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Wednesday, 16 December 2020

# 29 Steele’s Road

Basement impact assessment

**Constant Structural Design**

This report has been prepared for the sole benefit, use, and information for the client. The liability of Constant Structural Design Limited (CSD) with respect to the information contained in the report will not extend to any third party. Our report is provided for the sole use of the named client and is confidential to the client and his professional advisors. All parts of the property that were covered, unexposed or inaccessible were not inspected and therefore we are unable to report that such parts are free from defects.
It should be read in conjunction with all other Consultants reports and specifications and CSD drawings.

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**Appendices**

Appendix A - Structural markups – Constant Structural Design
Appendix B - Ground investigation borehole log

## 1 Non technical summary

The floor level within an existing rear conservatory is proposed to be lowered by 300mm. This will require an excavation below the existing slab of approximately 450mm.

With good workmanship, the lower ground floor level can be lowered as proposed, without imposing damage to the existing structure or neighbouring buildings.

A possible structural sequence of works has been outlined in this report.

The proposed development will not increase flood risk at the site or in the surrounding area. It will also not adversely impact the Council's sustainability objectives.

The construction will be overseen by a Project Engineer chartered with the Institute of Structural Engineers.

## 2 Introduction

Constant Structural Design has been appointed to provide structural advice and a report to accompany their planning submission for a refurbishment, lowering the floor level within an existing conservatory.

The purpose of this report is the review the impact of the excavation and construction.

It includes a desk study of the site and refers to intrusive ground investigations. It includes screening and scoping of risks to land stability, surface water and ground water flooding.

Finally, we establish an outline method statement to carry out the proposals safely. This is followed by more detailed scheming for key elements and conclusions.

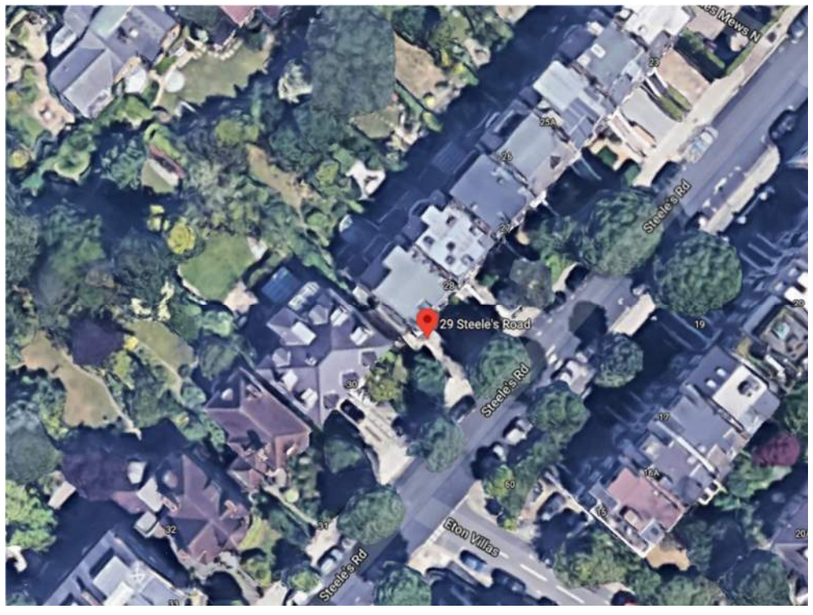



Figure 2.1 – Aerial view

## 3 Desk study

### 3.1 Site history & existing structure

The property is a lower and upper ground floor maisonette within a 5 storey semi detached period property.

The property is not listed, nor is it directly adjacent to any listed property.

Figure 3.1 – Photo of existing conservatory

Figure 3.2 – Photo of existing rear terrace to be retained

### 3.2 Neighbouring structure

The property shares a party wall with no.28 Steele's Road to the North. No.30 Steele's Road is detached to the south.

There are no basements in the vicinity and there currently appear to be no planning applications for basement insertions in the area.

### 3.3 Ground conditions

According to British Geological Survey (BGS) mapping, the local ground conditions are assumed to be London Clay with overlying Claygate Member and made ground.

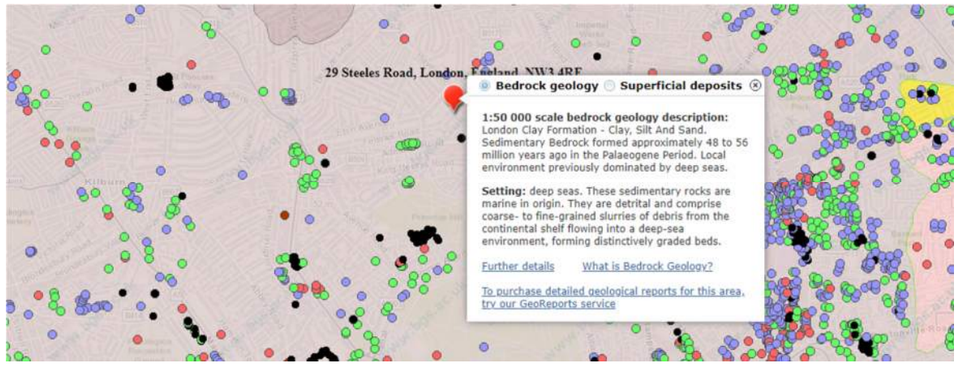



Figure 3.3 – BGS map extract

A borehole investigation has been carried out by Risk Management Ltd.
Refer to section 8.1 for the ground investigation summary.

