading conditions.

Filling

Backfilling shall consist of approved suitable excavated material as specified which shall be deposited in layers not exceeding 250mm loose depth.

Due regard shall be paid to the method of backfilling and of compaction to ensure that no damage is done to any structure, including pipes and services. Care shall be taken to ensure that the filling to all trenches and excavations proceeds at the same rate as the timbering or other supports are removed.

Filling around structures shall be carried out in such a manner as to avoid uneven loading of the structure and only at such time as any Works have achieved adequate strength to accept the loading.

All materials placed as filling or embankments shall be compacted as soon as possible after deposition.

The permitted depth of each layer of fill is dependent upon the type of fill to be consolidates and the compaction plant which will be used.

The Contractor's proposals for compaction shall be submitted to the Engineer. The submission shall include full details of the type of plant and method of operation to be used. Regardless of the method of compaction he proposes to use, the Contractor shall compact the filling to the specified density.

Tests shall be carried out in accordance with Clauses in this Specification to measure the actual density achieved. Wherever low test results are obtained the Contractor shall improve the degree of compaction to the specified level and carry out additional tests.

Compaction of Hardcore

Each layer of hardcore shall be compacted and the degree of compaction obtained on layers not exceeding 300mm thick shall be not less than that which would be obtained by six passes with a vibration-plate compactor with a static pressure under the baseplate of not less than 17 kN/m2.

QUALITY CONTROL

Sample loads of imported filling material and hardcore shall be supplied for approval.

Before using fill materials in permanent earthworks the Contractor shall carry out five compaction tests using BS: 1377, Part 4, Section 3 Clause 3.5 to determine the dry density/moisture content relationship for each classification of fill material he proposed to use and submit the results of these tests to the Employer's Agent for information.

Formation levels shall be within zero and -25mm of the levels shown on the Drawings. Other earthworks levels shall be within zero and -100mm of the levels shown on the Drawings.

Settlement and Heave Allowance

In the setting out and construction of excavations and filled areas the Contractor shall allow for settlement and heave whether caused by consolidation of fill, settlement of foundations, heave in excavations or change in volume of materials after excavation.

SPECIFICATION FOR UNDERPINNING OF EXISTING FOUNDATIONS

GENERAL

The Contractor is advised that BS.8004, Code of Practice for Foundations (and amendments), and any requirements or guidance therein are applicable to this Specification.

Drawings and Instructions

The work shall be carried out in accordance with Engineer's drawings and specifications and to the approval of the District Surveyor or Local Authorities.

The contractor shall prepare drawings and calculations showing details of his proposals for temporary works and shall submit these to the Engineer well in advance of work proceeding. These details shall be based on principles of construction shown on Engineer's drawings.

Safety of Structure

The contractor shall be responsible for the safety of the structure being underpinned during the construction and shall provide all of the shoring, strutting and bracing deemed necessary by him to ensure its safety and stability.

Preliminary Information

The Contractor shall submit the following information to the Engineer before the work is commenced.

a Source of supply of concrete

b Source of supply of reinforcement, including test certificates. c

Source of supply of cement, including test certificates

d Source of supply and other information about aggregates.

Responsibilities and Defects

The fact that the Contractor has used materials, workmanship, etc. to the satisfaction of the Engineer shall in no way relieve him of his responsibilities in producing work satisfactory in every respect. Any work considered to be unsatisfactory shall be rectified to the satisfaction of the Engineer at the sole cost of the Contractor.

Party Wall Awards

The Contractor shall obtain confirmation from the Architect that construction of any section of underpinning can commence and that all matters referring to any Party Wall Award have been completed.

MATERIALS

General

All materials used in normal reinforced and/or unreinforced concrete for the structural underpinning of existing walls and foundations shall comply with the requirements of Clause 2 of the Specification for Concrete and Reinforced Concrete Construction.

Concrete

The concrete used in underpinning bases shall have the following characteristics: Strength

at 28 days; 25N/mm^2
Cement; Ordinary Portland or Sulphate Resisting
Maximum Coarse Aggregate Size; 20 mm.
Cement Content; min. 290 Kg/m^3, max. 360 Kg/m^3
Maximum free water/cement ratio

WORKMANSHIP

General

All workmanship and construction with normal reinforced and/or unreinforced concrete for the structural underpinning of existing walls and foundations shall comply with the requirements of Clause 3 of the Specification for Concrete and Reinforced Concrete Construction.

Underpinning operations shall be executed in sections in strictly predetermined sequence. The order of work shall be as shown on Engineers' drawings and construction of any section shall not be commenced until underpinning of previous section has been completed and pinned.

Excavation

All excavation shall be carried out in compliance with all relevant and current statutory regulations and following the safety precautions recommended in Section 11 of BS.8004 and Section 1 Clause 4 of BS.6031 Code of Practice for Earthworks.

Excavations shall be of depth and width as shown on Engineer's drawings. Sides of excavations shall be vertical, and adequately shored and retained against subsidence or slip of soil. Soil face behind the underpinning and at formation level shall be undisturbed. Where ground conditions prevent this requirement from being met, the face of excavation shall be grouted and the bottom of excavation shall be blinded immediately after the exposure. Grout shall consist of sharp sand and cement mixed to liquid consistency in proportion similar to that of underpinning.

Strutting

Strutting shall be in accordance with clause 1.3 of this specification and shall be so designed as to permit re-strutting of excavation during construction of underpinning if required.

All strutting shall be fixed in position using hardwood folding wedges or jacks capable of transferring, to exposed soil faces, support equal to that offered by ground removed by excavations.

Existing Foundations

The underside of existing foundations shall be levelled and/or shaped as shown in Engineers' drawings. Loose or deteriorated areas of existing foundations shall be removed and thoroughly cleaned.

Concrete Construction of Underpinning

Construction shall be in lifts determined by position of strutting frames. Excavations shall be re- strutted against new construction prior to removal of next frame above.

Construction shall be completed to within 100 mm of the underside of existing foundations and underpinning then completed as described in clause 3.7 below.

The pinning of 75 mm gaps shall be with concrete using 10 mm graded aggregate and cement in semi-dry mix.

This operation shall commence not earlier than 48 hours after completing main construction described above.

The excavation of adjoining sections shall not take place until at least three days after the pinning of the adjoining section.

QUALITY CONTROL

All tests and checks on site shall be carried out in the presence of or as directed by the Engineer. The Contractor shall be responsible for carrying out all tests required by this specification or called for by the Engineer and shall arrange for copies of test results to be supplied direct to the Engineer immediately they are available.

Before concreting starts the Contractor shall submit the name of the Natlas Accredited Independent Testing Authority he proposes to employ.

All sampling and testing of aggregates shall be carried out in accordance with BS.812, and/or using other appropriate standard test procedures.

As soon as the sources of supply of aggregates have been provisionally agreed, the Contractor shall instruct the Testing Authority to carry out the following tests:

1. Sieve analyse
2. Test for clay, silt, dust and shell content
3. Test for organic impurities
4. Analyses for salt content
5. Analyses for sulphates
6. Analyses for alkali metals (K2O and Na2O) contents.

The results of these tests shall be submitted for approval as soon as they are available.

All works classed as defective shall be cut out and removed from the Works and replaced or otherwise dealt with in a manner agreed with the Engineer.

SPECIFICATION FOR CONCRETE AND REINFORCED CONCRETE CONSTRUCTION

GENERAL

The Contractor is advised that British Standard BS.8110 Structural Use of Concrete (and amendments) is applicable to this Specification.

Preliminary Information

The Contractor shall submit the following information of his proposals to the Engineer before work is commenced: -

a. Source of supply of concrete.
b. Source of supply and test certificates for reinforcing steel.
c. Types of water-bars and manufacturer.
d. Types of joint fillers and sealants and manufacturer e. Position of all construction joints.
f. Source of supply of cement, including test certificates.
g. Source of supply and other information about aggregates.

Where the specification and drawings allow the Contractor a choice of materials to be used in the Works, the materials chosen and their proposed sources of supply shall be to the satisfaction of the Main Contractor and the Engineer.

Responsibilities and Defects

The fact that the Contractor has used materials, workmanship, etc. to the satisfaction of the Engineer this shall in no way relieve him of his responsibilities in producing work satisfactory in every respect. Any work considered to be unsatisfactory shall be rectified to the satisfaction of the Engineer at the sole cost of the Contractor.

The Contractor shall be responsible for all aspects of temporary works necessary for the support of the new and also the adjacent structures and ground profiles for all conditions of temporary loading likely to be encountered, for the duration of the contract.

MATERIALS

Concrete shall be made with cement, aggregate and water; no other ingredients shall be used without the written agreement of the Engineer.

All materials shall conform to the current relevant British Standard and shall be to the satisfaction of the Engineer. The Contractor shall no alter the source of supply of any material from that initially agreed without the written agreement of the Engineer.

Concrete grade shall mean for Designed Mixes the characteristic strength, and for Prescribed Mixes, an arbitrary number to denote the mix.

All cement shall be delivered to the site in sealed containers or bulk cement lorries.

Provision shall be made to protect cement before use and accidental mixing of different types. The Contractor must ensure that the alkali content of the cement supplied is compatible with the proposed aggregates.

Cement used as a constituent material for concrete shall comply with the requirements of British Standards BS.12 Ordinary Portland Cement, BS.4027 Sulphate Resisting Portland Cement and shall be obtained from a single source unless otherwise agreed.

Under no circumstances shall high alumina cement be used.

Aggregates used in the manufacture of concrete shall comply with the requirements of BS.882 Aggregates from Natural Sources.

The Contractor shall obtain an undertaking from the suppliers of both fine and coarse aggregates of the quality and type selected that sufficient supplies are available to complete the contract.

In addition to ensuring compliance with the above the Contractor shall ensure that the combination of the proposed fine and coarse aggregates will not be susceptible in concrete to excessive dimensional changes as a result of alkali reactivity.

The limiting requirements for the flakiness index, shell content and mechanical properties shall be as defined in Section 4 of BS.882 together with the following exceptions: aggregates used in construction specified as waterproof shall not have a Flakiness Index exceeding 35 percent or a water absorption rate greater than 3.0 per cent by weight".

Aggregates shall not contain more than 1.0 percent hollow shells nor shells of unsuitable shape. The

Grading, including the contents of clay, silt and fine clay of fine and coarse aggregates shall comply with the requirements of BS.882.

The maximum total chloride content of the fine and coarse aggregates shall be as given in Appendix C of BS.882.

Water shall be clean and free from harmful matter that would affect the properties of the concrete. If water for the works is not available from a Public Utility Undertaking supply, approval shall be obtained regarding the source of supply and manner of its use. When so directed the Contractor shall arrange for tests of the water to be carried out in accordance with BS.3148.

The Contractor shall obtain the written agreement of the Engineer to all materials, which he proposes to use which are not covered by this Specification.

Where the use of proprietary material is agreed it shall be used strictly in accordance with the Manufacturer's instruction and specification, which must be forwarded to the Engineer in advance for consideration.

Concrete

Designed mixes shall be used for each grade of concrete listed in Table l of this Specification and shall be in accordance with BS.5328 except that the Contractor shall obtain approval for any change in sources of materials and any change in cement content over 20kg/m³.

The Contractor may use ready mixed concrete, subject to agreement. The concrete shall comply with BS.5328.

Concrete shall be manufactured from a depot included in the Quality Scheme for Ready Mixed Concrete (QSRMC) and evidence of such inclusion will be required on submission of mix details. In particular concrete will comply with the requirements within the scheme for design mixes.

All delivery notes shall be retained by the Contractor and made available to the Engineer for inspection throughout the duration of the contract.

Concrete shall be delivered and placed within 1 ½ hours of the water being added.

If at any time the Engineer is not satisfied that the ready mixed concrete complies with this specification he may alter the frequency of the sampling.

All the constituents for each mix shall be added at the manufacturers' depot. No extra water or other material shall be added after the concrete has left the depot, without prior agreement of the Engineer.

50mm blinding concrete of Grade 10 shall be provided under all reinforced concrete work in contact with the ground unless otherwise directed by the Engineer/Main Contractor.

The workability of the concrete shall be such that it can be readily compacted around the reinforcement and into the corners and angles of the Formwork.

The water content of the mix shall be the lowest possible compatible with the required workability without giving a water/cement ratio greater than that given in Table l.

Reinforcement

The reinforcement shall be free from paint, loose mill scale, loose rust, dirt, oil and grease, snow or ice or any other substance which can be shown adversely to affect the steel or concrete chemically or reduce the bond. Reinforcement shall be bent cold in accordance with the Engineer's drawings.

All steel reinforcement shall be of the diameter, lengths and form shown on the drawings.

High Yield reinforcement shall comply with the requirements BS4449 or BS4461. All high yield reinforcement shall be deformed to comply with Type 2 reinforcement as specified in BS.8110.

Steel mesh reinforcement shall comply with BS4483.

Miscellaneous Materials

Waterbars, where the Engineer specifies their use, shall be of PVC and manufactured by an approved supplier.

