elliottwood

53 Fitzroy Park
London, N6 6JA

Structural Engineering Design and Construction Method Statement

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date:	23/02/2017		I J Shepherd		GTPovey		GTPovey

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1.0 Non-Technical Summary

1.1 Elliott Wood Partnership have been appointed by the owner of this site to provide supporting documentation for the proposed Planning application for a new building on this site. The report focuses on the potential effect of the proposed development on adjoining properties and land, including hydrology. It forms part of the Basement Impact Assessment as required by the London Borough of Camden Planning Guidance CPG4 'Basements and Lightwells'. It is to be read in conjunction with the accompanying RSK Basement Impact Assessment (BIA 14th February 2017).

1.2 Elliott Wood Partnership have been involved with a number of projects in the immediate vicinity of this site. Previous projects include The Wallace House and Annex, The Water House, 49 Fitzroy Park and The Elms. All of these have involved excavation to create subterranean development of varying extent. We have also compiled the Basement Impact Assessment for the previous granted Planning permission on the site. The proposed development is for the demolition of an existing building and replacement with a three storey building including a partially submerged lower ground floor. This latest proposal will require significantly less excavation and consequence below groundwater compared to previous granted scheme.

1.3 The underlying ground conditions comprise made ground over London Clay. It is accepted that near surface ground water may currently be flowing through the upper made ground layer.

1.4 The approach adopted accepts that near surface water flows are likely to exist both during construction and after completion.

1.5 The proposals allow for water flows to be able to pass either around or under the new ground floor, both in the temporary and permanent condition. The temporary condition assumes that the perched water will flow into sumps dug into the lowest level following excavation at each level. This water is then pumped away to the existing surface water system. This is normally accepted by Thames Water in the short term. The permanent solution can be achieved relatively easily on this site by constructing a wall with permeable layers. As a result of this type of approach there should be no significant impact on the hydrogeology in the area of this development either from this proposal, or cumulatively from existing or consented basements (see accompanying RSK BIA).

1.6 The works are to be sequenced in such a way to ensure stability of the roadway is maintained throughout. It is accepted in the extant permission that there are no unacceptable impacts to the road and this is also true of these revised proposals (see accompanying RSK BIA). The contiguous piled wall will provide continued stability to the ground adjacent to the road throughout the excavation. Given the distance from the existing road the piles are only subjected to traffic surcharge loading at the base and will be designed accordingly. The piles will be designed to allow for site traffic in the short term. A series of land drains have been added around the basement and across the ground. This is a further measure to allow ground water to continue through the ground in the unlikely event that the entire main permeable wall systems blocks.

1.7 Contiguous piles are to be installed to the rear of the lower ground floor to maintain slope stability in the temporary case. The lower ground retaining walls will maintain stability in the permanent case.

1.8 It can be concluded from all the enclosed reports, and provided that the works are carried out by a suitably qualified contractor adopting the proposals within this report, that there should be no significant issues or unacceptable effects regard to:-

- Groundwater
- Surface water
- Stability of the road
- Stability of the ground
- Condition of the existing pond
- Local hydrogeology or hydrogeology beyond the site

1.9 Consequently there will be significantly less construction traffic, muck-away lorries etc. compared to the previous scheme.

2.0 Geology and Hydrogeology

A series of geological and hydrological investigations have been undertaken in 2009, 2010 and 2014.

GEA Report Summary – November 2009

2.1 An initial site investigation was undertaken at the site by GEA Ltd. which included four small diameter boreholes to a depth of 6m.

2.2 The ground conditions found during the site investigations appear to align with published geological data. The site is shown to be underlain by London Clay from the surface (with the exception of varying quantities of made ground) with the Claygate member overlying the London Clay to the North East of the site. The London Clay is defined as a non-aquifer and the Claygate member is defined as a minor aquifer. The London Clay effectively acts as a barrier to flow to the lower chalk major aquifer. Perched water is therefore likely to occur at the surface in the form of springs at the boundary between the Claygate member and the impermeable London Clay. London Clay has been proved directly below the made ground on this site and therefore springs associated with the boundary condition noted above should not occur on this site, although near surface flows are likely to be present in the made ground.

2.3 Ground water flow will be in a down slope direction Westerly or South-Westerly towards the Highgate ponds and the pond in the garden of 55 Fitzroy Park. Ground water flow within the London Clay is likely to be very slow, whereas flows in the made ground directly overlying the London Clay may occur at a greater rate. The made ground on the site varies in thickness from a maximum of 1.1 metres in BH 4 to 0.5 m in BH 1.

RSK report summary – December 2010 (Updated February 2017).

2.4 A further more detailed site investigation was carried out by RSK Group PLC. This included 9 boreholes (4 to a depth of 4m, 4 at 10m, 15m). A further report is attached updating the previous report which includes ground modelling.

2.5 The ground conditions were confirmed as made ground overlying London Clay across the site. This was found to be of very high plasticity, and desiccated.

2.6 Perched water was confirmed in the made ground, and flows are expected to be slow. Some seepage was noted in the clays, again at low rates.

2.7 Chemical testing of the site and pond water indicates that the pond water levels are not related to ground water flows, and are related to surface water flows.

2.8 Groundwater levels in the boreholes were measured in 2010 and again in 2014 which may more accurately represent the groundwater levels at equilibrium. Refer to accompanying RSK report for water levels.

3.0 Proposed Works at 53 Fitzroy Park

3.1 The development comprises the construction of a new three storey residential building. One storey of this building will be partially submerged below ground level at the rear with an anticipated FFL level of 80.34 AOD. The lift pit will extend lower to a SSL of 78.74 AOD, albeit localised to a small area of the footprint. The proposed ground levels to the front of the new building will be at approximately 82.34 AOD. The ground slopes down from Fitzroy Park road each side of the new building (from the north east and south east corners of the site), with the ground to the rear at a level of approximately 80.74 AOD. It is proposed that the retaining structure and superstructure will be constructed in reinforced concrete with a piled raft to support the vertical loads and deal with any tensile forces that might occur as a result of the hydrostatic pressures and heave that are likely to develop around the building. The lower ground level will be located fully within the London Clay.

4.0 Proposed Construction Method.

4.1 The most reliable approach for dealing with the possibility of ground water flow around a building or basement is to provide the necessary means for the water to continue to flow before, during and after construction without being impeded. This will avoid the buildup of water due to the damming effect of retaining walls, or the diversion of water into other areas or strata previously not affected by near surface water flow.

4.2 The main concern in terms of water flows on the site is therefore considered to be the near surface flows in the made ground overlying the London Clay. As already noted the flows through the London Clay will be at a very slow rate. This is also our experience of other adjoining sites particularly following heavy rainfall. In all cases the underlying clay has been dry and stable during the excavation and only becomes problematic during or shortly after rainfall. The proposed reinforced concrete retaining walls will maintain the stability of the slopes during rainfall. Therefore, there needs to be a strategy in place to allow the near surface flows to continue down slope during construction and after completion.

4.3 This can be facilitated by providing free draining or permeable zones both vertically and horizontally to allow the water to flow. The attached Schematic drawings show how this would work in principle in the permanent conditions. The permeable zones will comprise a hardcore type material or no fines concrete that both have reliable levels of porosity. Geotextiles may be used to prevent silting up of the voids and to prevent fines being washed out of the existing made ground. Water will be able to flow around and under the building from the uphill East side to the lower West side where it would rejoin the natural strata. Should water flows be high then a series of counterfort type drains could also be incorporated within the porous layer.

4.4 The vertical layer can be formed by using a proprietary void forming material that is then removed following construction of the permanent reinforced concrete wall. The void between the temporary piles and the permanent retaining wall can be backfilled with a free draining material. The temporary piled wall would be left in place.

4.5 Clearly this form of construction is likely to develop hydrostatic pressures to the perimeter walls and lower ground raft of the building as ground water will remain around the building until sufficient head of water is built up on the upstream side to effectively allow the water to continue to the downstream side. This replicates the existing condition and will prevent water from being displaced laterally. The lower ground construction will therefore need to be designed with this in mind. It is likely that the lower ground structure will therefore be designed as a water retaining structure in accordance with BS8007, design of concrete structures for retaining aqueous liquids, with a secondary means of defence such as an internal drained cavity system and associated sumps and pumps.

4.6 The new building will be set in from the boundaries to allow the temporary works wall and permeable layer to be formed.

4.7 During construction, ground water will be allowed to flow in to the excavation through the contiguous piled wall, in the same manner as the permanent condition. The proposed lower ground level will be near/below the level of the London Clay / made ground interface. In the temporary condition, water in the excavation will need to feed into sumps formed below the temporary formation level. This water will be pumped to the existing sewer system and will be subject to the agreement of Thames Water. Further in-situ testing is required to establish permeability of the made ground and this will be used to confirm whether land drains for adequate distribution of the ground water back in to the ‘down slope’ made ground in the permanent condition, are necessary.

4.8 On the basis that the water flows almost entirely exist within the made ground which is at a very shallow depth, contamination due to the introduction of wet concrete construction of the basement should be no more onerous than would occur for traditional foundations bearing through the fill in to the London Clay. Because the lower ground raft will be cast partially within the made ground layer, care should be taken to ensure the heave protection and shuttering on all sides prevents any contamination as in the case for traditional foundation. As all retaining walls will be shuttered on all sides there is actually less risk of contamination than for a traditional foundation where the concrete is simply cast against the made ground. Furthermore this method of construction actually allows water to continue to flow under the building whereas a more traditional strip foundation would act as a barrier to water flows within the made ground.

4.9 The London clay layer has been found to have a high plasticity and was extremely desiccated, and therefore the basement raft will need to be suspended to prevent heave affecting the building. This is to be achieved by utilizing a heave protection board on the formation level, with the permeable layer above, and the concrete structure built over this. Vertical loads would then only be transferred via a piled raft into the ground.

4.10 As an added 'belt and braces' approach, land drain will be included around the basement and across the site. This provides a further means by which the ground water can continue to move freely through the ground in the permanent condition.

5.0 Below ground drainage

5.1 It is proposed that the existing drainage connection to the public combined sewer in Fitzroy Park is retained and reused. This will be subject to its location and condition, which will be confirmed by CCTV survey.

5.2 Due to the slope of the site the proposed basement level is likely to be higher than the level of the existing public sewer connection. Consequentially the foul effluent generated at basement level is likely to be pumped to the main public system. Every effort will be made to drain the building via gravity wherever possible.

5.3 The impermeable area as a result of the development will be less than existing. Consequently, the surface water rate of discharge shall be restricted to match that of the existing site or 5L/s (whichever is greater). Note that 5L/s is the industry accepted minimum rate to which a flow control can viably be provided without introducing a significant risk of blockage. SUDS for the development will be considered with the inclusion of green roofs, permeable paving and ground attenuation crates, as necessary. The attached surface water flow and flooding scoping report discusses this in more detail.

5.4 The site is located in Flood Zone 1 as shown on the latest Environmental Flood maps, and as the site area is less than 1 hectare, a Flood Risk Assessment in accordance with the NPFF is not required. Fitzroy Park is not in Camden's own list of streets at risk of surface water flooding.

6.0 Construction Generally

6.1 Some of the issues that affect the sequence of works on this project are:

- The ground conditions
- The hydrogeology conditions on the site
- Drainage of the site during construction
- The stability of the adjoining highway
- Potential heave issues from the London Clay
- Vertical and lateral hydrostatic pressures from ground water acting on the basement.
- Forming sensible access onto the site to minimise disruption to the neighbouring residents
- Providing a safe working environment

7.0 Preliminary Assumed Sequence of Construction (To be read in conjunction with EW Section drawings 4000-4007)

7.1 Erect a fully enclosed site hoarding. All works are to take place within the hoarded zone. Tree and root protection zones should be established and maintained to satisfy the accompanying arboricultural protection strategy when approved. Any vulnerable services within the site and adjacent footpath should be identified and isolated if required.

7.2 Demolish existing building and level site over footprint of lower ground floor slab to a level of approximately 82.3 AOD. (Phase 1)

7.3 Lay piling mat of 300mm crushed concrete. Install contiguous piles around the South and East side of the proposed lower ground floor slab, ensuring there is adequate spacing between piles to facilitate the flow of water. (Phase 2)

7.4 Excavate down to 81.2 AOD and lay piling mat for the main building footprint. Install piles for the lower ground raft and lift pit (Phase 3)

7.5 Excavate down to underside of the new lower ground slab and lift pit ensuring the depth for the free draining material and heave protection is also excavated. Ensure suitable temporary sumps are excavated at all stages within the excavation to allow groundwater to be collected and pumped out of the main excavation. (Phase 4)

7.6 The clay in the immediate vicinity of the lift can be battered back at a safe angle. Excavate sumps below lower ground floor slab formation level. The form of construction for the sumps would be decided by the main contractor but could consist of either in-situ reinforced concrete or precast concrete rings. (Phase 4)

7.7 Lay Cellcore by Cordek for heave protection on blinding, and then 500 thk layer of free draining material (either no fines concrete or hardcore) to underside of lift pit slab. (Phase 5)

7.8 Cut down piles to required levels. Fix reinforcement and cast lift pit base and sumps (Phase 5)

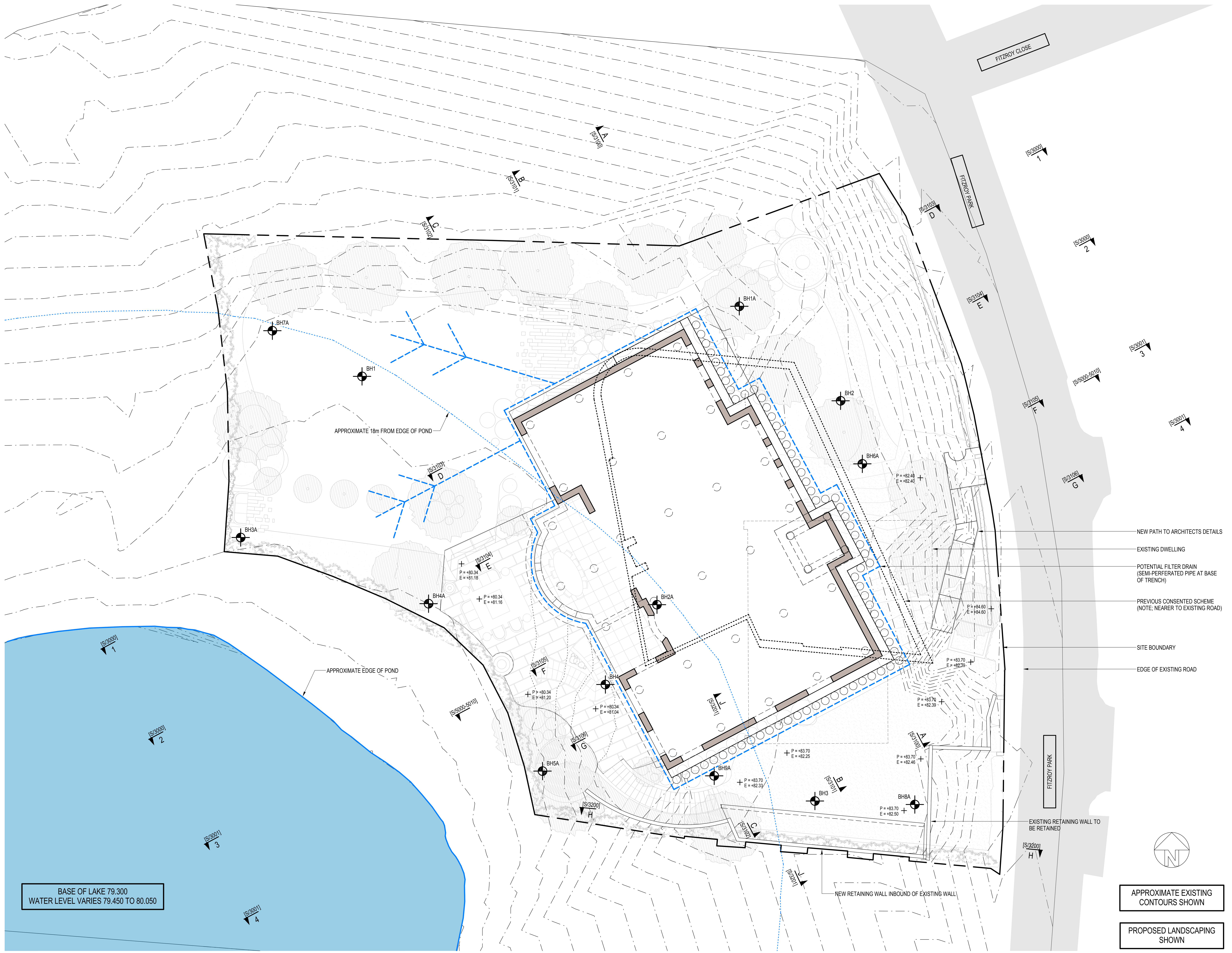
7.9 Repeat 7.6 and 7.7 for lower ground slab and kickers. (Phase 6)

