# BASEMENT IMPACT ASSESSMENT

27 A Lady Somerset Road, NW5 1TX

Project Number: 7285

**Revision A**

Prepared by David Coles

8 July 2021

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BLUE ENGINEERING

# 27 A Lady Somerset Road, 7285

8 July 2021

**STRUCTURAL ENGINEER'S BASEMENT IMPACT ASSESSMENT**

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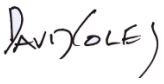
*This document is to be read in conjunction with all other planning documents submitted including drawings 7285-100, 101 & 103*

Reviewed and approved by

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## 1.0 EXECUTIVE SUMMARY

This is a Basement Impact Assessment Report for the proposed works to the above-named property and has been written in compliance with the London Borough of Camden's Supplementary Planning Guidance document "Basements", and addressing the headlines of the Council's BIA proforma. The proposed works have been designed to safeguard the structural stability of the existing building, nearby buildings and other infrastructure.

This report considers the existing construction and ground conditions, a possible sequence of construction and the impacts on surrounding structures. To demonstrate the feasibility of the proposed subterranean development, supplementary drawings have also been provided.

The proposed extension of the existing lower ground floor to the rear of the property requires the excavation of 2m of height of the rear garden to form the new lower ground floor level. The party wall to number 29 will require its foundation to be extended down to the proposed foundation level by underpinning it with a reinforced concrete retaining wall. The party wall to number 25 is founded at the proposed lower ground floor level due to it also having an existing lower ground floor.

It is considered that as the proposed work is an extension to an existing lower ground floor a full site investigation with fractural report is not required.

The levels of the existing foundations were confirmed by excavating trial pits on site, and the founding soil of London Clay was also confirmed. No ground water was encountered when excavating the trial pits.

The desk study confirmed that the prior to the existing property being built CIRCA 1890 the site was a green field site.

The BIA has not indicated any concerns with respect to land stability or groundwater and a requirement for a flood risk assessment has not been identified.

The conclusion to this report is that the proposed development and works required to achieve them will not present an adverse impact on the existing building or neighbouring buildings during the works or thereafter as a consequence of them.

## 2.0 PROPOSED WORKS

The proposed works to the property involves the extension of the rear of the existing lower ground floor of the property by 4m at the longest length and 6.5m width at the longest width.

Reinforced concrete retaining walls are to retain approximately 1.4m of soil height to the rear wall of the extension, with the soil sloping up from the top of the retaining wall to the existing garden level.

The party wall with no 25 is to be under pinned with a reinforced concrete retaining wall.

The finished floor level of number 27 is approximately level with the proposed finished floor level to the extension, consequently a retaining wall is not required.

The new lower ground floor walls that require retaining strictures are to be constructed in an underpinning sequence.

## 3.0 SCREENING

The proposed works are an extension to an existing lower ground floor of a late Victorian property.
Section 1.6 of Camden Council's Supplementary Planning Guidance document "Basements " states "When identifying a basement the Council will generally consider that a basement is a floor that is predominantly under the prevailing ground level of the site".

As the finished floor level (FFL) of the lower ground floor is 1.8m below the existing ground level to the front of the property it is considered that the lower ground floor is predominantly under the prevailing ground level of the site.

The guidance also states that "all basement proposals should be subjected to the screening stage of a BIA to identify the matters relevant to assessment of local flooding and/or neighbour amenity and structural risks".

The screening stage of the three main issues of Ground Water Flow, Land Stability and surface water and flooding are below.

**Ground Water Flow Assessment**

**Question 1 a**: Is the site located directly above an aquifer?
**No**, the site is located north east of the borough and is underlain by London Clay which is designated as Unproductive Strata by the Environment Agency.

**Question 1 b:** Will the proposed basement extend beneath the water table surface?
**No**, trial pits were dug on site to the proposed formation level of the proposed retaining structures (as reported in section 5) and ground water was not struck. A BGS borehole local to the site indicated that the ground water table was at 7.3m below ground level which is 5.5m below the proposed formation level.

**Question 2**: Is the site within 100m of a watercourse, well (used or dis-used) or potential spring?
**No**, the nearest surface water feature is Highgate Ponds 1.2km north west of the site. The site is located approximately 50m away from the river fleet former water course which is not present at the surface and has been culverted to form part of the local surface water sewer.

**Question 3**: Is the site within the catchment of the pond chains on Hampstead Heath?
**No,** the site lies outside the catchment of Hampstead Ponds.

**Question 4:** Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas
**Yes**, approximately 9 m2 of additional hard surfaced areas would occur, however, this is at roof level and this hard surface roof will drain onto a green flat roof which will act as storage .

**Question 5:** As part of the site drainage, will more surface water (eg,rainfall and run off) than at present be discharged to the ground (eg, via soakaways and or SUDS)?
**No,** The low permeable nature of the London Clay strata is unsuitable for receiving discharge to ground.

**Question 6:** Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to , or lower than, the mean water level in any local pond( not just the pond chains on Hampstead Heath) or spring line.
**No** There are no local ponds or spring lines present within 100m of the site.

The assessment did not highlight any potential issues that need to be assesses except the increase in hard surfaced areas of approx. 9m2. This however is mitigated by this area draining into a green roof which will act as storage.

**Stability Screening Assessment**

**Question 1**: Does the existing site include slopes, natural or manmade, greater than 7 degrees?
**No**

**Question 2**: Will the proposed re-profiling of landscaping at site change slopes at the property boundary to more than 7 degrees?
**No**

**Question 3**: Does the development neighbour land, including railway cuttings and the like with a slope greater that 7 degrees?
**No**

**Question 4:** Is the site within a wider hillside setting in which the slope is greater than 7 degrees ?
**No**

**Question 5**: Is the London Clay the shallowest strata at the site ?
**Yes**

**Question 6**: Will any trees be felled as part of the proposed development and / or are any works proposed within any tree protection zones where trees are to be retained?
**Yes,** some young trees are to be removed.

**Question 7**: Is there a history of seasonal shrink swell subsidence in the local area, and /or evidence of such effects on the site.
**Yes:** There may be seasonal shrink swell subsidence in the local area due to the London clay but there was no evidence of it within number 27 Lady Somerset Road

**Question 8**: Is the site within 100m of a watercourse or a potential spring line
**No**

**Question 9**:Is the site previously worked ground
**No**

**Question 10**: Is the site within an aquifer? If so , will the proposed basement extend beneath the water table such that dewatering may be required during construction?
**No**

**Question 11:** Is the site within 50m of the Hampstead Heath Ponds
**No**

**Question 12**: Is the site within 5m of a highway or pedestrian right of way
**No** the proposed extension is 11m away from the back of footway.

**Question 13**: Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties.
**Yes,** The differential depth of foundations will be 1.9m to number 27, there will be no difference to number 25 as there is also a lower ground floor to number 25.

**Question 14**: Is the site over ( or within the exclusion zone of ) any tunnels, eg railway lines?
**No**

The assessment has highlighted the following issues that need to be addressed.

**Question 5**: Is the London Clay the shallowest strata at the site ? **Yes**

**Question 6**: Will any trees be felled as part of the proposed development and / or are any works proposed within any tree protection zones where trees are to be retained? **Yes,** some young trees are to be removed.

**Question 13**: Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties. **Yes,** The differential depth of foundations will be 1.9m to number 27, there will be no difference to number 25 as there is also a lower ground floor to number 25.

