### **APPENDIX 2**

Elliott Wood Partnership Structural and Drainage Supplementary Information for BIA







# 59 Maresfield GardensHampstead, London NW3

### Structural and Drainage Supplementary Information for Basement Impact Assessment

Job number: 211590
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#### 1.0 Introduction

- 1.0.1 Elliott Wood Partnership has been appointed to provide structural and civil consultancy services for the redevelopment of the building at 59 Maresfield Gardens, Hampstead.
- 1.0.2 We have been provided with site investigation results and information regarding the site, existing building and proposed developments by the Architects: 51% Studios, who were appointed on the previous preliminary stage.
- 1.0.3 This document gives a description of the proposed structural and drainage works relating to the development at 59 Maresfield Gardens to support the planning application by LOM Architects.
- 1.0.4 This document is to be read in conjunction with the design information produced by the rest of the design team.

### 2.0 Existing Site Information

#### 2.1 Existing Site and Structure

- 2.1.1. The site is situated on the Western side of Maresfield Gardens in Hampstead. The grid reference is TQ 264852. It is assumed that the existing two-storey building on the site is of typical masonry construction. The site is and end terrace property on a terrace of three houses extending to the South of the site. It is bounded to the North by the garden of a detached property, to the West by a small access road and to the East by Maresfield Road which lies above the main level of the site at +85.3m AOD. There is an existing retaining wall on the site with the ground level sloping from the road to +84.0m AOD just behind the wall. The site then steps to a ground level of +81.7m AOD In front of the retaining wall and remains relatively flat towards the West of the plot. There are no underground lines in the vicinity or tunnels beneath the site.
- 2.1.2. As part of a ground investigation by Ian Farmer Associates in 2008, a trial pit revealed that the existing foundations under the adjacent terrace are 700mm below ground level, 150mm deep and extend 250mm from the party wall. The concrete boundary wall to the North extends to 400mm below ground.
- 2.1.3 The land on the adjacent property: No. 40 Netherhall gardens, steps down from east to west. There are differences in ground level between the two sites which are retained by existing retaining walls along the site boundary, which are constructed separately from the main structure at No. 59 Maresfield Gardens. There is a swimming pool approximately 2m from the site boundary on the adjacent property, which was installed after the property at No. 59 Maresfield Gardens was constructed, meaning it is unlikely that any services for the pool will cross the site boundary.

#### 3.0 Proposed Development

### 3.1 Proposed Scheme

- 3.1.1 It is proposed that the existing structure will be completely demolished and replaced with a new build residential property. The proposed development will be a new five storey, single unit residential building including a basement. The basement has been proposed with a depth of three full stories at the East end (9.65m below ground level) and two full stories at the West side (5.5m below ground level) and with light wells to two floors below ground level. The proposed basement formation level is +76.0m AOD, with a lowered swimming pool to the front of the site with a formation level of +74.5m AOD. The basement footprint is approx. 144m² and extends beyond the above ground footprint underneath the garden to the West and up to the position of the existing retaining wall to the East.
- 3.2.1 It is proposed that the basement is constructed using a permanent secant piled retaining wall propped in the permanent condition by the 250mm thick RC floor slabs. A 200mm thick perimeter RC wall is to be cast up against the secant piled retaining wall to support the spanning floor slabs. The perimeter RC wall is to be dowelled in to the secant piled wall with stainless steel reinforcement acting as a shear key such that the gravity loads are transferred to the piles and in to the ground. The perimeter reinforced concrete structure provides the primary means of defence against water ingress. The lower basement RC slab is 350mm thick and spans between the perimeter secant piles and 600mm thick internal pile caps. The pool level slab is a 350mm thick RC piled raft which spans between the perimeter and internal piles. The internal piles and pile caps support internal RC columns.
- 3.2.2 The proposed superstructure is to be constructed as an RC frame with spanning flat slabs with lateral stability provided through RC shear walls. The superstructure is considered to be beyond the scope of the BIA.
- 3.2.3 Proposed structural drawings are contained within Appendix 2.1