7.10 Install void former between contiguous piles and all low level RC walls. Cast RC walls against void former to the rear. Erect formwork and cast other walls and columns to ground level. Erect formwork, fix reinforcement and cast RC ground floor slab. (Phase 7)

7.11 Once ground floor slab concrete is cured, backfill behind retaining walls with free draining material to the new proposed ground level (Phase 8)

7.12 Continue construction of RC frame to roof level.

Proposed Drawings



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Elliott Wood Partnership LLP, 241 The Broadway, London SW19 1SD
Consulting Structural and Civil Engineers. www.elliottwood.co.uk
tel: 020 8544 0033. fax: 020 8544 0066. info@elliottwood.co.uk

project
53 Fitzroy Park

drawing title
Proposed Site Plan

scale (s)	date	drawn
1:100@A1; 1:200@A3	January 2017	BMC

project no.	drawing status
2160751	Preliminary

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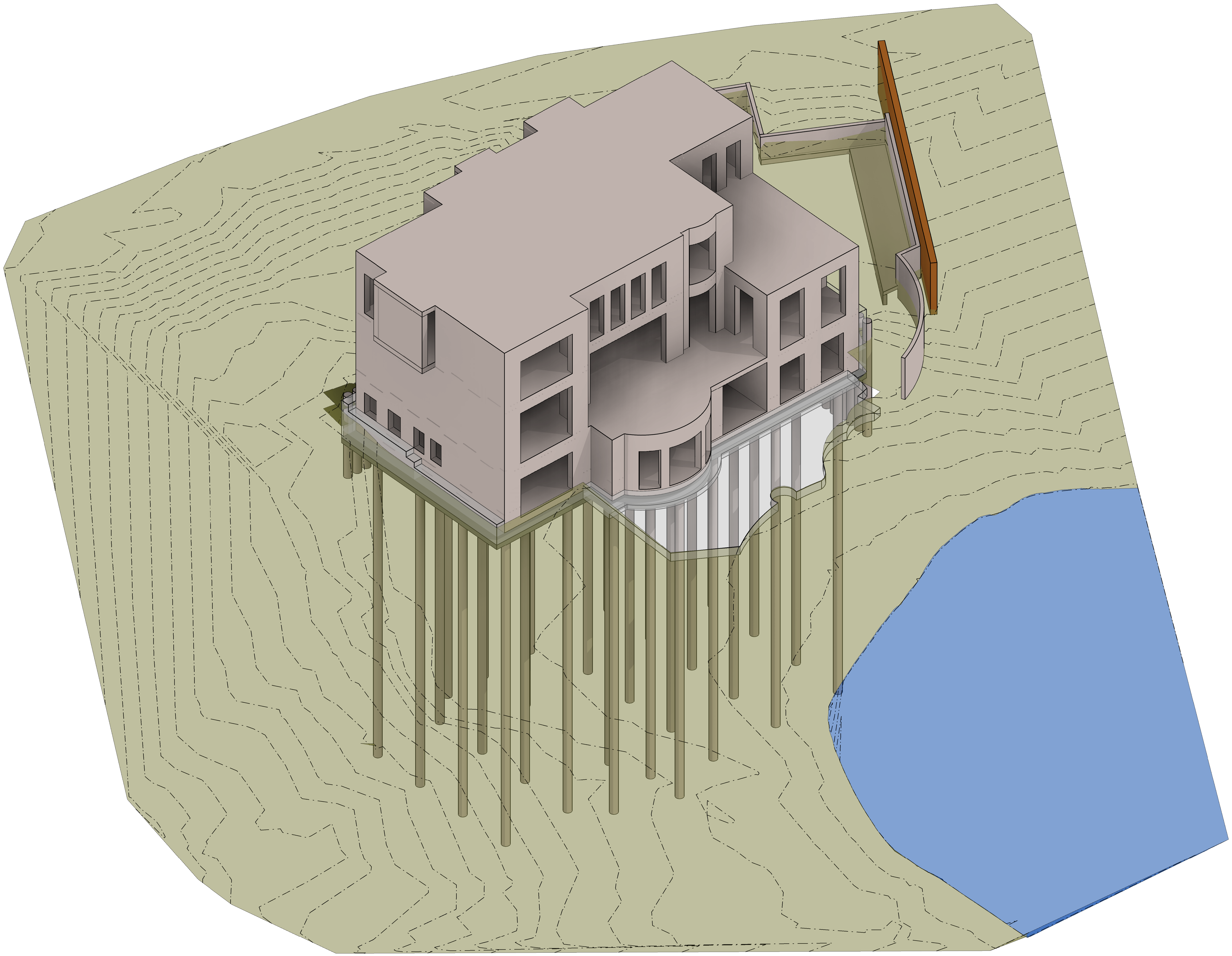

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drawing title
Proposed Site - 3D view

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NTS	January 2017	BMC

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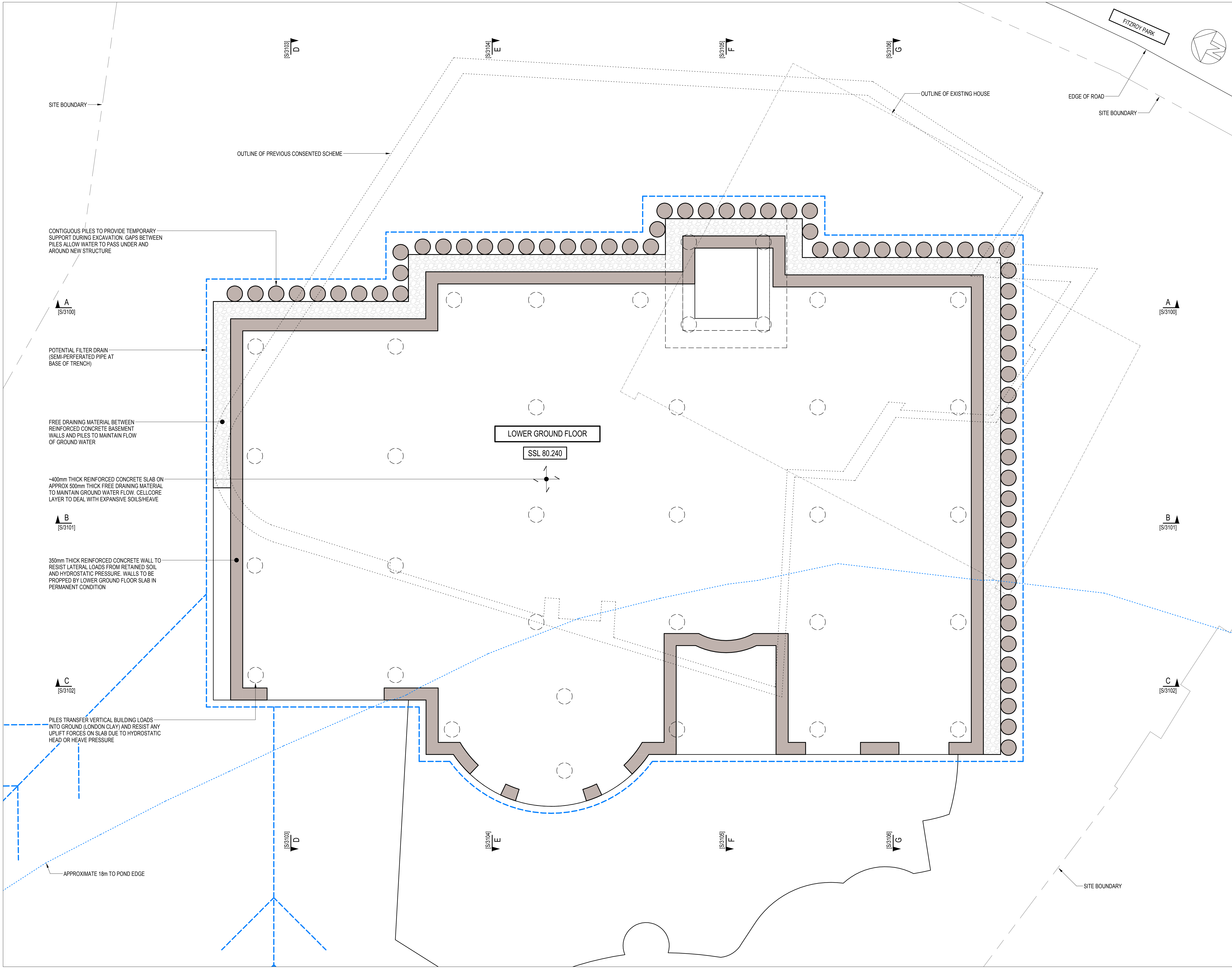

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drawing title
Proposed Lower Ground Floor Plan

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project no.	drawing status.
2160751	Preliminary

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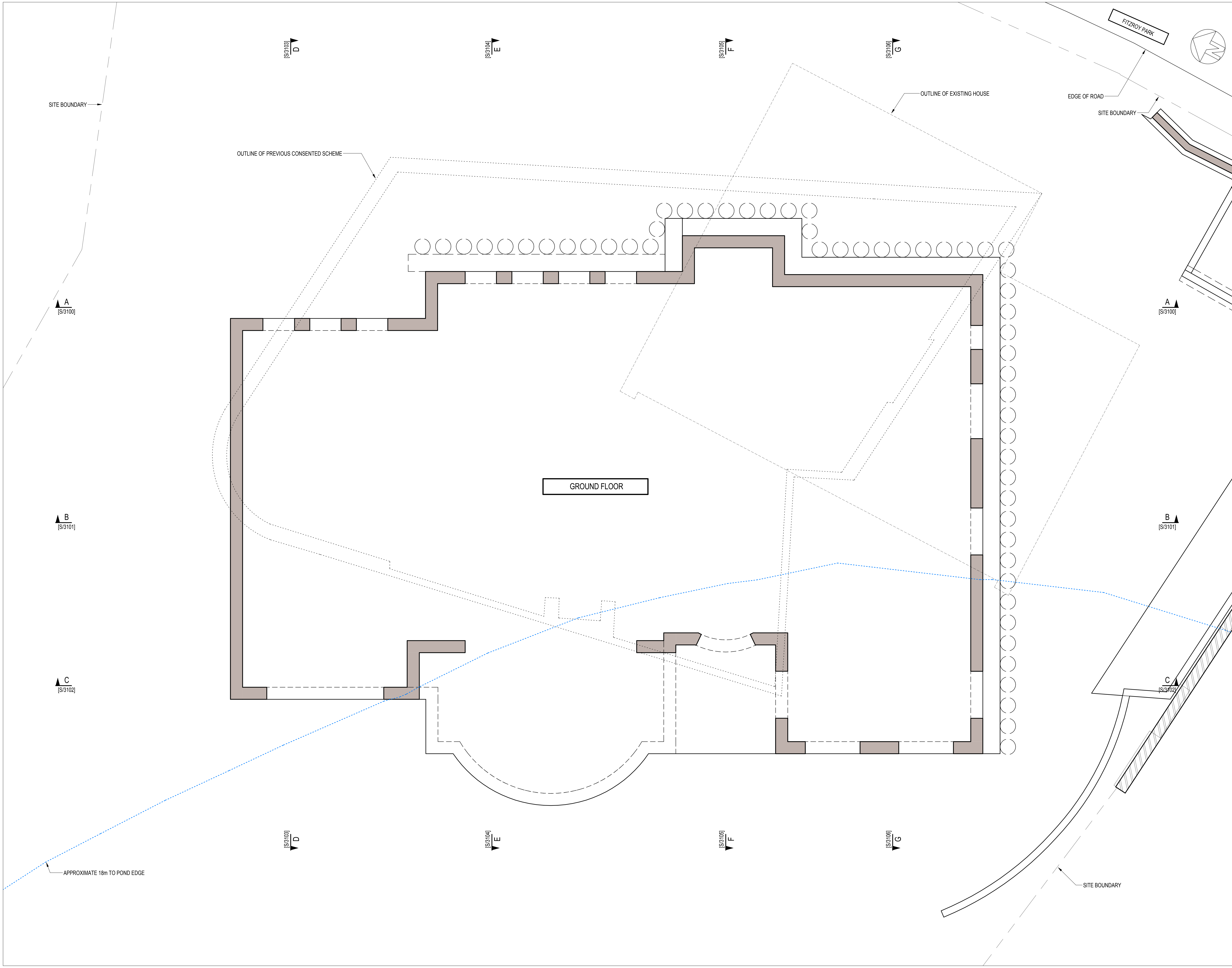

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drawing title
Proposed Ground Floor Plan