Site welding to Waterbars will only be allowed on butt joints and is to be in accordance with the Manufacturer's written instructions with all other junctions shall be factory made.

Waterbars may be internal or external type depending on application and details. Sizes and types are indicated on the Engineer's drawings.

Consideration should be given for the use of Hydrophilic Rubber type water bars used in accordance with the manufacturer's instructions.

Reinforcement Splices

Mechanical reinforcement splices, where specified, shall be supplied by an approved manufacturer and used in accordance with his written instructions. The Contractor shall obtain the Engineer's written agreement for the use of splices where these are not shown on the drawings.

QUALITY CONTROL

The formwork shall be constructed as to support the concrete in its fluid state together with all subsequently imposed construction loads without appreciable movement or deflection. It shall be sufficiently tight to prevent loss of grout from the concrete and be free from undulations and distortions and stiff enough to prevent damage due to vibration.

The formwork shall, unless otherwise directed, have a smooth even face and be so supported as to provide a plain surface with clean and true arrises.

No metal part of any device for maintaining formwork in the correct location shall remain permanently within the specified concrete cover to the reinforcement.

Where concrete is cast against existing structures or walls etc., the Contractor is to ensure that in placing the concrete he does not overload, disturb or damage the adjacent structure or wall, limiting the height of the concrete pour as necessary.

The Main Contractor shall execute under his own supervision all cutting and making good of concrete which may be necessary either for the proper execution of the work under his contract or for the convenience of Sub-Contractors.
Damaged formwork shall not be re-used if in the opinion of the Main Contractor or Engineer the making good would impair the surface appearance of the concrete.

Formwork supports must be propped by an unyielding support to prevent movement during concreting and subsequently during curing.

Not less than two weeks before the start of any pour requiring props, the Contractor shall submit drawings indicating the props he proposes to use, linked to a detailed programme of work.

The responsibility for the safe removal of falsework so not to distress or distort the structure shall rest with the Contractor.

Where construction joints are not shown on the Engineer's drawings the Contractor shall submit proposals to the Engineer before work starts.

The Contractor shall obtain agreement for his proposals for forming and preparing construction joints prior to the work commencing on site. Unless otherwise agreed, these are to be rebated in profile and the

surface bush hammered and cleaned prior to pouring the adjacent concrete. Alternatively the surface can be wire brushed while the concrete is green.

Unless otherwise stated all cutting and bending of reinforcement shall be in accordance with Clause 7.2 of BS.8110.

Reinforcement shall not be bent except as shown in the bending schedules without prior agreement, and then only with a machine designed for that purpose.

Reinforcement shall be fixed in accordance with Clause 7.3 of BS.8110 but no reinforcement shall be welded without the Engineers written agreement.

The reinforcement shall be fixed in such a manner that the concrete covers noted on the drawings can be achieved in the final structure.

Where spacers are required to maintain the concrete cover to the reinforcement these may be of either concrete or plastics unless otherwise specified. Plastic spacers shall be of an agreed design and where soffits are to be exposed plastic spacers shall be used.

Where spacers are required to carry heavy loads plastic spacers shall not be used.

All reinforcement shall be accurately placed to conform to the detail drawings. Reinforcement shall be anchored securely in place and shall be tied with ample use of annealed 16 S.W.G. iron wires at each intersection.

The Contractor shall detail, supply and fix all chairs, U-bars and spacer bars requiring the reinforcement in the correct position and shall submit details and spacing of reinforcement chairs.

Adequate precautions shall be taken at all times to ensure that reinforcement in slabs and beams are not displaced after fixing and during concreting.

Any reinforcement that is placed within a concrete section for incorporation in subsequent work shall not be bent out to its final position until the concrete has achieved two thirds of its 28 day strength.

Before each concrete pour the Contractor shall give the Engineer or his representative 24 hours notice in writing in order that an inspection may be made before the concrete is placed.

Concrete shall be placed continuously up to construction joints while it is still sufficiently plastic for adequate compaction. Concrete shall not be moved by use of poker vibrators.

The concrete shall be placed in one continuous operation rising uniformly in the formwork at a rate of not less than 2.0m per hour. The concrete shall not be handled in any manner that may cause segregation.

The concrete shall not be placed directly against a vertical form face but shall be caused to flow to this surface during the compaction process. On fair-face work care shall be taken to avoid the form face being splashed with mortar during the placing operation.

Running of concrete using poker vibrators is not acceptable.Unless otherwise specified all structural concrete shall be compacted by mechanical vibrators of appropriate type carefully worked around the reinforcement, embedded fixtures and into corners of the formwork. Whenever concrete is being vibrated at least one spare vibrator of each type in use shall be available in case of breakdown.

Vibration shall be continued until concrete reaches a state of compaction, when air bubbles cease to break the surface and all loose stones are absorbed into the mass and the surface is free from pockets and is moist and glistening. Internal vibrators shall not be permitted to touch the shutters. They shall not be used to push the concrete along the forms and an ample supply of concrete shall always be available in front of the needle. External vibrators shall be securely clamped to the shutter frames or stiffeners (as in columns) or against the shutter face with chain or vice.

Immediately before the concrete is placed the formwork shall be thoroughly cleaned. All rubbish, chippings, shavings, sawdust, nails and tying wire, and any other deleterious material shall be removed from the interior of the formwork.

The Contractor shall submit weekly a complete record of the concrete work done, showing the time and date when concrete was placed in each part of the Works.

The method and duration of curing shall be such that the concrete sections will remain free of cracks or significant distortion and shall be such that the concrete will have satisfactory durability and strength.

The Contractor shall obtain the agreement of the Engineer for his methods of curing the cast concrete.

Before any formwork is removed the Contractor shall ensure that the concrete has attained sufficient strength for striking to proceed. The structure shall not be distorted, damaged or overloaded in any way by the removal of the formwork.

The responsibility for the safe removal of any part of the formwork or props shall rest with the Contractor.

The minimum periods before removing formwork to structural members shall be in accordance with BS.8110 and Table 3 in this specification shall be used in place of the Table in BS8110.

The earlier striking of forms (but not props) may be approved if the Contractor can show that this can be done without damage to the concrete.

The making and testing of cubes to establish the period before striking shall be at the Contractor's expense.

Permission to strike formwork on the basis of the strength of specially cast cubes will be withdrawn if the Engineer is not satisfied that the strength of the cubes is representative of the strength of the concrete.

Notwithstanding the above, formwork props shall remain in position for at least 3 days. Where the

member concerned may be called upon to take construction loading from higher floors, the member shall be re-propped down to an unyielding support.

Before concreting starts the Contractor shall submit for approval the name of the Independent NATLAS Accredited Testing Authority he proposes to employ.

All sampling and testing of aggregates shall be carried out in accordance with BS.812, and/or using any other appropriate standard test procedures.

The testing of all concrete shall be carried out in accordance with BS.1881 and/or using any other appropriate test procedures.

The sampling of works concrete using designed mixes shall be in accordance with BS.5328 and BS. 1881 except that samples shall be taken at the mixer or at the point of casting as directed. The frequency of sampling shall be not less than that specified in Table 7 in BS. 5328 of this Specification. In special circumstances an increased rate of sampling may be directed.

At least one sample of each grade shall be taken on each day that concrete of that particular grade is used.

Samples of concrete shall be taken in accordance with the requirements of this specification at the point and time of delivery.

The concrete shall be sampled and tested in accordance with Clause 15 of BS.5328 at least once a day for each mix delivered for the first five days on which that mix is delivered and thereafter for each 40 cubic metres of each mix.

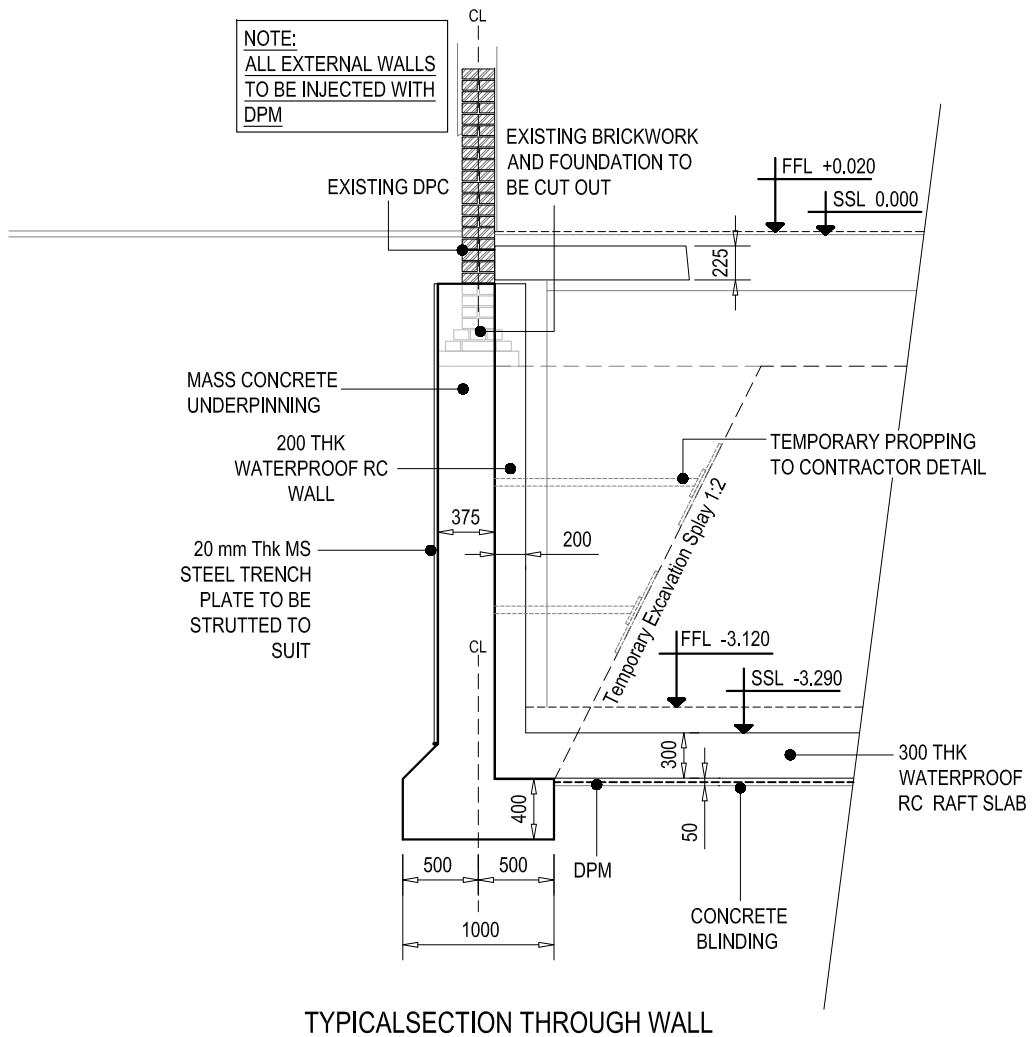
For each sample, workability tests shall be carried out and at least two sets of two cubes shall be made, one set for test at 7 days and the other for test at 28 days. The results of these tests shall be submitted with copies of typical manufacturer's certificates for each type of cement used.