#### 4.0 Construction Considerations

#### 4.1 Construction Generally

- 4.1.1 The enabling and temporary works and excavations will need to be undertaken in a carefully controlled sequence. In completing the preliminary structural design we have assumed the sequence below. The Contractor will, however, have to provide a detailed method statement including all temporary and permanent works design before the works can commence on site. These notes are to be read in conjunction with all EWP drawings relating to the proposed work.
- 4.1.2 The key issues that affect the scope and sequence of works on this project are:

The demolition of the existing building;

The stability of adjoining structures;

The stability of adjoining walls, paths and highways;

Protection and waterproofing to existing party wall in temporary condition:

Providing a permanent water barrier for basement construction.

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- 4.1.3 The undertaking of such projects is specialist work and Elliott Wood Partnership will be involved in the selection of a competent Contractor who will need the relevant expertise and experience for this type of project.
- 4.1.4 The Contractor will need to undertake the works in such a way as to minimise noise, dust and vibration when working close to adjoining buildings.
- 4.2 Assumed Sequence of Works Refer to Sequencing Drawings for Details (Appendix 2.2)
- 4.2.1 Demolish roof, 1<sup>st</sup> floor, upper ground floor and part of lower ground floor of existing property leaving all retaining walls in place as well as the existing driveway. Providing propping to existing retaining walls where horizontal support is removed through demolition and to driveway where wall returns are removed. Provide waterproofing and temporary supports to party wall with number 57 Maresfield Gardens, if required.
- 4.2.2 Level existing lower ground level to +81.77m AOD. Install temporary piling platform at +84.0 AOD and temporary access ramp. Redress drive level to +84.0m AOD.
- 4.2.3 From temporary piling platform and driveway install 1<sup>st</sup> stage secant piling from 600mm diameter piles cut off at +84.0m AOD.
- 4.2.4 Transfer piling rig to existing lower ground level via temporary access ramp. Remove temporary piling platform and temporary access ramp. Temporarily prop existing sloped brickwork retaining wall (at the front of the property) along the party wall line with No. 57 Maresfield Gardens. Cast capping beam on top of 1st stage piles to +84.52m AOD. Prop capping beam with flying shores.
- 4.2.5 Demolish existing driveway and sloped brickwork retaining wall in front of 1<sup>st</sup> stage piles.
- 4.2.6 Carry out 2<sup>nd</sup> stage 600mm diameter secant piles from lower ground level and internal 600mm diameter piles. Secant piles to be cut off at +81.77m AOD. Internal piles to be cut off at formation level and filled with grout between formation level and existing lower ground level. Grout to be dug out in conjunction with ground during excavation.
- 4.2.7 Install temporary access ramp, remove piling rig and remove temporary access ramp.
- 4.2.8 Cast capping beam on low level secant piles (above existing ground level) to +82.27m AOD. Install temporary waling beams and props as temporary works (by others).
- 4.2.9 Excavate ground within secant piled retaining wall to reduced dig level at +77.5m AOD. Install perimeter waling beams and props as temporary works (by others) at +78.0m AOD.
- 4.2.10 Excavate to formation level; +74.00m AOD at pool level and +75.44m AOD at lower basement level. Expose tops of internal piles.

- 4.2.11 Cast pile caps and 350mm thick basement slab (including crack between levels) with appropriate heave protection. Cast perimeter retaining walls to +77.0m AOD and internal columns to underside of upper basement slab. Install temporary props and waling beam at lower basement slab level (+76.2m AOD) to prop front retaining wall.
- 4.2.12 Install temporary waling beams and props at +80.15m AOD. Remove temporary waling beams and props at +78.0m AOD. Cast remainder of lower basement perimeter walls to underside of upper basement slab level. Cast upper basement slab to form a permanent prop to the secant piled retaining wall.
- 4.2.13 Remove temporary works at +80.15m AOD. Cast upper basement perimeter and internal walls/columns to underside of lower ground floor level slab. Cast lower ground level floor slab to +81.774m AOD.
- 4.2.14 Remove temporary props at +82.0m AOD. Dowel in to end return of existing sloped brickwork retaining wall with stainless steel rods and cast integrally with perimeter reinforced concrete wall to provide permanent restraint. Remove temporary propping to existing sloped brickwork retaining wall. Prop the top of the front perimeter RC wall beneath the upper capping beam.
- 4.2.15 Knock out existing low level capping beam and remove top 300mm of secant piled wall. Cast new capping beam 300mm deep fully tied in to lowed ground floor slab to match SSL of +81.774m AOD.
- 4.2.16 Cast lower ground floor RC walls and columns. Cast upper ground floor slab to act as a permanent prop to front retaining wall. Remove props to front retaining wall to complete ground-works sequencing.

