Construction Method Statement

Roland House
121 Old Brompton Road
London, SW7 3RX

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Client: Residential Land
Main Contractor: TBA
Date: October 2015
Executive Summary

Calder Latif Associates, who are an experienced Chartered engineering design practice were commissioned to carry out relevant investigations and produce a detailed design and Construction Management Statement which complies with Policy CL7(m).

This Construction Management Statement and the supporting documentation provide a detailed evaluation, design and analysis of the existing building and the proposed extension to the existing basement. The design has been completed to RIBA Stage “D” and includes structural details and construction sequences, drainage strategies, flood risk assessment, ground movement & site investigations. Horizontal & vertical forces and movements have been analysed and are shown to be within acceptable levels.

Careful attention was given to the construction sequence of the basement extension and the attached structural drawings confirm that the extension can be constructed in a safe manner with no detrimental effect to the existing property and the adjoining buildings.

All calculations and reports can be found in the appendices.

This Construction Management Statement and supporting documentation is in full compliance with Policy CL7 (m).

Description of project

Roland House is a residential property positioned on a corner plot adjacent to Roland Gardens and Old Brompton Road in the South Kensington area of west London.

The building is a brick clad steel framed building built in the 1940s. The basement is solely in reinforced concrete so the steelwork springs from ground floor level. The steelwork is encased in concrete in the floors and brickwork in the facade. The floors are 150mm thick consisting of a traditional concrete hollow pot floor and concrete ribs with 50mm structural topping above. The building has a basement, ground floor and eight upper storeys given over to residential accommodation.

PHOTO 1 – ROLAND HOUSE
The works comprise the “strip-out” and extension of the existing basement. The works will include demolition, temporary works, structural walls and slabs, joinery, electrical and plumbing works with decorations, sanitary ware and the tiling as finishing trades, installation of new kitchen, bathrooms and audio visual. There will also be builders work in the installation of new steel beams and the demolition of some masonry walls.

**Demolition & Removal of materials**
Due to the constraints on space and access it is envisaged that waste materials will be removed by a “bag and drop” method, with the skip being removed on a daily basis.

The Contractor will ensure that all materials and equipment are delivered using vehicles that are suited to the limited access and constraints associated with this site. All deliveries will be timed such that site staff will be available to instantly offload the delivery items and place in the dedicated storage area.

A dedicated room within the property on the lower ground floor will be used for the storage of materials and equipment. This dedicated area will be reviewed and changed, if required, during the construction works.

All waste materials will be arranged and then disposed in accordance with regulations listed by the Local Authority.
Spoil removed from this site is likely to fall under the EU reference 17.05.04 - Clean inert soil and stones (other than those containing dangerous substances). The Spoil removal will be undertaken by specialist spoil removal licenced waste carriers, who operate an intelligent routing system and instant communications. Spoil will be disposed of at landfill sites within the M25.
The Contractor will ensure they have policies in place to ensure water (ground and surface) pollution does not occur on site. They will monitor the amount of Carbon Dioxide arising from site activities, and transport to and from site.

**Site Rules**
- No Smoking on site
- General building work which can be heard at the site boundary will be carried out between 08.00 and 18.00 during weekdays and between 08.00 and 13.00 during Saturdays, with no work taking place on Sundays, bank holidays and public holidays
- No excavation works to be undertaken on Saturday, Sunday, bank Holidays & Public Holidays
- Basement excavation works will be undertaken between 08.00 and 18.00 on weekdays only
- Hard hats and protective footwear to be worn when working in the building
- Protection of undamaged areas and control of dust is vital on this project
- No radios permitted

**Health and Safety Principles**
The Contractor will carry out all works in accordance with our Health and Safety Policy.
The main objectives will be to carry out the works correctly but with lowest possible risk of hazard to the operatives on the project and members of the public/visitors to the building.
The main contractor will be registered with “Considerate Constructors Scheme”

**Risk to Health and Safety**
The Contractor will identify in good time any likely hazard.

**Method Statement and Risk Assessments**
The Contractor in conjunction with the client will identify any works which require a method statement or risk assessment to reduce the possible risk to an absolute minimum.

