



Consulting Structural Engineers

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Structural Method Statement

18A Lonsdale Square
London
N1 1EN

Information

Site: 18A Lonsdale Square, London, N1 1EN

Client: Mr. & Mrs. Martin

Architect: Buckmaster Batcup Architects

Project manager: John Sullivan

Structural engineer: Aleck Associates Ltd.

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1. Description

1.1. The property is a three storey detached house with some extra accommodation in the loft space. 18a Lonsdale Square is only concerned with ground and lower ground levels. All other floors of the house are owned by someone else.

1.1.1. It is proposed to construct a basement beneath the rear garden which won't extend into more than 50% of the total garden. Other minor alterations are proposed on the upper floors. The design of the basement extension is similar to one already built next door at no. 17.

1.1.2. The structural method statement is intended to demonstrate that the works can be carried out safely and without inappropriate hazard to the existing structure or surrounding property. The method and sequence of the works is the responsibility of the Contractor. The Contractor's proposed method statement is to be submitted to the Architect and the Engineer for comment at least two weeks before work starts.

2. Proposed Works

2.1. The proposed development comprises extending the existing basement at the site to include a proportion of the rear garden area and some internal structural alterations. Excavation will extend between 4-5m below ground level. Basement headroom will be approximately 2.7m in compliance with paragraph 3.46 of the DM3 policy.

2.2. The existing lightwell will be retained between the existing basement and the extension; new roof lights will be installed in the basement roof by the side of the conservatory. The basement is being developed as a habitable space.

2.3. The existing basement party and boundary walls adjacent to 19 Lonsdale Square will need to be underpinned in 1 metre lengths, using reinforced concrete retaining walls, a typical section of which is included in Appendix 2. The boundary between 18 and 17 Lonsdale Square will not require underpinning as a basement retaining wall already exists from no.17's basement extension.

3. Desk Study, Site History, Site Geology and Hydrology

3.1. Aleck Associates Ltd. commissioned a Basement Impact Assessment report (BIA) for the next door property 17 Lonsdale Square. It includes a desk based study of the site history, ground conditions, boreholes on site and a conclusion with recommendation. The desk study conducted for 18 Lonsdale Square is using basic information such as site history. The rest of the information found in this desk study has been taken and analysed from Islington's Strategic Flood Risk Assessment (SFRA) found online and other reliable resources.

- 3.2.** According to the findings from the previous report, the site where the property is located hasn't changed since 1869 when the square was developed. Prior to this it was in agricultural use. There is no damage recorded to the property.
- 3.3.** The property is a terraced house of Victorian style; all properties around the square are of the same architecture. All façades appear in fairly good condition. 18a Lonsdale has no sign of damage such as cracks.
- 3.4.** With regard to the geology, hydrogeology and hydrology, the site is immediately underlain by up to 1.00m of loose made ground, 0.60m to 1.45m of low to medium strength cobbly clay underlain by the permeable dense, to very dense Boyn Hill Gravel of 0.60m to 1m thick overlying the relatively impermeable London Clay which is classified as non-productive for groundwater by the Environment Agency. See appendix B
- 3.5.** The site lies around National Grid Reference 531336_E, 184031_N at a height of approximately 40m above Ordnance Datum. A site plan can be found in appendix A.
- 3.6.** After studying the SFRA it has been observed that the site isn't a flood risk zone and as the existing rear side of the site is fully paved and has a conservatory, the additional construction work will not alter the hard cover; consequently there isn't any increase to the flood risk. There are no surface water features within 100m of the site, the closest being the Regents Canal to the South. See appendix B
- 3.7.** When the boreholes were drilled at the neighbouring property, no groundwater was encountered. It is expected that a limited amount of groundwater may be met within the made ground, sand and gravel, during construction.
- 3.8.** After a visit to the property and inspection, the position and appellation of trees have been noted on a tree plan. All trees are +/- 10m away from the conservatory. See drawing 2965-2 appendix A
- 3.9.** There is no underground infrastructure.
- 3.10.** At the neighbouring property, 17 Lonsdale Square, a basement extension has recently been completed. The structural design was undertaken by Aleck Associates Ltd.
- 3.11.** Conclusions and recommendations:

Excavations for the proposed basement structure will require temporary support in all strata to maintain the stability of surrounding structures and to prevent any excessive horizontal ground movements.

If any water is encountered while excavating or from rain ingress, it can be dealt with by sump pumping; the soft layer of strata containing water should be removed before pouring any concrete for the basement floor. See section 5. Sustainable drainage strategy.