#### 4.3 Temporary Works

- 4.3.1 Due to the nature of the proposals, temporary works will be required throughout the basement construction process.
- 4.3.2 Assumed temporary propping levels are shown on our assumed sequencing drawings.
- 4.3.3 The existing party wall may need to be propped during works, and design checks for wind loading need to be performed to estimate whether any permanent propping is required.
- 4.3.4 Temporary works design is the responsibility of the contractor. Detailed proposals, method statements and sequence of works proposals will be required prior to commencing work on site. The temporary works scheme is to be checked and agreed with the project structural engineer.

### 4.4 Piling in Relation to Existing Structures

4.4.1 The secant piles adjacent to the party wall of No 57 and 59 Maresfield Gardens should provide a minimum clear distance between the pile and foundation of 150mm. Based on the current trial pit information by lan Farmer Associates the centre line of the secant piled wall is to be set out 700mm from the vertical face of the party wall. Before the piling works are commenced further trial pits should be made to confirm the depth and profile of the party wall footings along the length of the wall.

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4.4.2 The secant piles adjacent to the existing masonry retaining walls which form the site boundary with 40 Netherhall Gardens are to be set out a minimum of 500mm from the centre line of the piles to the vertical face of the wall (as advised by GEA). Before piling works commence trial pits should be undertaken to confirm that the footings of these retaining walls do not project within 150mm of the face of the proposed secant piled wall.

It is considered highly unlikely that the foundations of these retaining walls project beyond the boundary line in to 59 Maresfield Gardens. This is due to the more recent construction of the swimming pool and associated retaining walls at 40 Netherhall Gardens. Furthermore, the flank wall of the existing structure at 59 Maresfield Gardens currently sits on independent foundations adjacent to the retaining wall. If the retaining wall foundation did project beyond the boundary line it would clash with the existing flank wall structure. As such a projection is highly unlikely.