**Main risks for this Project**
- Protection of workforce/public/visitors to the building
- Protection of adjacent areas
- Removal of waste
- Storage of materials
- Dust and Particles
- Hazardous substances (COSHH)
- Control and disposal of waste materials
- The risk of fire

The above risks are not uncommon and the procedures set out in the Contractors Health and Safety policy and normal good working practice will keep the level of risk classified “low”.

**F10**
A copy of the F10 will be on site.

**Restriction**
All work to be carried out without undue inconvenience and nuisance and without danger to any residents, pedestrians, neighbours or site staff.

**Sub-Contractors**
It will be the Principal Contractors responsibility to ensure that any sub-contractor or supplier is competent to carry out the works.

Any sub-contractors or supplier will be assessed by the main Contractor and approved prior to placing of an order.

Sub-contractor or suppliers performance included health and safety competence will be reviewed monthly.

All sub-contractors will be tied contractually into all of the site working terms and conditions. Failure for any sub-contractor to comply with site working terms will lead to their management team being given a written warning about their operative’s future behaviour. Any re-occurrence will lead to the operative being removed permanently from site.

**Manual Handling**
Any materials or plant which requires manual handling will be lifted using the correct technique. The Project Manager will determine if a method statement or Risk Assessment is required.

**Communication**
A designated site staff will be in regular contact with the neighbours and will keep residents informed of all relevant matters, and will deal with complaints and inquiries, should they arise. All health and safety information supplied by the Clients project team
will, if relevant, be copied and put in the site file for the Project Manager’s reference. Any complaints will be logged on site and, where necessary, reported in accordance with the Considerate Contractor’s Scheme.

**Site Conditions**
The site will be maintained to the highest possible standards at all times. The Contractor will ensure the surrounding highways are clean from materials emanating from the development, especially during the initial groundwork phase. All the site vehicles will be parking on the public highway and will not enter a construction site. It will therefore not be necessary to provide dedicated wheel washing facilities at the site. The hoarding to the site perimeter will be maintained regularly. This will keep the appearance acceptable, as well as assisting with any noise and dust nuisances.

**Fire Hazards**
Fire is always a risk upon building sites; therefore, it is necessary to reduce this risk by means of changing the materials used in the process or the method of working. Prevention is the best method of avoiding fire hazards. Knowing what to do in the event of fire is essential. Our prevention measures include:
- Storing the least amount at the work place.
- Storing hazardous items safely and well away from hazardous materials.
- Using appropriate fire warning signs.
- Keeping the workplace tidy.
- Keeping flammable materials away from naked flames.

“Hot working” will be limited and only accompanied with hot work permits and a nominated fire watcher
If in the event of a fire all operatives will be aware of the Emergency Procedure.

**Hazardous Substances – (COSHH)**
The Control of Substances Hazardous to Health Regulations (COSHH) is another important health and safety aspect that will be fully implemented at this project. Substances that have a risk associated with their use will be discussed between the Client and the Project Manager. COSHH sheets will be provided to the operative carrying out the task.
Any Personnel Protection Equipment (PPE) required during the use of the hazardous substances will be on site prior to the task being undertaken.
Once the risk assessment has been undertaken a decision will be made by the Project Manager whether to use the material or if it is possible to use another, less hazardous material.
The materials being used at this project are of a low risk nature; however, the Contractor will notify any change to this.

**Waste Materials**
All waste materials to be bagged up as necessary and cleared on a regular basis using wait and load Lorries.
**General Storage of Materials**  
Dedicated areas will be allocated on each floor and revised subject to the project programme.

**Emergency Procedure**  
An emergency evacuation procedure will be planned by the Contractor’s Project Manager and agreed by the Client.  
All operatives will be given a site induction course to indicate the emergency procedure, general site housekeeping and the management expectations of the operative all to be recorded in the site diary.  
If possible the Contractor’s Project Manager will carry out a trial emergency test, to monitor the time for all operatives to leave site and meet at the designated point.