**Surface flow and flooding screening**

**Question 1:** Is the site within the catchment of the pond chains on Hampstead Heath?
**No**

**Question 2.** As part of the proposed site drainage, will surface waterflows (e.g. volume of rainfall and peak run-off) be materially changed from the existing route?
**No**
**Question 3**. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?
**No,** the existing rear garden has approx. 7m of hard surfacing and the proposed will have 4.5m2

**Question 4:** Will the proposed basement development result in changes to the profile of the inflows (instantaneous and long term) of surface water being received by adjacent properties or downstream watercourses?
**No**

**Question 5:** Will the proposed basement result in changes to the quantity of surface water being received by adjacent properties or downstream watercourses?
**No**

**Question 6:** . Is the site in an area known to be at risk from surface water flooding such as South Hampstead, West Hampstead, Gospel Oak and Kings Cross, or is it at risk of flooding because the proposed basement is below the static water level of a nearby surface water feature?
**No**

The above assessment has not identified any potential issues that need to be assessed.

## 4.0 SCOPING AND SITE INVESTIGATION

The purpose of scoping is to assess in more detail the factors to be investigated in the impact assessment. Potential impacts have been identified as below.

| Potential Impact | Potential outcomes |
|---|---|
| The London Clay is prone to seasonal shrink / swell(subsidence and heave) | Shrinkage and swelling of the underlying soil may result in structural damage of the buildings. |
| The development will increase the foundation depths relative to the neighbouring properties to a relatively significant extent | Excavation may lead to structural damage to neighbouring properties if there is a significant differential depth between adjacent properties |
| Some trees are to be removed | Ground heave could occur due to the removal of the trees |

These potential impacts have been further assessed through a desk study and trial pits dug on site, as detailed below.

## 5.0 EXISTING CONSTRUCTION AND SITE DESK STUDY

The existing property is situated at 27 Lady Somerset Road, London, NW5 1TX. A desk study revealed that the property first appeared on the 1895 archive map. The 1873 archive map shows the site as green fields.

The property is not within a conservation area nor is it situated within an existing listed building.

The ground is relatively flat in the north-south and east-west direction . Large trees exists outside the boundary of the property to the rear and young trees in close proximity to the rear of property were noted.

There are no known tube lines passing under or close to the property. The Northern line is approximately 280m away east of the site.

The late Victorian property is semi detached with number 25 forming the left hand side and number 27 forming the right hand side (when looking at the front of the property). The property was converted into flat units in 1972. Flat 27 A is located at lower ground floor level, with access through the shared entrance hall at the front of the property and stairs down to the lower ground floor within the entrance hall.

The property is formed of traditional solid load bearing masonry external walls, a carcassed timber roof structure supported on the external walls and load bearing internal timber stud walls. Suspended timber floors spanning between the load bearing walls, and a ground bearing slab at lower ground floor level.

It appears that the floor to the existing lower ground floor has been lowered as an upstanding plinth exists at the base of the lower ground floor external walls. It is assumed that a new ground bearing slab was installed with the top of the slab located just above the base of the existing brick corbelled foundations.

As part of the desk study local boreholes the British Geological Survey's Geology Viewer was used to inspect the borehole records local to the site. These indicated that the ground local to the property is London Clay – Clay, Silt and Sand.

BGS boreholes approximately 230m east of the property indicated the following (refer to appendix A)

**BH NGR 2913 8566**
Made ground to 3' (0.9m)BGL ( below ground level) overlying firm clay to 18'6"(5.6m)BGL overlying stiff clay to depth.
Water was struck at 24 ' (7.3m)

**BH NGR 2908 8564**
Made ground to 2' 6"(0.76m) BGL overlying firm clay to 12'6"(3.8m) BGL overlying stiff clay to depth.
No water was struck

## 6.0 SITE INVESTIGATION

Three trial pits were dug onsite to confirm the levels of the existing foundations to the party wall with number 25, the party wall with number 29 and the existing rear wall to number 27A.

The trial pits revealed made ground to approx. 600mm below garden level overlaying Brown clay strata with frequent gravel.

A concrete mix with a sulphate resistance class of DC-1 or greater will be used within the reinforced concrete.

An allowable bearing pressure at basement level will be limited to 100 kN/m2 which is considered conservative

## 7.0 GROUND MODEL

The desk study has revealed that the site has not had a potentially contaminative history, having apparently been occupied by a residential property for the entirety.

On the basis of the investigation carried out, the ground conditions at this site can be characterised as follows:

Beneath a moderate thickness of made ground, London Clay is present

The made ground extends to depths of approximately 0.6m below garden level and generally comprises greyish brown silty sandy clay with occasional fragments of brick and rootlets.

Ground water was not encountered on site but the BGS borehole indicates the water table at 7.5m below ground level.

## 8.0 DRAINAGE AND FLOODING

Drainage on the site will be handled by the existing drainage systems.

A green roof is proposed to act as storage from the new areas of hard surfaced roof

New external hard landscaping areas are not proposed.

Environment Agency Flood maps indicate that the site is located within Flood Zone 1 (0.001% annual probability of river or sea flooding and less than 0.1% chance of surface water flooding) and less than 1 hectare in plan.

Therefore, no additional flood protection measures are necessary, and Flood Risk Assessment has not been undertaken.

The substructure is to be designed as a fully sealed structure in accordance with BS8102:2009 to inhibit any groundwater ingress.

## 9.0 CONSTRUCTION SEQUENCE METHODOLOGY

**Reinforced Concrete Retaining Wall Construction**

The ground to the rear of the lower ground floor will be excavated with the excavation battered at an angle of 45 degrees to the existing ground level to the rear garden and to the existing bottom of foundation level to number 29

The retaining walls will be installed in a hit a miss process to the party wall with number 25 and the rear garden.

The retaining walls will be in the form of L-shaped reinforced concrete 1.0m wide bays with the stem to provide both restraint against lateral loading and support to the existing brickwork walls over. The stem is to be suitably reinforced with high yield steel bars to resist the lateral forces imposed on the wall.

Throughout the underpinning process the ground conditions will be continuously assessed by a competent person to determine the means and method of supporting any face of temporary excavation. Battering back, stepping and benching will all be used to ensure that the ground is stable. Where this is not possible due to site restraints the introduction of sacrificial plywood sheets supported by Acrow props will be used to retain the ground.

The sequence of the underpinning is to be confirmed by the contractor although a suggested sequencing is shown on the proposed structural drawings. The sequencing will be such that any underpin will be completed, dry packed and a minimum period of 48 hours lapsed before adjacent excavation works are undertaken.

The walls have sections excavated in a “hit and miss” sequence to a founding depth below the existing foundation. The toe then the stem will be cast in a two stage sequence with reinforcement lapped up in the toe to ensure that both elements are tied in together. Horizontal steel dowels are to be cast into the toe and stem and left a minimum 400mm proud to tie adjacent pins together.

The maximum width of any pin is to be 1.0m to minimise the risk of undermining the structure over. This method is carried out until all of the walls have been underpinned.

Drawing 7285 – 100 shows a proposed plan of the lower ground floor and gives the likely underpinning sequence to be carried out by the contractor. Drawing 7285 – 101 shows various sections around the perimeter of the basement whilst drawing 7285 – 102 gives a possible sequence in which the individual underpin can be excavated and constructed.

## 10.0 IMPACTS ON SURROUNDING STRUCTURES

The proposed method of construction is well tested and is considered to be of low technology. The contractor undertaking the works will have suitable experience and all necessary insurances and will follow current standards and good building guides.
Providing the works are carried out correctly, movement to the existing building and to all surrounding structures should be no greater than described as 'very slight' under CIRIA C580 Category 1 ( Burland Scale). Procedures, should any movement occur, will be covered by party wall agreements between the relevant parties. No visible change to the adjacent pavement or road is expected. Given the founding depth and bearing strata anticipated, any settlement associated with the construction of the lower ground floor would be considered immediate and no long-term movement is expected. Any long term movement will be minimised by consideration of the detailed design and would still be considered to be no greater than category 1 under CIRIA C580 (Burland Scale).

The results of the site investigation have therefore been used below to review the remaining potential impacts, to assess the likelihood of them occurring and the scope for reasonable engineering mitigation.