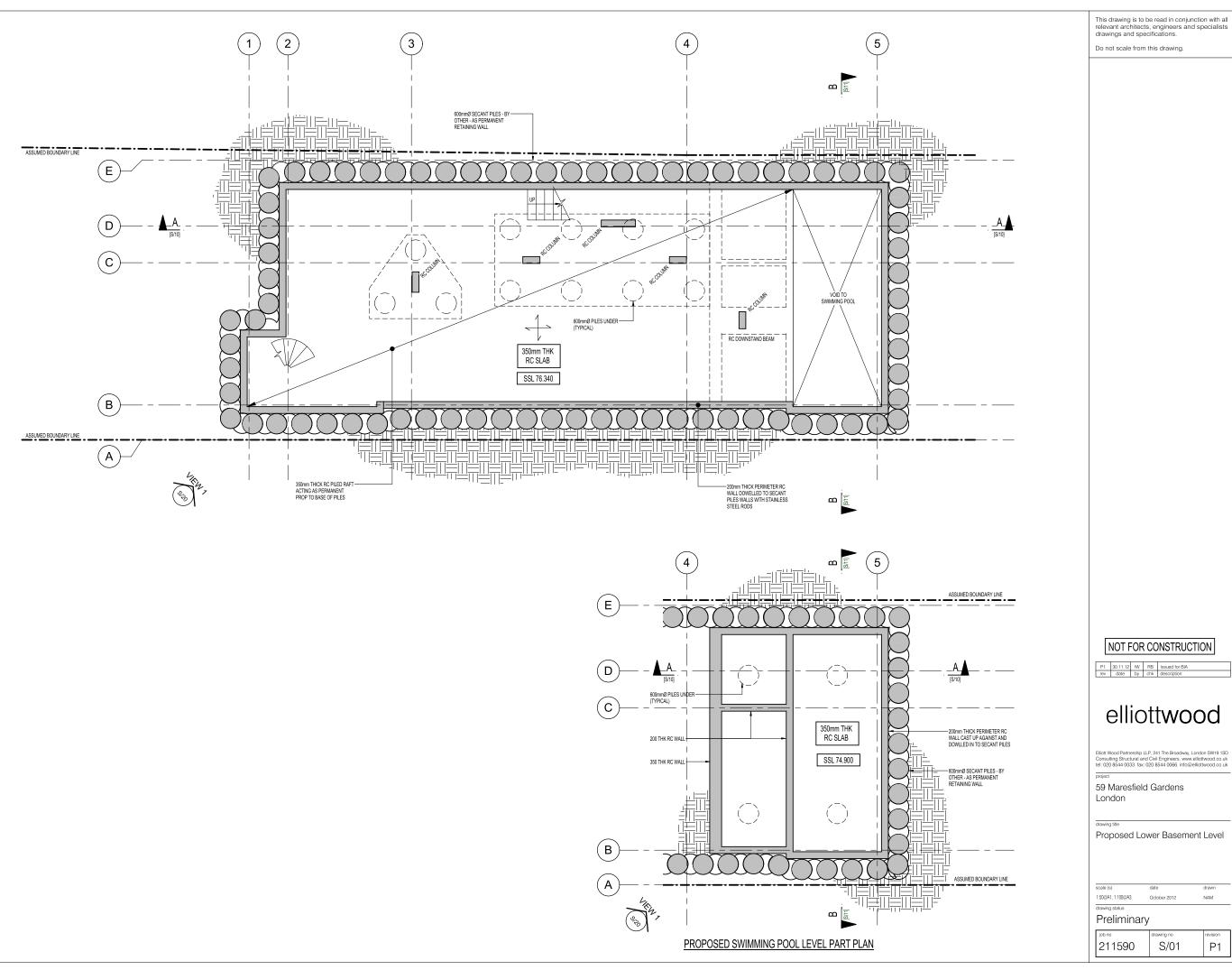
4.4.3 The secant piled wall at high level bored behind the existing sloped brickwork retaining wall from the temporary piling platform is considered unlikely to clash with the existing footings of the wall. In the event that a clash does occur, the foundation should be cored before boring and casting the piles with appropriate temporary works designed to laterally restrain the top of the existing retaining wall.