**The local hospital is - Chelsea and Westminster Hospital**  
369 Fulham Road  
London  
SW10 9NHT:  
**Telephone Number** - +44 (0) 20 3315 8000

The designated fire/emergency point will be outside the entrance door at the front of the property. The Project Manager will report any minor emergency immediately to the Project Director. He will then contact the Client to report the incident.

**Health and Safety Training / Site Induction**  
At the start of the project and whenever a new operative is employed, the Project Manager will carry out site induction training for the project, and obtain signature from each operative.  
A record of the induction training will be kept in the site file.  
The induction training will cover:-  
• The type of work at this project.  
• The risks identified for the specific project/task.  
• Site emergency procedures  
• Site Rules  
• Complaints by operatives regarding health and safety.  
• Contents of the Health and Safety Plan.  
• What CITB CBCS safety course the operative has recently undergone.  
• Welfare facilities on site.  
• Copies of all health and safety training records will be passed on/made available to the CDM Co-Ordinator.

**Welfare Facilities**  
A site office officer/operative personal belongings store will be available on site.  
A toilet will be available on site. This, with available hand washing facilities will be cleaned daily.  
A fire extinguisher and first aid kit will be kept and maintained on site.

**First Aid**  
A first aid kit suitable for the number of operatives on site will be kept on site. The will be checked on a weekly basis by the Project Manager and replenished as necessary.
Monitoring
The Project Manager will carry out regular checks on health and safety matters, and write in the site diary that a check has been carried out. Any instructions regarding health and safety will be issued in writing to the Project Manager either by memo or notes made in the site diary. The Project Manager will complete a weekly site report and return the form to the Project Director. The Project Manager will actively monitor the site on a regular basis by recording his review in the site diary. Any serious breach of site rules will cause the Proprietor to hold a further tool box talk to ensure the breach does not occur again. Any “incident” recorded by the Project Manager will be investigated accordingly and a report written to identify the cause and provide a remedy to prevent any further “incident”.

RIDDOR
All work related injuries, diseases and dangerous occurrences will be reported in accordance with RIDDOR 95 regulations.

Accident and Accident Reporting
Accident Records sheets are kept on the site and are completed in the event of an accident. All accidents records will comply with the Data Protection Act. Any accident or incident which requires the completion of an Accident Report will be investigated. Any completed Accident Reports will be sent the HSE within 10 days.

Noise & Vibration Level and Monitoring
The following processes have been identified as operations that may cause high levels of noise and vibration:
- Demolition
- Striking scaffold
- Cutting, Grinding, Drilling and Sawing
- Striking formwork
- Unloading of materials
- Loading of construction waste

The following actions will be taken to minimise the adverse impacts of the noise and vibration created during the construction works:

- Liaise with residents and local businesses to inform them of planned noisy works and set up a formal complaints procedure. This notification will take place prior to works commencing.
- Carry out a full Acoustic Assessment prior to commencement of operations on site to establish a background noise level against which the predicted construction noise levels can be measured. The background noise assessment along with the predicted construction noise level must be submitted to the Local Borough Council for approval prior to commencement on site.
- Noise level monitoring will be carried out at regular intervals and any noisy activities will be scheduled according to the results of community liaison to give local residents and businesses some quiet times.
- Avoid scheduling deliveries and collections of materials or waste before 08:00 and Coordinate delivery times and efficient traffic management to prevent queues of traffic forming close to the site.
• Ensuring all vehicles, plant and machinery used for the purpose of the works are fitted with effective exhaust silencers, are maintained in good effective working order and operated in such a manner as to minimise noise emissions according to the principles of BS 5228:2008 Vol I (noise) and Vol II (vibration).

• Wherever practicable, utilise construction techniques that minimise the production of noise (e.g. the use of prefabricated materials) and erection of an acoustic site hoarding. Any mobile screen shall have sufficient mass so as to be able to resist the passage of sound across the barrier and to be free of significant holes or gaps between or under any acoustic panels or board materials as far as is reasonably practicable.