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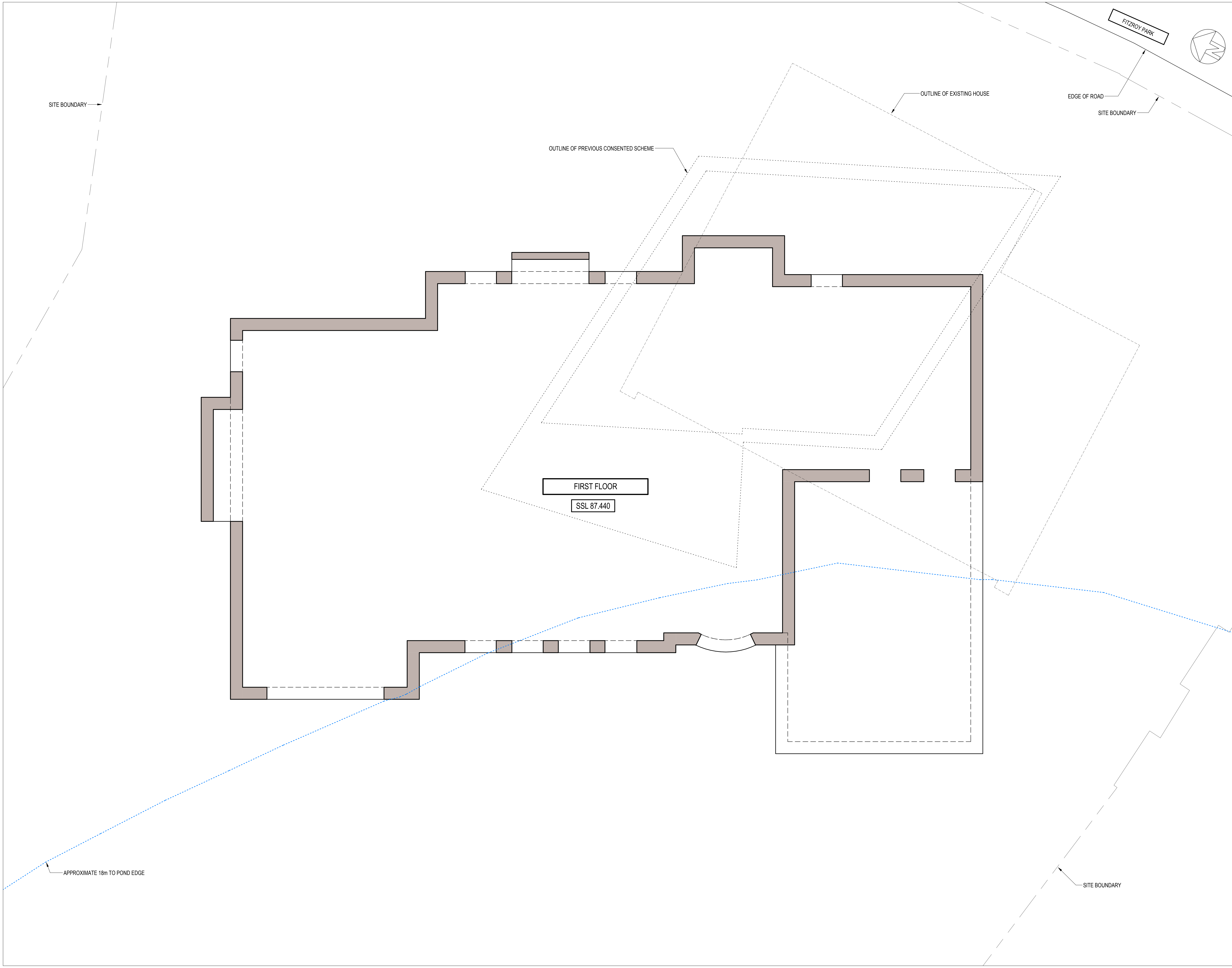

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project
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Proposed First Floor Plan

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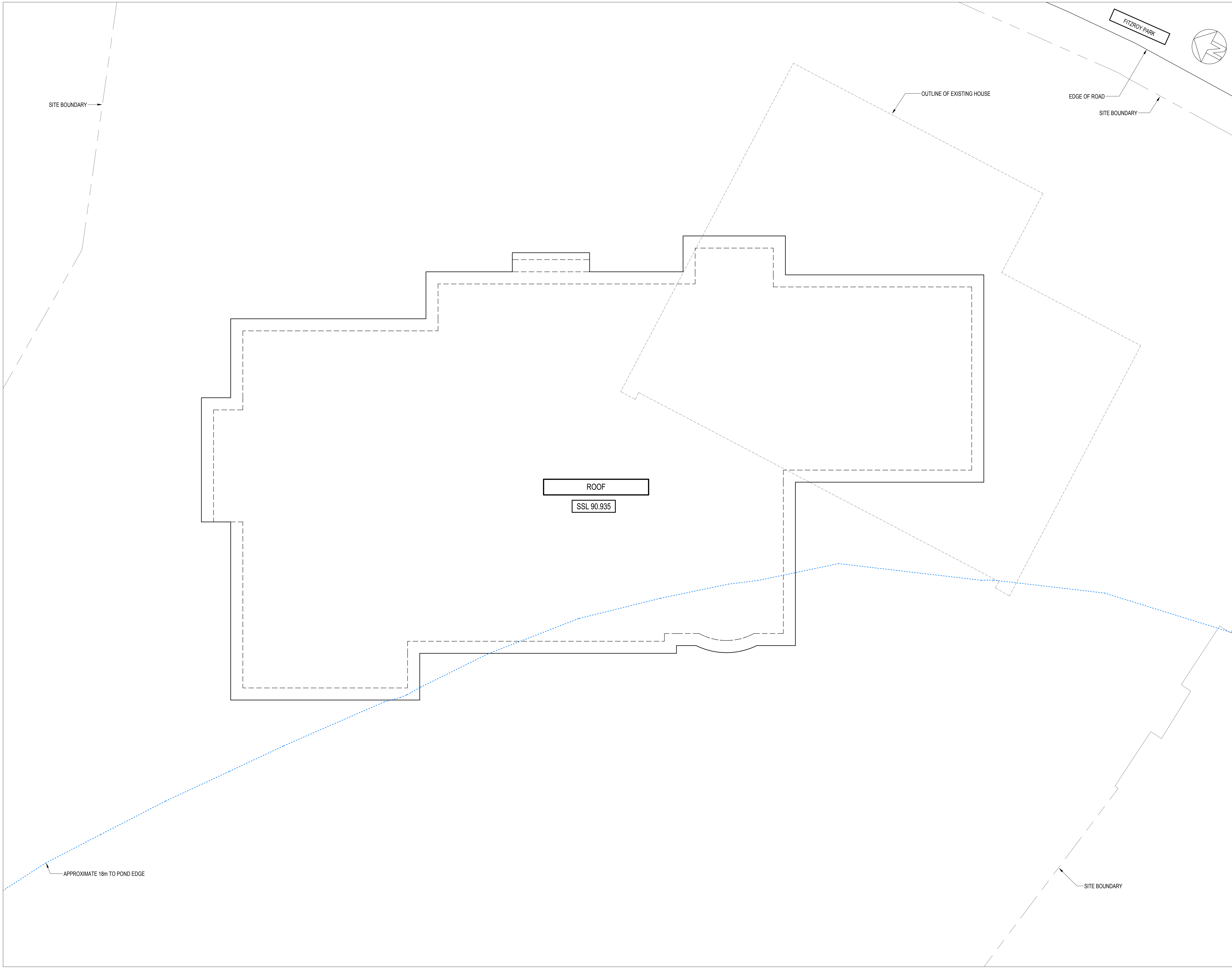

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project
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drawing title
Proposed Roof Plan

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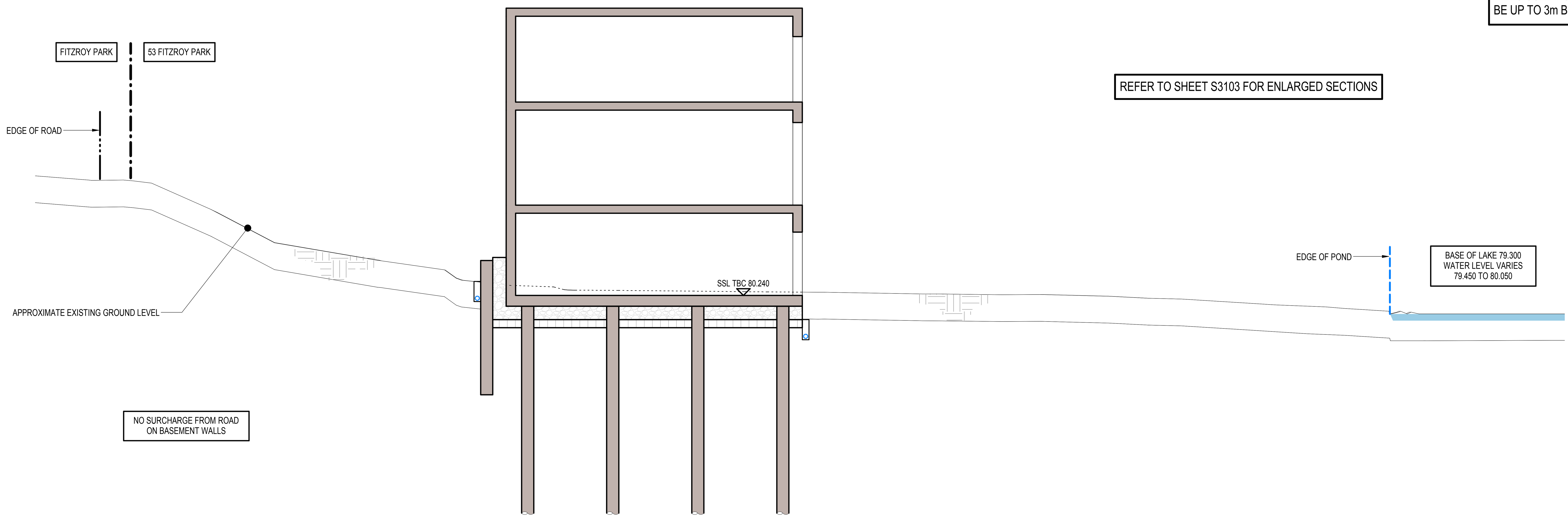

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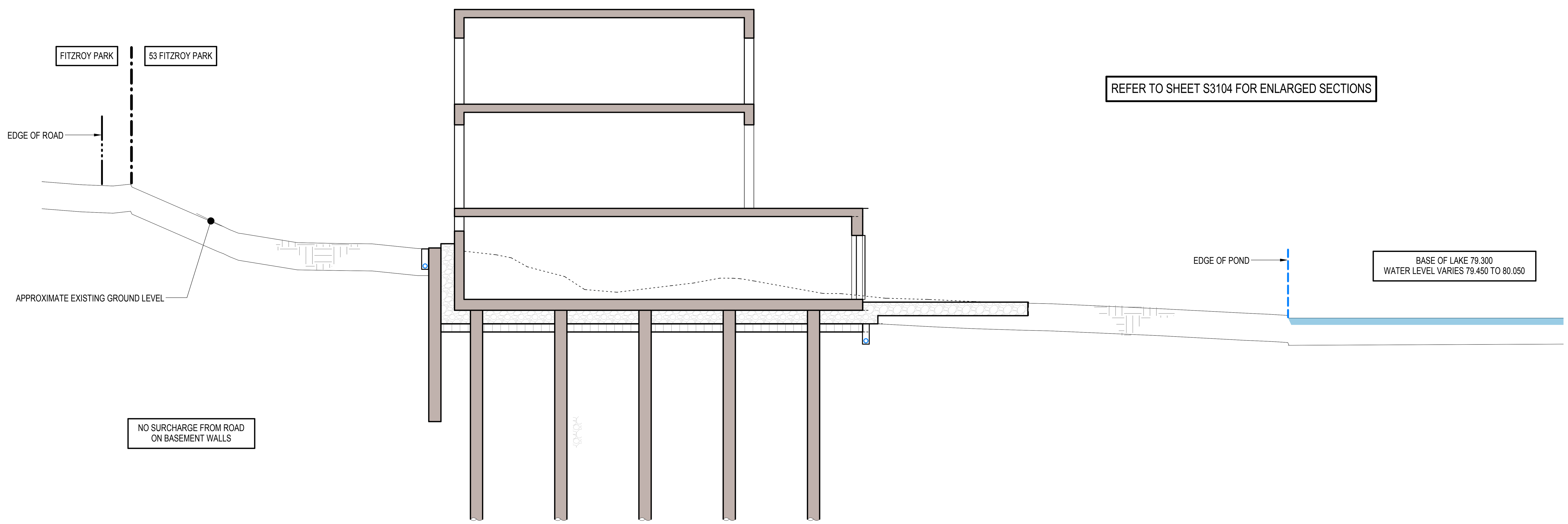

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tel: 020 8544 0033. fax: 020 8544 0066. info@elliottwood.co.uk

project
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drawing title
Site Section 1-1 and 2-2

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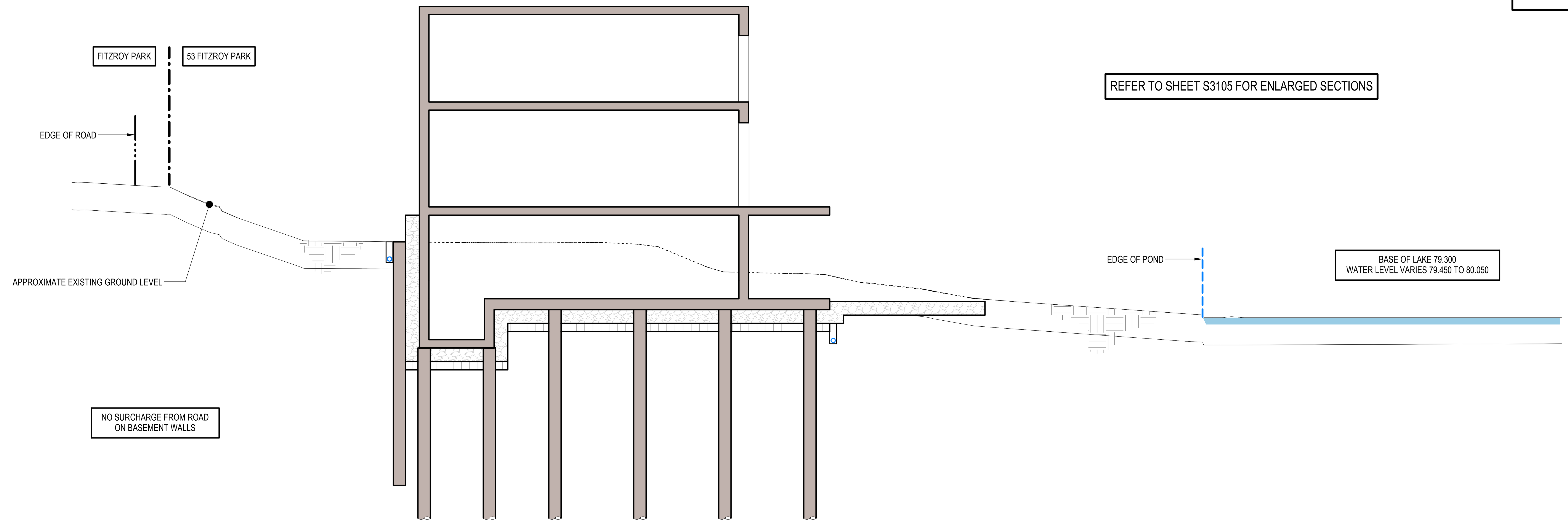