#### 4.5 Surface water drainage strategy

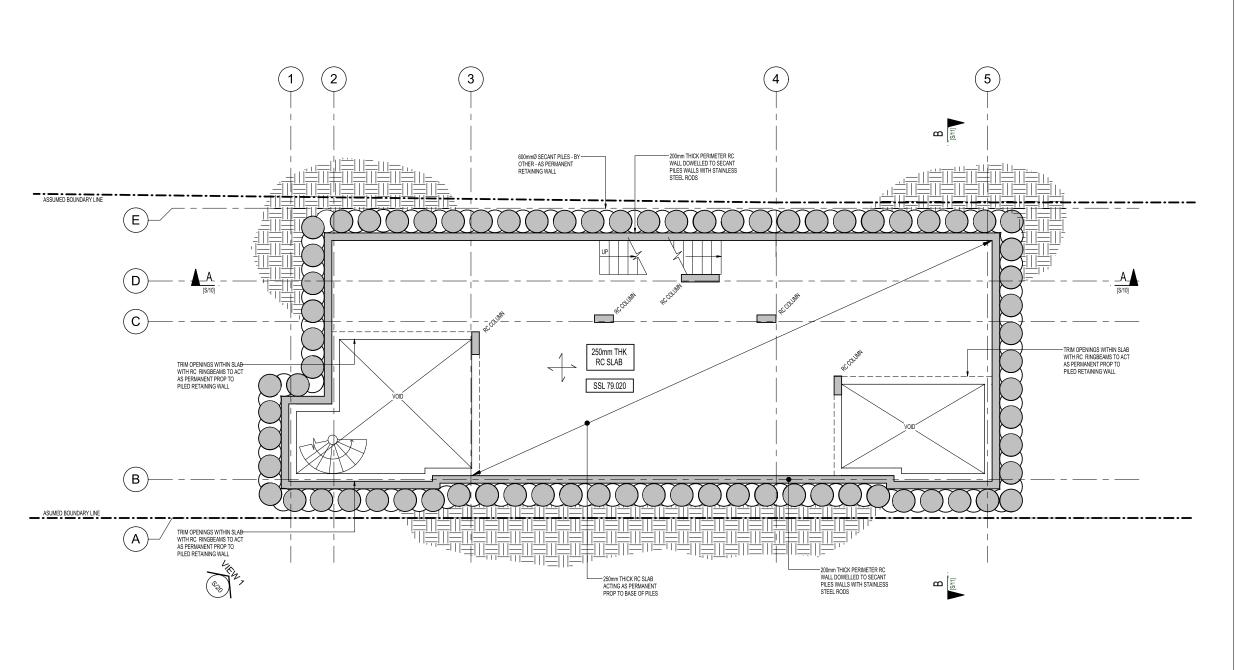
- 4.5.1 As indicated in the Surface Water Assessment prepared by WEL (appendix 3.0 of Basement Impact Assessment revision P2 and included within this document for reference in Appendix 2.5), the intent is to restrict the surface water run-off discharge to 50% of the existing rate. However, it may not be practical to restrict to such a low rate (0.8 l/s).
- 4.5.2 A CCTV drainage survey of the existing network is included in the appendices. It shows that the existing property discharges to a combined run in front of the property. This run continues downstream to serve other properties.
- 4.5.3 Drawing SKD/01 in the appendices gives a diagram of the proposed surface water drainage. The aim is to limit the pumping of surface water wherever possible. The roof run-off will be collected into a rainwater harvesting tank at lower ground floor level and the overflow will discharge to the main drainage outlet. With this tank, most of the common storms run-off will not discharge to the sewers and will be retained on site for reuse.
- 4.5.4 The rear and front courtyards will be collected into an underground sump where storage will be provided. The flow from this sump pump will be restricted by the pump capacity.