Defective Works

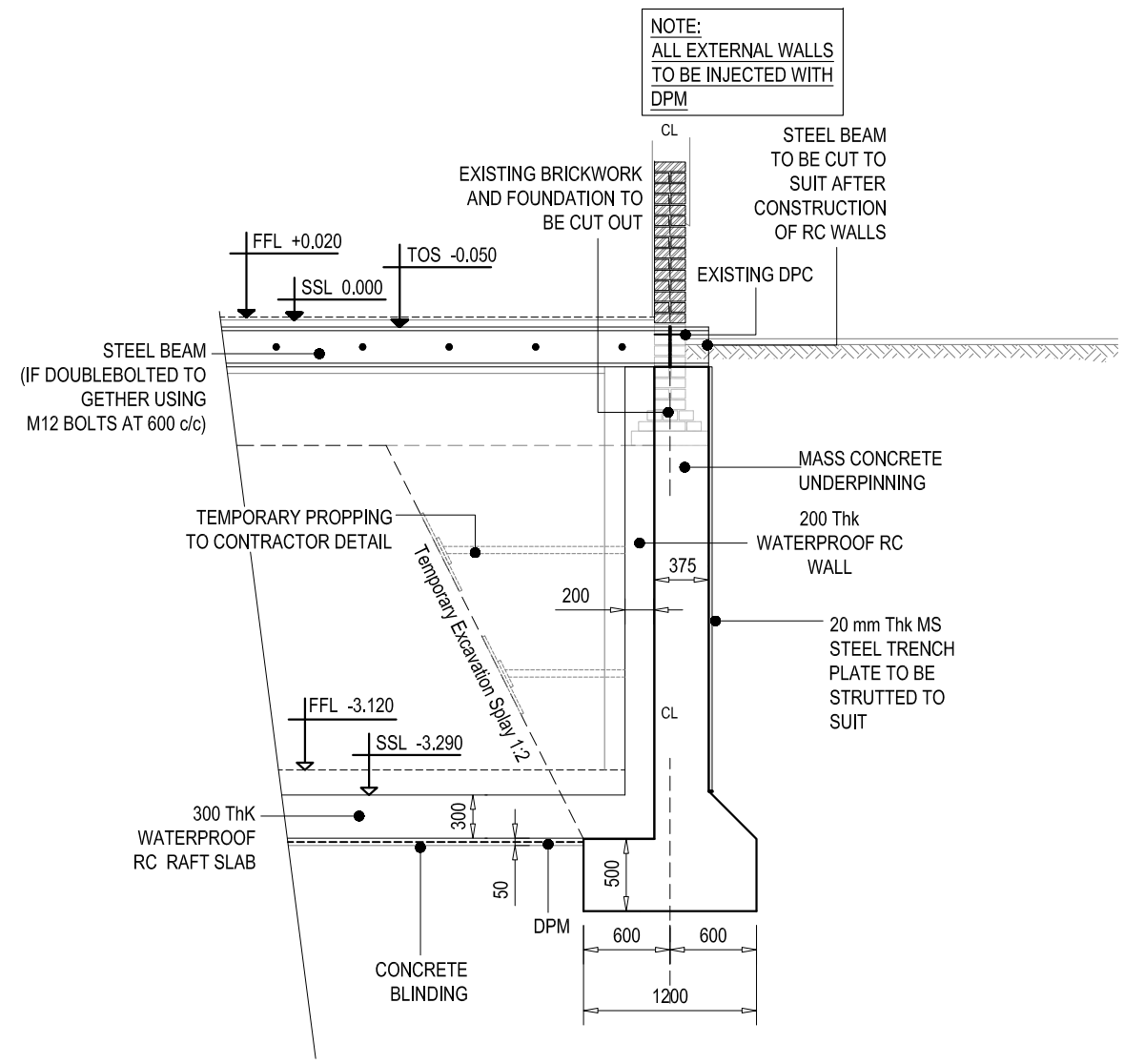
Where, in the opinion of the Engineer, any of the finished Works or the materials or workmanship in any part of the Works fails to comply with this Specification, that part of the Works will be classed as defective.

All work classed as defective shall be cut out and removed from the Works and replaced or otherwise dealt with in an approved manner. For the repair of concrete damaged by shrinkage a repair by the Colebrand (or similar approved) system may at the discretion of the Engineer be used, the costs of such work to be met by the Contractor.

APPENDIX A: TYPICAL UNDERPINNING SECTION AND DETAILS



TYPICALSECTION THROUGH WALL
- UNDERPINNING DETAIL
Scale 1:50



TYPICALSECTION THROUGH WALL
- UNDERPINNING AND STEEL BEAM SUPPORTING DETAIL
Scale 1:50

NOT APPROVED FOR CONSTRUCTION

SAT INC LIMITED
STRUCTURAL DESIGN SERVICES
03, SHETLAND HOUSE, PIONEERWAY, WATFORD, WD186SF
TEL: 01923441727
MOB: 07877385486
EMAIL: i n f o @ satinc.co.uk

NOTES
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL AND ENGINEERING DWGS

REVISION	DESCRIPTION	DATE

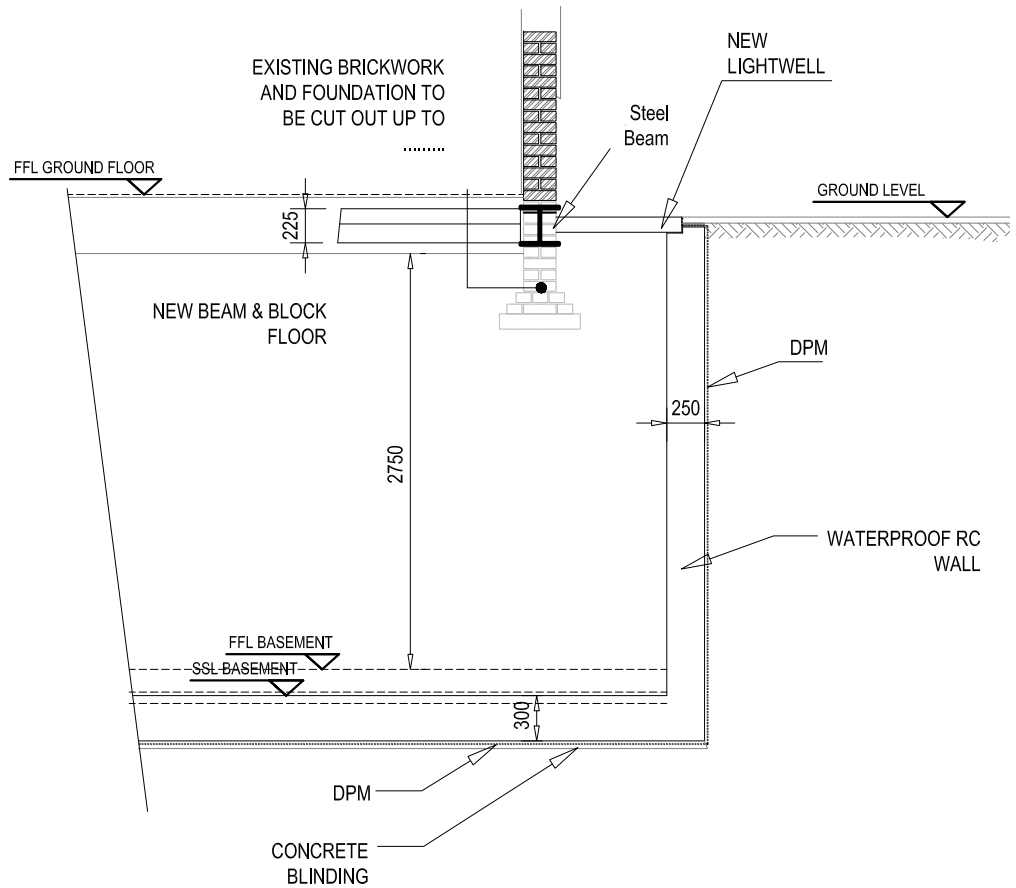
PROJECT
PROPOSED BASEMENT CONSTRUCTION, EXTENSION, LOFT CONVERSION AND INTERNAL ALTERATIONS AT 73 CONSTANTINE ROAD, HAMPSTEAD, LONDON, NW3 2NG

CLIENT CG Contractors
MOB: TEL: EMAIL:

DRAWING TITLE
TYPICAL SECTIONS AND DETAIL

SCALE	1:50	@ A3	STATUS	PA
DATE	21/01/2014		CHECKED	TM
JOB.NO.	CG-13-01		DRAWN	AT
DWG.NO.	STR-01		REVISION	

APPENDIX B: TYPICAL SECTION THROUGH LIGHT WELL



TYPICAL SECTION THROUGH LIGHT WELL
Scale 1:50

NOT APPROVED FOR CONSTRUCTION

SAT INC LIMITED
STRUCTURAL DESIGN SERVICES

03, SHETLAND HOUSE, PIONEERWAY, WATFORD, WD186SF

TEL: 01923441727
MOB: 07877385486
EMAIL: i n f o @ satinc.co.uk

NOTES
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL AND ENGINEERING DWGS

REVISION	DESCRIPTION	DATE

PROJECT
PROPOSED BASEMENT CONSTRUCTION, EXTENSION, LOFT CONVERSION AND INTERNAL ALTERATIONS AT 73 CONSTANTINE ROAD, HAMPSTEAD, LONDON, NW3 2NG

CLIENT CG Contractors
MOB: TEL: EMAIL:

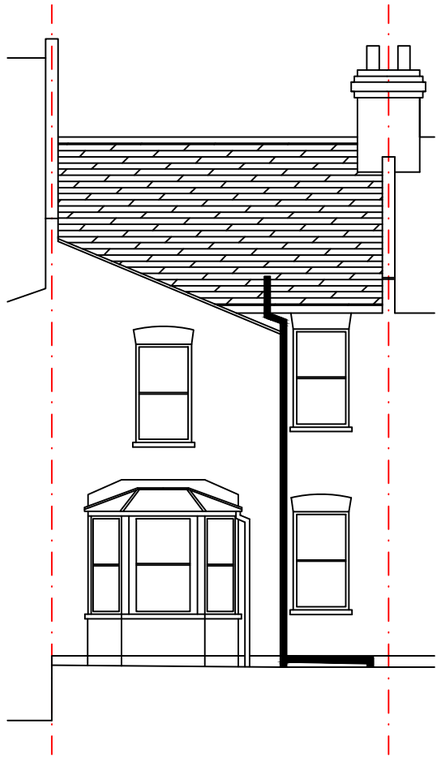
DRAWING TITLE
TYPICAL SECTION THROUGH LIGHT WELL

SCALE	1:50	@ A3	STATUS	PA
DATE	21/01/2014		CHECKED	TM
JOB.NO.	CG-13-01		DRAWN	AT
DWG.NO.	STR-02		REVISION	

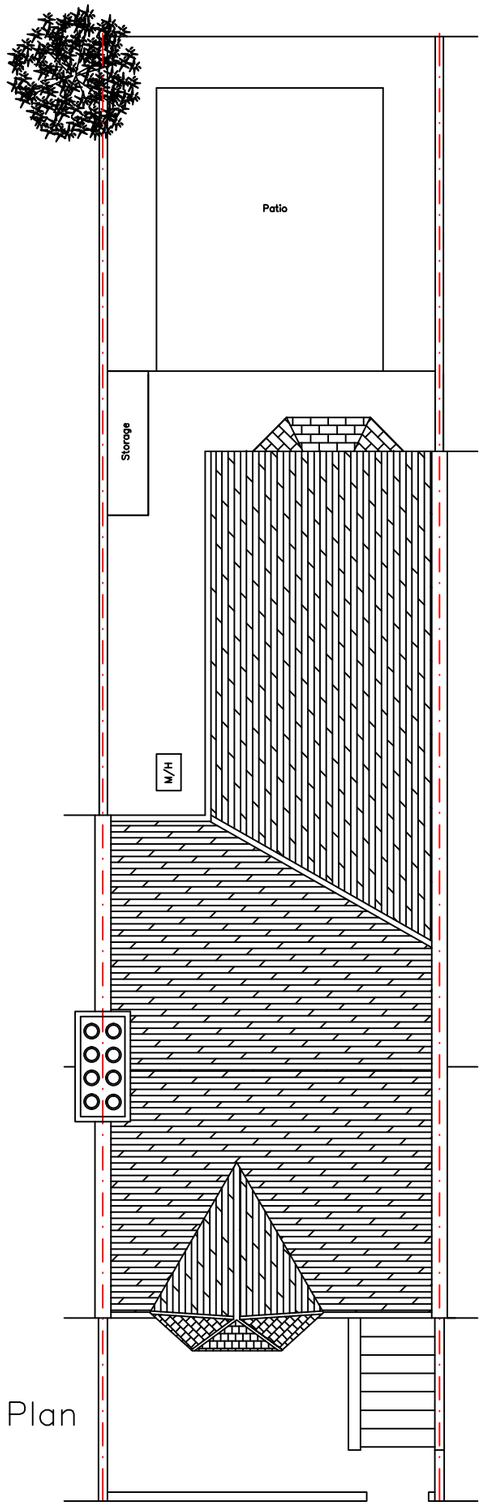
APPENDIX C: ARCHITECTURAL PLANS

0 1 2 3 4 5 6 7 8 9 10

Existing Front Elevation



Existing Rear Elevation



Existing Roof Plan

General Notes

- Copyright is held by Mr B Cunningham
- All dimensions must be re-checked on site.
- Any discrepancies to be reported immediately.
- Works to be in accordance with current Building Regs & Codes of Practice & to satisfaction of Governing Bodies.
- Necessary notices on relevant adjoining owners in respect of works on the Party Wall(s) & appoint a Party Wall Surveyor if required.
- OnSite Works are NOT to commence until Full Plans Approval has been sought.
- Structural Engineer to recheck all dimensions before producing calcs
- Apply for: Build Over Agreement with Thames Water
- Issue: Party Wall Agreement with Neighbouring Property

Loft Conversion Including Front & Rear Conservation Roof Lights Single Storey Side Extension & Formation of Basement Level with Associated Works