Works are to be done in short lengths of 1m and no more than 2m deep per lift. Further details in section 7. Basement Works and drawing 2965-1.

All vertical and lateral loads will be transferred to the floor slab by the retaining walls and then to the ground. Reinforced concrete will be used for the design of the basement's structure. The thickness of each member will be appropriate to its loads.

As all trees surrounding the area are about 10m or more away from the construction works, and none of them have more than an 800mm diameter, they will not be affected by the basement extension. However, the demolition and construction phase should be executed with suitable supervision and provide adequate protection to the trees following BS 5837:2012.

4. Sustainable Drainage Strategy

4.1. Regarding the drainage, the schemes will be designed to reduce flows to 'greenfield rate' of runoff - 8l/sec/ha for Islington; therefore the installation of a sump pump will be required. As the basement is only extending around a metre in the garden, the storage capacity will be dependent on the existing drainage put in place to service the conservatory and the surface area of the basement. The sump pump will require extra storage capacity to store the rainwater to reduce the flow of the water to the sewage and avoid sewage flooding. See drawing 2965-3 in appendix A

4.2. Calculation for sump storage based on:

Figure 5: Storage volumes for Islington with different return periods and runoff rates (m³/m²)

	Return period (yrs)	1	2	30	100	100 + 30%
Runoff rate	8l/sec/ha	0.010	0.014	0.032	0.045	0.062
	50 l/sec/ha	0.004	0.006	0.016	0.024	0.035
	100l/sec/ha	0.002	0.003	0.01	0.016	0.025

Surface area of basement: 35m² -> storage capacity -> 35*0.062= 2.17m³ ->2170L

4.3. The addition of a manhole will be necessary to allow access to the supplementary connections to the original drainage piping leading to the sewage.

5. General works

5.1. Occupy the site, establish welfare facilities and erect hoarding and scaffold gantry to site frontage

5.2. Prior to start of works, locate and examine all services on site. E.g. gas, electricity, water and drainage runs. All live services to be marked or made safe by a suitably qualified person.

5.3. Establish the location of the existing foundations, underground drains and any other obstruction or service runs. The engineer is to be advised of any details that

might conflict with the drawings.

- 5.4. Once all the items above have been completed, start with the general stripping out works in the house.

6. Site Preparation and Enabling Works

- 6.1. Hoardings are to be a maximum of 2.4m high and to be painted.
- 6.2. Spoil arising from the works will be removed by conveyor, or by hand, bagged from the working area and deposited within a roadside skip.
- 6.3. Pavements and roadside kerbs will be cleaned on a daily basis at the end of each shift or as and when required.
- 6.4. Temporary water supply and electrical services are to be provided to the working area.

7. Basement works

- 7.1. Form sequential reinforced concrete underpinning in a 2m deep x1m wide maximum sections. Push dowel bars into the soil to provide continuity with the bays adjoining and below (the basement will have to be constructed in two vertical lifts as the depth to formation level is about 2.7m). These works are to be undertaken following the sequence shown on drawing 2965/1 in appendix A. Excavation may need temporary propping using trench sheeting and acrow props, depending on the stability of the soil.
- 7.2. Excavation of underpin bases are not to exceed 1.0m in length and 2.0m deep, and no two adjacent sections should be excavated simultaneously.
- 7.3. As excavation progresses, install “waling beams” and lateral props to provide temporary support to underpinning and RC retaining walls.
- 7.4. Dry packing to underpin sections must only take place a minimum of 24hrs after concreting. Maximum thickness of dry packing shall not exceed 75mm and should only be placed after the underside of the existing foundation is cleaned and thoroughly regulised.
- 7.5. Once the first lift of underpinning has been completed, repeat the underpinning sequence with the second lift of underpinning.
- 7.6. Form the second lift of underpinning in a 2m deep x 1m wide maximum sections. Push dowel bars into the soil to provide continuity with the adjoining bays and the basement floor slab.
- 7.7. Once the second lift of underpinning has been completed, proceed with the bulk excavation down to formation level.

- 7.8. Install sump and drainage runs. Install reinforced concrete basement raft slab.
- 7.9. Install the permanent basement roof slab.
- 7.10. Seven days after the floor slab of the basement has been cast, the temporary lateral propping can be removed, allowing the permanent retaining walls to stand without further support.