**Shrink / swell potential of London Clay**
Shrinkable clay is present within a depth that can be affected by tree roots. There is no
evidence of structural movement within the existing building. The basement depth will extend well below the potential depth of root action to the mature trees to beyond the boundary of the property and the young trees close to the property.

**Increase in the differential depth of neighbouring foundations**
The stability of neighbouring property will be ensured at all times with the party wall to number 25 to be underpinned in an underpinning sequence.

**Removal of trees causing ground heave**
The trees to be removed are young trees and roots or desiccated soil were not found within the trial pits at the depth of the existing foundations.

## 11.0 UNDERPINNING SPECIFICATION

The underpinning legs are to be constructed in the stages indicated on the drawing. Should the contractor wish to undertake the works in different stages this must be agreed with the Structural Engineer prior to undertaking the works.

The excavation works are to be undertaken carefully so that the existing footings are not disturbed. Excavations are to be temporarily supported as necessary.

When excavating for an underpinning leg, if any deviation is found in the nature of the bearing strata, or if obstacles or obstructions are encountered, the facts are to be reported to the Engineer.

All underpinning legs should have keys formed in them for bonding into succeeding legs as indicated on the Engineer's drawing.

A minimum of 48 hours after concreting a leg of underpinning, the footings above may be pinned up.

The pinning concrete is to be driven into place using a hand held hammer and a 75 mm square hardwood drift against a substantial timber, secured on far side of footing.

Concreting and pinning-up must be completed before starting to excavate the next section of underpinning in the sequence.

Underpinning legs should preferably be concreted on the same day as they are excavated. If it is necessary to leave them open overnight temporary works and timbering are to be used to ensure that all is secure. On no account are underpinning legs to be left open over the weekend.

Pinning concrete shall be approximately 75 mm thick pea-shingle concrete 1:1:5:3 mixing using 5 mm - 10 mm coarse aggregate and "Cebex 100" expanding admixture by Messrs Fosroc UK Ltd in accordance with their instructions.

The water content in the pinning concrete is to be the minimum necessary to ensure hydration of the cement and the consistency should be such that the wetted mix will just bind under strong hand pressure.

Materials and Workmanship are to comply with BS 8110.

Concrete for reinforced concrete structures, including ground bearing slabs, is to be designated mix RC40 to BS EN 206:2013, unless noted otherwise on the drawings.

Ready mix concrete is to be used unless otherwise allowed by the Structural Engineer. This must be obtained from a plant which holds a current Certificate of Accreditation under the Quality Scheme for Ready Mix Concrete. Details of cement type, aggregate grading and sources, with chloride and sulphate content of mixes to be submitted to the Structural Engineer for their approval prior to ordering any concrete.

Concrete is not to be placed when the ambient air temperature is less than 5°C.

## 12.0 CONTROL OF NOISE, DUST AND VIBRATION

The primary receptors have been identified as the immediate neighbours. There is also potential for local residents and pedestrians to be affected by the proposed works. The site is in a residential area, existing ambient noise and vibration levels are considered to be relatively low.

**Noise and Vibration**

Works will be carried out according to a stated schedule, production of which is the responsibility of the contractor, and conducted between the following hours( or as otherwise agreed with Camden Council).

- Mondays to Fridays - 8am to 6pm
- Saturdays - 8am to 1pm
- Sundays and Bank Holidays - No noisy work

The Contractor will develop a Liaison and Consultation Strategy involving the following:

a) Identifying all stakeholders, and consulting with them **before** commencing works.

b) Maintaining a dialogue and information exchange with all interested parties throughout the proposed works.

c) Responding to complaints and resolving where practical.

d) Ensuring neighbours and interested parties are kept informed of works as they progress and are consulted where necessary.

1. Noise will be kept within the legal limits as defined in the Environmental Protection Act 1990.

2. All works will be carried out in accordance with BS 5228-1:2009 and BS 5228-2:2009. All works will employ Best Practicable Means as defined by Section 72 of the Control of Pollution Act 1974 to minimise the effects of noise and vibration. All means of managing and reducing noise and vibration, which can be practicably applied at reasonable cost, will been implemented.

3. The impact of vibrations on adjacent properties have been considered in compliance BS 7385-1:1990 and BS 7385-2:1993. Contractor to familiarise themselves with both documents.

4. The following general measures will be taken:
   a) The employment of only modern, quiet and well-maintained equipment complying with the EC Directives and UK Regulations set out in BS 5228-1:2009.

   b) Avoidance of unnecessary noise such as loud radios, shouting and engines idling between operations by effective site management.

   c) Careful handling of materials and waste such as lowering rather than dropping items.

   d) Operating the site as a closed site, that is:
   i. Having all windows and doors closed during noisy operations.
   ii. Retaining the building front façade and roof during construction.
   iii. Installing insulation in the windows and other opening to reduce the amount of noise escaping the site.

5. The following specific measures will be taken during each stage of the construction:
   a) Demolition of corbels:
   i. Corbels will be cleanly disk cut back and carefully broken away from masonry. Percussive breaking techniques will not be used.

   b) Concrete demolition and removal:
   i. In compliance with the expectations of The Council, concrete is to be demolished using non-percussive breaking techniques (e.g. mechanical concrete pulverisers, hand-held concrete crunchers, diamond saw-cutters and drills and hydraulic bursting equipment).
   ii. Any air compressors required are to be located within the site, behind hoarding and if necessary in purpose built acoustic enclosures.
   iii. Concrete will be levered from position and broken up off-site.

iv. Where appropriate, structural breaks will be cut between adjacent properties as soon as possible to reduce noise and vibration transfer.

c) Excavation:

i. The site will be excavated manually, causing minimal noise or vibration.
ii. The conveyors will not be operated outside normal working hours and will be switched off when not in use. Conveyors will be well maintained with well-oiled rollers in good working order and be located as far away from neighbouring properties as practicable.
iii. Lorries removing the spoil will only operate within normal working hours and will have their engines switched off while waiting. Further information regarding the movement of vehicles in and around the site is provided in the CTMP.

d) Piling:

i. If piling is required on site, fully silenced modern bored or hydraulically-jacked piling rigs will be used with careful operation of the rig so as to minimised disturbance.
ii. Where practicable, a transmission pathway will be cut by introducing a trench around the piling site.

e) Concrete construction:

i. RC underpinning will be used to form the retaining structure of the basement.
ii. Contractors will carefully plan and coordinate with concrete suppliers, subcontractors and any other parties involved in the pour to ensure the concrete pours can be done within normal working hours. Contractor is required to conduct an assessment of potential disruptions to the concrete pour and to include contingency measures to ensure works will not overrun.

f) Steelwork and reinforcement:

i. All fabrication and cutting of steelwork will be carried out off-site. Where not possible, contractor will erect a mobile acoustic screen or enclosure as appropriate.
ii. Reinforcement bars will be cut to length prior to site delivery. Hydraulic or pneumatic tools will be used in preference to angle grinders when trimming reinforcement bars.

g) Water

i. If necessary a submersed pump will be used to remove any water from basement level. This is to be located within the excavation itself so as to provide best possible acoustic screening from neighbouring properties.

**Dust and Emissions**

1. As defined in the Mayor of London's Best Practice Guidance on The control of dust and emissions from construction and demolition, November 2006, section 4.1 the site is classified as a low risk site, fitting the following criteria:
   a) A development less than 1,000 square metres of land.
   b) A development of ten or less properties.
   c) There is potential for emissions and dust to have an infrequent impact on sensitive receptors.

2. Contractor will follow good housekeeping practices with site being regularly swept to avoid the build-up of dust, and where possible washed down with wet methods. This will include the immediate pavement/road area outside the property as well as any hoardings, fences, barriers or scaffolding.

3. Dust will be minimised by effective site planning, including doing the following:
   a) Where practicable prefabricated materials will be utilised to minimise the need for dust generating activities.

b) Erecting effective barriers around dusty activities.
c) Covering stockpiles of sand and any other dust generating materials/activities.
d) Planning the site layout as so dust generating activities and/or machinery are located away from sensitive receptors.
e) Sealing or completely enclosing cement, sand, fine aggregates and other powders to limit the amount of debris that can be blown from site.