PLANNING DRAWING

No.	Revision/Issue	Date

Firm Name and Address

CG – Contractors Ltd
Office 8
Britannic House
Stirling Way, Herts
WD6 2BT

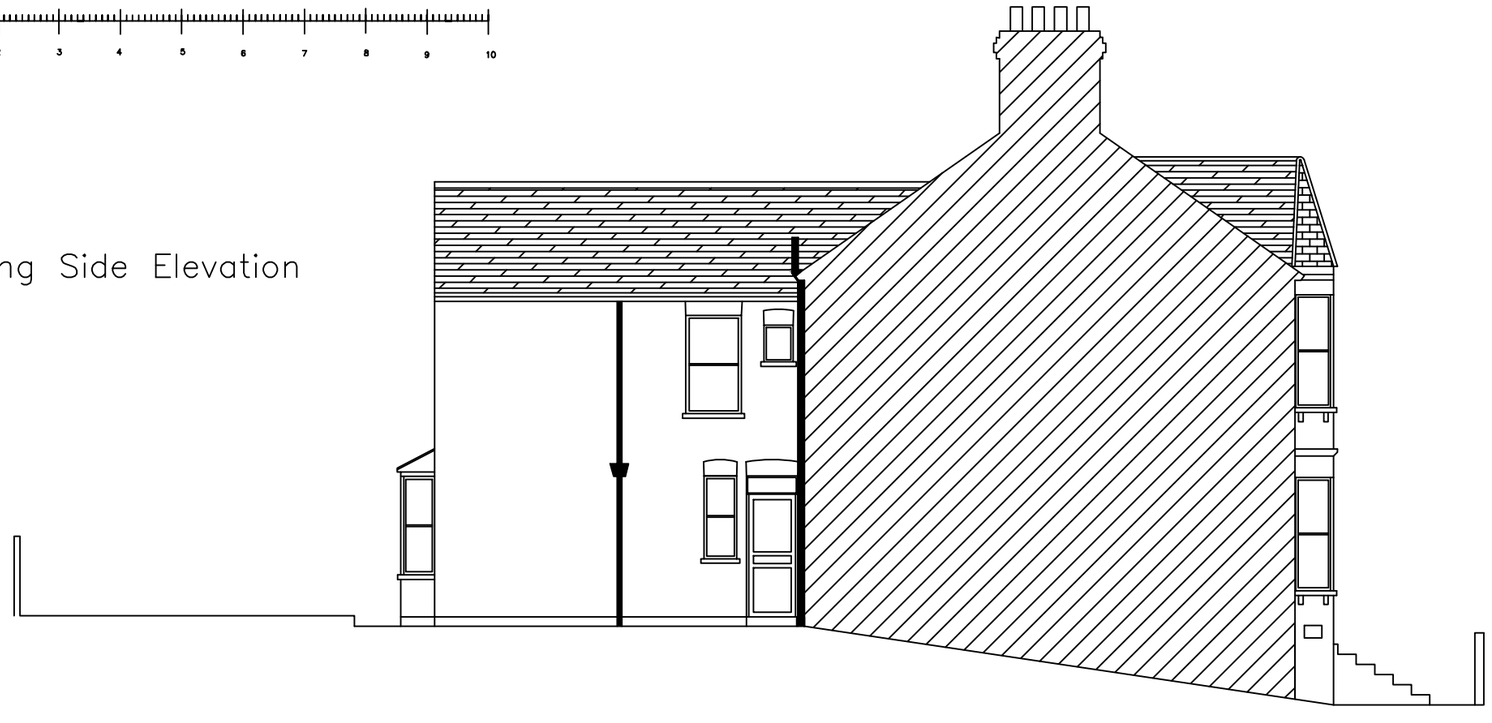
Project Name and Address

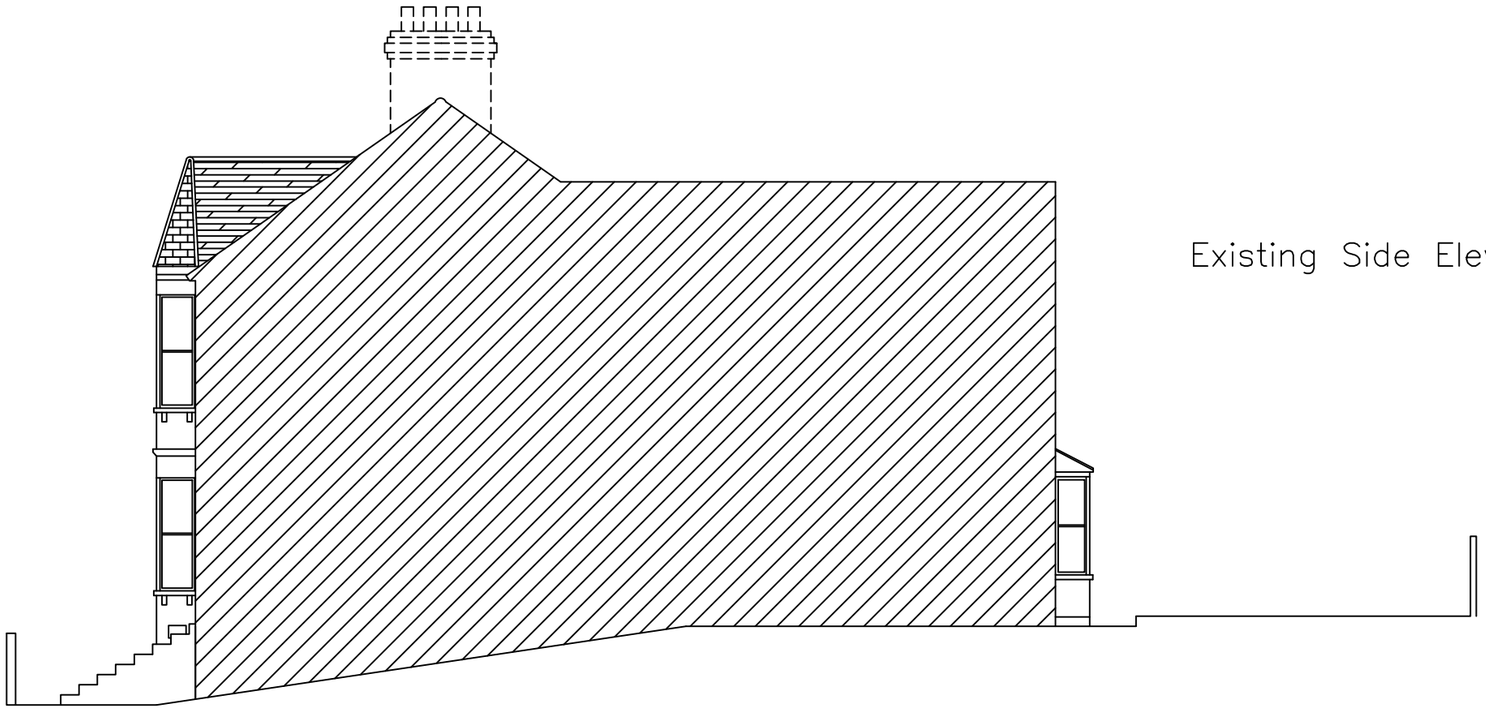
Mr & Mrs Jones
73 Constantine Road
Hampstead, London
NW3 2LP

Project	Sheet
Paper Size – A3	Drawing No
Date 14/01/2014	73Cnstn/13/01
Scale 1:100	

0 1 2 3 4 5 6 7 8 9 10

Existing Side Elevation





Existing Side Elevation

General Notes

- Copyright is held by Mr B Cunningham
- All dimensions must be re-checked on site.
- Any discrepancies to be reported immediately.
- Works to be in accordance with current Building Regs & Codes of Practice & to satisfaction of Governing Bodies.
- Necessary notices on relevant adjoining owners in respect of works on the Party Wall(s) & appoint a Party Wall Surveyor if required.
- OnSite Works are NOT to commence until Full Plans Approval has been sought.
- Structural Engineer to recheck all dimensions before producing calcs
- Apply for: Build Over Agreement with Thames Water
- Issue: Party Wall Agreement with Neighbouring Property

Loft Conversion Including Front & Rear Conservation Roof Lights Single Storey Side Extension & Formation of Basement Level with Associated Works

PLANNING DRAWING

No.	Revision/Issue	Date

Firm Name and Address

CG – Contractors Ltd
Office 8
Britannic House
Stirling Way, Herts
WD6 2BT

Project Name and Address

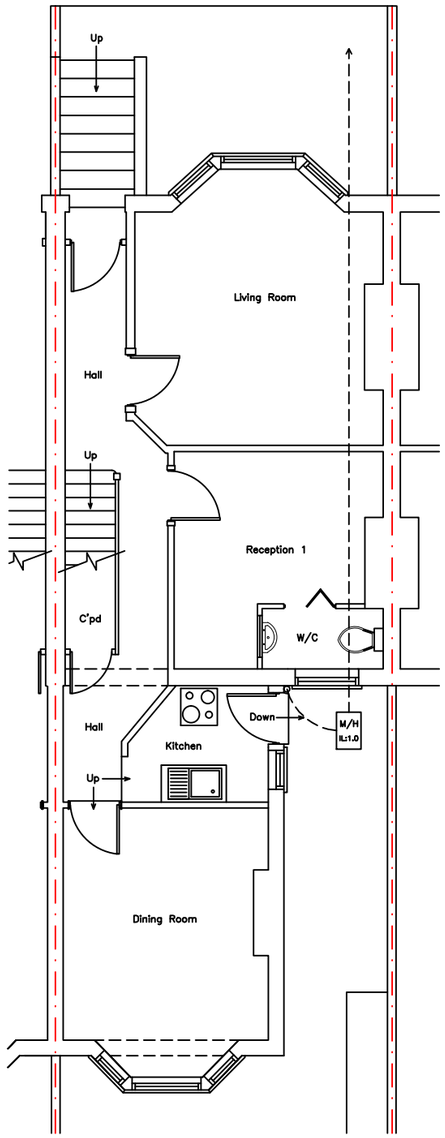
Mr & Mrs Jones

73 Constantine Road
Hampstead, London
NW3 2LP

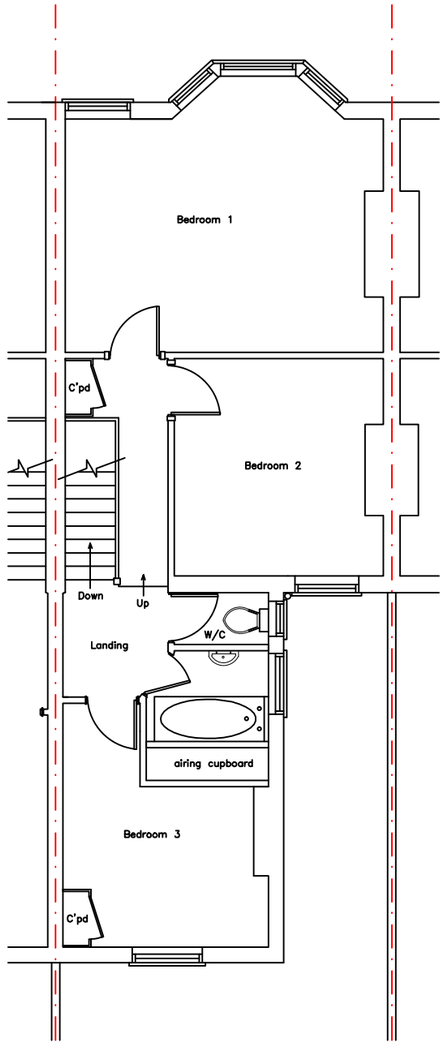
Project	Sheet
Paper Size – A3	Drawing No
Date 14/01/2014	73Cnstn/13/02
Scale 1:100	

0 1 2 3 4 5 6 7 8 9 10

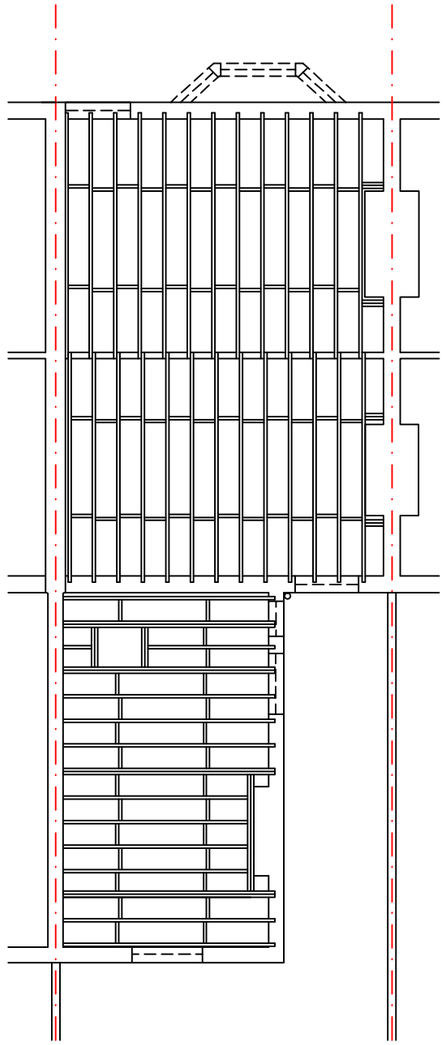
Existing Foul Drainage System



Existing Ground Floor



Existing First Floor



Existing Loft Plan

General Notes

- Copyright is held by Mr B Cunningham
- All dimensions must be re-checked on site.
- Any discrepancies to be reported immediately.
- Works to be in accordance with current Building Regs & Codes of Practice & to satisfaction of Governing Bodies.
- Necessary notices on relevant adjoining owners in respect of works on the Party Wall(s) & appoint a Party Wall Surveyor if required.
- OnSite Works are NOT to commence until Full Plans Approval has been sought.
- Structural Engineer to recheck all dimensions before producing calcs
- Apply for: Build Over Agreement with Thames Water
- Issue: Party Wall Agreement with Neighbouring Property