Appendix 2.1: Structural Drawings and Surcharge Loading



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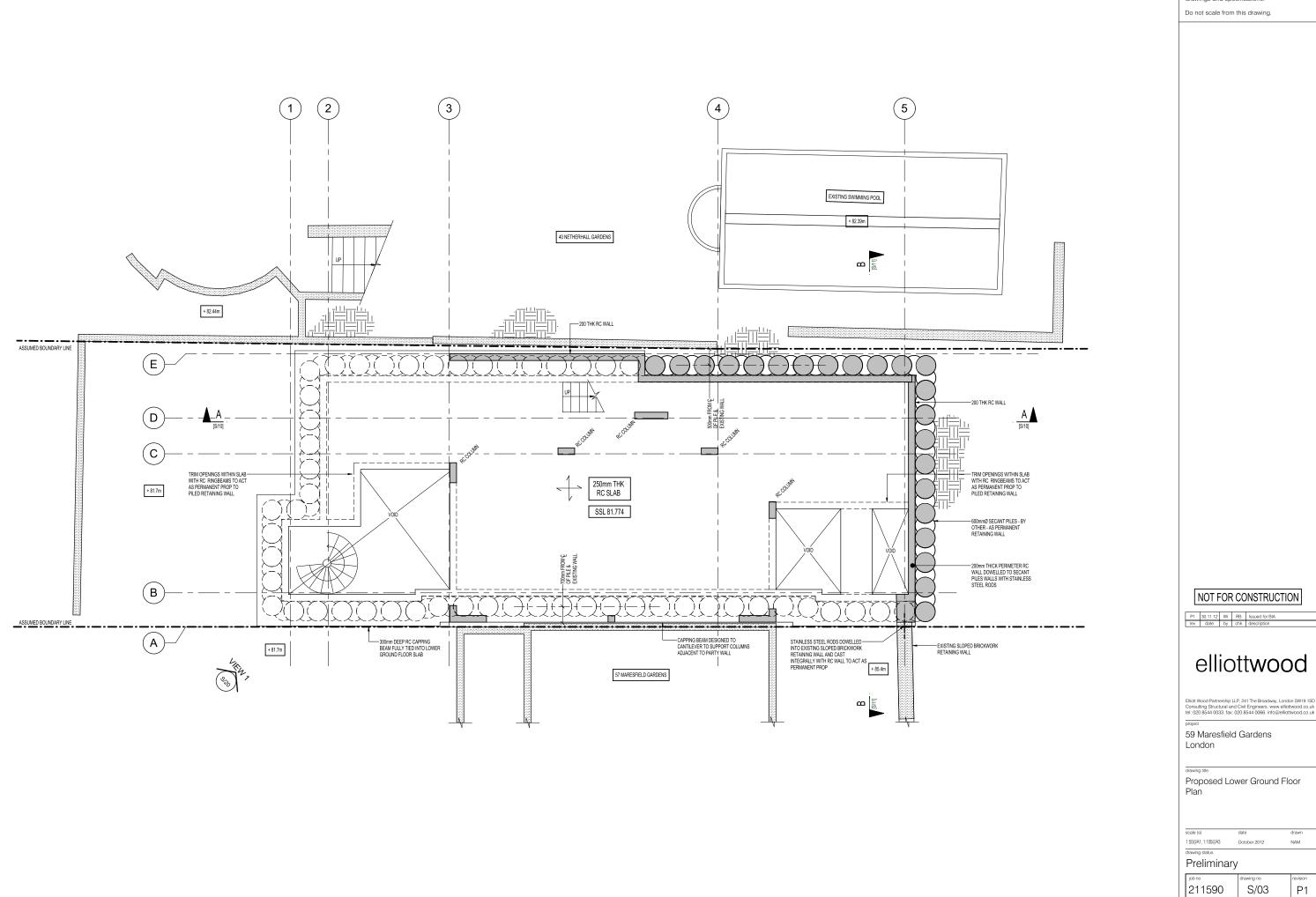
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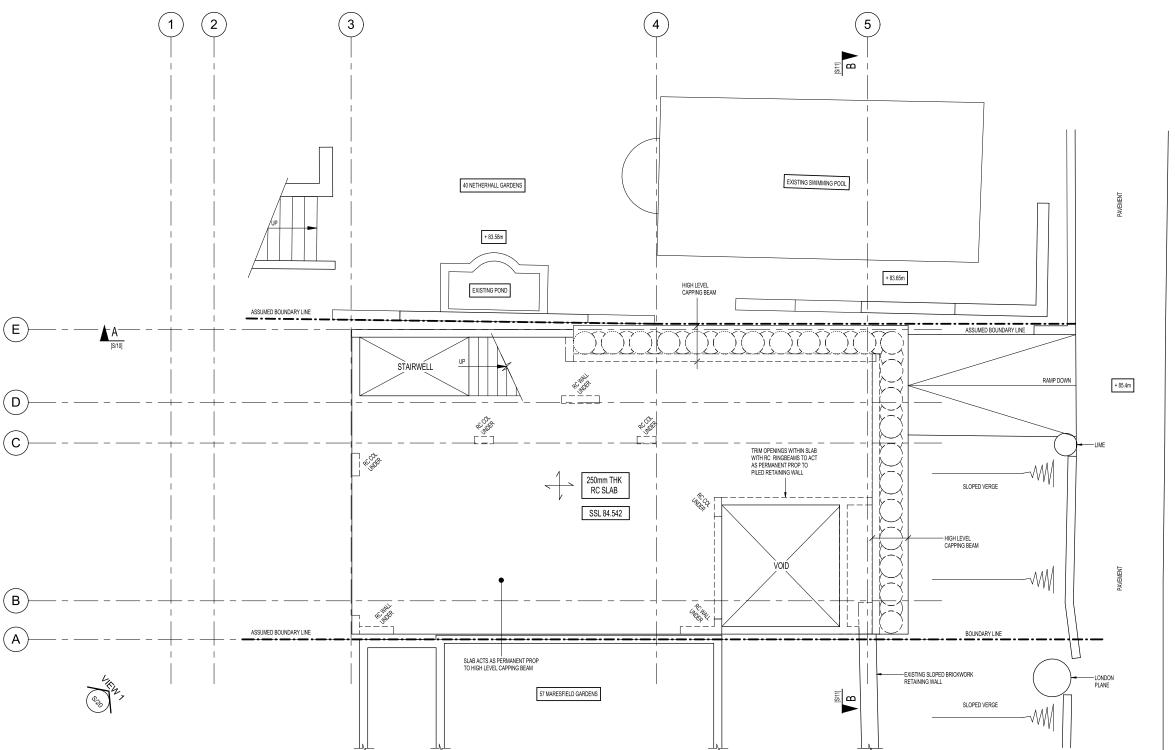
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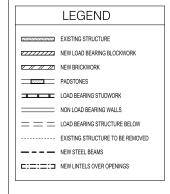