4. In regard to construction traffic:
   a) Idle vehicles to switch off engines.
   b) Vehicles to be effectively washed or cleaned before leaving site.
   c) Construction materials entering or leaving the site to be covered.
   d) Traffic management to be established by identifying and using appropriates routes to the vehicles so to avoid peak traffic periods

5. During demolition works:
   a) Equipment with dust suppression (i.e. water spray) or a dust collection facilities will be used.
   b) Specific dust suppression equipment will be used where substantial levels of dust are generated.
   c) Covering of skips, chutes and conveyors, completely enclosing if necessary, and minimising drop heights.

6. Contact details for the Site Manager from the site will be displayed clearly on the site boundary so that local residents and businesses are able to contact the contractor to raise any issues that they may have and report complaints.

*Contractor will provide a method statement and temporary works design which is to be approved by the Engineer, taking into account noise, dust and vibration. Contractor to notify the Engineer of any deviation from the above processes or procedures.*

**Appendix A: BGS Borehole Logs**

## RECORD OF BOREHOLE NO. 2

[redacted] NGR 2913 8566

Ground level: 170.9ft. above O.D. Newlyn — Dia. of boring: 8in.

Type of boring: Shell and Auger — Lining tubes: Not used

| Daily Progress | Samples: Depth | Samples: Type | Change of Strata: Legend | Change of Strata: Depth | Change of Strata: O.D. Level | Description of Strata |
|---|---|---|---|---|---|---|
| | | | | 0'3" | 170.6 | FILL (tarmac) |
| | 2'0" | D | | 1'6" | 169.4 | FILL (brick rubble and ash) |
| | 3'0" | D | | 3'0" | 167.9 | FILL (mottled brown and grey silty clay, gravel, brick fragments) |
| | 3'6" – 5'0" | U(4) | | | | |
| | [illegible] | D | | | | |
| | 4'6" – 6'0" | U(4) | | | | |
| | [illegible] | D | | | | |
| | 9'6" – 11'0" | U(4) | | | | Firm fissured brown, with grey veining, silty CLAY with occasional partings of silty fine sand and some gypsum crystals |
| | 11'6" | D | | | | |
| | [illegible] | D | | | | |
| | 14'6" – 16'0" | U(4) | | | | |
| | [illegible] | D | | | | |
| | 18'6" | D | | 18'6" | 152.4 | |
| | 19'6" – 21'0" | U(4) | | | | |
| | 21'0" | D | | | | Stiff fissured brown silty CLAY with occasional partings of silty fine sand and some gypsum crystals |
| | [illegible] | D | | | | |
| 7.8.65 | | | | | | |
| 9.8.65 | [illegible] – 27'0" | U(4) | | 27'0" | 143.9 | |
| | [illegible] | D | | | | |

## RECORD OF BOREHOLE NO. 3

[redacted] NGR 2908 8564

Ground level: 166.4ft. above O.D. Newlyn — Dia. of boring: 8in.

Type of boring: Shell and Auger — Lining tubes: Not used

| Daily Progress | Samples: Depth | Samples: Type | Change of Strata: Legend | Change of Strata: Depth | Change of Strata: O.D. Level | Description of Strata |
|---|---|---|---|---|---|---|
| | | | | 0'3" | 166.1 | FILL (tarmac) |
| | 1'0" | D | | 1'0" | 165.4 | FILL (brick rubble) |
| | 2'6" | D | | 2'6" | 163.9 | Brown silty sandy CLAY with occasional gravel and traces of brick (Presumed Fill) |
| | 3'0" – 4'6" | U(4) | | | | |
| | 4'6" | D | | | | |
| | 6'0" – 7'6" | U(4) | | | | Firm, becoming stiff, fissured brown, with grey veining, silty CLAY, with occasional partings of silty fine sand and some gypsum crystals |
| | 7'6" | D | | | | |
| | 9'0" – 10'6" | U(4) | | | | |
| | 10'6" | D | | | | |
| | 12'6" | D | | 12'6" | 153.9 | |
| | 14'0" – 15'6" | U(4) | | | | |
| | 15'6" | D | | | | |
| | 18'0" | D | | | | Stiff fissured brown silty CLAY with occasional partings of silty fine sand and some gypsum crystals |
| | 19'0" – 20'6" | U(4) | | | | |
| | 20'6" | D | | | | |
| | 23'0" | D | | | | |
| 9.8.65 | 24'0" – 25'6" | U(4) | | 25'6" | 140.9 | |
| | 25'6" | D | | | | |

Key to type of sample:
U (4) — 4 in. dia. undisturbed sample.
U ($1\frac{1}{2}$) — $1\frac{1}{2}$ in. dia. " "
D — disturbed sample.
BD — bulk disturbed sample.
V — vane test.
S ( ) — standard penetration test.
C ( ) — dynamic cone penetration test.
Figure in brackets is No. of blows for penetration given in depth column (see Notes, page 1).

Remarks: (Observations on ground-water, etc.)

B.H.2 Ground-water level stood at a depth of 24ft. below ground level on the morning of 9.8.65. Sample of ground-water taken.

B.H.3 No ground-water was encountered during boring.

ELEANOR PALMER PRIMARY SCHOOL, ST. PANCRAS

Soils No: S/4919

FIG. 2

GEORGE WIMPEY & CO., LTD. CENTRAL LABORATORY HAYES

**Appendix B: Trial Pit Photos**

**Trial Pit 1**

**Trial Pit 2**

**Trial Pit 3**

**Appendix C: Flood Risk Zone**

Environment Agency

# Flood map for planning

| Your reference | Location (easting/northing) | Created |
|---|---|---|
| 27 A LS Rd | 528857/185603 | 8 Jul 2021 1:01 |