• Monitor and record the site noise levels at the boundaries to ensure that the noise levels of each activity do not exceed 3dB above the predicted noise levels that have been reported to the local community. Monitoring will be achieved through the use of electronic monitoring devices, permanently affixed a small distance away from the site boundary. Measured vibration levels shall be measured against the criteria in BS 5228: 2009 part 2 (i.e 1mms⁻¹ PPV for potential disturbance in residential and using a trigger criteria of 2mm⁻¹ for commercial).

• In the case that an operation on site exceeds the 3dB threshold for noise production, an alarm connected to the permanent noise monitoring equipment will be triggered and the operation will be suspended immediately. A solution must be found to reduce the noise levels produced before the operation in question can resume. This could be achieved through an alternative constructing method or through localised acoustic hoarding to the area.

**Dust Level and Monitoring**

The following processes have been identified as potentially dust creating operations

- Demolition
- Excavation
- Cutting, Grinding, Drilling and Sawing
- Cleaning

The following actions will be taken to minimise the amount of dust created and to minimise the impacts of the dust created during the construction works:-

• Notify and liaise with the local community with regard to planned dusty works and set up a formal complaints procedure. This notification shall take place prior to works commencing.

• Schedule potentially dusty works in accordance with liaison with the local community to minimise the risk of complaints. Should a complaint be received in regard to the level of dust being created by the works, the operation in question will be suspended immediately. That operation shall not resume until the complaint has been fully satisfied or an alternative method has been approved that creates less dust.

• Prior to commencement of construction activity on site, establish that there is adequate hydration facilities on site to ensure that damping down of the whole site is practicable.

• Any plant used on site should, where possible, be fitted with dust suppressant attachments. For example, any cutting equipment on site should be fitted with either a vacuum device or a constant water feed to suppress any dust created.
• Covering of baulk materials and ensuring that any stockpiles are kept below the height of the site hoarding and positioned with regard for the prevailing wind and proximity to the site boundary and proximity of neighbours. Keeping the loading drop heights of spoil into Lorries as low as possible.
• Erection of Monarflex dust protection to site hoarding and scaffolding to the building for the duration of the demolition and construction operation to contain any dust created on site.
• Monitor and record dust levels on site through permanent monitoring stations. Should the amount of dust in the air recorded by the monitoring stations exceed safe levels an alarm will be triggered and the operation causing the dust must be suspended immediately. That operation shall not resume until an alternative solution that will create less dust has been agreed.
• Ensure that plant and machinery used on site is well maintained to reduce exhaust emissions.
• Emissions and ensure that all vehicles leaving the site have been through the wheel wash and that loads are covered where spoil or demolition materials are being removed.

Completion Handover/Health and Safety File
This will be continually updated and monitored by the Project Manager to ensure that all necessary and available information is in the file. Copies of any information, records or reports, with regards to elements of Health and Safety, will be forwarded/made available to the CDM Co-Ordinator as soon as they become available.
The file will also contain details of any residual hazards, cleaning and maintenance information of items installed or used within the project.
Structural Methodology Statement

1.0 Introduction
1.1 Calder Latif Associates LLP, a firm of consulting engineers, has been appointed by Residential Land to advise on the structural implications of the proposed alteration work to the existing building and on the viability of the construction of a further basement extending the existing basement to the full curtilage of the building.
1.2 This report has been prepared to ensure this building can be safely modified and that the effects on neighbouring properties are minimised.
1.3 Drawings showing a practical construction sequence have been prepared to illustrate the construction process both to assist the contractor during tender and pricing but also to show that the process has been thought through with some rigour. These drawings should be examined to properly understand the scheme and it is considered beneficial to illustrate the methodology rather than describe in detail in text.