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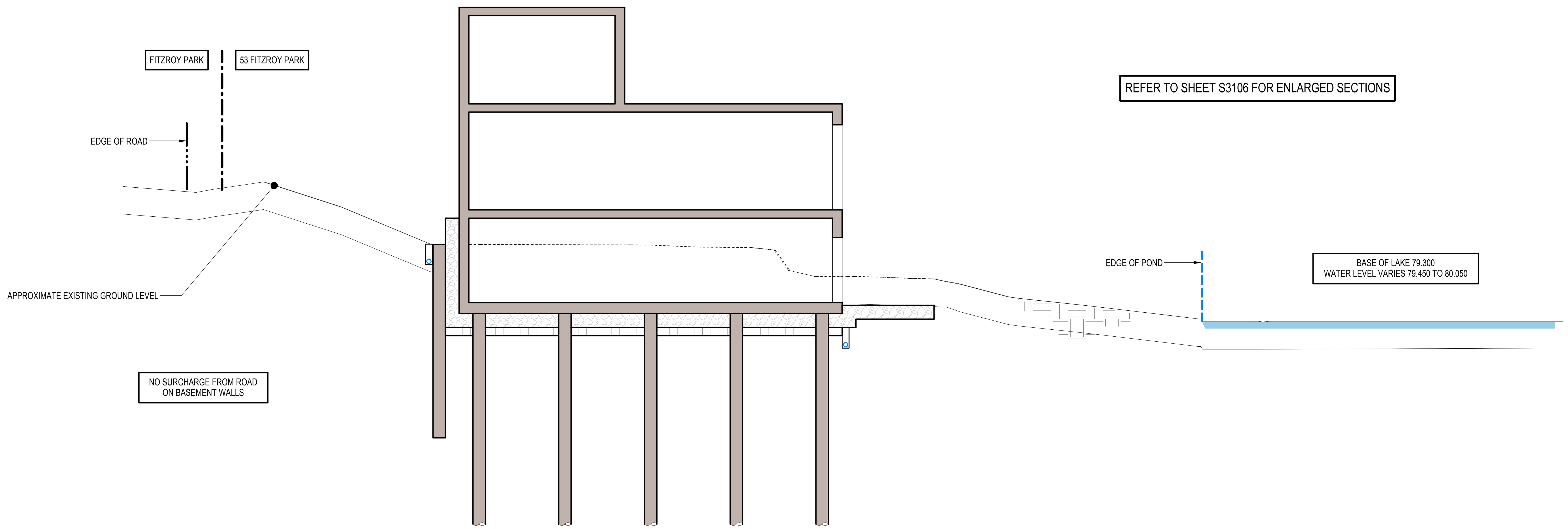

SECTION 4-4

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project
53 Fitzroy Park

drawing title
Site Section 3-3 and 4-4

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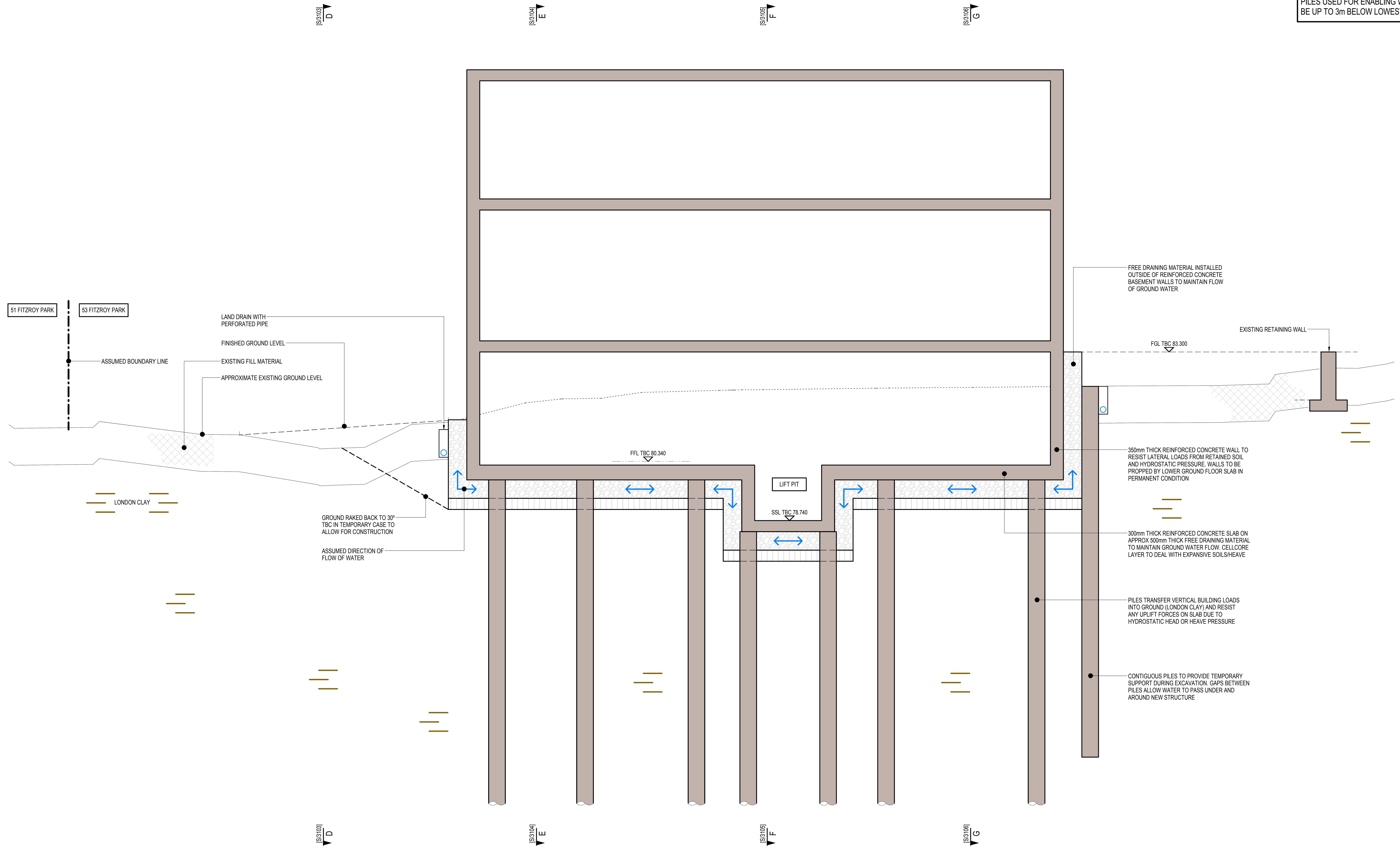

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Building Sections A-A

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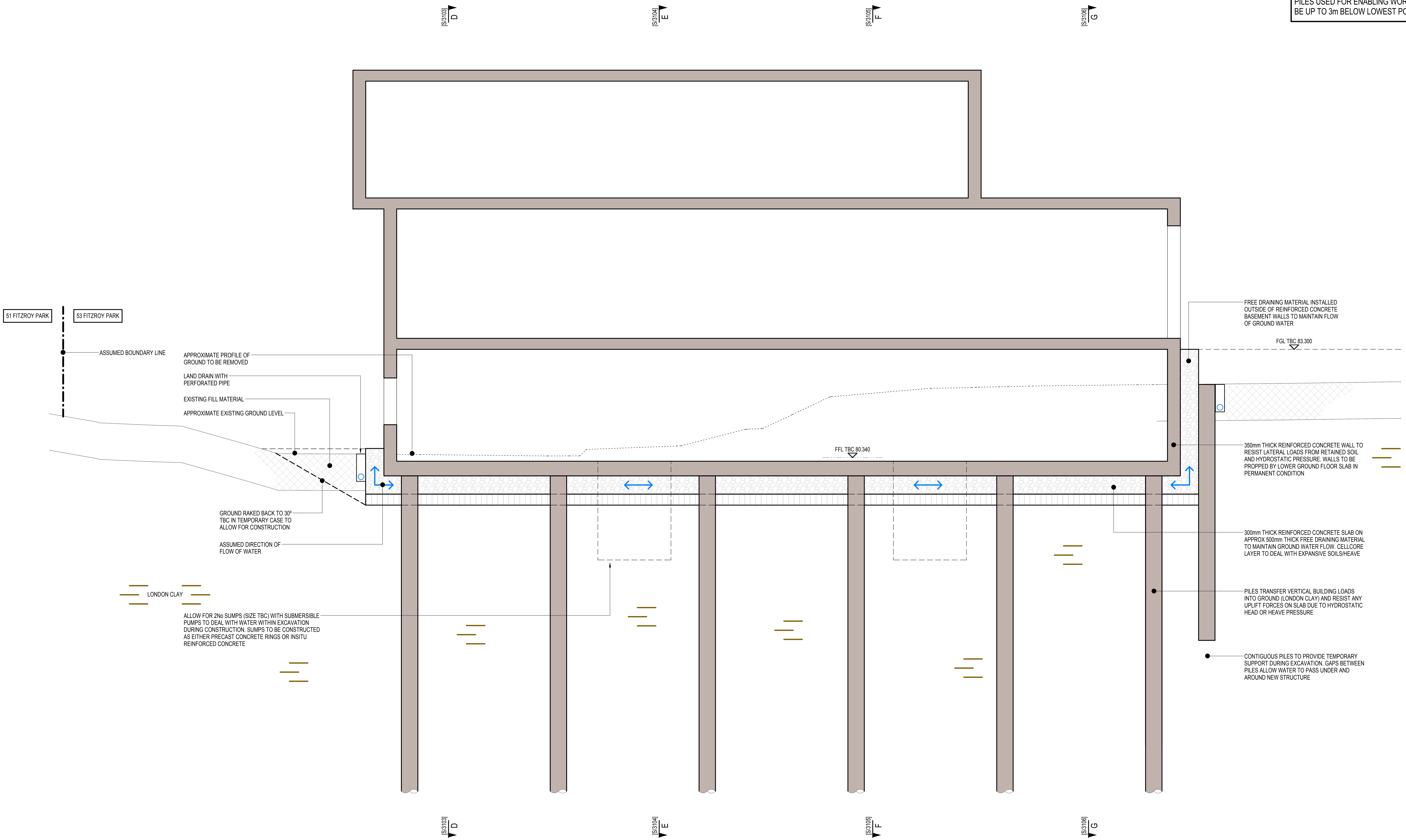

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Building Sections B-B

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tel: 020 8544 0033. fax: 020 8544 0066. info@elliottwood.co.uk

project
53 Fitzroy Park

project no.			drawing status.		
2160751			Preliminary		
originator.	zone.	level.	role.	drg no.	revision
EW	00	SEC	S	3101	P1

NOTE:
-ALL INTERNAL LOADBEARING PILES TO BE UP TO 15m BELOW LOWEST POINT.
-ALL EXTERNAL NON-LOADBEARING PILES USED FOR ENABLING WORKS TO BE UP TO 3m BELOW LOWEST POINT.

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Do not scale from this drawing.

0 500 1000 1500 2000 2500mm
SCALE 1:50 AT A1

NOT ALL INTERNAL COLUMNS AND WALLS SHOWN FOR CLARITY

NOT FOR CONSTRUCTION

rev	date	by	chk	description
P1	22.02.17	BMC	GP	Issued for Planning

drawing title
Building Sections C-C

scale (s)	date	drawn
1:50@A1; 1:100@A3	January 2017	BMC

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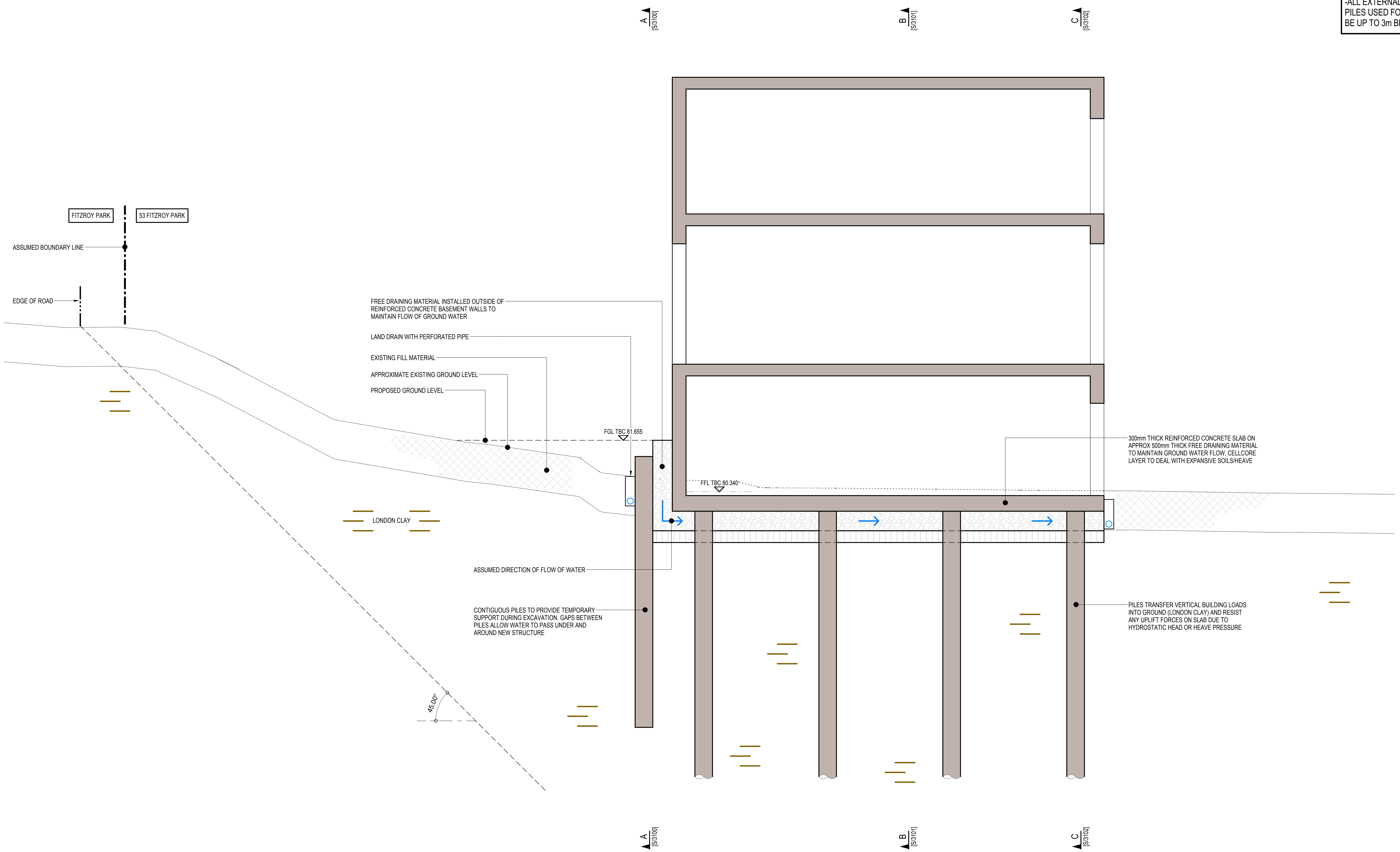
project
53 Fitzroy Park

project no.	drawing status.
2160751	Preliminary

originator.	zone.	level.	role.	drg no.	revision
EW	00	SEC	S	3102	P1

NOTE:
-ALL INTERNAL LOADBEARING PILES TO BE UP TO 15m BELOW LOWEST POINT.
-ALL EXTERNAL NON-LOADBEARING PILES USED FOR ENABLING WORKS TO BE UP TO 3m BELOW LOWEST POINT.



This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

Do not scale from this drawing.