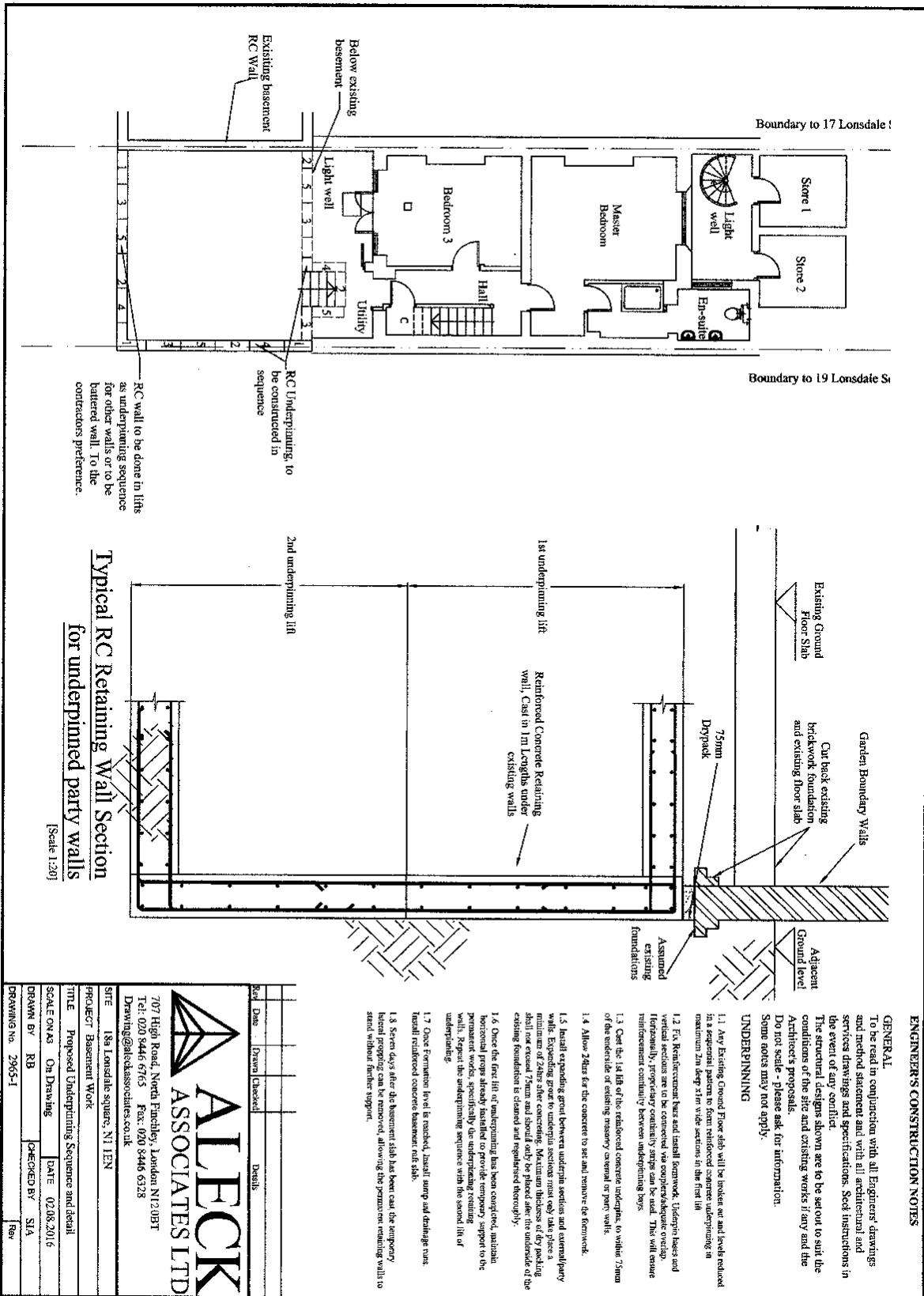
8. General risks to Health and Safety relating to structural works