### 3.4 Underground infrastructure

According to transit mapping there are no London Underground tunnels local to the site.
A CCTV survey was carried out on the existing drainage and all inspected pipes were in an acceptable condition.

Any existing services local to the excavation will be confirmed prior to construction.

### 3.5 Current/historical water courses

According to records there are no current or historical water courses local to the site.

### 3.6 Flood risk and surface water considerations

Based on Environment Agency mapping the site is in Floor Zone 1. Therefore, a detailed Flood Risk Assessment is not required.

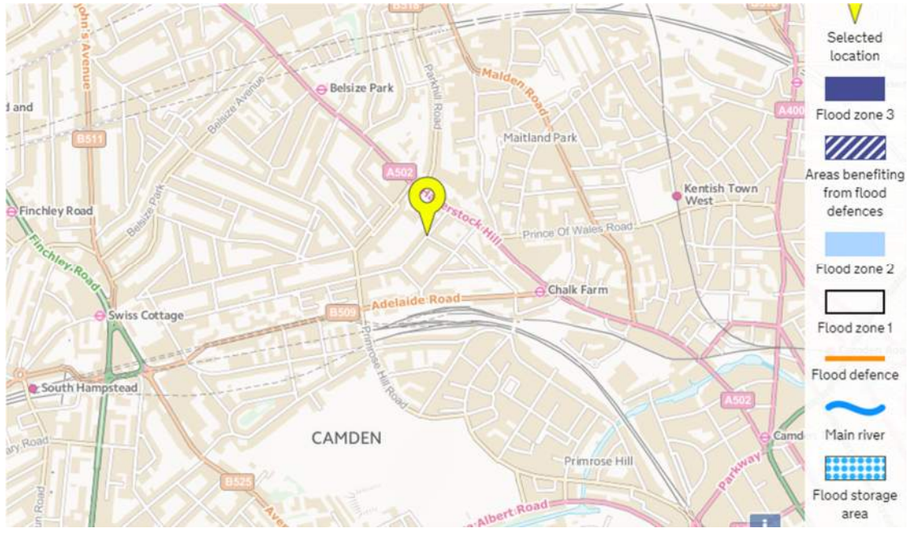



Figure 3.4 – Environment Agency flood risk map extract

## 4 Outline proposals

A minor excavation is proposed below an existing conservatory to lower the floor level locally.

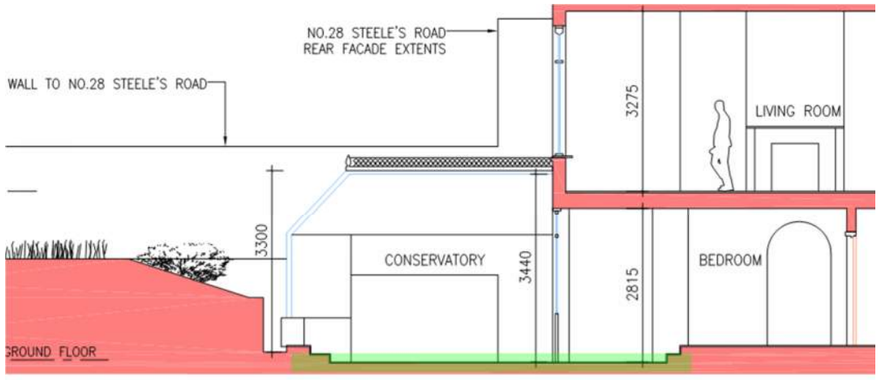



Figure 4.1 – Proposed section

The existing rear conservatory is at lower ground floor level, located against the party wall with no.28 Steele's Road. It has been established that the existing floor levels either side of the party wall are similar.