Loft Conversion Including Front & Rear Conservation Roof Lights Single Storey Side Extension & Formation of Basement Level with Associated Works

PLANNING DRAWING

No.	Revision/Issue	Date

Firm Name and Address

CG – Contractors Ltd
Office 8
Britannic House
Stirling Way, Herts
WD6 2BT

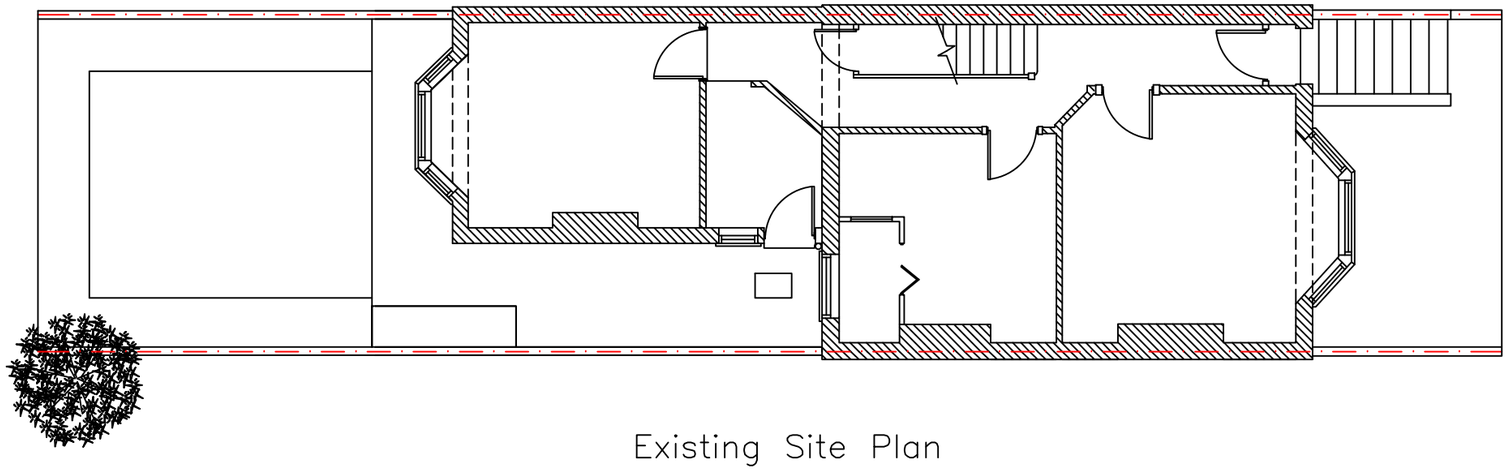
Project Name and Address

Mr & Mrs Jones

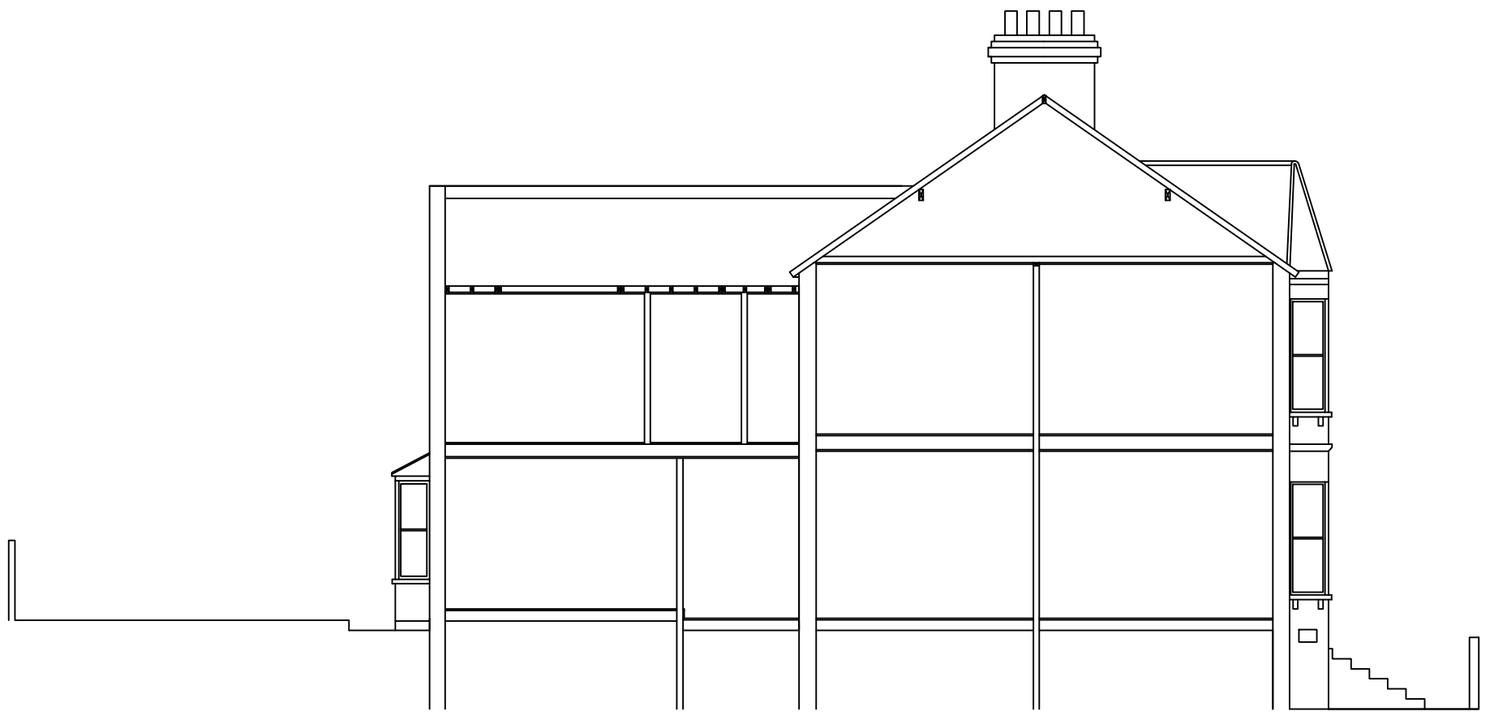
73 Constantine Road
Hampstead, London
NW3 2LP

Project	Sheet
Paper Size – A3	Drawing No
Date 14/01/2014	73Cnstn/13/03
Scale 1:100	

0 1 2 3 4 5 6 7 8 9 10



Existing Site Plan



Existing Section

General Notes

- Copyright is held by Mr B Cunningham
- All dimensions must be re-checked on site.
- Any discrepancies to be reported immediately.
- Works to be in accordance with current Building Regs & Codes of Practice & to satisfaction of Governing Bodies.
- Necessary notices on relevant adjoining owners in respect of works on the Party Wall(s) & appoint a Party Wall Surveyor if required.
- OnSite Works are NOT to commence until Full Plans Approval has been sought.
- Structural Engineer to recheck all dimensions before producing calcs
- Apply for: Build Over Agreement with Thames Water
- Issue: Party Wall Agreement with Neighbouring Property

Loft Conversion Including Front & Rear Conservation Roof Lights Single Storey Side Extension & Formation of Basement Level with Associated Works

PLANNING DRAWING

No.	Revision/Issue	Date

Firm Name and Address

CG – Contractors Ltd
Office 8
Britannic House
Stirling Way, Herts
WD6 2BT

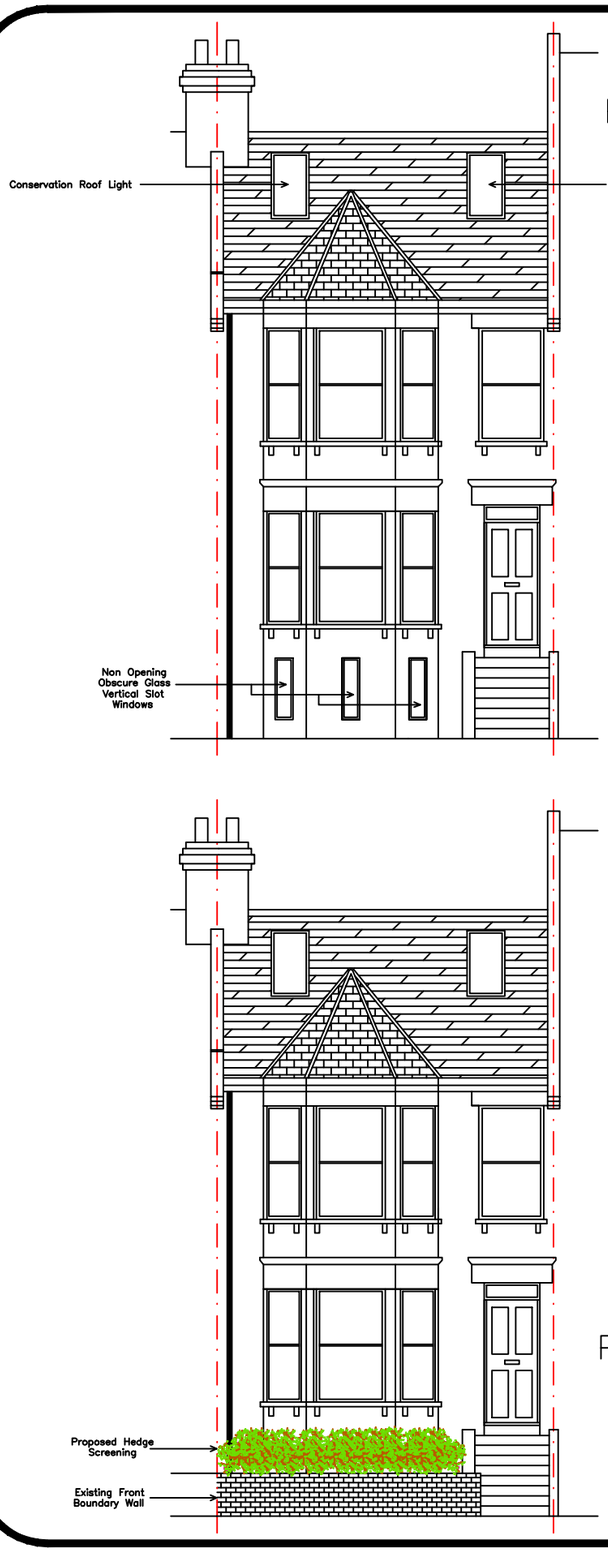
Project Name and Address

Mr & Mrs Jones

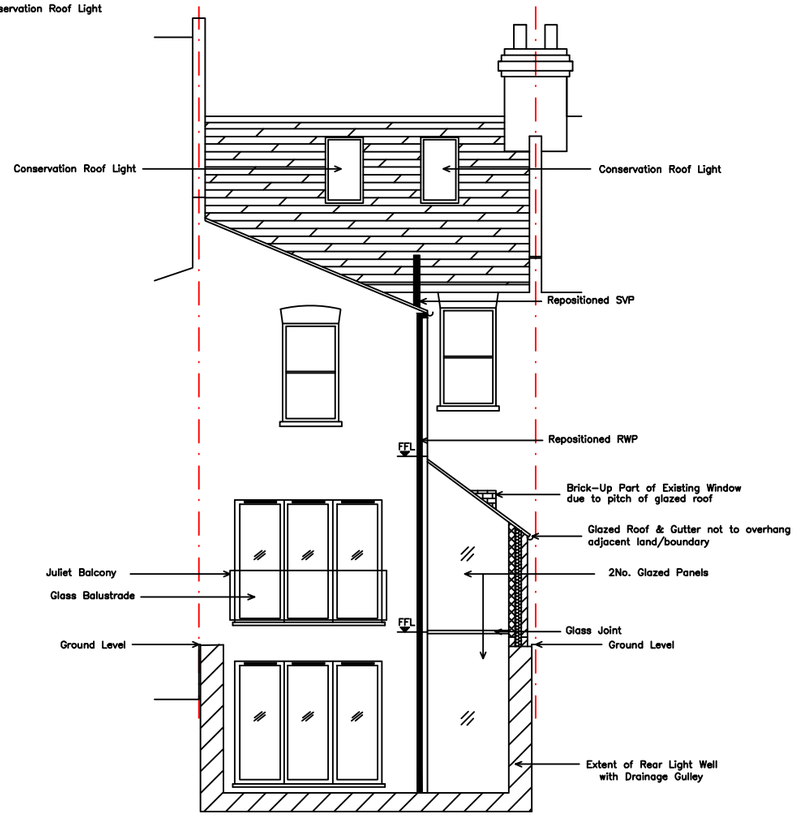
73 Constantine Road
Hampstead, London
NW3 2LP