- 8.1. **SERVICES:** The electrical, water and gas main supplies are or should be assumed to be live at all times until proven otherwise. Take all necessary steps to locate them before starting work and ensure that they are not damaged by the Works.
- 8.2. **OPEN EXCAVATIONS AND HOLES IN FLOORS:** Cover or guard all open excavations and holes in floors at all times. Place temporary boards on unboarded joists. Provide a safe and adequate ladder for access in each excavation where work is taking place.
- 8.3. **CONTACT WITH SEWAGE AND SOIL CONTAMINATION:** Foul and surface drains may be encountered in excavations. Provide washing facilities.
- 8.4. **SAFETY OF PERSONS IN EXCAVATIONS:** Provide all necessary shoring to excavations.
- 8.5. **SAFETY OF PERSONS IN THE SITE:** Protect the works from any form of damage or deterioration by any cause. Keep the site (including any area where the Contractor is operating in or near the premises) clean and tidy.
- 8.6. **CONTACT WITH CEMENT ETC.:** Provide protective clothing for all operatives who come into contact with dry or setting cement products. Provide clothes washing and drying facilities and protective and remedial skin cream.
- 8.7. **ASBESTOS:** If asbestos is found or suspected in the Site close off the area and advise the CA immediately.
- 8.8. **PERSONAL INJURY:** Ensure all operatives have and use hard hats, gloves, safe footwear and eye protection.
- 8.9. **HEARING DAMAGE:** Use only low noise equipment. All operatives using breakers or other noisy equipment at close quarters to be provided with and use ear protectors.
- 8.10. **VIBRATION:** Use only low vibration equipment. Limit operating times within correct limits for the type of tool and type of work being carried out.
- 8.11. **WORKING IN WATER:** Provide or ensure that all operatives have access to watertight footwear and waterproof clothing. Provide drying facilities and clean secure storage for operatives' clothing and effects.

8.12. SUPERVISION: Provide a competent and experienced site foreman at all times to whom instructions can be given and who will be in charge of the proper management of the Works including the health and welfare of the main Contractor's own labour and domestic and nominated subcontractors.

8.13. WELFARE: Provide toilets, washrooms, eating places, changing rooms and clothes drying facilities.

APPENDIX A



ENGINEER'S CONSTRUCTION NOTES

GENERAL

To be read in conjunction with all Engineer's drawings and method statement and with all architectural and services drawings and specifications. Seek instructions in the event of any conflict.
The structural designs shown are to be set out to suit the conditions of the site and existing works if any and the Architect's proposals.
Do not scale - please ask for information.
Some notes may not apply.

UNDERPINNING

- 1.1 Any Existing Ground Floor slab will be broken up and levels reduced in a sequential pattern to form reinforced concrete underpinning in maximum 2m deep x 1m wide sections in the first lift
- 1.2 For Reinforcement bars and install framework, Underpin beams and formwork shall be set out and supported on temporary concrete footings. The wall shall be cast in 1m lengths and shall be placed over a underside of the existing foundation it cleared and repointed thoroughly.
- 1.3 Cast the 1st lift of the reinforced concrete underpin, to within 75mm of the underside of existing masonry external or party walls.
- 1.4 Allow 24hrs for the concrete to set and remove the formwork.
- 1.5 Install expanding joint between underpin sections and external party walls. Expanding joint to underpin sections must only take place a maximum of 2m apart. The concrete shall be cast in 1m lengths and shall be placed over a underside of the existing foundation it cleared and repointed thoroughly.
- 1.6 Once the first lift of underpinning has been completed, install horizontal props already installed to provide temporary support to the walls. Repeat the underpinning sequence with the second lift of underpinning.
- 1.7 Once formation level is reached, install ramp and drainage runs install reinforced concrete basement tank slab.
- 1.8 Seven days after the basement slab has been cast, the temporary lateral propping can be removed, allowing the permanent retaining walls to stand without further support.