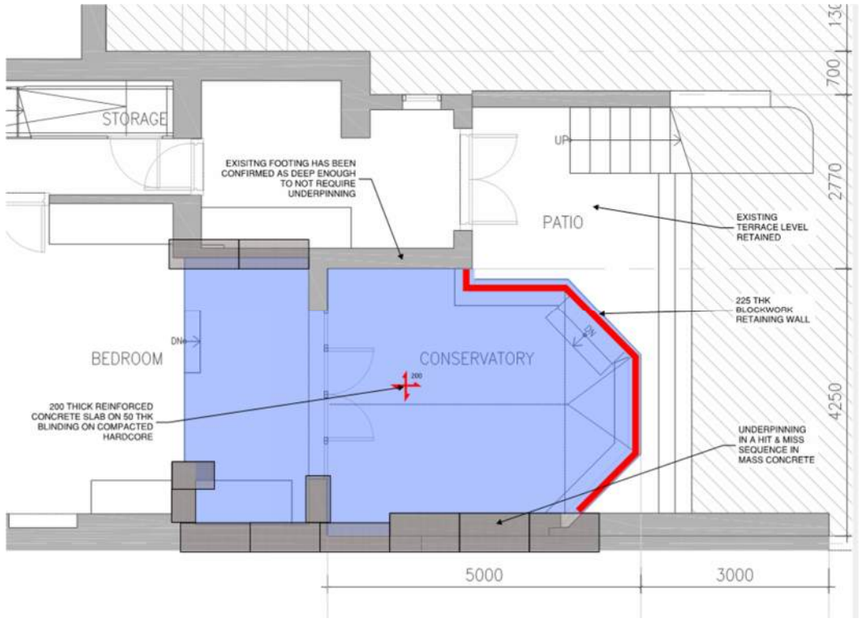



Figure 4.2 – Proposed LG floor plan

## 6 Screening

A screening process has been undertaken for the site:

| ITEM | QUERY | RESPONSE | COMMENT |
|---|---|---|---|
| SLOPE STABILITY | Does the existing site include slopes greater than 7 degrees (1 in 8)? | No | |
| | Will the proposals lead to a slope at the boundary of more than 7 degrees (1 in 8)? | No | |
| | Does the neighbouring land include railway cuttings? | No | |
| | Is the site within 5m of a highway or pedestrian right of way? | No | |
| | Is the site within a wider hillside setting with a slope greater than 7 degrees? | No | |
| | Will any trees be felled during the works, or root protection areas built over? | No | |
| | Is London Clay the shallowest strata? | Yes | |
| | Is there a history of seasonal movement? | No | |
| | Is the site within an area of previously worked ground? | No | |
| | Will the basement excavation be within an aquifer? | No | |
| | Will the proposed basement significantly increase the differential depth of foundations to neighbouring buildings? | No | |
| SURFACE WATER | Will surface water flows be altered from the existing routes? | No | |
| | Will the attenuation of surface water be altered across the site? | No | |
| | Will the proposals alter the quality of the surface water received by adjacent properties? | No | |
| | Does the site have a history of surface water flooding? | No | |
| GROUNDWATER | Is the site located directly above an aquifer? | No | |
| | Do the existing foundations bear within the aquifer? | No | |
| | Will the proposed excavation extend below the water table? | No | |
| | Is the site within 100m of a watercourse, well or spring line? | No | |
| | Will the proposed excavation extend below the mean water level in any local pond or spring line? | No | |
| | Will more surface water be discharged into the ground via soakaways/SUDS? | No | |

## 7 Scoping

No significant risks have been identified in the screening phase.

## 8 Site investigations and additional assessments

### 8.1 Ground investigation

A trial pit investigation was carried out by Exposem.
The following summarises the report:

- The trial pit within the conservatory confirmed a lower slab below the existing.

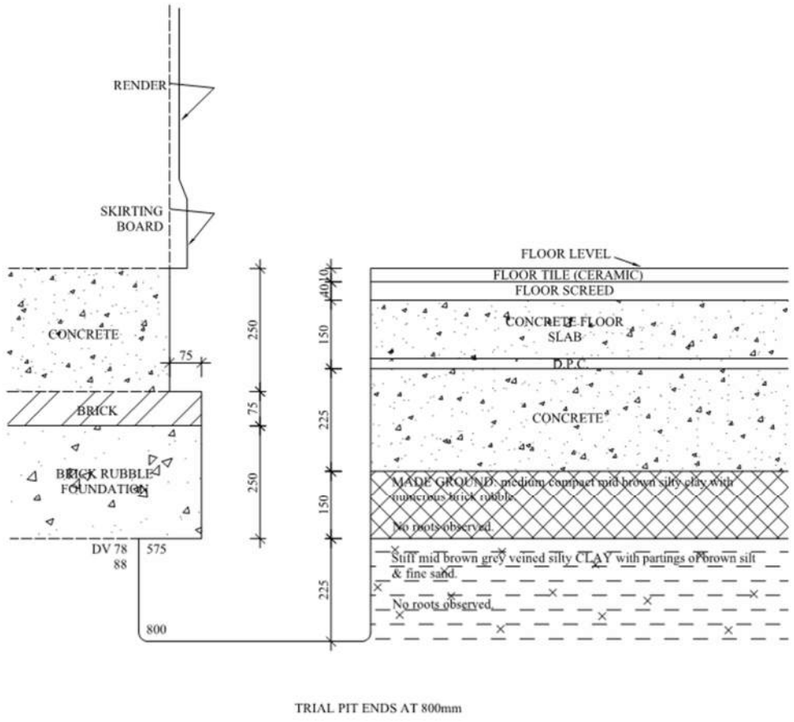



Figure 8.1 – Conservatory trial pit log

- Made ground extends to 575mm below existing ground level.
- No water was noted during the investigation.