2.0 Description of the existing building
2.1 The property is situated at the corner of Old Brompton Road and Roland Gardens and comprises a rectangular building over nine stories with an inset in plan in the top two stories, they being a later addition.
2.2 The building is approximately 35m x 12m and sits with its long axis predominantly north-south.
2.2 Roland House is a brick clad steel framed building built in the 1940s. The existing part basement is in reinforced concrete but the steelwork springs from pad foundations below ground floor or basement level as appropriate. The steelwork is encased in concrete in the floors and brickwork in the facade. The floors are 150mm thick consisting of a traditional concrete hollow pot floor and concrete ribs with 50mm structural topping above. The building has a basement, ground floor and eight upper storeys given over to residential accommodation. In the recent past, believed to be in 2000, the top floor – eighth – was rebuilt and a ninth floor added. From the reports in the records it appears the building was extended in 1990 at ground, 5th, 6th 7th and 8th including part of an additional storey to the rear (east elevation). Much of this was later modified or replaced in the 2000 construction work.
2.3 There are some small trees to the rear, believed to be of the Laburnum species, but these are noted as being of low water uptake.
2.4 There is an existing basement under 50% of the building.

3.0 Ground Conditions
3.1 A ground investigation was commissioned and undertaken in 1989 by Wembley Laboratories Limited and comprised a borehole and several trial pits. This was to establish the criteria for extending the storey height.
3.2 The GI undertaken established the ground beneath Roland House as 1.0m - 4.0m made ground over 0.5m – 2.0m brickearth (silty sandy clay with scattered gravel) over 3.5m – 5.0m flood plain gravel over London clay.
3.3 The ground would be described as competent with a safe bearing capacity of 250KN/m2 and permitting only small settlements.
3.4 Further, trial pits carried out by Packman Lucas in 2012 confirmed the masonry walls are founded on slightly corbelled suspended concrete beam strips 430mm deep which span between pad footings at the column lines.
3.4 Groundwater was encountered at the site in the GI work at 6.9m below ground level and well below the planned SSL of the proposed basement.
3.5 The nearest water course is the River Thames located 1300m to the south of the site.
3.5 The site lies 700m outside the flood risk area, zone 3, of the Thames. Zone 3 is defined as an area with greater than 1% annual probability of river flooding as defined by the Environmental Agency in their London mapping of Flood Risk Areas.

3.7 No protection against radon is considered to be necessary.

4.0 Desk Study Summary

4.1 The building is in good condition and the brick facade has benefitted from general repairs and cleaning and all windows have been upgraded to double glazed units. There is no obvious sign, either externally or internally, of movement or differential settlement to this building or to the adjacent buildings on either side of the property.

4.2 The new loading is confined to the safe bearing allowances recommended but, in general, there will be an off loading with the new basement construction.

4.3 The GI report noted that ground heave would not be a problem with the original basement construction.

4.4 The site is flat and the proposed works will not initiate any slope instability.

4.5 There are no London underground lines in the vicinity of the site and the running tunnels for the District Line between South Kensington and Gloucester Road are over 900m to the north so do not affect the proposed basement.

5.0 Design Philosophy

5.1 The proposal is to construct a new basement under approximately 50% of the curtilage of this existing multi-storey building with a view to extending the existing basement, which already occupies the south end of the site, to 100% of the curtilage of the building footprint. Lightwells are proposed to the east and west elevations and for this reason the external pile lines are between 1.5 and 2.0m from the building face.

5.2 Although research through the building archives shows no foundation details and the limited recent trial pits confirm the existence of footings, there is no conclusive evidence to suggest that the footings are indeed pad foundations; they could be a series of pile caps. Indeed, the original GI gives pile capacities for various lengths and diameters.

5.3 The loadings calculated from capacities of the steel stanchions measured during the recent repair work put the maximum value of axial compression (assuming buckling is restrained) as approximately 300 tonnes for the 9”x7” section measured. This would not be carried by a pad base limited to 250KN/m2.

5.4 By calculating the actual loading per floor the calculation produces a column load at foundation level of 155 tonnes, a value which does indeed fall within the safe bearing capacity with 2.5m square pad bases.

5.5 On this basis the design will proceed assuming the existing pad bases, 2.5m square, support the stanchions internally and are 1.1m x 2.5m rectangular pads at the perimeter.