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SCALE 1:50 AT A1

NOT ALL INTERNAL COLUMNS AND WALLS SHOWN FOR CLARITY

NOT FOR CONSTRUCTION

rev	date	by	chk	description
P1	22.02.17	BMC	GP	Issued for Planning

drawing title
Building Sections D-D

scale (s)	date	drawn
1:50@A1; 1:100@A3	January 2017	BMC

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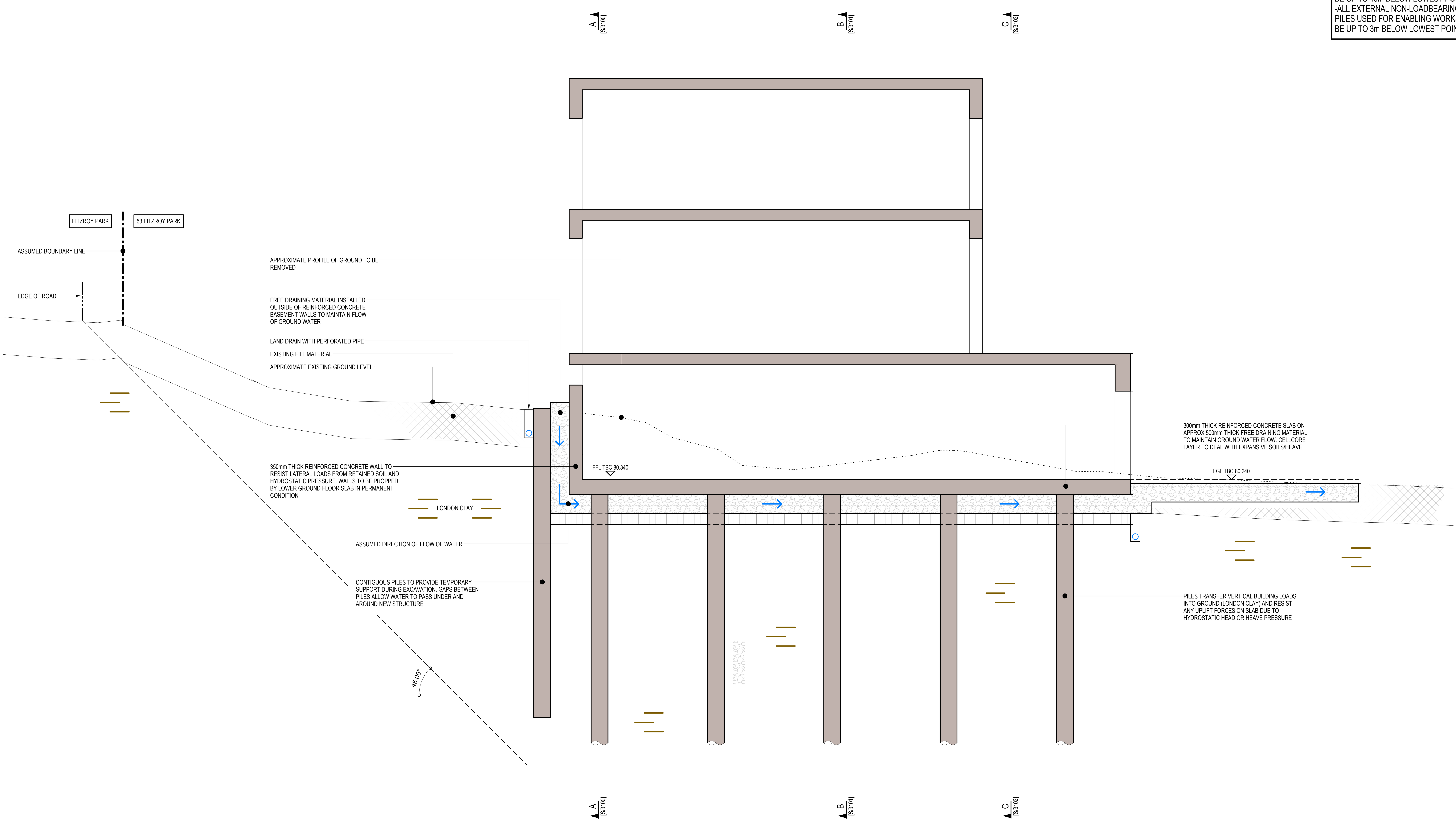
tel: 020 8544 0033. fax: 020 8544 0066. info@elliottwood.co.uk

project
53 Fitzroy Park

project no.			drawing status.		
2160751			Preliminary		
originator.	zone.	level.	role.	drg no.	revision
EW	00	SEC	S	3103	P1

NOTE:
-ALL INTERNAL LOADBEARING PILES TO BE UP TO 15m BELOW LOWEST POINT.
-ALL EXTERNAL NON-LOADBEARING PILES USED FOR ENABLING WORKS TO BE UP TO 3m BELOW LOWEST POINT.



This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

Do not scale from this drawing.

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SCALE 1:50 AT A1

NOT ALL INTERNAL COLUMNS AND WALLS SHOWN FOR CLARITY

NOT FOR CONSTRUCTION

rev	date	by	chk	description
P1	22.02.17	BMC	GP	Issued for Planning

drawing title
Building Sections E-E

scale (s)	date	drawn
1:50@A1; 1:100@A3	January 2017	BMC

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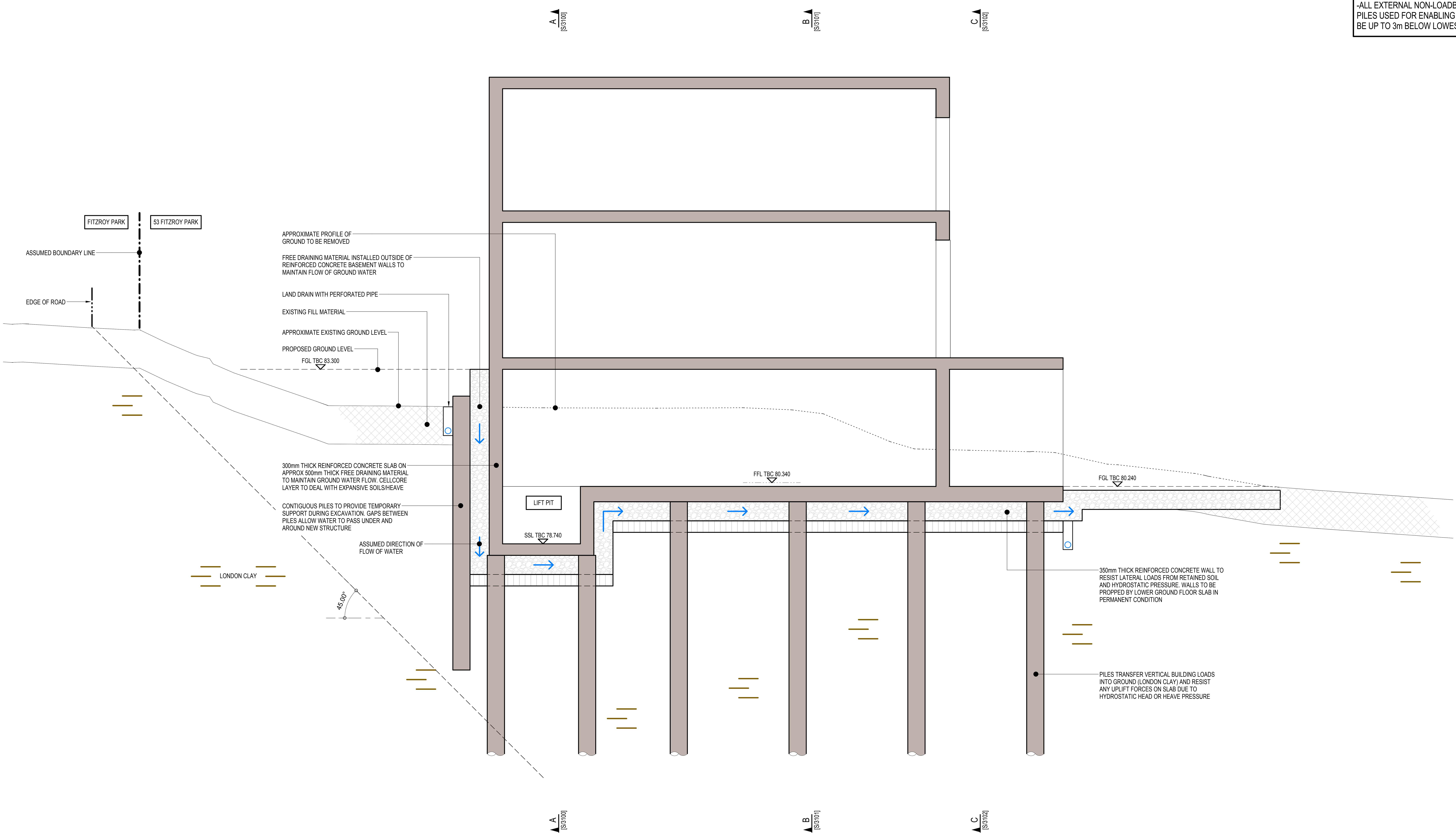
tel: 020 8544 0033. fax: 020 8544 0066. info@elliottwood.co.uk

project
53 Fitzroy Park

project no.			drawing status.	
2160751			Preliminary	
originator.	zone.	level.	role.	drg no.	revision

originator.	zone.	level.	role.	drg no.	revision
EW	00	SEC	S	3104	P1

NOTE:
-ALL INTERNAL LOADBEARING PILES TO BE UP TO 15m BELOW LOWEST POINT.
-ALL EXTERNAL NON-LOADBEARING PILES USED FOR ENABLING WORKS TO BE UP TO 3m BELOW LOWEST POINT.



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SCALE 1:50 AT A1

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NOT FOR CONSTRUCTION

rev	date	by	chk	description
P1	22.02.17	BMC	GP	Issued for Planning

drawing title
Building Sections F-F

scale (s)	date	drawn
1:50@A1; 1:100@A3	January 2017	BMC

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Consulting Structural and Civil Engineers. www.elliottwood.co.uk
tel: 020 8544 0033. fax: 020 8544 0066. info@elliottwood.co.uk

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project no.	drawing status.
2160751	Preliminary

originator.	zone.	level.	role.	drg no.	revision
EW	00	SEC	S	3105	P1

NOTE:
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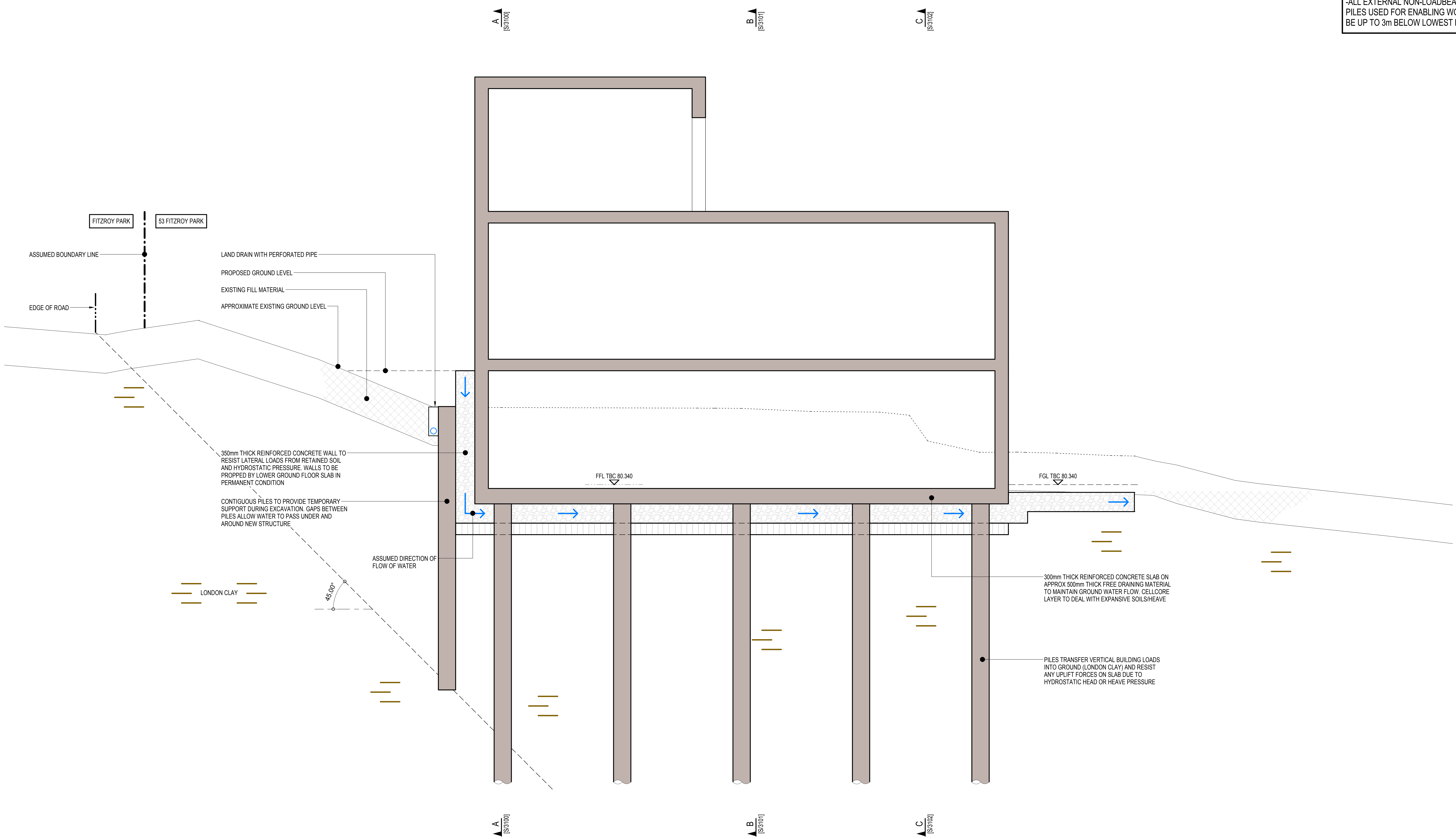

This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

Do not scale from this drawing.