Project	Sheet
Paper Size – A3	Drawing No
Date 14/01/2014	73Cnstn/13/04
Scale 1:100	

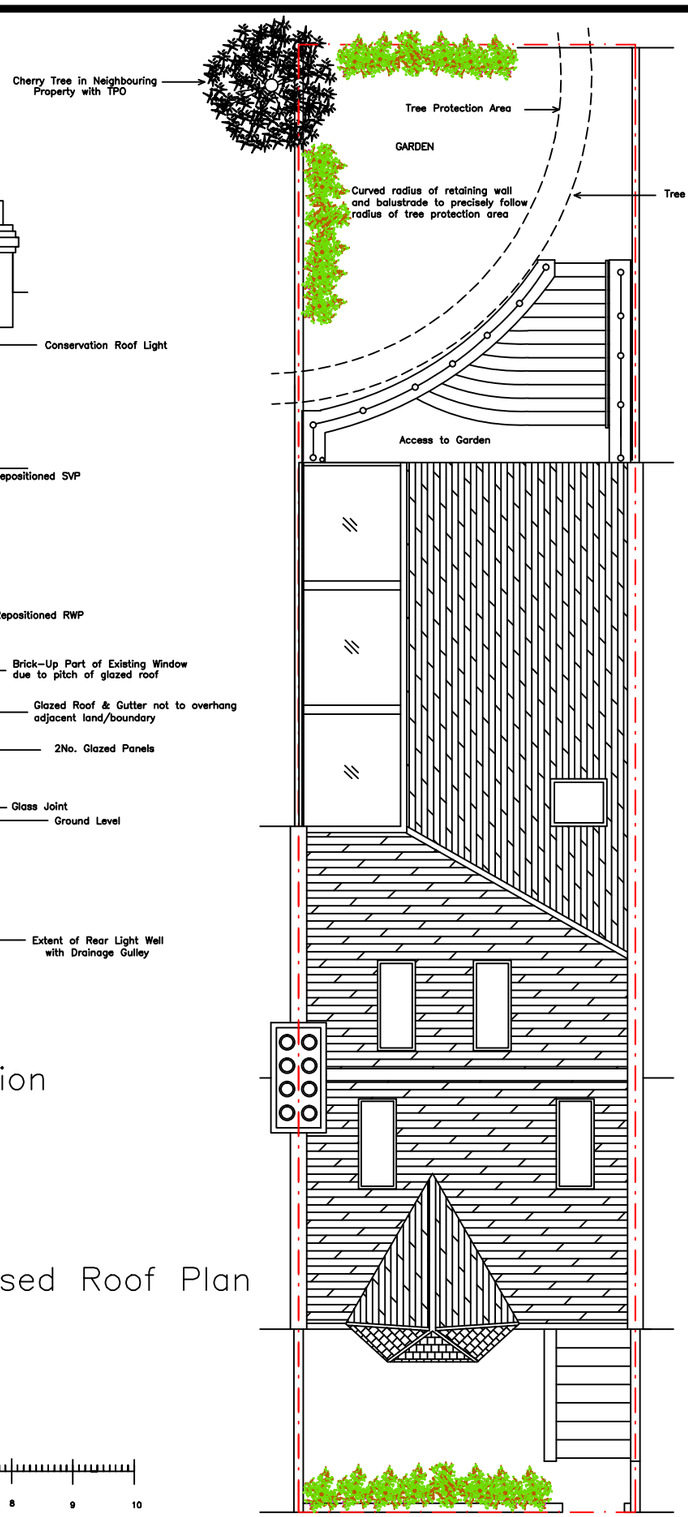
Proposed Front Elevation



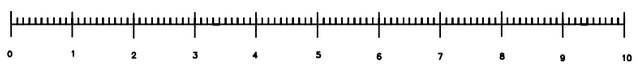
Proposed Rear Elevation



Proposed Roof Plan



Proposed Street Scene



General Notes

- Copyright is held by Mr B Cunningham
- All dimensions must be re-checked on site.
- Any discrepancies to be reported immediately.
- Works to be in accordance with current Building Regs & Codes of Practice & to satisfaction of Governing Bodies.
- Necessary notices on relevant adjoining owners in respect of works on the Party Wall(s) & appoint a Party Wall Surveyor if required.
- OnSite Works are NOT to commence until Full Plans Approval has been sought.
- Structural Engineer to recheck all dimensions before producing calcs
- Apply for: Build Over Agreement with Thames Water
- Issue: Party Wall Agreement with Neighbouring Property

Loft Conversion Including Front & Rear Conservation Roof Lights Single Storey Side Extension & Formation of Basement Level with Associated Works

PLANNING DRAWING

No.	Revision/Issue	Date

Firm Name and Address

CG – Contractors Ltd
Office 8
Britannic House
Stirling Way, Herts
WD6 2BT

Project Name and Address

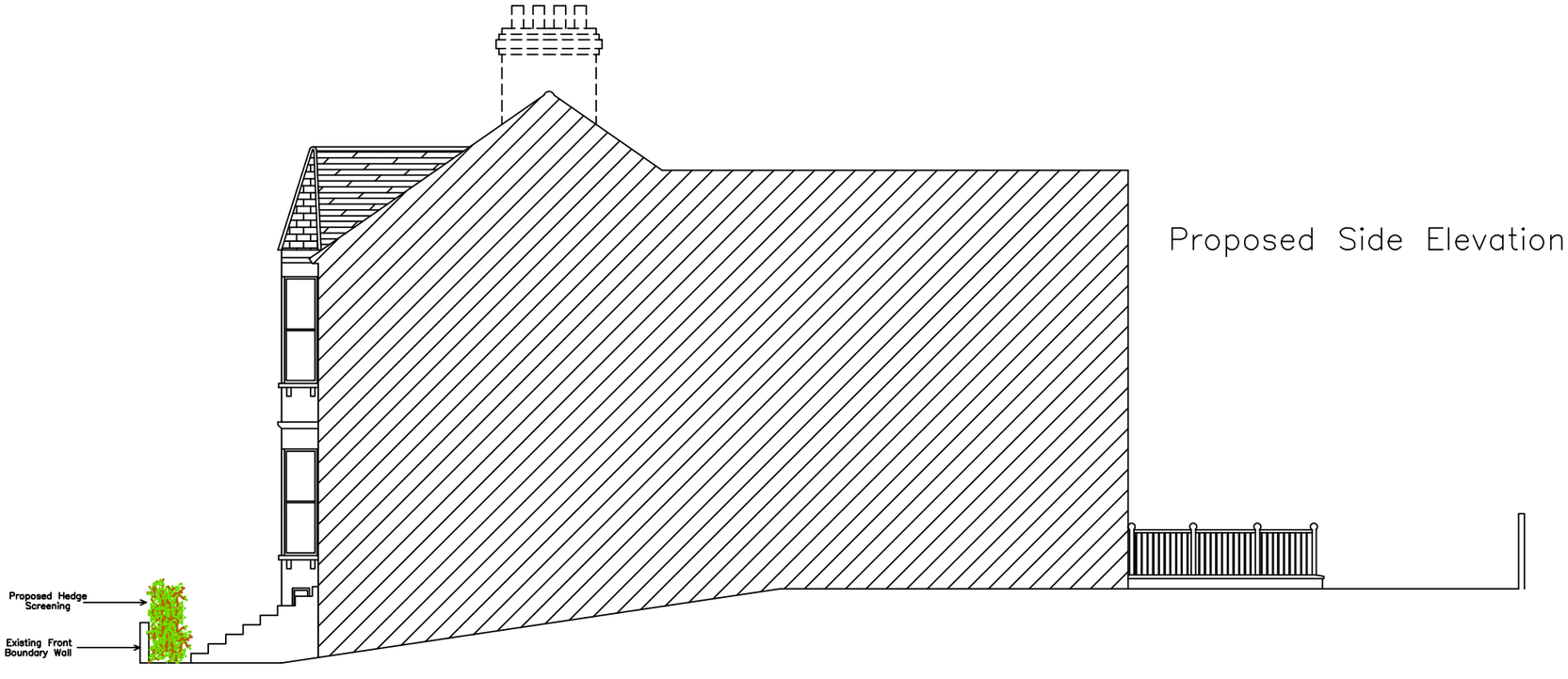
Mr & Mrs Jones

73 Constantine Road
Hampstead, London
NW3 2LP

Project	Sheet
Paper Size – A3	Drawing No
Date 14/01/2014	73Cnstn/13/05
Scale 1:100	

0 1 2 3 4 5 6 7 8 9 10

Proposed Side Elevation



Proposed Side Elevation

General Notes

- Copyright is held by Mr B Cunningham
- All dimensions must be re-checked on site.
- Any discrepancies to be reported immediately.
- Works to be in accordance with current Building Regs & Codes of Practice & to satisfaction of Governing Bodies.
- Necessary notices on relevant adjoining owners in respect of works on the Party Wall(s) & appoint a Party Wall Surveyor if required.
- OnSite Works are NOT to commence until Full Plans Approval has been sought.
- Structural Engineer to recheck all dimensions before producing calcs
- Apply for: Build Over Agreement with Thames Water
- Issue: Party Wall Agreement with Neighbouring Property

Loft Conversion Including Front & Rear Conservation Roof Lights Single Storey Side Extension & Formation of Basement Level with Associated Works

PLANNING DRAWING

No.	Revision/Issue	Date

Firm Name and Address

CG – Contractors Ltd
Office 8
Britannic House
Stirling Way, Herts
WD6 2BT

Project Name and Address

Mr & Mrs Jones

73 Constantine Road
Hampstead, London
NW3 2LP

Project: Paper Size – A3	Sheet: Drawing No 73Cnstn/13/06
Date: 14/01/2014	
Scale: 1:100	

0 1 2 3 4 5 6 7 8 9 10

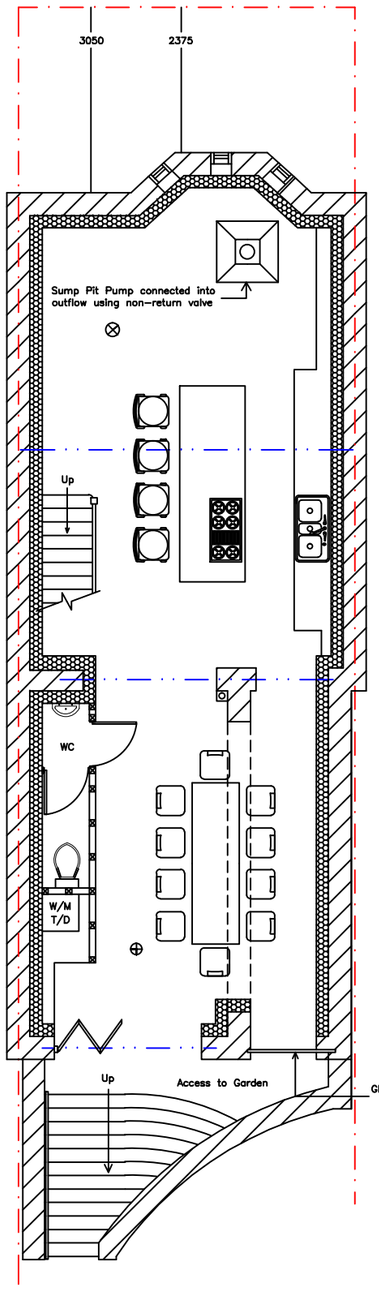
FD 20 Fire Door Resistant for 20 Minutes. Doors incorporated with intumescent strips and fitted with 3 No steel hinges