**Your selected location is in flood zone 1, an area with a low probability of flooding.**

**This means:**

- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

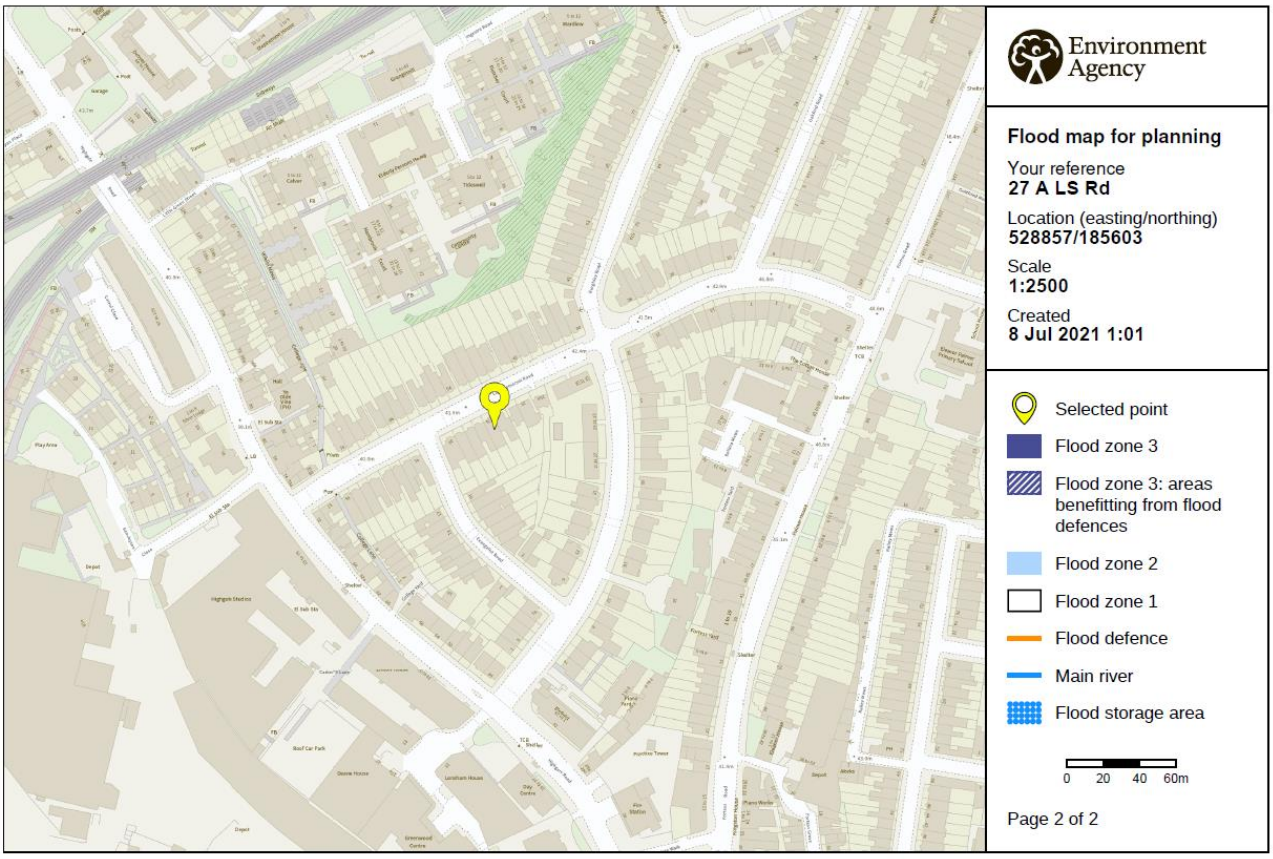
**Notes**

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

The Open Government Licence sets out the terms and conditions for using government data. https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/

Page 1 of 2



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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | 08.07.21 | 29.07.21 | | | | | | | | | | | | | | | | | |
| Issue | 1 | 2 | | | | | | | | | | | | | | | | | |

| Drawing Number | Document Title | Scale | Paper Size | Revision | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | Construction Sequence Methodology: Plans | 1:50 | A2 | P1 | P2 | | | | | | | | | | | | | | |
| 101 | Construction Sequence Methodology: Sections | 1:20 | A3 | P1 | P2 | | | | | | | | | | | | | | |
| 102 | Construction Sequence Methodology: Trial Pit Results | 1:20 | A3 | P1 | - | | | | | | | | | | | | | | |
| 103 | Construction Sequence Methodology: Sequence of Works | 1:20 | A2 | P1 | - | | | | | | | | | | | | | | |
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Distribution — Issue (E denotes electronic issue)

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| Polysmiths | E | E | | | | | | | | | | | | | | | | | |
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Revision prefixes: P — Preliminary T — Tender C — Construction R — Record

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| Title: | Issue: |
|---|---|
| Document Register | 2 |
| **Project:** | **Job No:** |
| 27a Lady Somerset Road | 7285 |
| **By:** | **Sheet:** / **Date:** |
| AK | 1 of 1 / 29.07.21 |

## Underpinning Specification

The underpinning has been designed so that the maximum bearing pressure is 150 KN/m2 (SLS) based on medium dense sand and gravel indicated on borehole logs local to the site. Should the ground conditions found to be different the structural engineer must be informed prior to the casting of the underpinning.

The Contractor is to be responsible for the accurate construction of the works according to the true intent of the Engineer's drawings and this specification.

The Contractor is to consider the need for any temporary works required to ensure the stability of the walls underpinned and provide any needling, dead shoring, propping etc. as may be appropriate.

The underpinning legs are to be constructed in the stages indicated on the drawing. Should the contractor wish to undertake the works in different stages this must be agreed with the engineer prior to undertaking the works

The excavation works are to be undertaken carefully so that the existing footings are not disturbed. Excavations are to be temporarily supported as necessary

When excavating for an underpinning leg, if any deviation is found in the nature of the bearing strata, or if obstacles or obstructions are encountered, the facts are to be reported to the Engineer.

All underpinning legs should have keys formed in them for bonding into succeeding legs as indicated on the Engineer's drawing.

A minimum of 48 hours after concreting a leg of underpinning, the footings above may be pinned up.

The pinning concrete is to be driven into place using hand held hammer and a 75 mm square hardwood drift against a substantial timber, secured on far side of footing.

Concreting and pinning-up must be completed before starting to excavate the next section of underpinning in the sequence.

Underpinning legs should preferably be concreted on the same day as they are excavated. If it is necessary to leave them open overnight temporary works and timbering are to be used to ensure that all is secure. On no account are underpinning legs to be left open over the weekend.

Particular care is to be taken to clean off and if necessary hack or scabble side of previously cast legs to provide adequate bond before concreting subsequent legs.

If water is encountered in excavation the Contractor is to provide sumps, grips and pumps as necessary to keep the excavations free from water always.

### Materials

The concrete used in underpinning legs shall be minimum grade RC40 in accordance with BS EN 206:2013, with a minimum cement content of 330 kg/m³ or a 1:1.5:3 prescribed mix using 20 mm maximum aggregate, subject to proper ganging facilities being available on site.

Pinning concrete shall be approximately 75 mm thick pea-shingle concrete 1:1:5:3 mixing using 5 mm - 10 mm coarse aggregate and "Cebex 100" expanding admixture by Messrs Fosroc UK Ltd in accordance with their instructions.

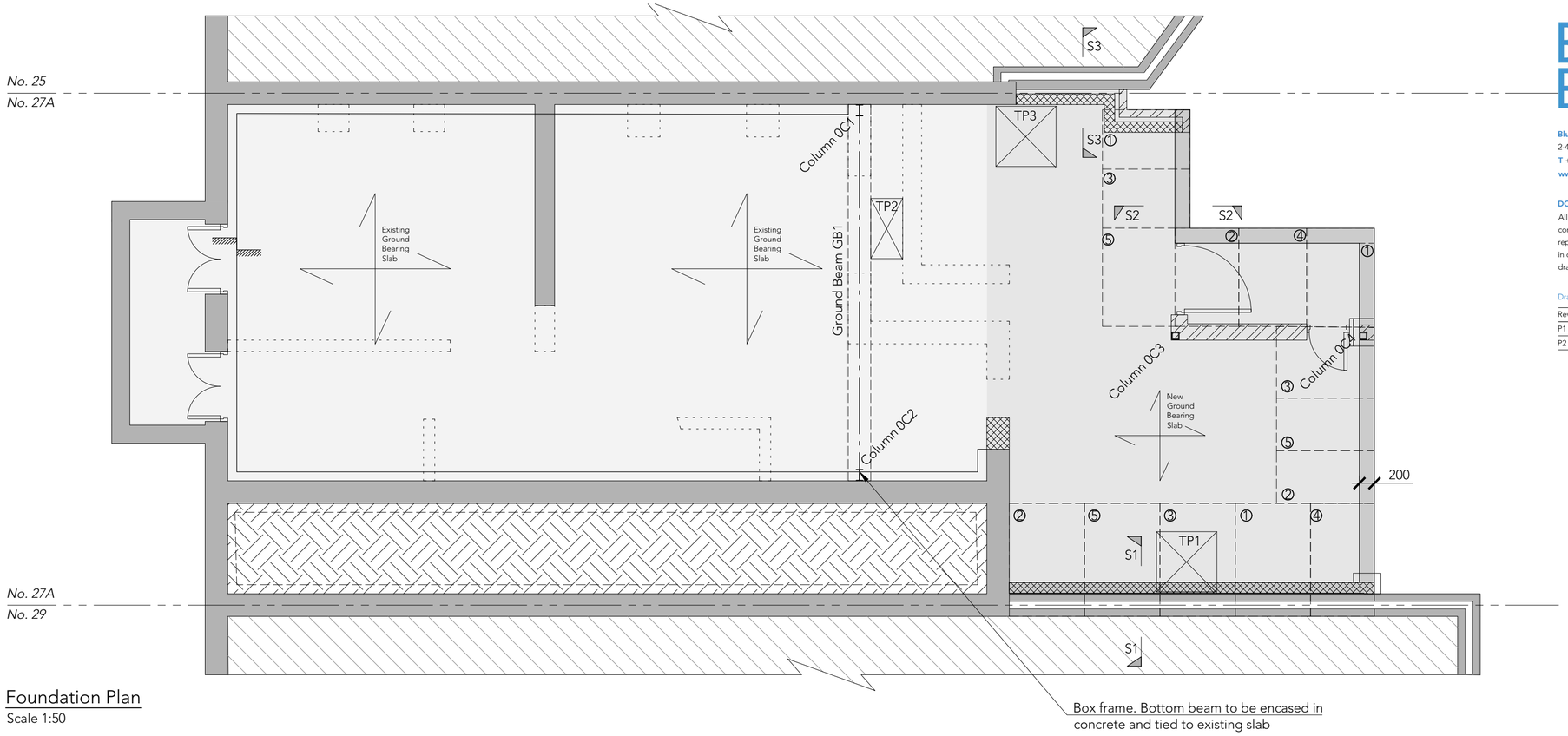
The water content in the pinning concrete is to be the minimum necessary to ensure hydration of the cement and the consistency should be such that the wetted mix will just bind under strong hand pressure.