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SCALE 1:50 AT A1

NOT ALL INTERNAL COLUMNS AND WALLS SHOWN FOR CLARITY

NOT FOR CONSTRUCTION

rev	date	by	chk	description
P1	22.02.17	BMC	GP	Issued for Planning

drawing title
Building Sections G-G

scale (s)	date	drawn
1:50@A1; 1:100@A3	January 2017	BMC

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Elliott Wood Partnership LLP, 241 The Broadway, London SW19 1SD
Consulting Structural and Civil Engineers. www.elliottwood.co.uk
tel: 020 8544 0033. fax: 020 8544 0066. info@elliottwood.co.uk

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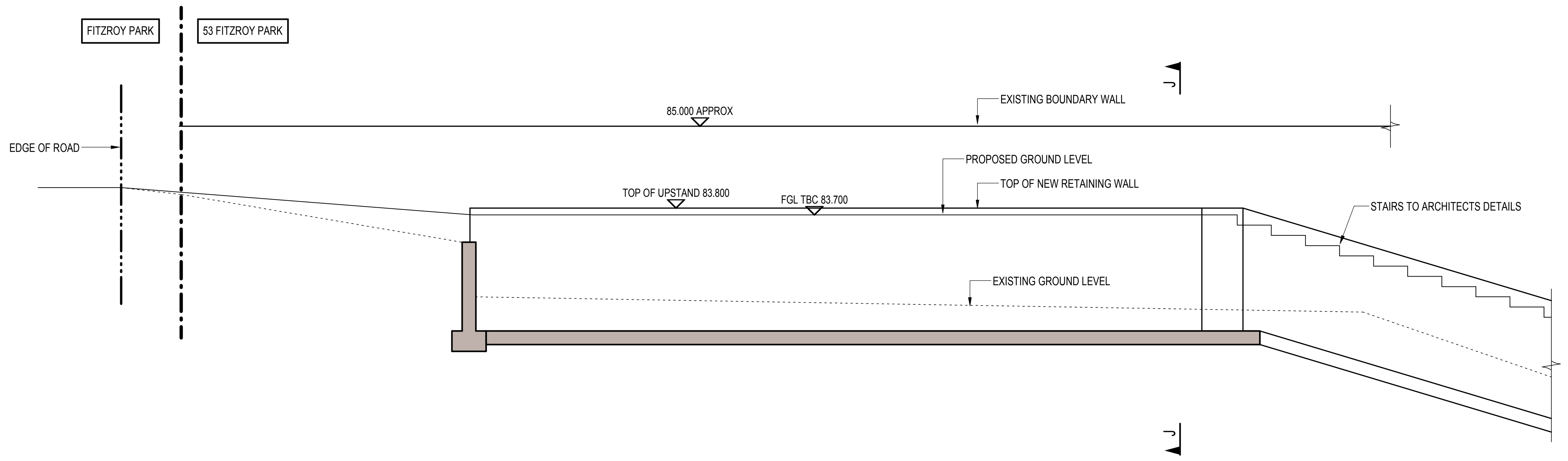
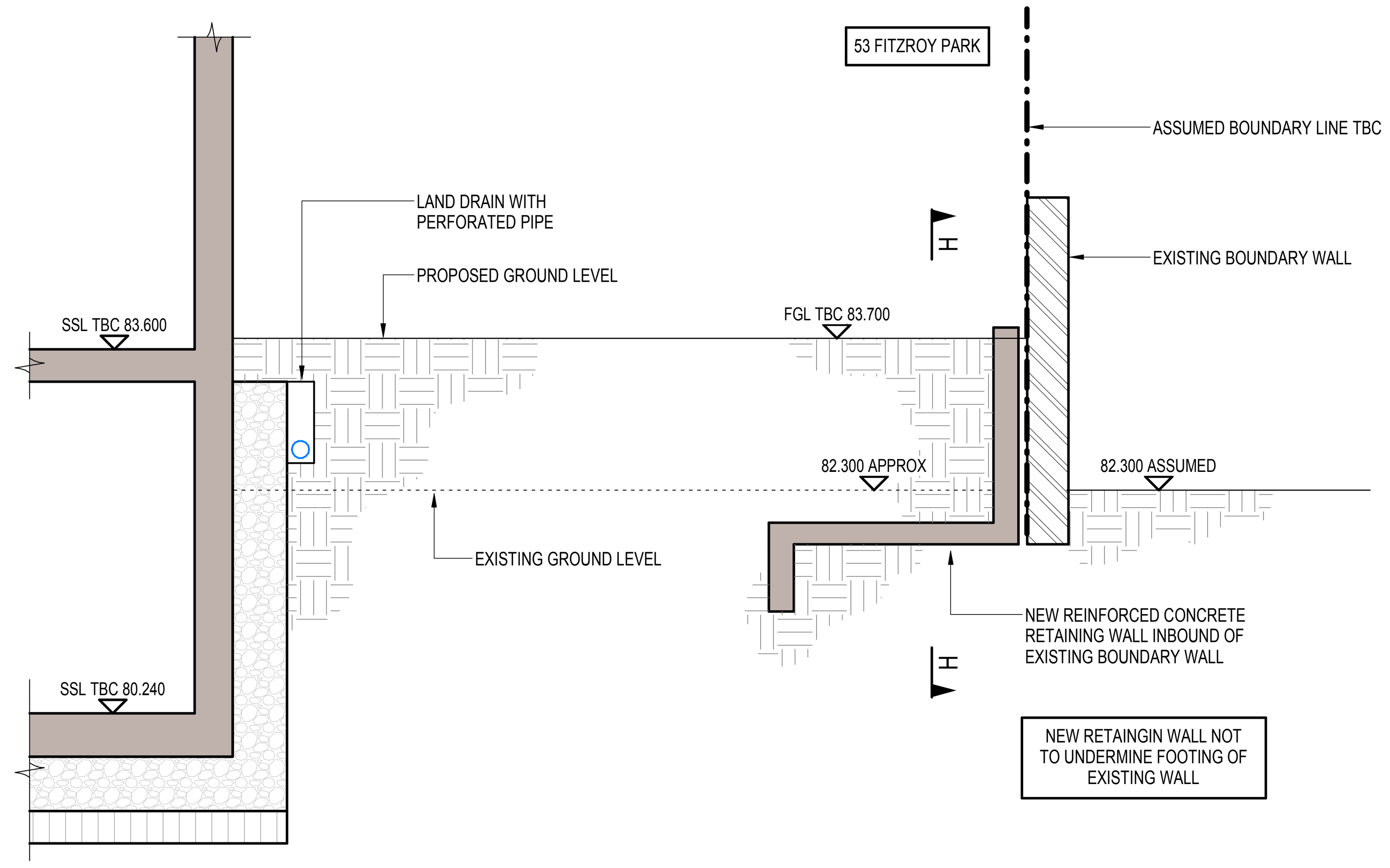
53 Fitzroy Park

project no.			drawing status.		
2160751			Preliminary		
originator.	zone.	level.	role.	drg no.	revision
EW	00	SEC	S	3106	P1



SECTION H-H



SECTION J-J

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Do not scale from this drawing.

rev	date	by	chk	description
P1	22.02.17	BMC	GP	Issued for Planning

drawing title
External Sections H-H & J-J

scale (s)	date	drawn
1:50@A1; 1:100@A3	January 2017	BMC

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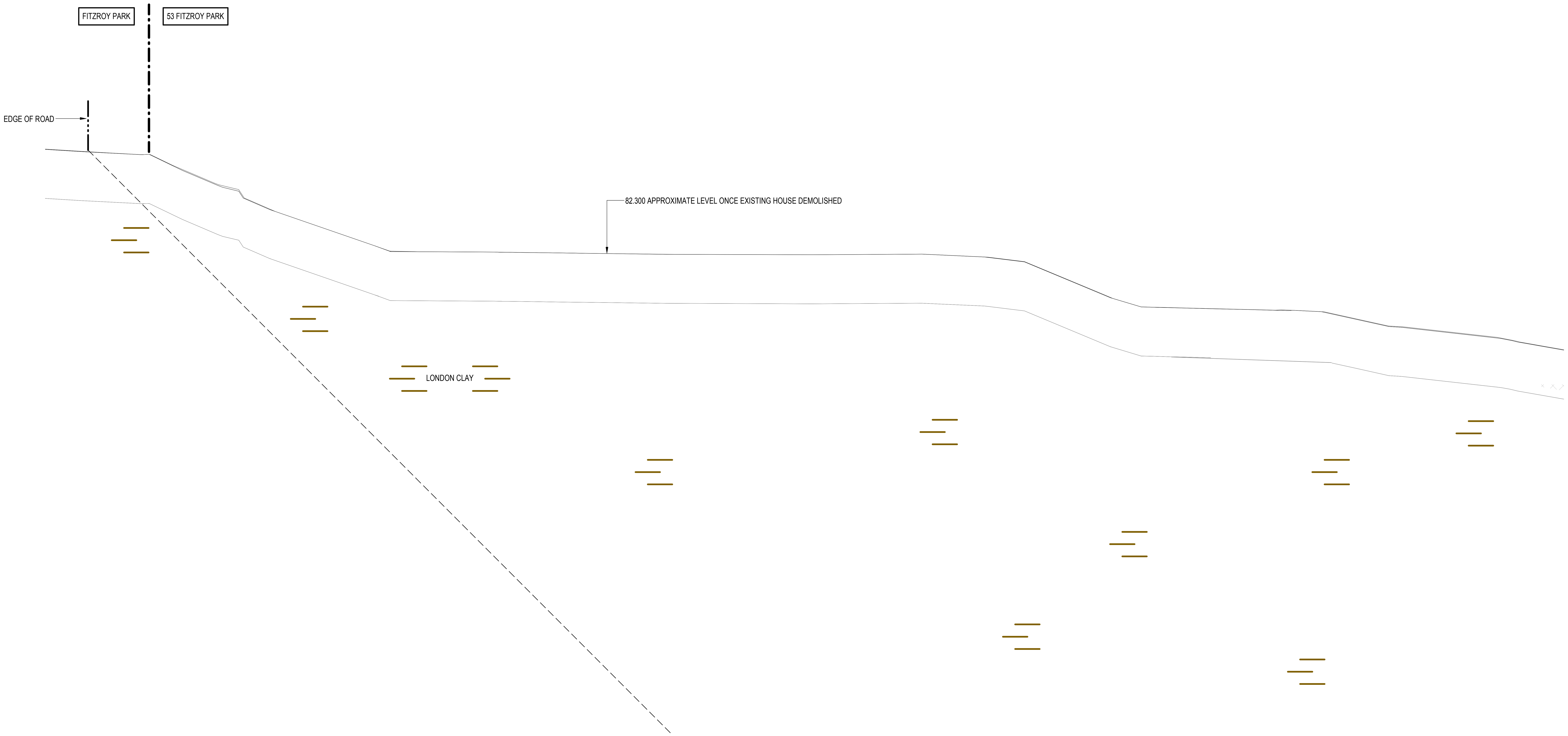
Consulting Structural and Civil Engineers. www.elliottwood.co.uk
tel: 020 8544 0033. fax: 020 8544 0066. info@elliottwood.co.uk

project
53 Fitzroy Park

project no.			drawing status.		
2160751			Preliminary		
originator.	zone.	level.	role.	drg no.	revision
EW	00	SEC	S	3200	P1



CONSTRUCTION SEQUENCE - PHASE 1

- DEMOLISH EXISTING BUILDING AND LEVEL SITE OVER FOOTPRINT OF LOWER GROUND FLOOR SLAB TO A LEVEL OF APPROXIMATELY 82.300

This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

Do not scale from this drawing.

0 500 1000 1500 2000 2500mm

SCALE 1:50 AT A1

NOT ALL INTERNAL COLUMNS AND WALLS SHOWN FOR CLARITY

LAND DRAIN OMITTED FOR CLARITY

NOT FOR CONSTRUCTION

rev	date	by	chk	description
P1	22.02.17	BMC	GP	Issued for Planning

drawing title

Construction Sequence - Sheet 1

scale (s)	date	drawn
1:50@A1; 1:100@A3	January 2017	BMC

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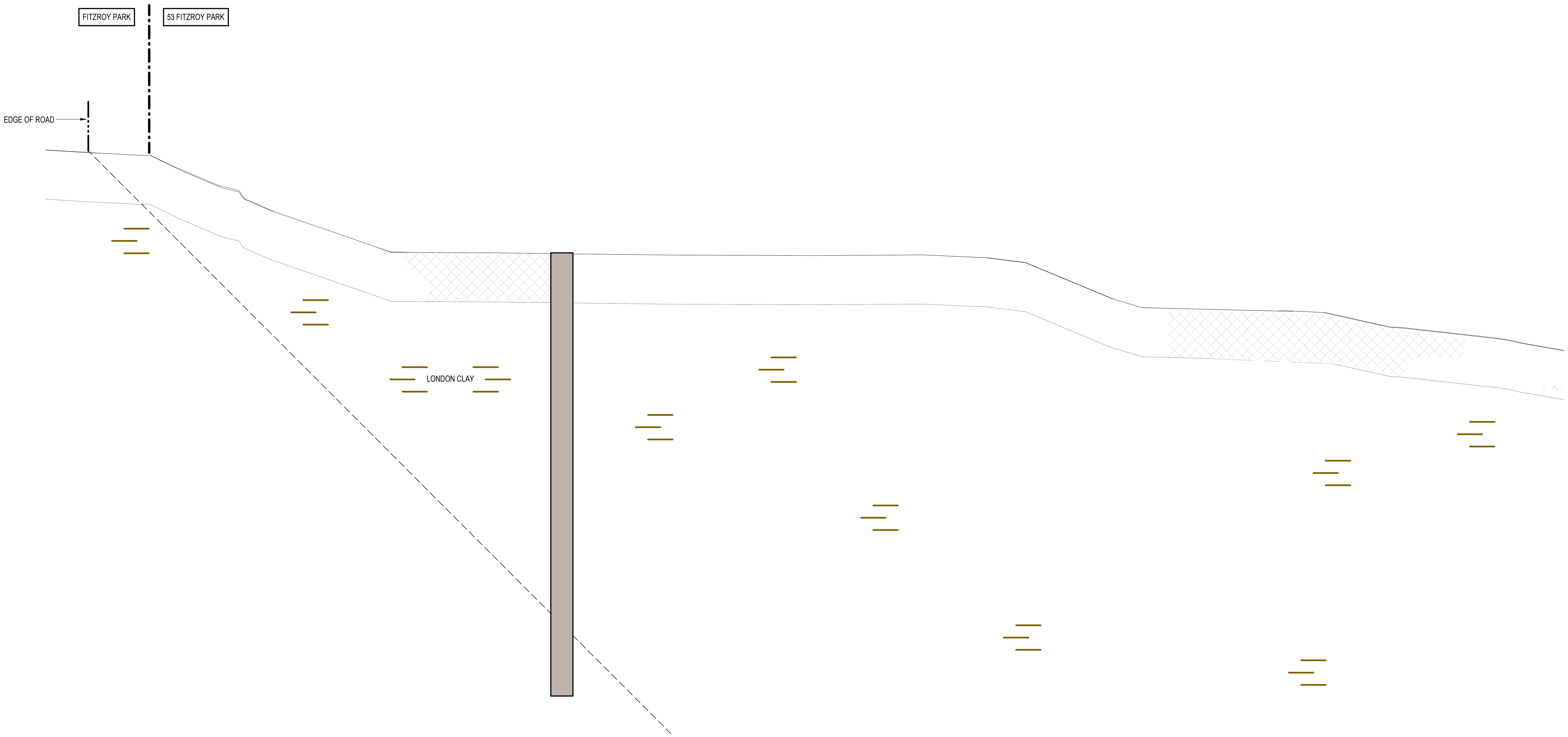
tel: 020 8544 0033. fax: 020 8544 0066. info@elliottwood.co.uk

project

53 Fitzroy Park

project no.			drawing status.		
2160751			Preliminary		
originator.	zone.	level.	role.	drg no.	revision
EW	00	ZZZ	S	4000	P1



CONSTRUCTION SEQUENCE - PHASE 2

- LAY PILING MAT OF CRUSHED CONCRETE. INSTALL CONTIGUOUS PILES AROUND THE SOUTH AND EAST SIDE OF THE PROPOSED LOWER GROUND FLOOR SLAB, ENSURING THERE IS ADEQUATE SPACING BETWEEN PILES TO FACILITATE THE FLOW OF WATER

This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

Do not scale from this drawing.