Rev	Details	Checked	Drawn
1			

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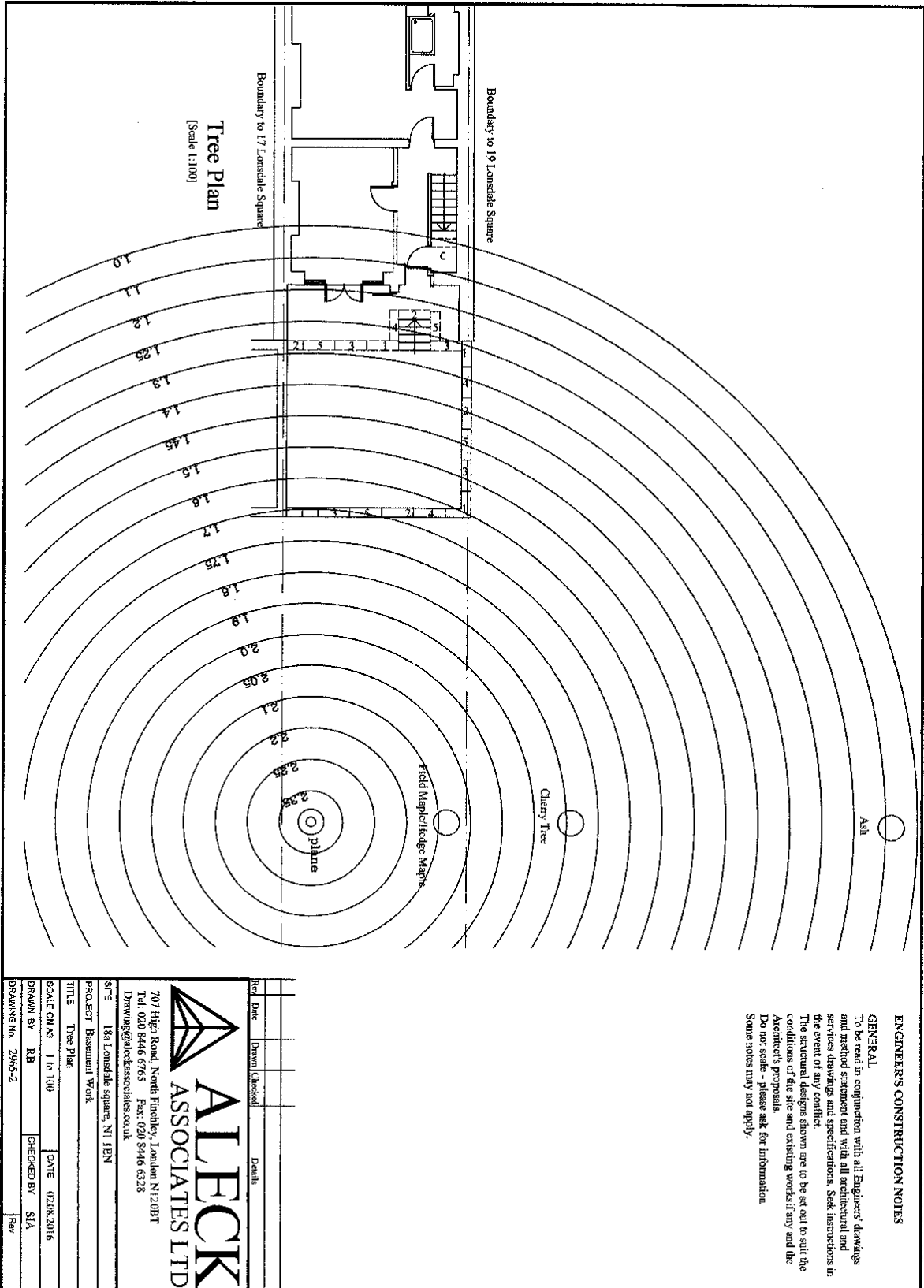