⊕ Smoke Detector Interlinked with Battery Back–up

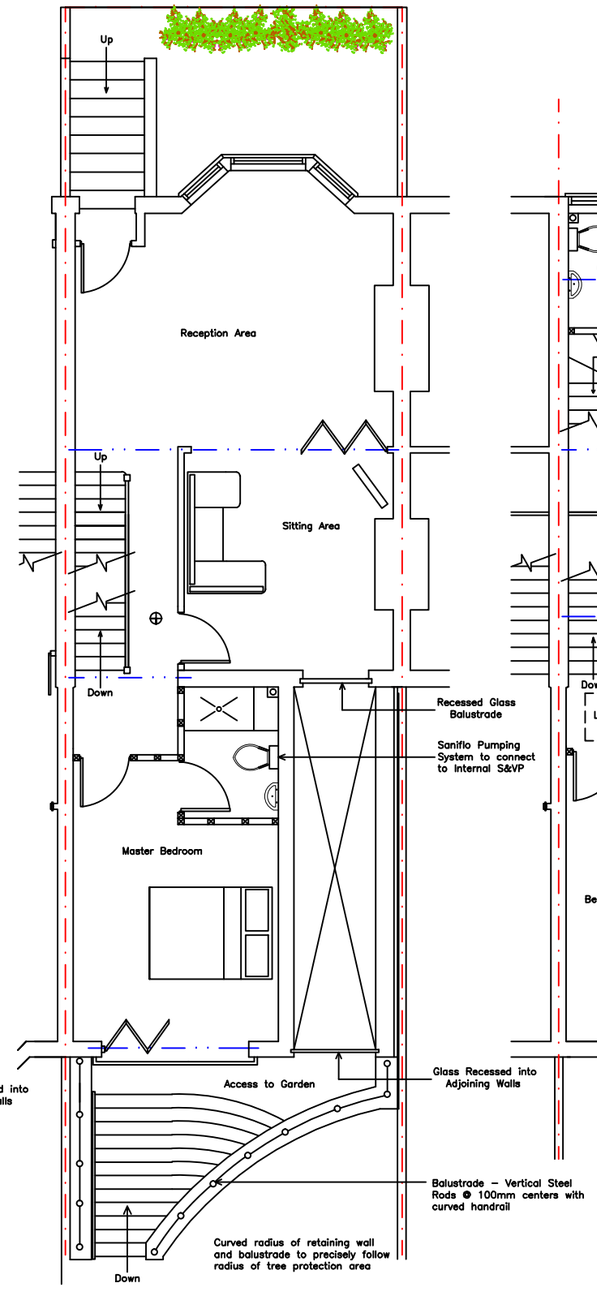
⊗ Heat Detector with Battery Back–up

Due to Open Plan Ground Floor Sprinkler System will be required & Approved by Building Control

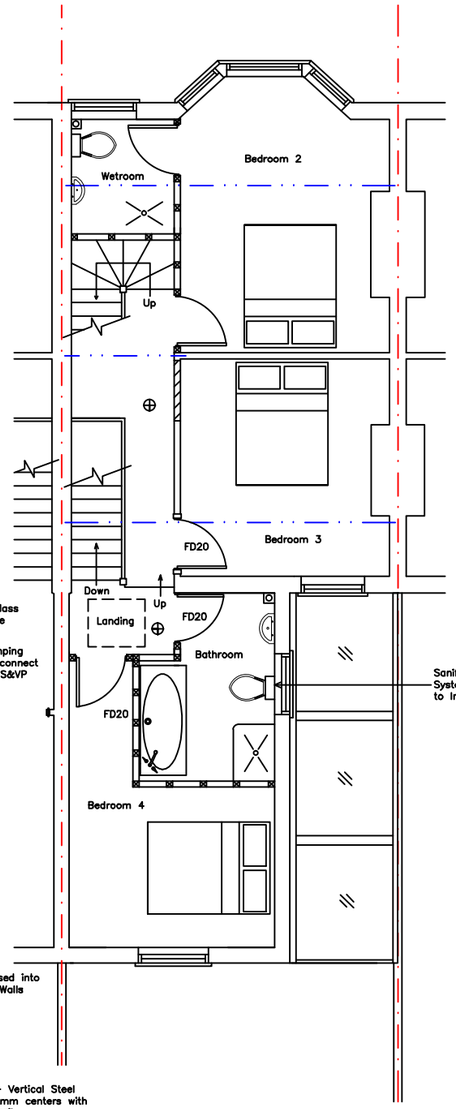
Pump for Sump Pit to be Installed by Competent Person



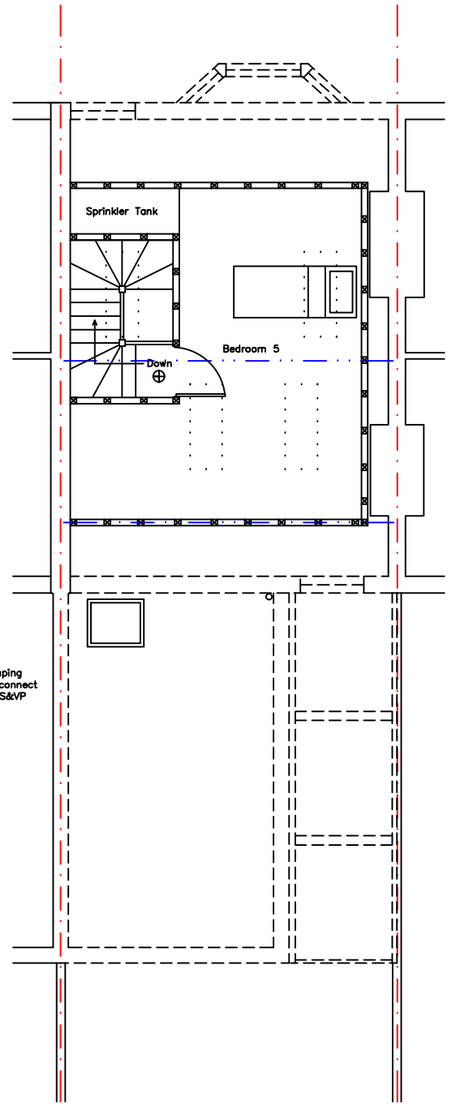
Proposed Basement



Proposed Ground Floor



Proposed First Floor



Proposed Loft Plan

General Notes

–Copyright is held by Mr B Cunningham

–All dimensions must be re–checked on site.

–Any discrepancies to be reported immediately.

–Works to be in accordance with current Building Regs & Codes of Practice & to satisfaction of Governing Bodies.

–Necessary notices on relevant adjoining owners in respect of works on the Party Wall(s) & appoint a Party Wall Surveyor if required.

–OnSite Works are NOT to commence until Full Plans Approval has been sought.

–Structural Engineer to recheck all dimensions before producing calcs

–Apply for:
Build Over Agreement with Thames Water

–Issue:
Party Wall Agreement with Neighbouring Property

Loft Conversion Including Front & Rear Conservation Roof Lights Single Storey Side Extension & Formation of Basement Level with Associated Works

PLANNING DRAWING

No.	Revision/Issue	Date

Firm Name and Address

CG – Contractors Ltd
Office 8
Britannic House
Stirling Way, Herts
WD6 2BT

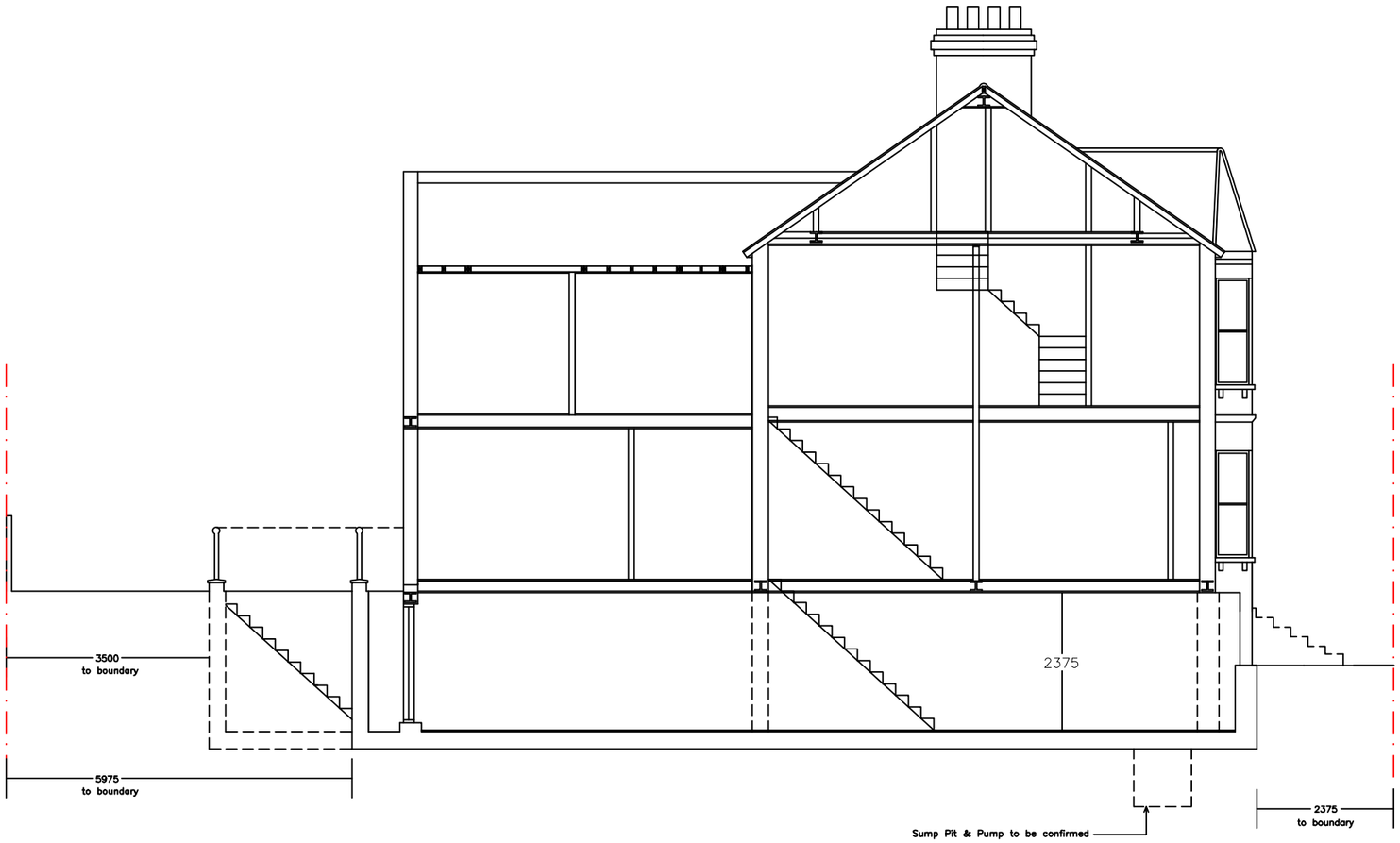
Project Name and Address

Mr & Mrs Jones

73 Constantine Road
Hampstead, London
NW3 2LP

Project	Sheet
Paper Size – A3	Drawing No
Date 14/01/2014	73Cnstn/13/07
Scale 1:100	

0 1 2 3 4 5 6 7 8 9 10



Proposed Section

General Notes

- Copyright is held by Mr B Cunningham
- All dimensions must be re-checked on site.
- Any discrepancies to be reported immediately.
- Works to be in accordance with current Building Regs & Codes of Practice & to satisfaction of Governing Bodies.
- Necessary notices on relevant adjoining owners in respect of works on the Party Wall(s) & appoint a Party Wall Surveyor if required.
- OnSite Works are NOT to commence until Full Plans Approval has been sought.
- Structural Engineer to recheck all dimensions before producing calcs
- Apply for: Build Over Agreement with Thames Water
- Issue: Party Wall Agreement with Neighbouring Property

Loft Conversion Including Front & Rear Conservation Roof Lights Single Storey Side Extension & Formation of Basement Level with Associated Works

PLANNING DRAWING

No.	Revision/Issue	Date

Firm Name and Address

CG – Contractors Ltd
Office 8
Britannic House
Stirling Way, Herts
WD6 2BT

Project Name and Address

Mr & Mrs Jones

73 Constantine Road
Hampstead, London
NW3 2LP

Project	Sheet
Paper Size – A3	Drawing No
Date 14/01/2014	73Cnstn/13/08
Scale 1:100	

APPENDIX D: SUMMARY OF SITE INVESTIGATION REPORT

Ground and Water Limited
Unit 2 The Long Barn
Norton Farm
Selborne Road
Selborne, Alton
Hampshire
GU34 3NB

Tel: 0333 600 1221
E-mail: enquiries@groundandwater.co.uk/
francis.williams@groundandwater.co.uk

Preliminary Summary – Ground Investigation Report

CLIENT	CG Contractors Limited
SITE ADDRESS	73 Constantine Road, Hampstead, London NW3 2LP
REPORT REFERENCE	GWPR824
ENGINEER	Mathias Gabrat/Francis Williams, Ground and Water Limited
INVESTIGATION LOCATIONS	Please see Figure 1 Attached.
GROUND CONDITIONS ENCOUNTERED	