A borehole investigation was carried out by Risk Management ltd.
The following summarises the report:

- The borehole was carried out at the front o the property due to access restrictions to the rear.
- Made ground was found to 0.6m bgl.
- London Clay was confirmed to 7m bgl where the borehole terminated.
- No water was noted during the investigation.
- SPT values suggest clay with an allowable bearing capacity greater than 100kPa.

## 9 Structural method statement

### 9.1 Brief sequence of works

The following method statement outlines one possible sequence of works. This will be superseded by the information submitted by the contractor prior to construction.

1. Erect site hoarding with skip adjacent to front elevation.

2. Demolish existing conservatory.

3. Underpin no.28 party wall within conservatory. Backfill each pin excavation with compacted hardcore up to proposed blinding level.

These pins would generally be formed in short sections of no more than a metre width and would be cast in a hit and miss sequence. Each pin is to be completed and dry-packed, and a minimum of 48 hours must pass before an adjacent excavation can begin.

The sequence of underpinning is to take place in an order arranged prior to works beginning, and in general a 1-3-5-2-4 sequence will be adopted.

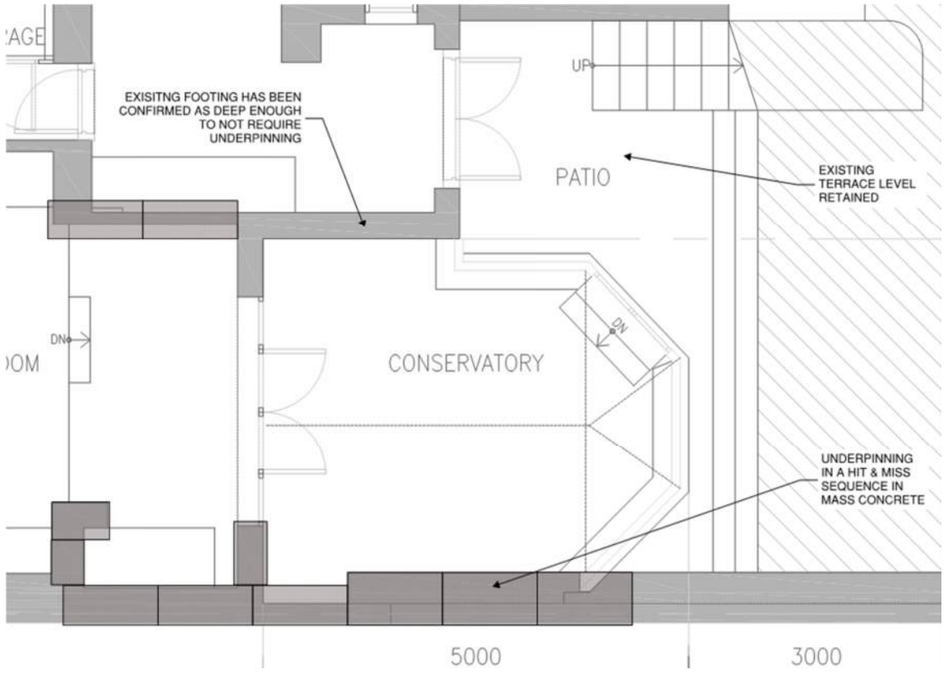



Figure 9.1 – Underpinning plan

4. Install below ground drainage.

5. Excavate the remaining spoil down to formation level.

6. Install compacted hardcore base, concrete blinding and cast new slab foundation.

7. Construct new blockwork retaining wall to support conservatory wall.

8. Rebuild conservatory to arch specification.

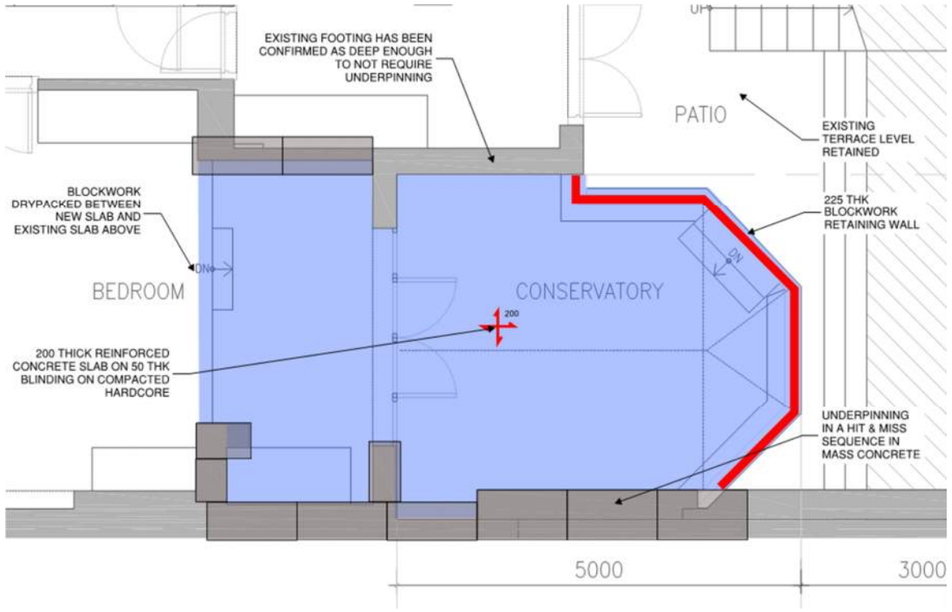



Figure 9.2 – Proposed LG floor plan

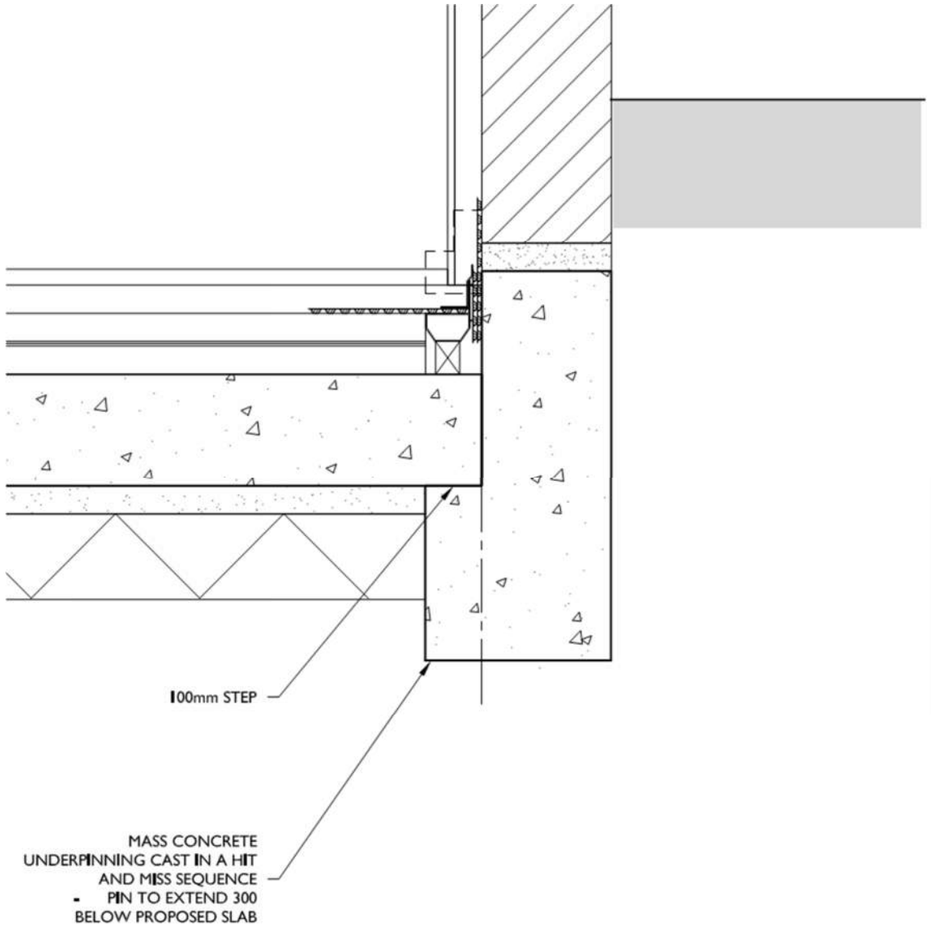



Figure 9.3 - Underpinning section below party wall

### 9.2 Permanent and temporary works proposals

#### 9.2.1 Ground conditions & foundations

The loads on the London Clay will not be significantly altered.