0 500 1000 1500 2000 2500mm
SCALE 1:50 AT A1

NOT ALL INTERNAL COLUMNS AND WALLS SHOWN FOR CLARITY

LAND DRAIN OMITTED FOR CLARITY

NOT FOR CONSTRUCTION

rev	date	by	chk	description
P1	22.02.17	BMC	GP	Issued for Planning

drawing title
Construction Sequence - Sheet 2

scale (s)	date	drawn
1:50@A1 ; 1:100@A3	January 2017	BMC

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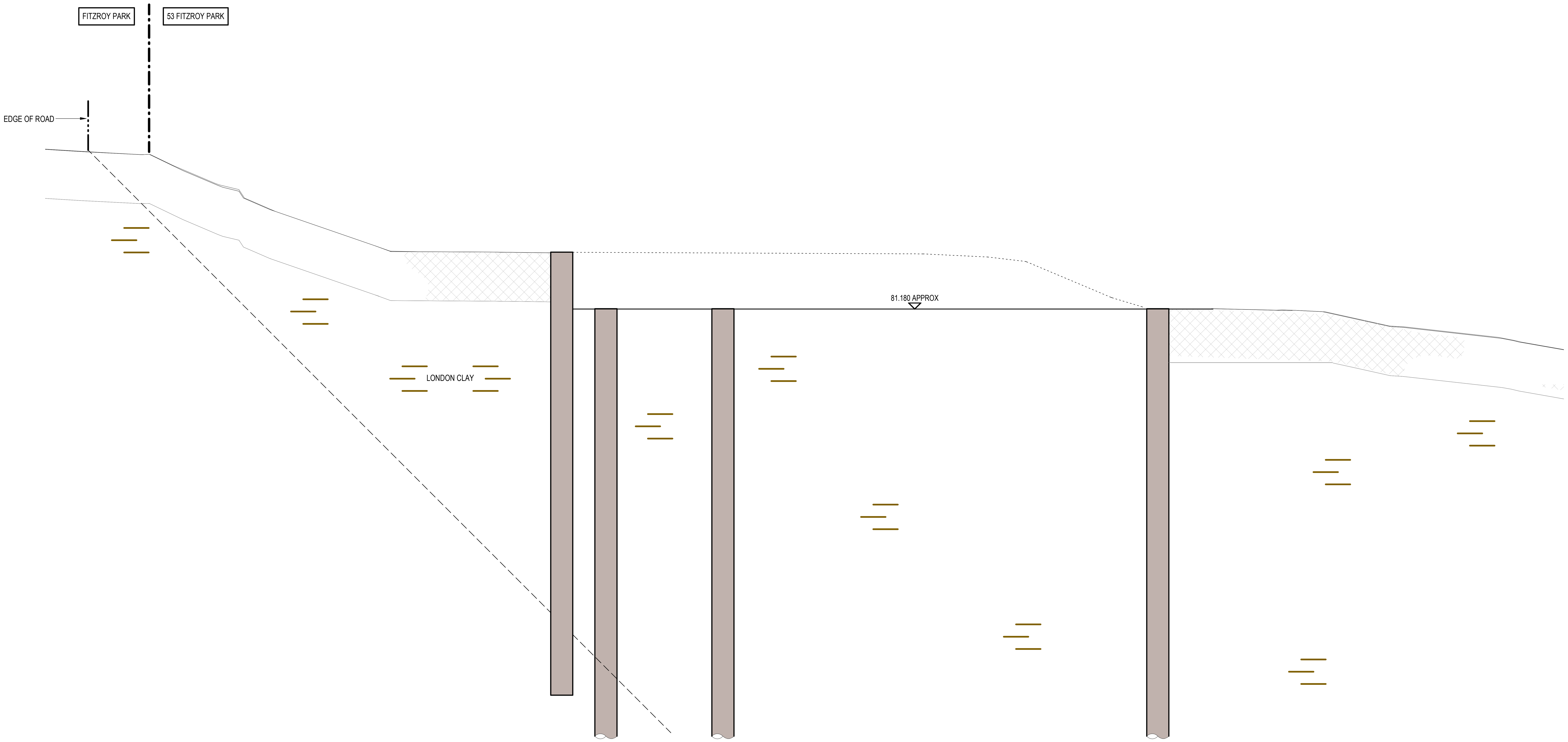
tel: 020 8544 0033. fax: 020 8544 0066. info@elliottwood.co.uk

project
53 Fitzroy Park

project no.	drawing status.
2160751	Preliminary

originator.	zone.	level.	role.	drg no.	revision
EW	00	ZZZ	S	4001	P1



CONSTRUCTION SEQUENCE - PHASE 3

- EXCAVATE DOWN TO 81.180 AOD AND LAY PILING MAT FOR THE MAIN BUILDING FOOTPRINT. INSTALL PILES FOR THE LOWER GROUND RAFT AND LIFT PIT

This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

Do not scale from this drawing.

0 500 1000 1500 2000 2500mm
SCALE 1:50 AT A1

NOT ALL INTERNAL COLUMNS AND WALLS SHOWN FOR CLARITY

LAND DRAIN OMITTED FOR CLARITY

NOT FOR CONSTRUCTION

rev	date	by	chk	description
P1	22.02.17	BMC	GP	Issued for Planning

drawing title
Construction Sequence - Sheet 3

scale (s)	date	drawn
1:50@A1; 1:100@A3	January 2017	BMC

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tel: 020 8544 0033. fax: 020 8544 0066. info@elliottwood.co.uk

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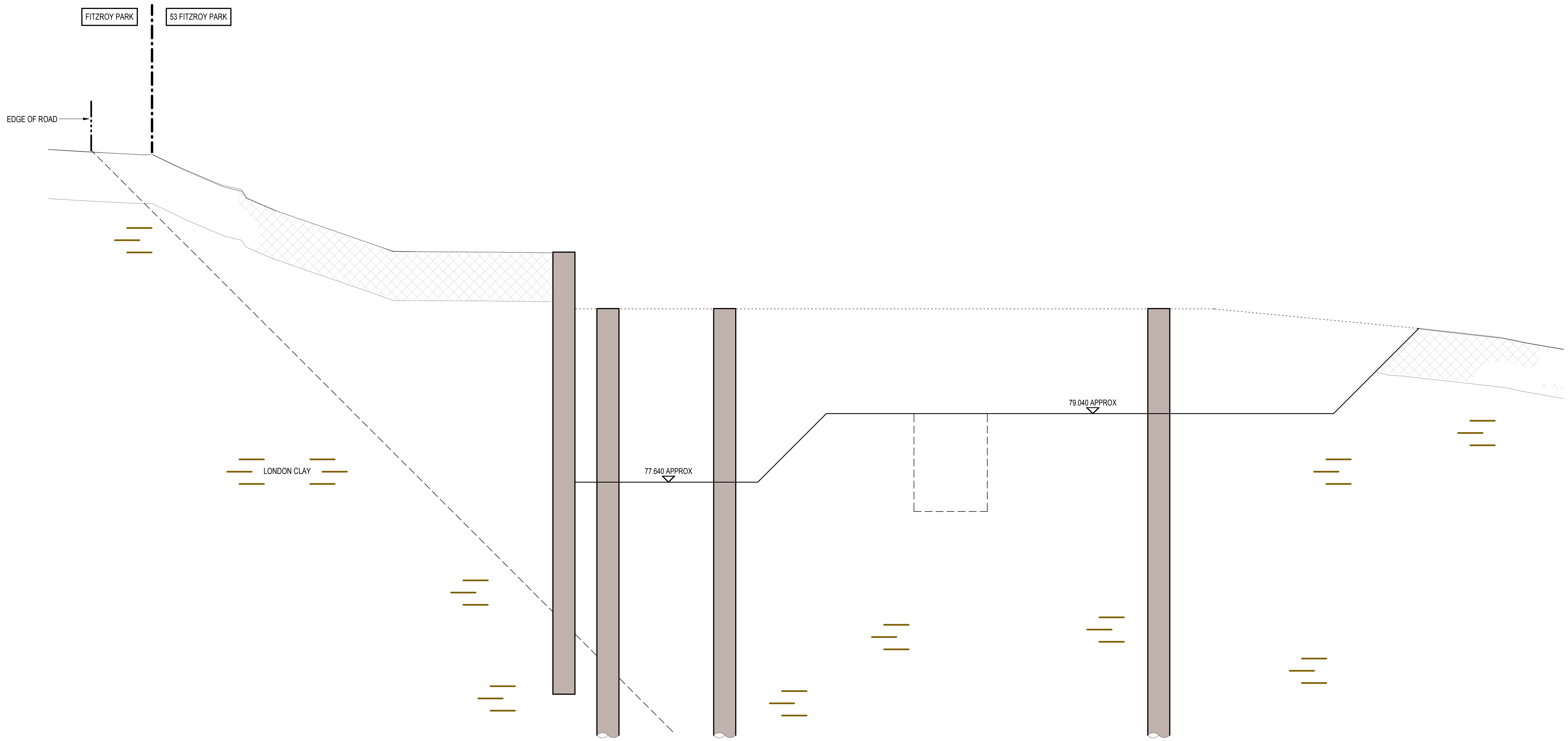
project no.			drawing status.		
2160751			Preliminary		
originator.	zone.	level.	role.	drg no.	revision
EW	00	ZZZ	S	4002	P1



CONSTRUCTION SEQUENCE - PHASE 4

- EXCAVATE DOWN TO UNDERSIDE OF THE NEW LOWER GROUND SLAB AND LIFT PIT ENSURING THE DEPTH FOR THE FREE DRAINING MATERIAL AND HEAVE PROTECTION IS ALSO EXCAVATED. ENSURE SUITABLE TEMPORARY SUMPS ARE EXCAVATED AT ALL STAGES WITHIN THE EXCAVATION TO ALLOW GROUNDWATER TO BE COLLECTED AND PUMPED OUT OF THE MAIN EXCAVATION
- THE CLAY IN THE IMMEDIATE VICINITY OF THE LIFT CAN BE BATTERED BACK AT A SAFE ANGLE. EXCAVATE SUMPS BELOW LOWER GROUND FLOOR SLAB FORMATION LEVEL. THE FORM OF CONSTRUCTION FOR THE SUMPS WOULD BE DECIDED BY THE MAIN CONTRACTOR BUT COULD CONSIST OF EITHER IN-SITU REINFORCED CONCRETE OR PRECAST CONCRETE RINGS

This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

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0 500 1000 1500 2000 2500mm

SCALE 1:50 AT A1

NOT ALL INTERNAL COLUMNS AND WALLS SHOWN FOR CLARITY

LAND DRAIN OMITTED FOR CLARITY

NOT FOR CONSTRUCTION

rev	date	by	chk	description
P1	22.02.17	BMC	GP	Issued for Planning

drawing title
Construction Sequence - Sheet 4

scale (s)	date	drawn
1:50@A1; 1:100@A3	January 2017	BMC

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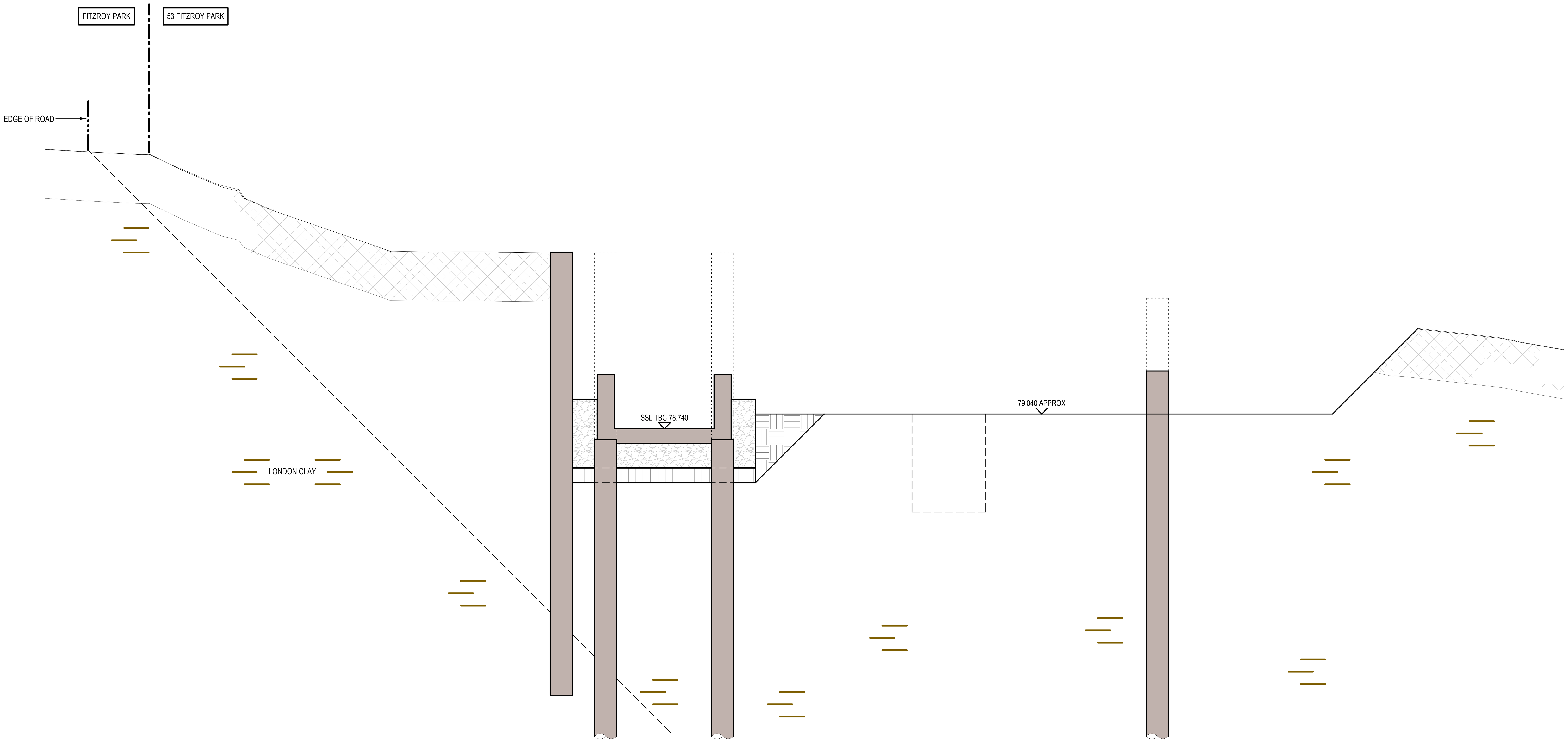
53 Fitzroy Park

project no.	drawing status.
2160751	Preliminary

originator.	zone.	level.	role.	drg no.	revision
EW	00	ZZZ	S	4003	P3



CONSTRUCTION SEQUENCE - PHASE 5

- LAY CELLCORE BY CORDEK FOR HEAVE PROTECTION ON BLINDING, AND THEN 500 THK LAYER OF FREE DRAINING MATERIAL (EITHER NO FINES CONCRETE OR HARDCORE) TO UNDERSIDE OF LIFT PIT SLAB
- CUT DOWN PILES TO REQUIRED LEVELS. FIX REINFORCEMENT AND CAST LIFT PIT BASE AND SUMPS

This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

Do not scale from this drawing.