Indicates change in level

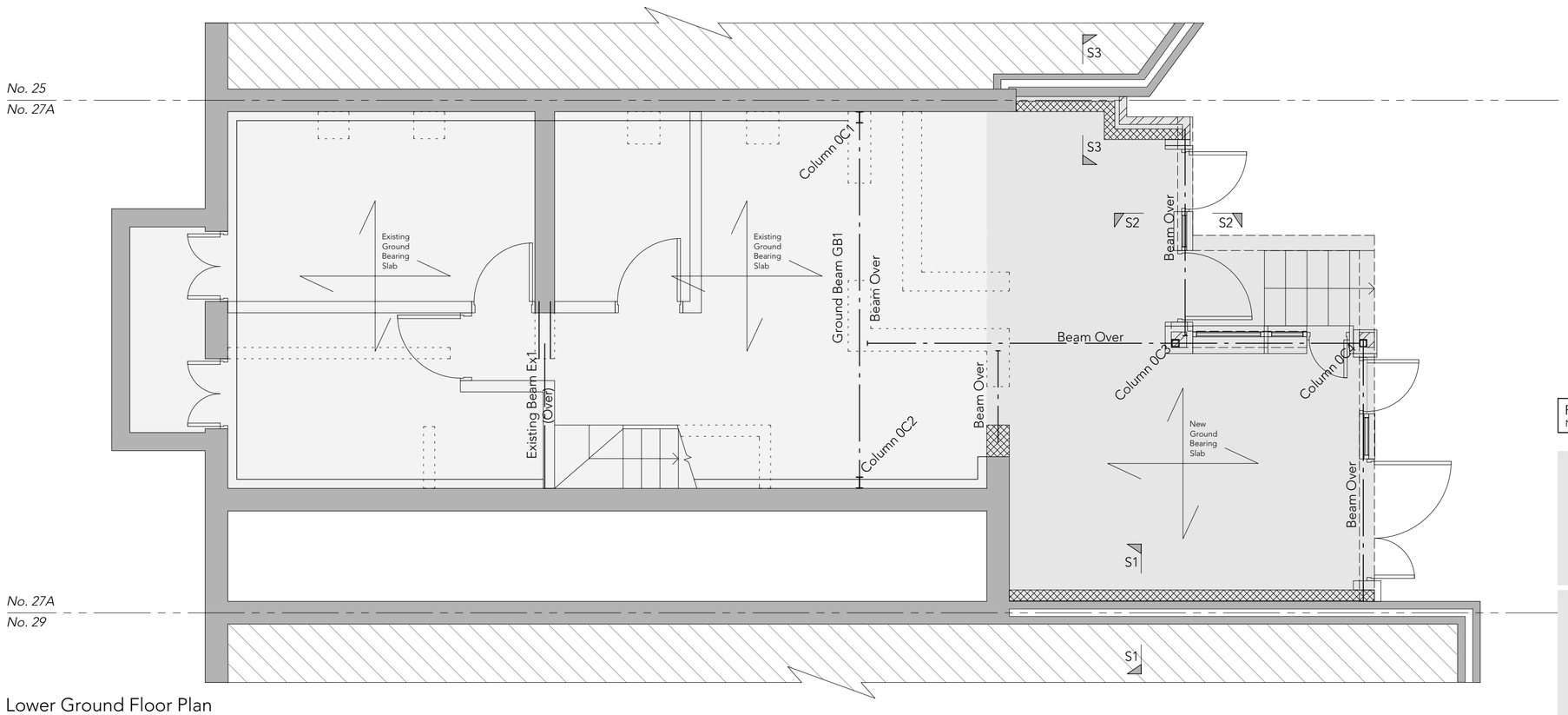
TP — Indicates trial pit location

Indicates line of structure under

Indicates existing structure to be demolished




Foundation Plan
Scale 1:50




Lower Ground Floor Plan
Scale 1:50

A2

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Drawing History

| Rev | Date | Description | Drawn | Checked |
|---|---|---|---|---|
| P1 | 08.07.21 | For Comment | AK | OG |
| P2 | 29.07.21 | For Comment | AK | OG |