5.6 Although the perimeter pads can be ascertained from deeper and more extensive trial pitting the internal pads are more difficult to locate. These too could be located by trial pitting through the ground bearing ground floor slab or by a series of small diameter core bores which would establish the depth and perimeter edges of the pad footing beneath the internal columns (6no.)

5.7 In order to construct a new but deeper base the load must first be removed from the existing columns as a temporary transfer. This process entails the use of a support saddle, site welded to the existing columns at high level on the ground to first storey. This is then to be used as the means to transfer the load from the columns to a new temporary support system supported by piles installed from ground level. Hot working will be limited and only accompanied with hot work permits and a nominated fire watcher.
5.8 The construction dictates the initial installation of perimeter secant piles (chosen to ensure stability at the perimeter) and internal contiguous piles in lines between the stanchions. The contiguous piles are to be sleeved to a level of the new formation. This will ensure that the benefit of skin friction is not developed over a length that will, in time, be excavated.

5.9 Capping beams will be cast on the piles and these will form the base for a temporary steel moment frame running across the building. Sequence #1 shows.

5.10 The frame geometry is such that it allows the introduction of Freyssinet flat jacks, in pairs, one either side of the steel saddles to be inserted between the saddle and the girders. Details show the proposed arrangement. Each jack rating is 1100KN lift capacity.

5.11 Jacking is taken in slow increments as a whole. Load cells and independent deflectometers are to be provided for each jack. The jacks are to be linked together such that they all inflate from zero to the maximum value indicated within an identical time frame. This may be computer controlled but whichever system is selected, the operation to ensure uniform jacking to the load specified should be demonstrated in a trial run-through prior to jacking the building the jacking and load transfer is designed to ensure deflections do not exceed 2.5mm.

5.12 On load transfer the building is effectively sitting on the temporary steel frame carried by the recently installed piles. The excavation to the underside of the existing pads can commence.

5.13 Once the level of the bottom of the pads is reached the stanchions may be cut through releasing any residual load on these foundations, sequences #5 and #6 shows.

5.14 With the existing pads free of load and the existing stanchion load transferred to piles working at a lower depth the excavation can continue to the proposed deeper formation level ensure lateral restraint is provided to the piles during this work.

5.15 New RC raft slab to be cast as sequence #9 and contiguous piles sleeved to top of raft level to prevent capacity gained in friction being lost during excavation. Erect new 254 x 254 UC 132 on new foundation pad with 500 x 500 x 20 plate on top of stanchion leaving 50 gap to insert flat jack, sequence #11 shows. Between the new and existing steel columns further flat jacks are installed, all with a greater rating at 1700KN lift capacity. The reason being that in this location each jack will carry the full column load rather than the two that share in the upper level.

5.16 During load increments of this lower jack, over a 17 hour period, the upper jacks will be synchronised in a decrease in load that they are carrying. In this way the load is transferred from the temporary steel frame back into the extended column section and back into foundations.

5.17 The upper jacks are removed along with the steel saddles and all the temporary steel frame. During this time there is full orthogonal restraint provided at the lower jack position given that this is mid-point in a double height columns (extended). The contiguous piles are all cut down to RC raft level.

5.18 A second level of restraints is added across between the beams and columns which allows the top part of the beam to be adjusted to incorporate the new 150mm thick RC on metal decking spanning between new steel frame at ground floor level. See drawing XP014. This slab provides the permanent restraint to the columns at storey level.

5.19 With the casting of the 500RC basement raft complete (5.15 above), the installation of 150mm blockwall in front of the perimeter secant piled wall is constructed, sequence #18 shows.

5.20 The nineteen drawings that illustrate this whole process give sufficient detail to allow the scheme to be developed to tender and thereafter to construction with input, at that stage from an experienced contractor.
6.0 Basement Waterproofing

6.1 The GI report notes that the site does not fall within a fluvial or tidal river flood plain and no flood risk assessment is necessary. No groundwater inflows were observed in any of the exploratory excavations.