The new slab will bear onto a compacted hardcore base to avoid the risk of locally poor ground.

The mass concrete underpinning will extend into the ground. With the weight of the wall above this allows the underpin to retain the neighbours ground until the basement slab is in place.

There will be a drained cavity and sump pit to allow any minor water ingress to be removed and pumped to the existing sewer. The levels will be similar to the existing.

##### 9.2.1.1 Impact of trees

The proposed groundworks will be at lower ground floor level and the nearest trees are significantly higher to have no impact.

Further to this the trees and vegetation have had no clear impact on the existing conservatory and footings.

#### 9.2.2 Superstructure framing

The new conservatory will be similar to the existing.

## 10 Construction management

### 10.1 Contractor qualifications

The client should appoint a contractor with suitable experience in groundworks in period buildings within the London area. They should be a member of the Considerate Contractors Scheme.

The underpinning contractor should be a registered member of the Association of Specialist Underpinning Contractors.

### 10.2 Construction waste and traffic management

Access for materials and removal of spoil will be from the front of the property. Skips will be within a hoarded area adjacent to the highway. The frequency of skip removal trucks during the demolition and excavation, and the concrete mixers during the construction, will be confirmed by the contractor for approval prior to works starting onsite.

Details should be included in the Contractor's Site Waste Management Plan. The assumed route for removing spoil will be through the lower ground floor to the front of the property.

### 10.3 Noise, vibration and dust

The demolition will take place within a hoarded area. Any scaffolding will be clad in monarflex to limit noise and the spread of dust.