PRELIMINARY
NOT FOR CONSTRUCTION

Title
Construction Sequence Methodology: Plans

Project
27a Lady Somerset Road,
NW5 1TX

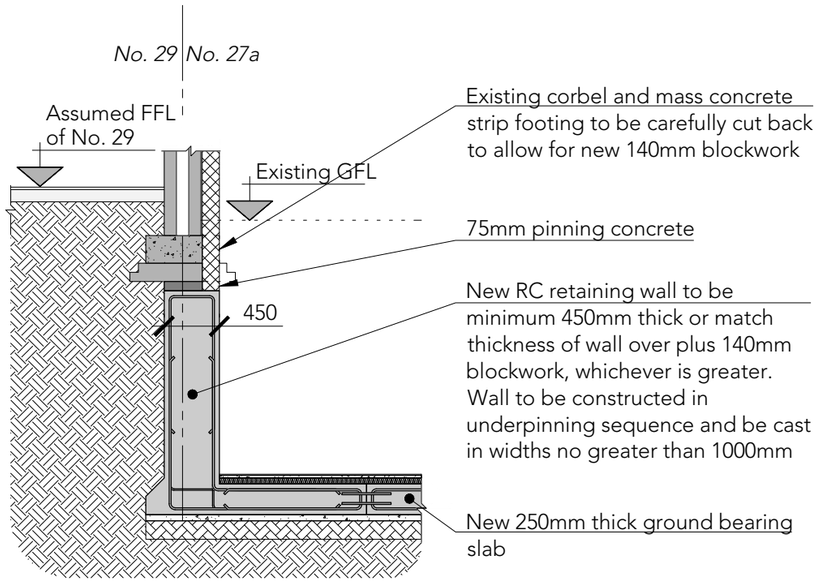
Client
Christoph Hus

Job No.
7285

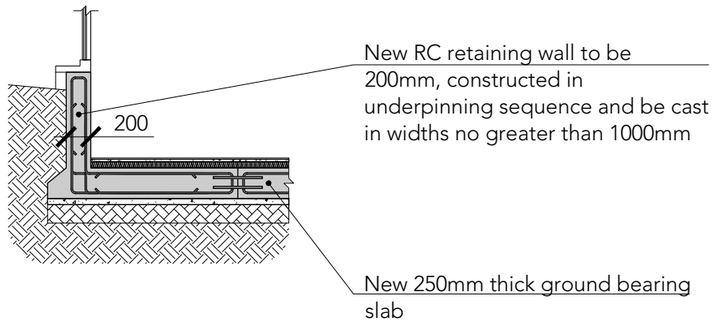
Drawing No.
100

Revision
P2

Scale
1:50 at A2




## Section S1
Scale 1:50

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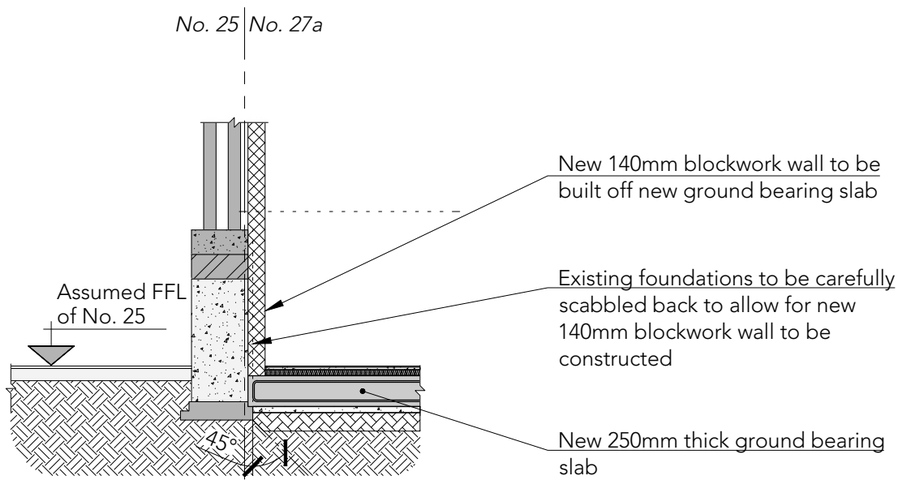
Scale 1:50




## Section S3
Scale 1:50

A3

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Drawing History

| Rev | Date | Description | Drawn | Checked |
|---|---|---|---|---|
| P1 | 08.07.21 | For Comment | AK | OG |
| P2 | 29.07.21 | For Comment | AK | OG |

PRELIMINARY
NOT FOR CONSTRUCTION

Title
Construction Sequence Methodology: Sections

Project
27a Lady Somerset Road,
NW5 1TX

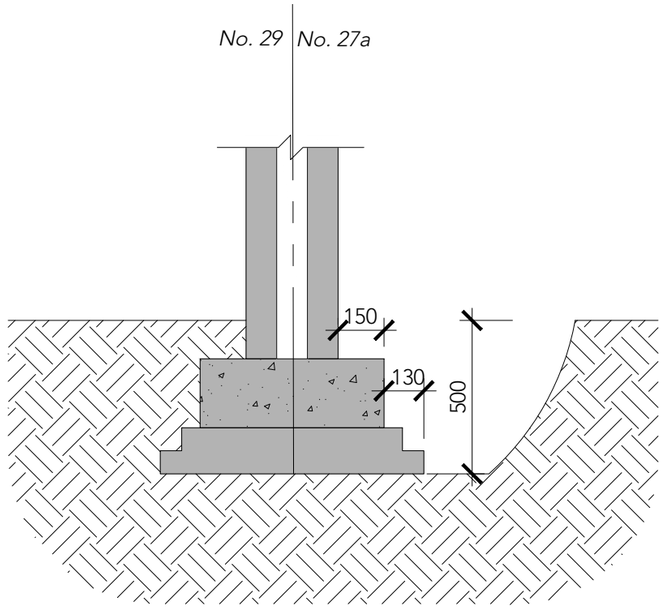
Client
Christoph Hus

Job No.
7285

Drawing No.
101

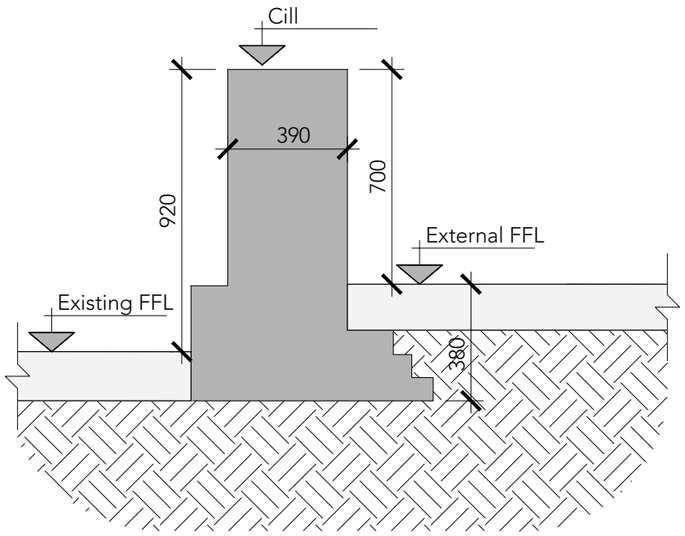
Revision
P2

Scale
1:50 at A3



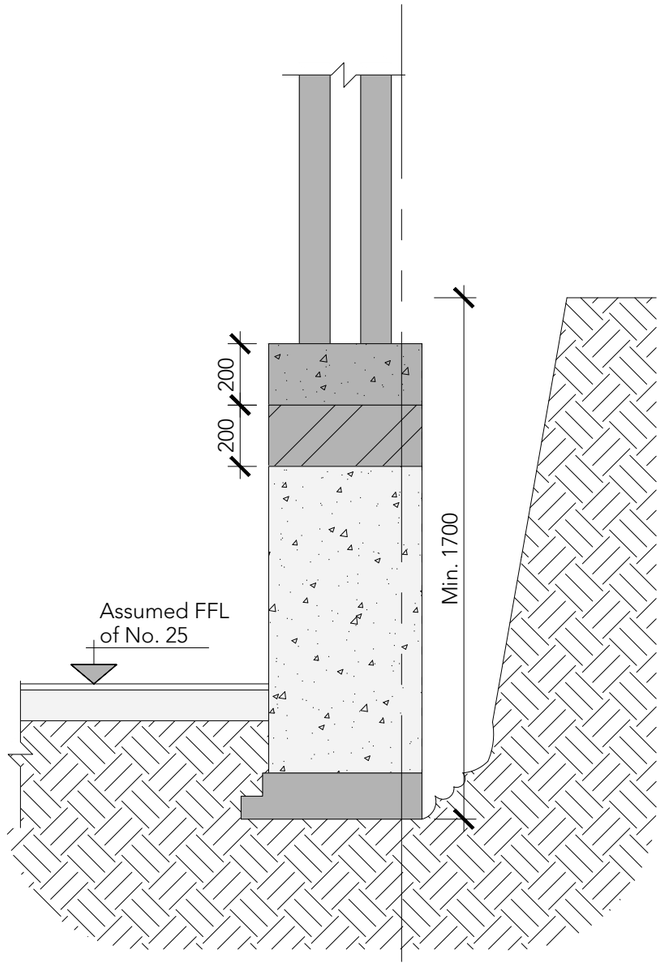

## Trial Pit 1

Scale 1:20



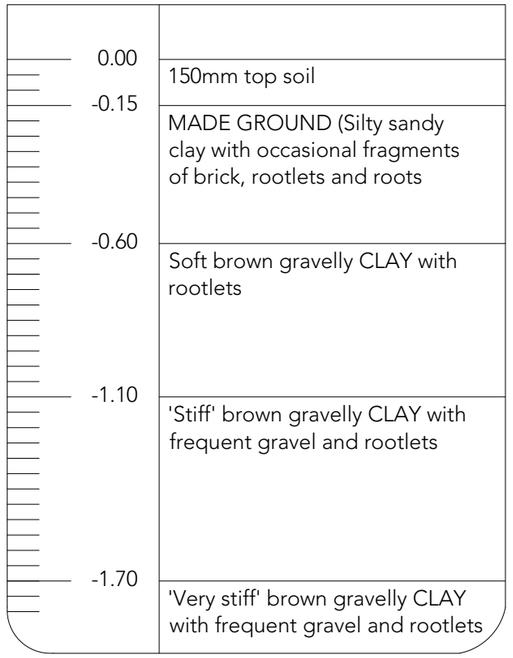

## Trial Pit 2

Scale 1:20




## Trial Pit 3

Scale 1:20




## Soil description

Scale 1:20

A3

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Drawing History

| Rev | Date | Description | Drawn | Checked |
|---|---|---|---|---|
| P1 | 08.07.21 | For Comment | AK | OG |