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PROJECT: Basement Work

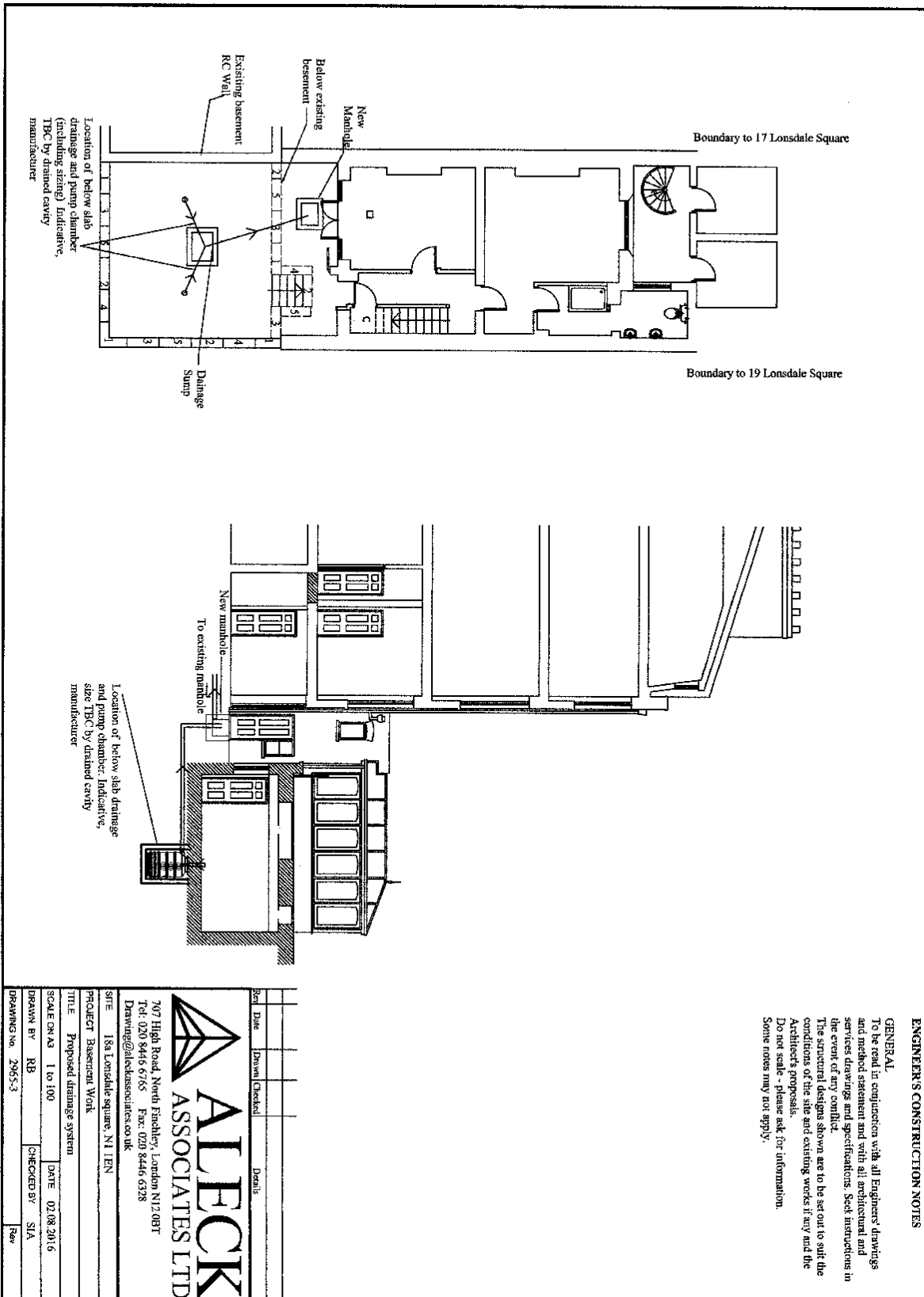
TITLE: Proposed Underpinning Sequence and detail