0 500 1000 1500 2000 2500mm
SCALE 1:50 AT A1

NOT ALL INTERNAL COLUMNS AND WALLS SHOWN FOR CLARITY

LAND DRAIN OMITTED FOR CLARITY

NOT FOR CONSTRUCTION

rev	date	by	chk	description
P1	22.02.17	BMC	GP	Issued for Planning

drawing title
Construction Sequence - Sheet 5

scale (s)	date	drawn
1:50@A1; 1:100@A3	January 2017	BMC

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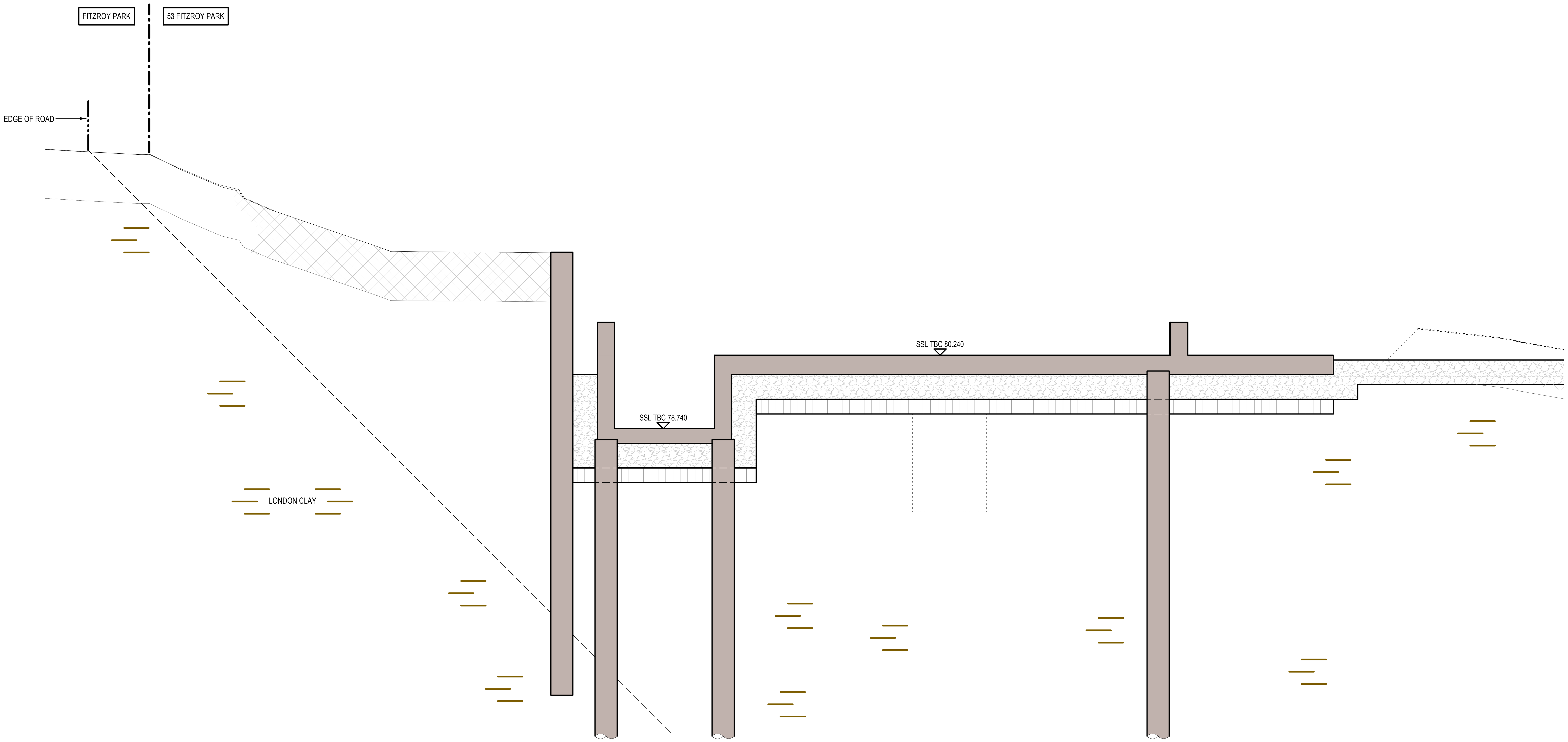
53 Fitzroy Park

project no.	drawing status.
2160751	Preliminary

originator.	zone.	level.	role.	drg no.	revision
EW	00	ZZZ	S	4004	P3



CONSTRUCTION SEQUENCE - PHASE 6

- LAY CELLCORE BY CORDEK FOR HEAVE PROTECTION ON BLINDING, AND THEN 500 THK LAYER OF FREE DRAINING MATERIAL (EITHER NO FINES CONCRETE OR HARDCORE) TO UNDERSIDE OF LOWER GROUND FLOOR SLAB
- FIX REINFORCEMENT AND CAST LOWER GROUND FLOOR SLAB AND KICKERS

This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

Do not scale from this drawing.

0 500 1000 1500 2000 2500mm

SCALE 1: 50 AT A1

NOT ALL INTERNAL COLUMNS AND WALLS SHOWN FOR CLARITY

LAND DRAIN OMITTED FOR CLARITY

NOT FOR CONSTRUCTION

rev	date	by	chk	description
P1	22.02.17	BMC	GP	Issued for Planning

drawing title: Construction Sequence - Sheet 6

scale (s): 1:50@A1; 1:100@A3 | date: January 2017 | drawn: BMC

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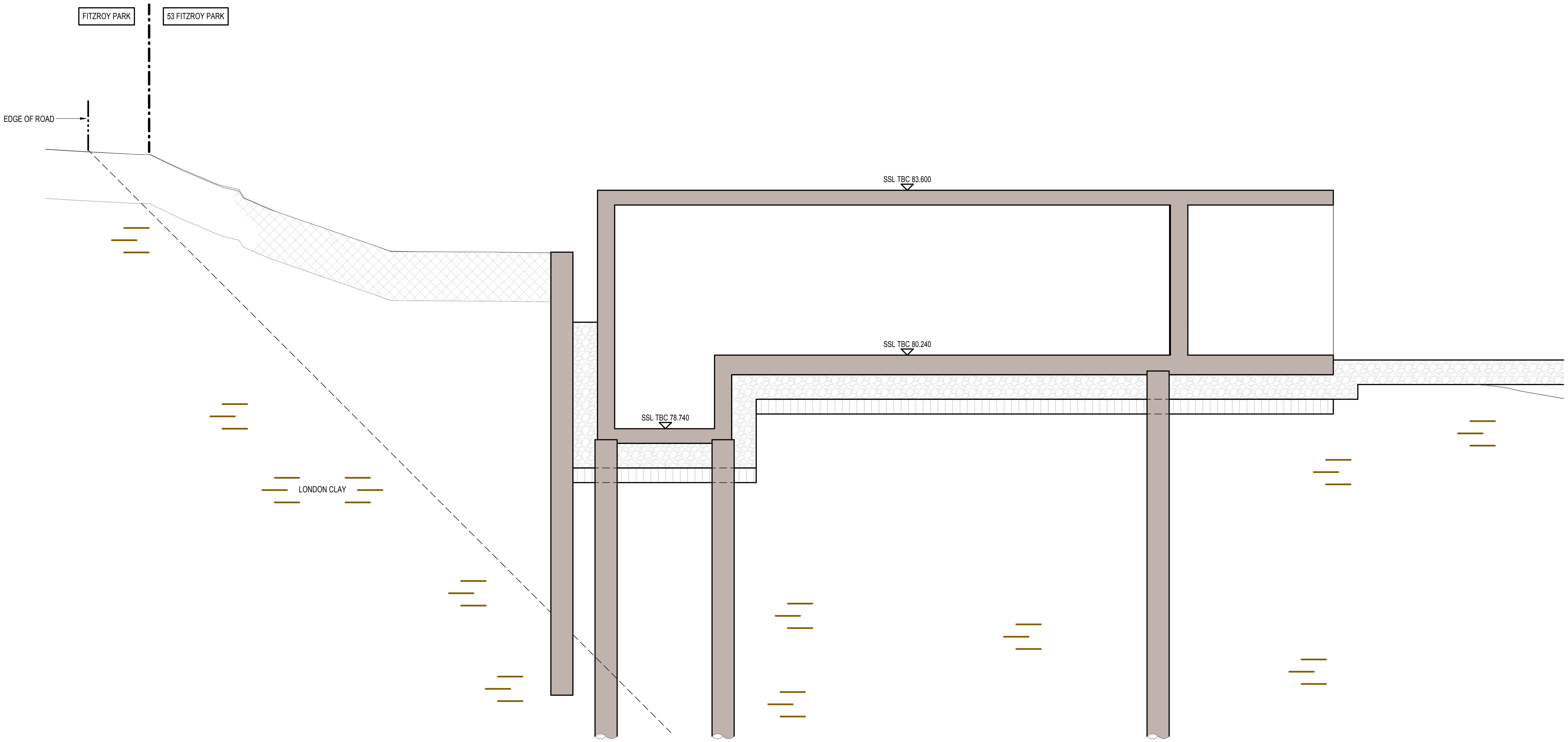
tel: 020 8544 0033. fax: 020 8544 0066. info@elliottwood.co.uk

project: 53 Fitzroy Park

project no.			drawing status.		
2160751			Preliminary		
originator.	zone.	level.	role.	drg no.	revision
EW	00	ZZZ	S	4005	P3



CONSTRUCTION SEQUENCE - PHASE 7

- INSTALL VOID FORMER BETWEEN CONTIGUOUS PILES AND ALL LOW LEVEL RC WALLS. CAST RC WALLS AGAINST VOID FORMER TO THE REAR. ERECT FORMWORK AND CAST OTHER WALLS AND COLUMNS TO GROUND LEVEL. ERECT FORMWORK, FIX REINFORCEMENT AND CAST RC GROUND FLOOR SLAB

This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

Do not scale from this drawing.

0 500 1000 1500 2000 2500mm
SCALE 1:50 AT A1

NOT ALL INTERNAL COLUMNS AND WALLS SHOWN FOR CLARITY

LAND DRAIN OMITTED FOR CLARITY

NOT FOR CONSTRUCTION

rev	date	by	chk	description
P1	22.02.17	BMC	GP	Issued for Planning

drawing title
Construction Sequence - Sheet 7

scale (s)	date	drawn
1:50@A1; 1:100@A3	January 2017	BMC

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tel: 020 8544 0033. fax: 020 8544 0066. info@elliottwood.co.uk

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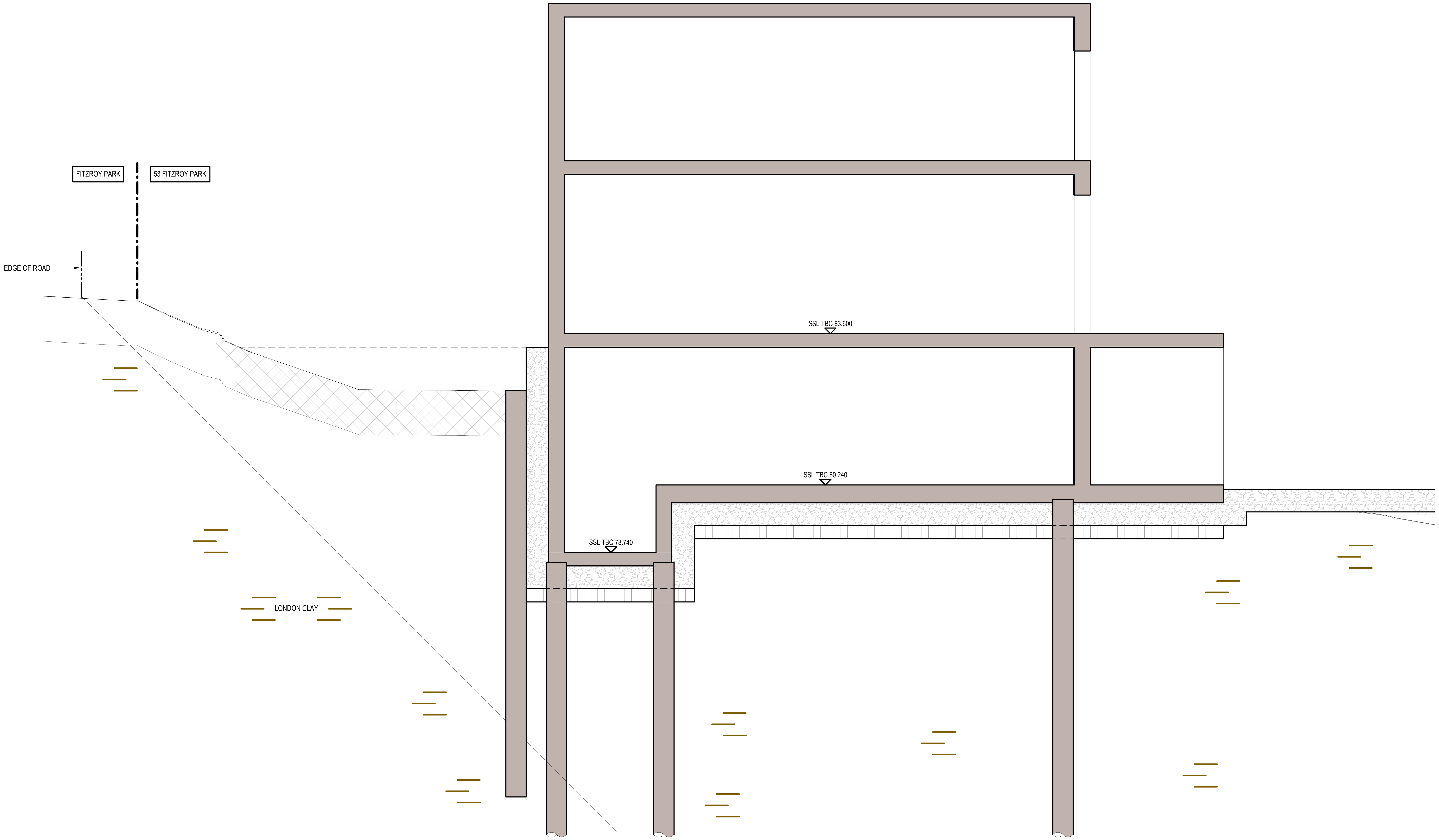
53 Fitzroy Park

project no.	drawing status.
2160751	Preliminary

originator.	zone.	level.	role.	drg no.	revision
EW	00	ZZZ	S	4006	P3



CONSTRUCTION SEQUENCE - PHASE 8

- ONCE GROUND FLOOR SLAB CONCRETE IS CURED, BACKFILL BEHIND RETAINING WALLS WITH FREE DRAINING MATERIAL TO THE NEW PROPOSED GROUND LEVEL

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Do not scale from this drawing.

0 500 1000 1500 2000 2500mm
SCALE 1:50 AT A1

NOT ALL INTERNAL COLUMNS AND WALLS SHOWN FOR CLARITY

LAND DRAIN OMITTED FOR CLARITY

NOT FOR CONSTRUCTION

rev	date	by	chk	description
P1	22.02.17	BMC	GP	Issued for Planning

drawing title
Construction Sequence - Sheet 8

scale (s)	date	drawn
1:50@A1 ; 1:100@A3	January 2017	BMC

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project no.			drawing status.		
2160751			Preliminary		
originator.	zone.	level.	role.	drg no.	revision
EW	00	ZZZ	S	4007	P1

Wimbledon
241 The Broadway
London
SW19 1SD

tel. (020) 8544 0033

Central London
46-48 Foley Street
London
W1W 7TY

tel. (020) 7499 5888

Nottingham
1 Sampson's Yard
Halifax Place
Nottingham
NG1 1QN

tel. 0870 460 0061

email: info@elliottwood.co.uk
www.elliottwood.co.uk

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