Summary of Strata Encountered

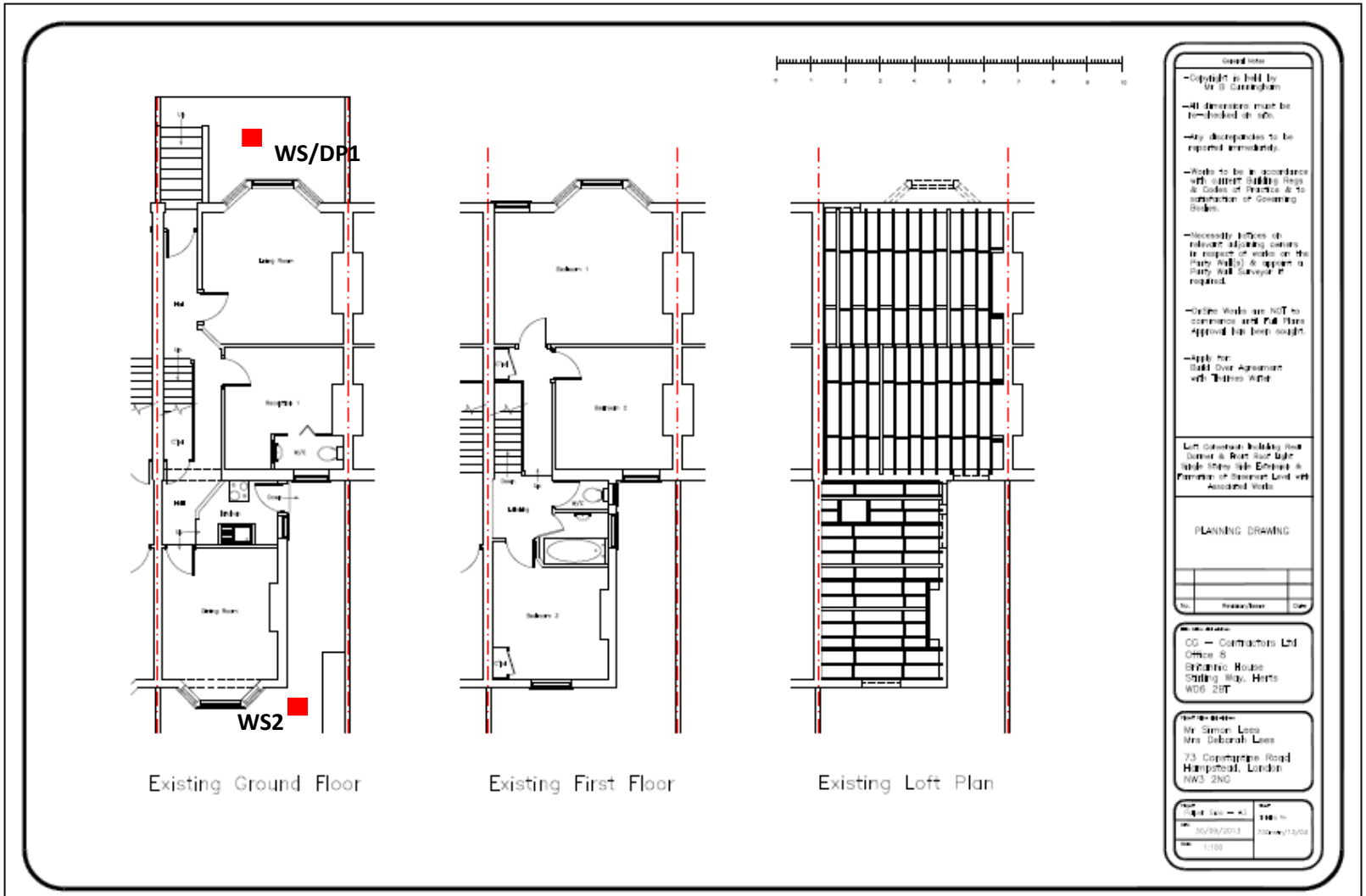
Strata	Depth Encountered (m bgl)	Thickness (m)
Made Ground	GL	1.40 – 2.40
London Clay Formation: Dark brown to brown and grey mottled silty clay with rare to occasional selenite crystals.	1.40 - 2.40	>3.60 - 6.90

INSITU-STRENGTH TESTING	Undrained shear strength of London Clay Formation: Very Low to Low to 3.0m bgl (10 – 25kPa). Low to Medium to 5.0m bgl (30 – 40kPa). Medium to very high to 8.3m bgl (70 – 170kPa).
GROUNDWATER	UNPRODUCTIVE STRATA. Not in catchment of Hampstead Ponds. No groundwater noted within WS1. Groundwater strike noted at 1.80m bgl within WS2 in Made Ground, possible associated with perched water.
ROOTS	Fresh root penetration noted to ~2.0m in WS1 and ~2.4 bgl within WS2.
ANTICIPATED VOLUME CHANGE POTENTIAL	LONDON CLAY FORMATION: **Assume High** (BRE240 & NHBC Standards Chapter 4.2).
FOUNDATION RECOMMENDATIONS	It is understood the proposed development will comprise construction of a basement beneath the footprint of the existing building. Due to the soils having the potential for volume change foundations must not be placed within cohesive root penetrated and/or desiccated soils and the influence of the trees surrounding the site must be taken into account. The base of foundation excavations must extend at least 300mm into non-root penetrated soils. Should trees be removed from footprint of proposed development then a piled foundation should be considered. Given the above, minimum foundation depths onsite would range between 2.30 – 2.70m bgl. It is considered likely the proposed basement will be constructed with load bearing concrete retaining walls with semi-ground bearing concrete floors. The following bearing capacities could be adopted for 5.0m long by 1.0m foundations constructed at the anticipated basement depth of 3.00m and 3.50m bgl. Bearing Capacity (5.0m long by 1.0m wide) at 3.00m bgl. Load applied 90kN/m^2 – Settlement <20mm. Bearing Capacity (5.0m long by 1.0m wide) at 3.50m bgl. Load applied 110kN/m^2 – Settlement <25mm. Heave of the underlying soils may occur if a bearing pressure of less than 50 kN/m^2 is applied at 3.0m bgl and 55kN/m^2 at 3.50m bgl.

SULPHATES

Concrete to be placed in contact with soil or groundwater must be designed in accordance with the recommendations of Building Research Establishment Special Digest 1, 2005, *'Concrete in Aggressive Ground'* taking into account the pH of the soils.

This preliminary information may be subject to amendment in the final report and no liability can be accepted for any actions based on this preliminary information.



Project: 73 Constantine Road, Hampstead, London NW3 2NG	**Figure 1**
Client: CG Contractors Limited	**Date:** January 2014
Trial Hole Location Plan	**Ref:** GWPR824

ground&water

ground &water
geotechnical and environmental consultants

Ground and Water Ltd
Tel: 0333 600 1221
email: enquiries@groundandwater.co.uk
www.groundandwater.co.uk

Borehole No
WS1
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Hole Type
73 Constantine Road, Hampstead	GWPR824		WS
Location: London NW3 2LP		Level: -	Scale 1:50
Client: CG Constractors Limited		Dates: 14/01/2014	Logged By M.G

Well	Water Strikes	Samples & In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
		0.30	D		0.40			MADE GROUND: Dark grey to dark brown gravelly clay. Gravel is occasional, fine to coarse, sub-angular to sub-rounded brick, concrete and flint.
		0.50	D					
		0.80	D					MADE GROUND:Dark brown to brown gravelly silty clay. Gravel is rare to occasional, fine to coase, sub-angular to sub-rounded brick, concrete and flint.
		1.00	D					
		1.50	D		1.40			LONDON CLAY FORMATION: Brown and grey mottled silty CLAY with pockets of selenite crystals.
		2.00	D					
		2.50	D					
		3.00	D					
		3.50	D					
		4.00	D					
		4.50	D					
		5.00	D					
		6.00	D					
		6.50	D					
		7.00	D					
		7.50	D					
		8.00	D					
		8.30	D		8.30			End of Borehole at 8.30 m
			Type	Results				

Remarks: Fine roots encountered ~2.0m bgl.
No groundwater encountered.

AGS

ground &water
geotechnical and environmental consultants

Ground and Water Ltd
Tel: 0333 600 1221
email: enquiries@groundandwater.co.uk
www.groundandwater.co.uk

Borehole No
WS2
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Hole Type
73 Constantine Road, Hampstead	GWPR824		WS
Location: London NW3 2LP		Level: -	Scale 1:50
Client: CG Constractors Limited		Dates: 14/01/2014	Logged By M.G

Well	Water Strikes	Samples & In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
					0.08			CONCRETE
		0.25	D		0.30			MADE GROUND: Dark brown sandy very gravelly clay. Sand is fine grained. Gravel is occasional, fine to coarse, sub-angular to sub-rounded brick, concret and flint.
		0.50	D					
		0.80	D					MADE GROUND: Dark brown sandy gravelly clay. Sand is fine grained. Gravel is rare to occasional, fine to coarse, sub-angular to sub-rounded brick, concrete and flint.
		1.00	D					
		1.50	D					
		2.00	D					
		2.50	D		2.40			LONDON CLAY FORMATION: Dark brown to brown and grey mottled silty CLAY with rare to occasional isolated pockets of fine selenite.
		3.00	D					
		3.50	D					
		4.00	D					
		4.50	D					
		5.00	D					
		5.50	D					
					6.00			End of Borehole at 6.00 m
			Type	Results				

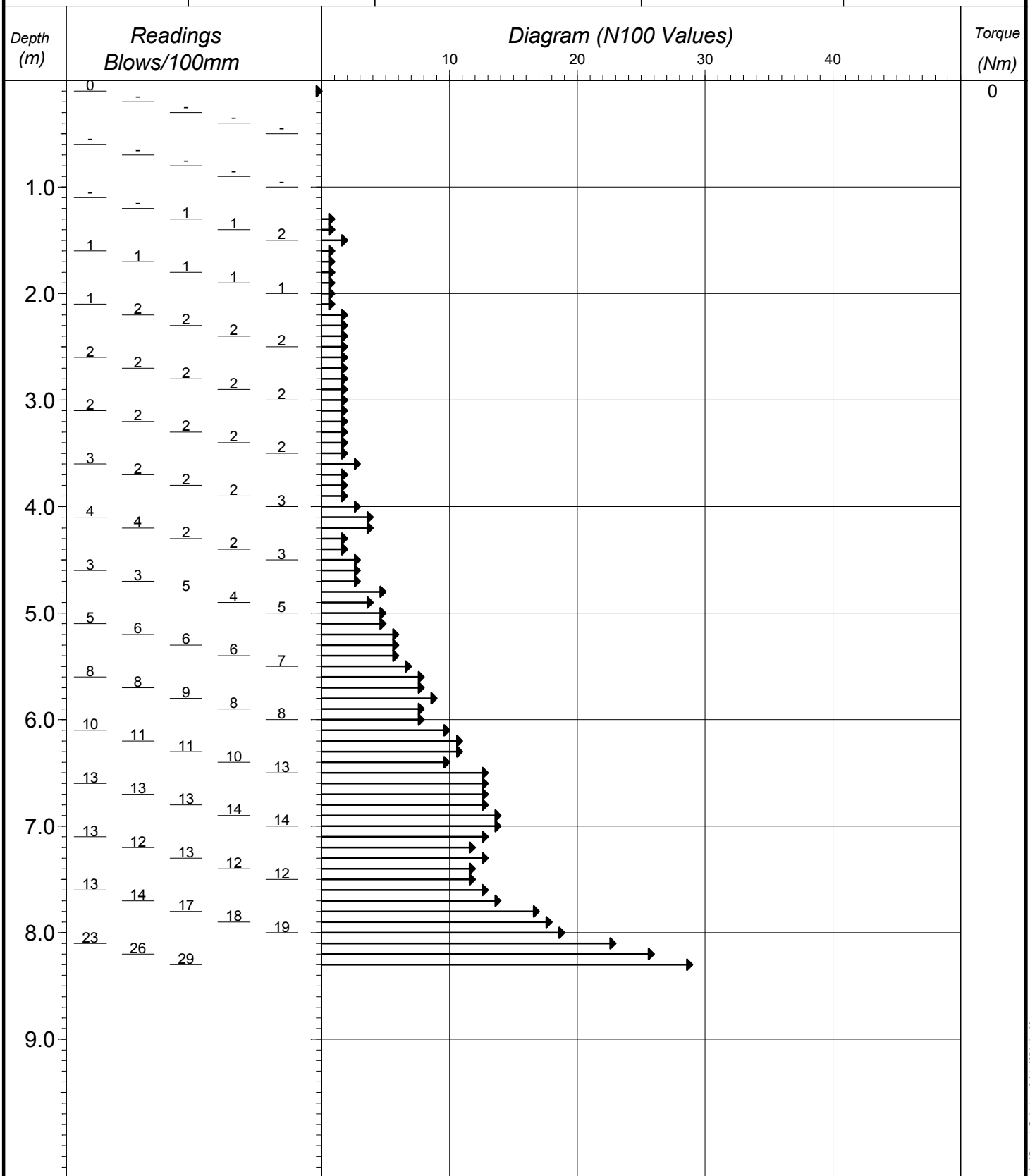
1 2 3 4 5 6 7 8 9

Remarks: Fine roots encountered ~2.4m bgl.
No groundwater encountered.

AGS

DYNAMIC PROBING

Probe No **DP1**			
Client **CG Constractors Limited**			Sheet 1 of 1
Site **73 Constantine Road, Hampstead**			Project No **GWPR824**
E -	N -	Level -	Date **14/01/2014** Logged by



Fall Height	500	Cone Base Diameter	43
Hammer Wt	50.00	Final Depth	8.20
Probe Type	DPH	Log Scale	1:50

ground &water
geotechnical and environmental consultants

Ground and Water Ltd
Tel: 0333 600 1221
email: enquiries@groundandwater.co.uk
www.groundandwater.co.uk

AGS