All concrete and masonry demolition work will be regularly watered down to reduce airborne dust. The pavement adjacent to the site will be cleaned daily.

Concrete to be broken out using non percussive techniques.

Working hours to be restricted as required by the Local Authority.

### 10.4 Construction monitoring

Due to the existing buildup a maximum of 300mm of virgin clay subsoils will be excavated. Therefore monitoring points are not considered necessary.

## 11 Basement impact assessment

### 11.1 Slope stability and ground movement assessment

Given the shallow excavation and existing topography there is no significant risk to land stability, to the existing building or to neighbouring structures.

With the traditional methods of construction proposed, the predicted damage to adjacent structure is limited to Category 1 (CIRIA report 580).

### 11.2 Cumulative impact

There are no consented or constructed basements in proximity to the site that give rise potential cumulative impacts.

### 11.3 Hydrogeology assessment

No groundwater was discovered in the thin band of made ground between the existing slab and the clay subsoils.

The proposed excavation will extend a further 300mm into the clay, which has been classified as an unproductive stratum.

Given the low permeability of the clay the proposed excavation is highly unlikely to adversely affect the flow of groundwater across the site.

The risk of backing up of groundwater around the excavation is also considered to be negligible.

Should any dewatering be required, to deal with rainfall and surface water, the ground conditions mean this should be relatively straight forward with minimal risk of the movement of fines causing subsidence to neighbouring buildings.

### 11.4 Flood risk, river and tidal flooding

The site is located within Environment Agency flood zone 1. As the site is below 1 hectare in size a Flood Risk Assessment is not recommended.

Gov.uk flooding maps indicate the site as very low risk.

### 11.5 Surface water and sewer flooding

The site is outside of Camden's 'critical drainage areas'. There is no increase in surface water runoff as a result of the works.

Gov.uk flooding maps indicate the site as low risk.