6.2 As is the case with other developments CLA has designed a prudent assessment for the structure to assume that water levels could rise in the future and could be as high as 1.0m from ground level. This also allows for the possibility of a sudden burst of the mains water supply. With this in mind the basement is waterproofed to cater for such water.

6.3 The waterproofing takes two forms; the first is to specify waterproof concrete for both the basement slab and the surrounding retaining walls. This specification includes for the additive Eversure Calitite system comprising superplasticier SR and Calitite in proportions as specified by the manufacture. The arrangement of reinforcement and the construction joints in the retaining walls are specially detailed to minimise plastic and drying shrinkage to eliminate water seepage ingress. The procedure, as installed in accordance with the manufacture’s recommendations, is guaranteed for a period of ten years from construction.

6.4 In addition, a secondary drainage medium is specified which is an egg crate wall and floor application to allow any water ingress to be drained away in the cavity so leaving a dry internal compartment.

7.0 Drainage

7.1 It is proposed to use the existing drainage system in the existing basement discharging to the sewer in Roland Gardens.

7.2 At the basement level there are two new external courtyards which will have the provision for surface water drainage and this will be linked to the system picking up the cavity drainage. Precise invert levels of the drainage have not yet been fully ascertained and it will be necessary to pump the basement drainage to the interceptor chamber level where the discharge can continue under gravity in the existing sewer network.

7.3 Should a sub-raft land drain be selected then this too will drain to the main sewer via a pump chamber if necessary.

8.0 Party Wall Matters

8.1 Although the adjacent buildings are separated by a pathway on each side, the development of the basement falls within the Party Wall Act 1996. The Party Wall Surveyors will deal with matters arising and will have at their disposal the structural drawings and full calculations to demonstrate that the basement development will not cause damage or distress to any of the properties. In this way the interests of affected owners will be protected.

9.0 Hydrological Statement Summary

9.1 The British Geological Survey (BGS) indicates that the site is underlain by Kempton Park Gravel over London Clay. Records held by the Environment Agency show the Kempton Park Gravel to be a Secondary Aquifer comprising permeable layers capable of supporting local groundwater resources with groundwater abstraction 550m north of the site for the Natural History Museum. The London Clay is shown to be an Un-productive Aquifer comprising low permeability clay. Borehole records obtained within 100m of the property confirm ground conditions to comprise approximately 2m of gravel over London Clay. There are no geotechnical hazards identified for the site.

9.2 The site is located in Flood Zone 1; outside the 1 in 1000 annual probability of flooding rivers and sea. As such there is a low risk of fluvial /tidal flooding to the site.
9.3 The groundwater levels are below the existing foundations and therefore the construction of foundations is unlikely to have any significant impact on the current flow of groundwater within the Kempton Park Gravels. On this basis, the proposed basement extension will not penetrate any water table and will have no adverse effect on the subsurface hydrology of the area.

9.4 The residual effects discussed in this report and the Basement Impact Assessment have been shown to not be impacted by the basement development proposed in this report. No increase in risk to the current building and surrounding properties is presented by the proposed basement development. Therefore, the residual risks discussed can be discounted as a basement development impact.

9.5 Proposals are to construct the basement predominantly beneath the existing building although encroaching the rear garden to the south-east. The rear garden is currently paved and is likely to remain so following completion of the proposed development. On this basis, there will be little change in the proportion of hard surfaced/paved areas at the property and surface flows and infiltration of rainwater into the ground will not be significantly changed.

10.0 Conclusions
10.1 Roland House is a 1940s steel frame building with concrete floors and encasement to the steelwork in either concrete or masonry. It is in effect a very stiff building and the load transfer by jacking needs to respect the lack of tolerance of differential movement during this work. For this reason the temporary frame is designed as being very stiff.

10.2 The Ground Investigation report concludes that the ground is competent to carry loads of the new construction and that the effect on the hydrology is minimal; this is clearly stated in the Basement Impact Assessment report.

10.3 The design of the retaining structure and the constant stiff propping of the walls will ensure there are no detrimental effects on neighbouring properties.

Najeeb Latif
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