SCALE: A3: On Drawing DATE: 02/08/2016

DRAWN BY: RB CHECKED BY: SIA

DRAWING NO.: 2965-1 Rev






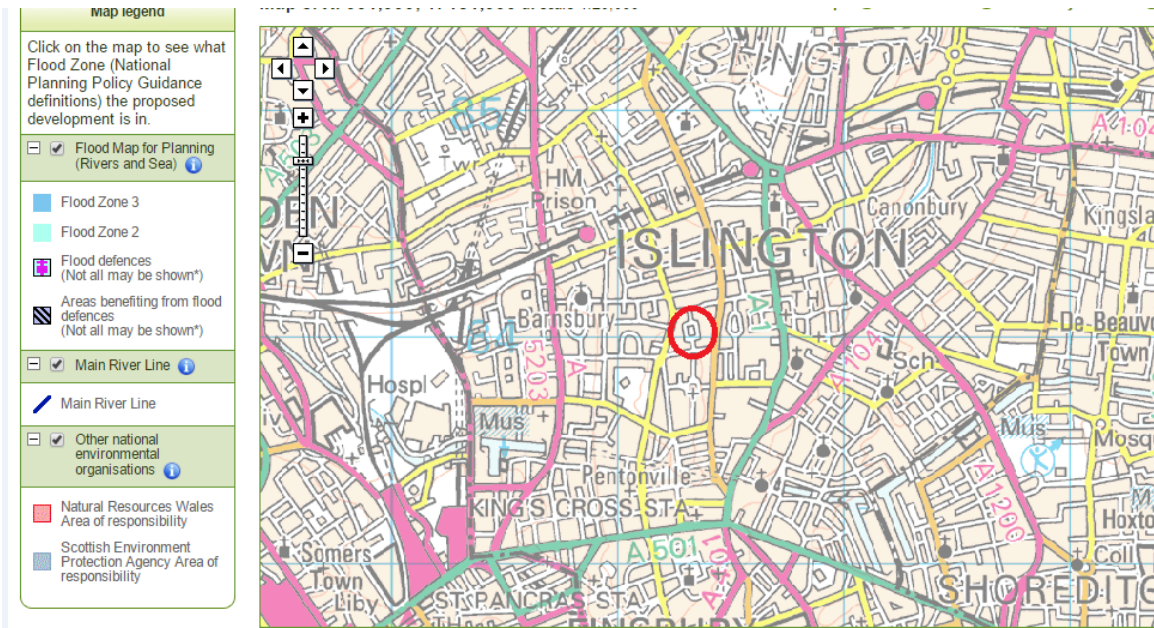
ENGINEER'S CONSTRUCTION NOTES

GENERAL

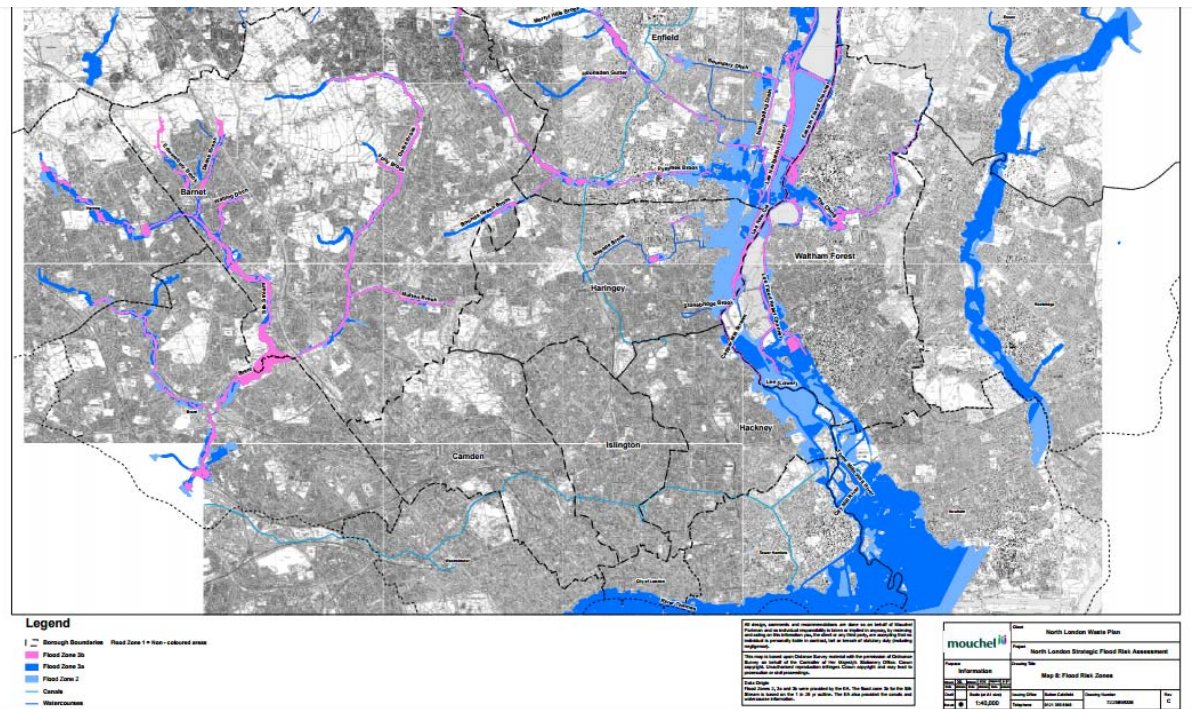
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Rev	Date	Drawn/Checked	Detail
			
707 High Road, North Finchley, London N12 0BT Tel: 020 8446 6765 Fax: 020 8446 6328 Drawing@aleckassociates.co.uk			
SITE 18A Lonsdale square, N1 1EN			
PROJECT Basement Work			
TITLE Proposed drainage system			
SCALE ON A3 1 to 100		DATE 02.08.2016	
DRAWN BY RB		CHECKED BY SJA	
DRAWING no. 2965-3			