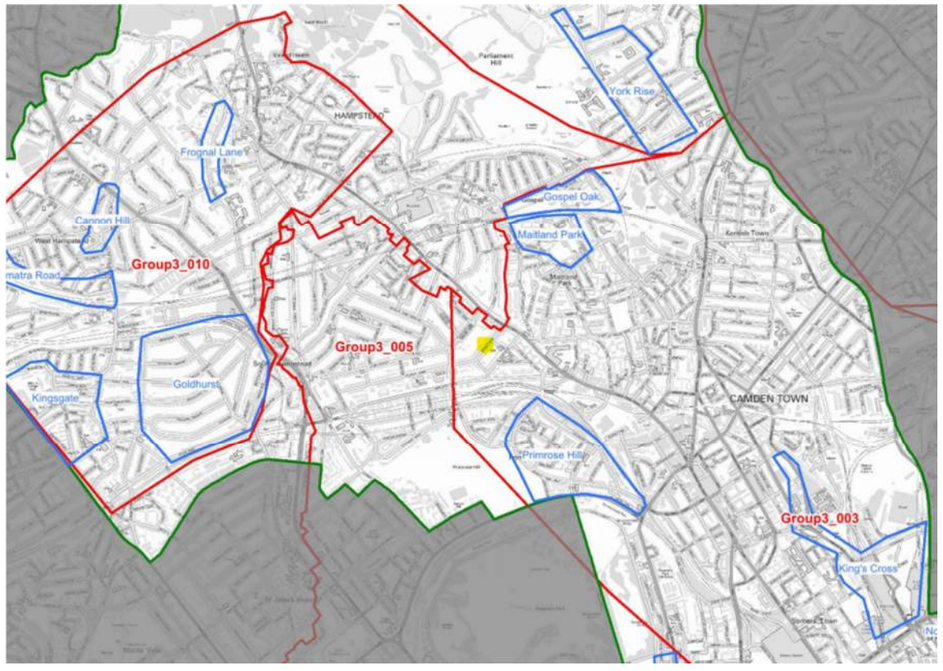



Figure 11.1 – Camden critical drainage areas

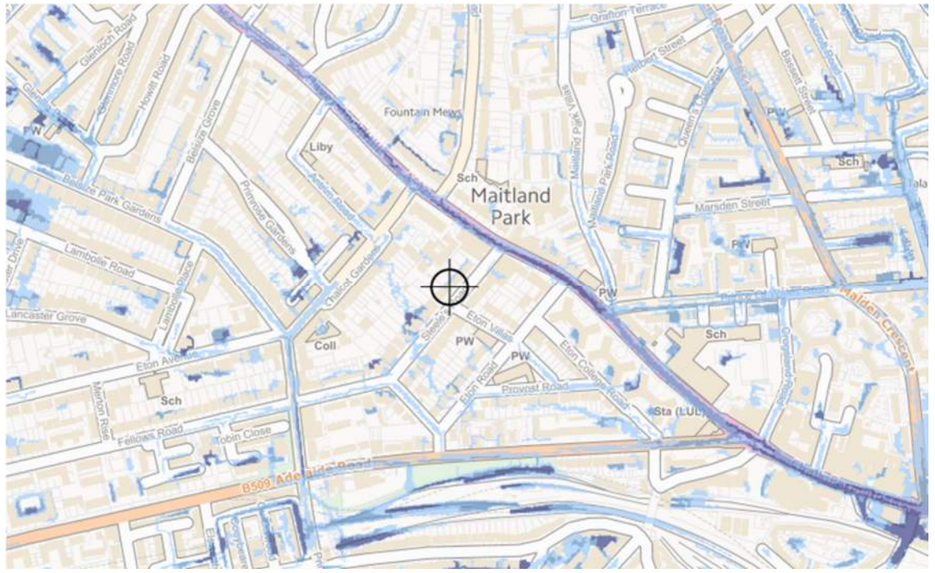



Figure 11.2 – Surface water flooding risk (Environment Agency)

### 11.6 Trees

Given the shallow excavation, the level relative to the nearest trees, and the lack of roots found in trial pit excavations, the risk to existing trees is considered negligible.

### 11.7 Archaeology

The site is outside Camden's Archaeological priority areas.

## 12 Conclusions

Primarily based on the ground investigation results it is our opinion that the proposed excavation can be carried out safely in the sequence described.

We do not anticipate any damage to the neighbouring buildings or the highway as a result of the works.

Any damage is predicted to be in line with damage category 1 (BRE Digest 251 Table 1) or less.

Based on the ground conditions the impact on groundwater flow is predicted to be negligible. The impact on surface water flooding is also considered negligible.

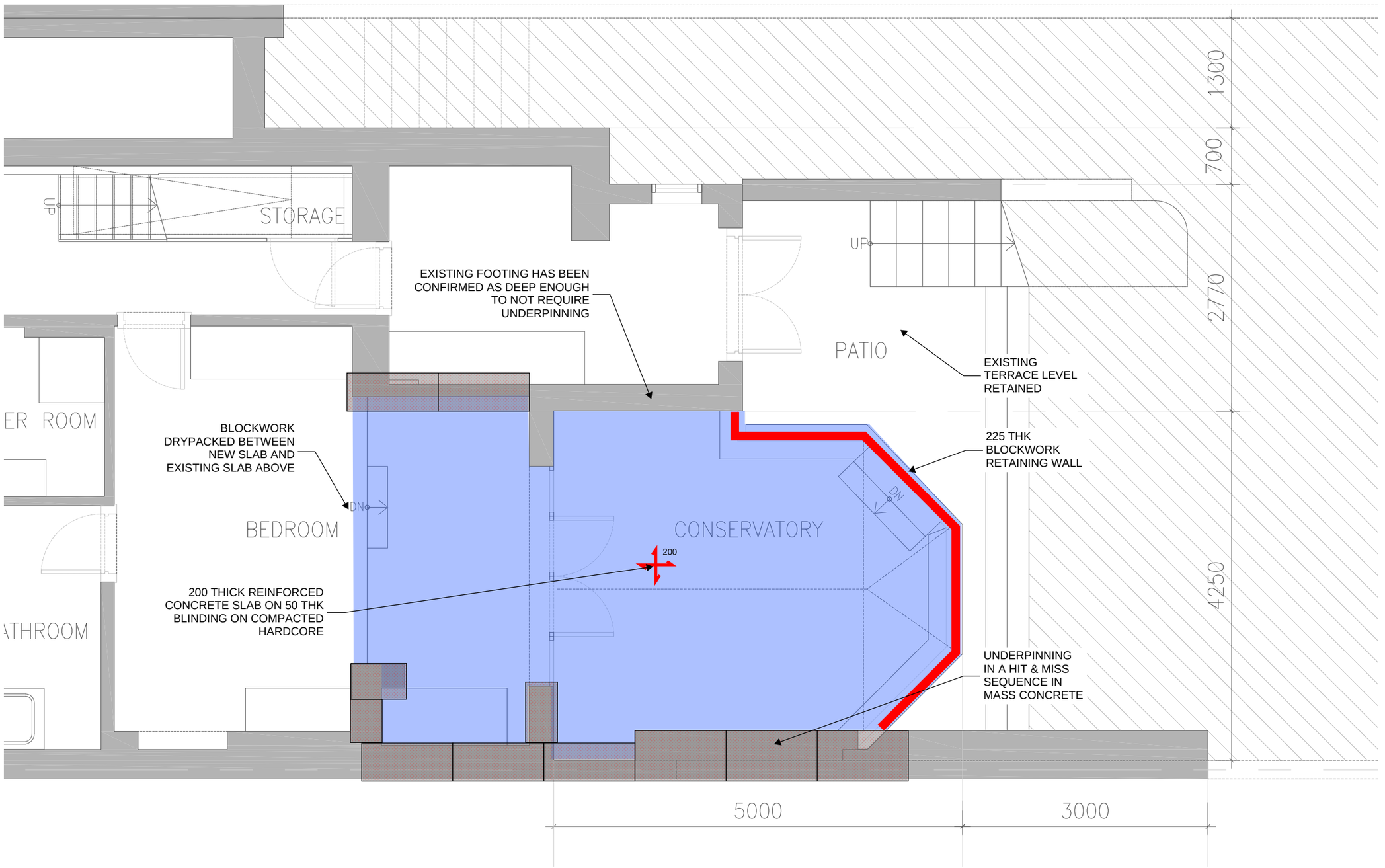
The permanent works have been designed to accommodate all vertical, lateral loads and combinations in line with the latest Eurocodes. A suitable temporary works proposal has been established and going forward this will be fully designed and detailed by a qualified structural engineer employed by the contractor.