PRELIMINARY
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Title
Construction Sequence Methodology: Trial Pit Results

Project
27a Lady Somerset Road,
NW5 1TX

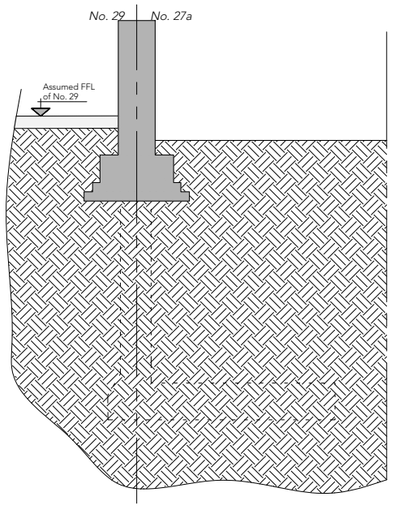
Client
Christoph Hus

Job No.
7285

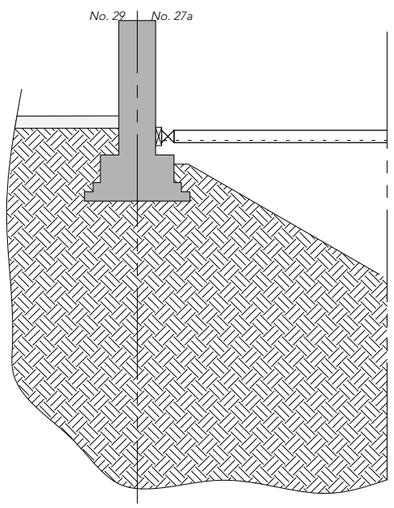
Drawing No.
102

Revision
P1

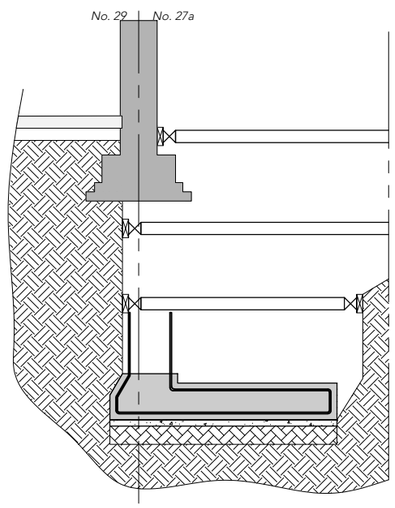
Scale
1:20 at A3



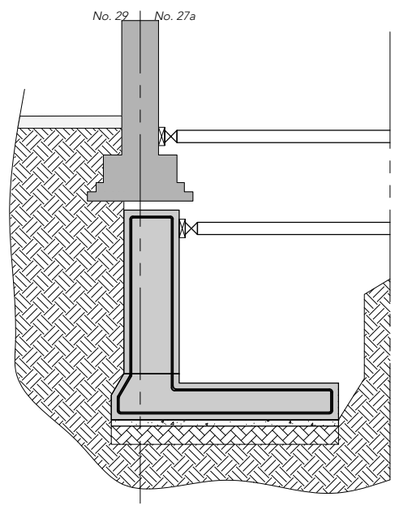

Existing - Before works commence



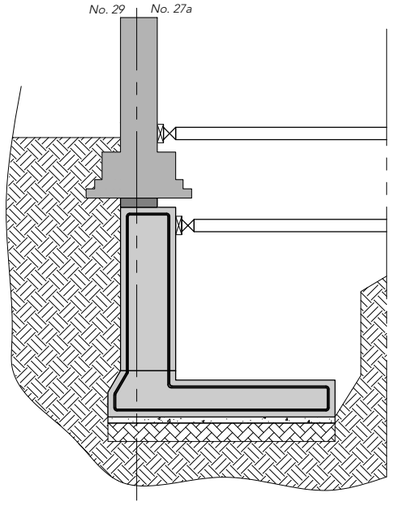

Stage 1 - Reduce ground levels generally throughout and install props between party walls



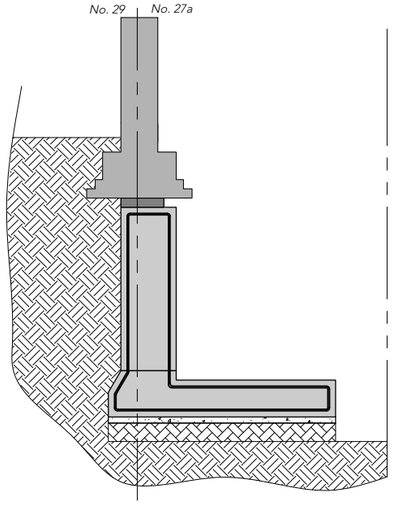

Stage 2 - Excavate to proposed founding depth. Prop any loose material as required. Pour base of retaining wall and form kicker



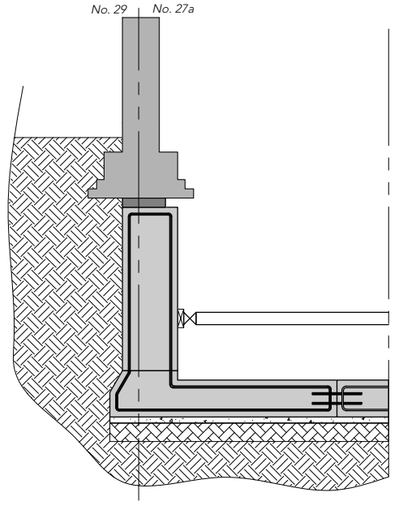

Stage 3 - Pour stem and prop retaining wall off adjacent pins or soil as appropriate



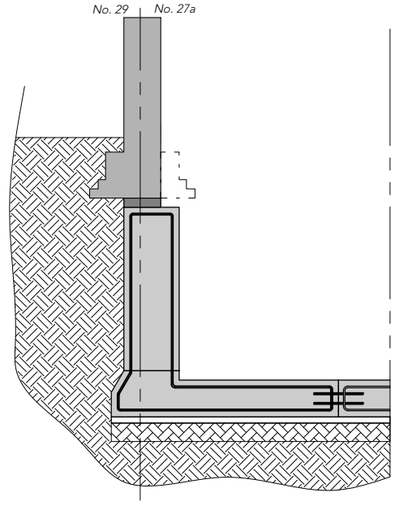

Stage 4 - Tightly dry pack between stem of underpin and underside of existing foundation. Repeat stages 2-4 for all pins




Stage 5 - Reduce level of central soil from front of property to back, lower props as excavation permits




Stage 6 - Once levels fully reduced cast slab throughout with dowels into retaining pins, remove high level props




Stage 7 - Once all concrete has cured, remove remaining props and demolish any existing foundations projecting internally. Install waterproofing system, internal insulation, screed, etc. Basement structural works completed

A3

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Drawing History

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|---|---|---|---|---|
| P1 | 08.07.21 | For Comment | AK | OG |

PRELIMINARY
NOT FOR CONSTRUCTION

Title
Construction Sequence Methodology: Sequence of Works

Project
27a Lady Somerset Road,
NW5 1TX

Client
Christoph Hus

Job No.
7285

Drawing No.
103

Revision
P1

Scale
1:50 at A3