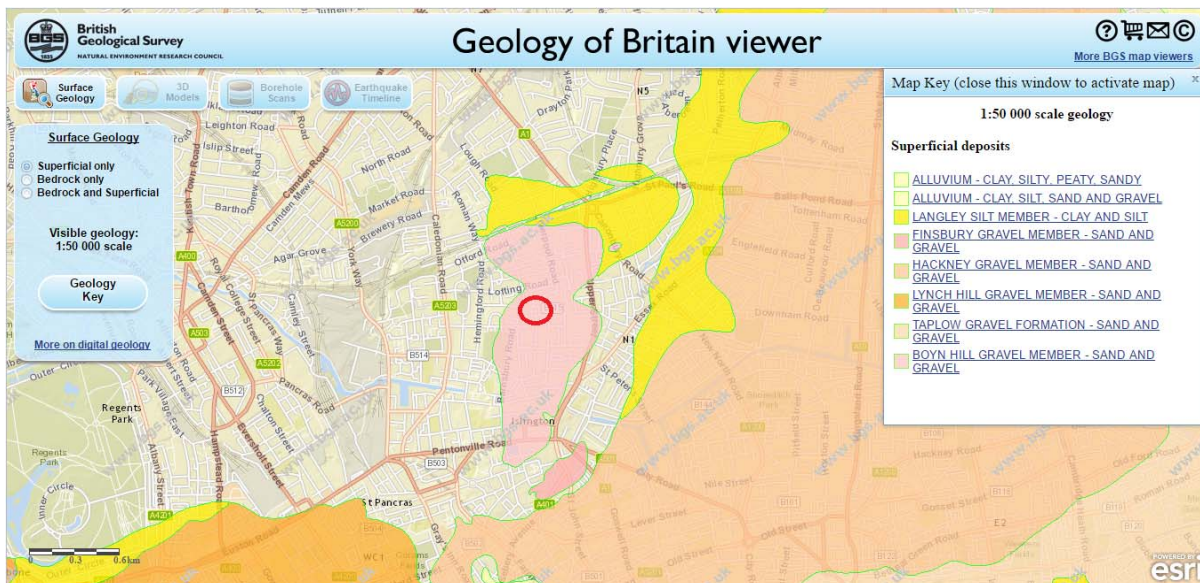
APPENDIX B



Flood Risk - Environment Agency



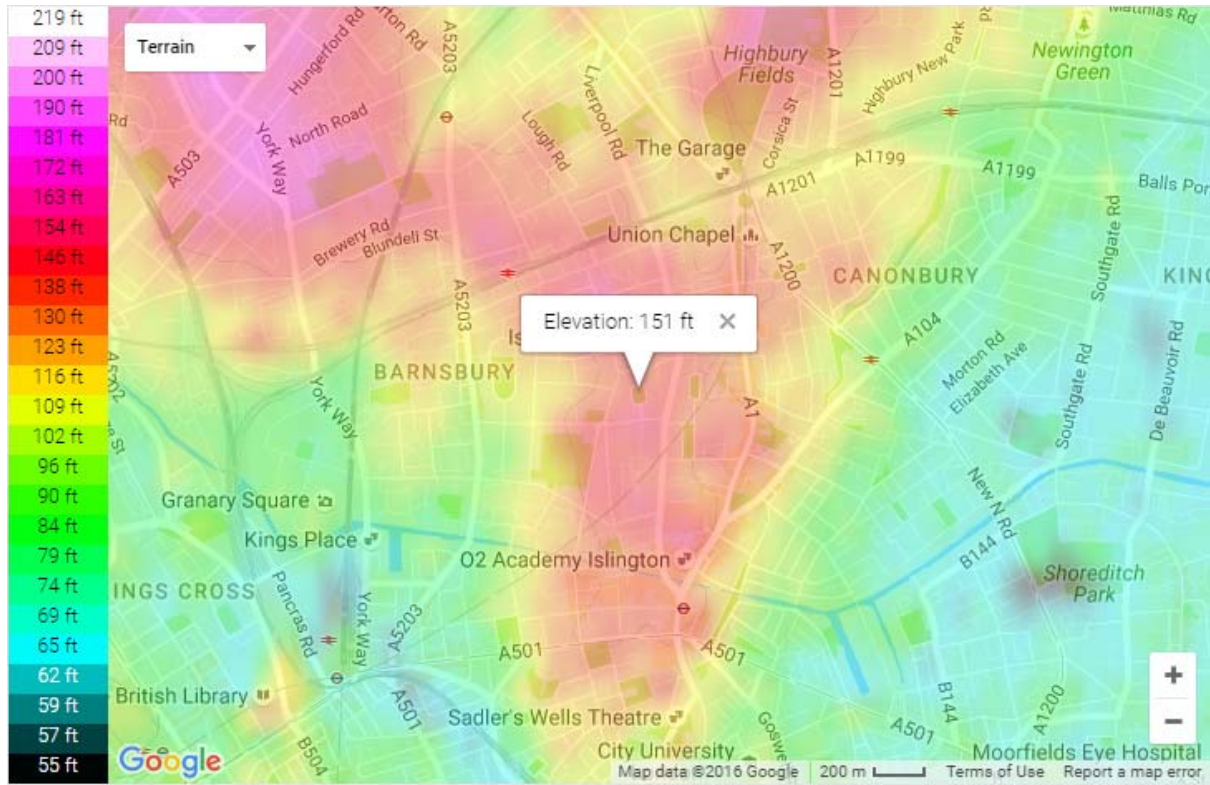
Water course – Mouchel



Superficial – Boy Hill Member



Bedrock – London Clay



Topography