The engineering design described here has been advanced to Developed Design Stage (RIBA Stage 3). Refer to the Stage 3 structural markups attached.

## Appendices

**Appendix A - Structural markups – Constant Structural Design**

**Appendix B - Ground investigation borehole log**




## NOTES

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS & ENGINEERS DRAWINGS & THE SPECIFICATIONS.
2. THE CONTRACTOR IS TO BE RESPONSIBLE FOR ALL DIMENSIONS & FOR THE CORRECT SETTING OUT OF THE WORK ON SITE.
3. DO NOT SCALE FROM THIS DRAWING.
4. WATERPROOFING TO ARCHITECTS DETAILS.

TEMPORARY WORKS

- CONTRACTOR IS FULLY RESPONSIBLE FOR ALL TEMPORARY WORKS DESIGN, SEQUENCE OF WORKS, PREPARATION OF METHOD STATEMENTS, ETC.

- CONTRACTOR IS FULLY RESPONSIBLE FOR ALL ASPECTS OF TEMPORARY STABILITY OF GROUND AND BUILDINGS DURING THE WORKS.

- CONTRACTOR IS TO ENGAGE A SPECIALIST TEMPORARY WORKS ENGINEER TO CARRY OUT ALL TEMPORARY WORKS DESIGN & SEQUENCING.

NOT FOR CONSTRUCTION

NOT FOR COSTING

LOAD BEARING STRUCTURE UNDER

RC SLAB

PROPOSED SPAN DIRECTION

MASS CONCRETE UNDERPIN

225 THK THERMALITE HI STRENGTH 7 BLOCKWORK

| Rev | Date | Amendments |
|---|---|---|
| P1 | 16.12.20 | PRELIMINARY ISSUE |

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Project
20073 - 29 STEELE'S ROAD

Drawing
LOWER GROUND FLOOR

Risk Management Limited
Unit 10 Coopers Place
Combe Lane
Godalming
Surrey GU8 5SZ

# Borehole Log

Borehole No. **BH1**

Sheet 1 of 1

| | | | |
|---|---|---|---|
| **Project No.** RML 7532 | **Coordinates:** | **Drilling Technique:** Light Percussion Rig | **Level (m):** |
| **Site Address:** 29 Steele's Road, Camden, London NW3 4RE | **Date:** 07/12/2020 | **Diameter (mm):** 85 | **Scale:** 1:50 |

| Stratum Description | Legend | Depth (m) | Level (m) | Samples and In Situ Testing: Depth (m) | Sample Type | Test Type | Results | Water Strikes | Well |
|---|---|---|---|---|---|---|---|---|---|
| **Paving over Concrete** | | 0.15 | | 0.15 | D1 | | | | |
| **MADE GROUND** (brick and concrete fill). | | 0.40 | | 0.50 | D2 | | | | |
| **MADE GROUND** (brown silty clay with brick fragments and roots). | | 0.60 | | 1.00 | D3 | | | | |
| **Weathered London Clay** Firm to stiff brown silty CLAY with pockets of grey silt and roots. *roots in evidence until at least 1.30m depth with selenite crystals from 1.50m depth* | | | | 1.50 | D4 | | | | |
| | | | | 2.00 | D5 | SPT | N=12 (3,3/3,3,3,3) | | |
| | | | | 2.50 | D6 | | | | |
| | | | | 3.00 | D7 | SPT | N=16 (4,3/4,3,4,5) | | |
| | | | | 3.50 | D8 | | | | |
| | | | | 4.00 | D9 | SPT | N=18 (4,4/5,4,5,4) | | |
| | | | | 4.50 | D10 | | | | |
| | | | | 5.00 | D11 | SPT | N=24 (6,8/7,6,5,6) | | |
| | | | | 5.50 | D12 | | | | |
| | | | | 6.00 | D13 | SPT | N=23 (5,5/5,6,6,6) | | |
| | | | | 6.50 | D14 | | | | |
| Borehole terminated at 7.00m depth | | 7.00 | | 7.00 | D15 | SPT | N=20 (4,4/5,5,5,5) | | |

Remarks: Service pit excavated to 1.20m depth. Groundwater not noted during boring. Standpipe installed to 6.70m depth. Roots in evidence until at least 1.30m depth.

**KEY**

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

CPT = Cone Penetration Test
SPT = Standard Penetration Test
V = Vane Test
PP = Pocket Penetrometer
MEXE = Insitu CBR test

AGS