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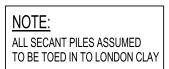
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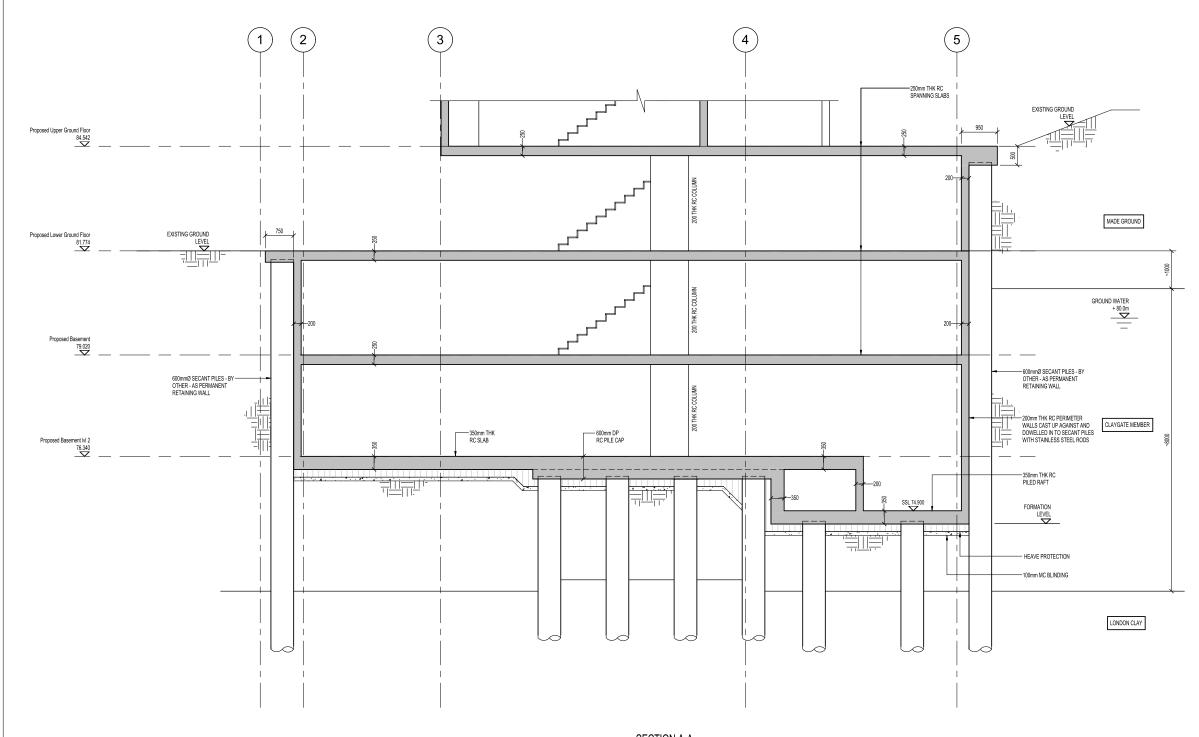
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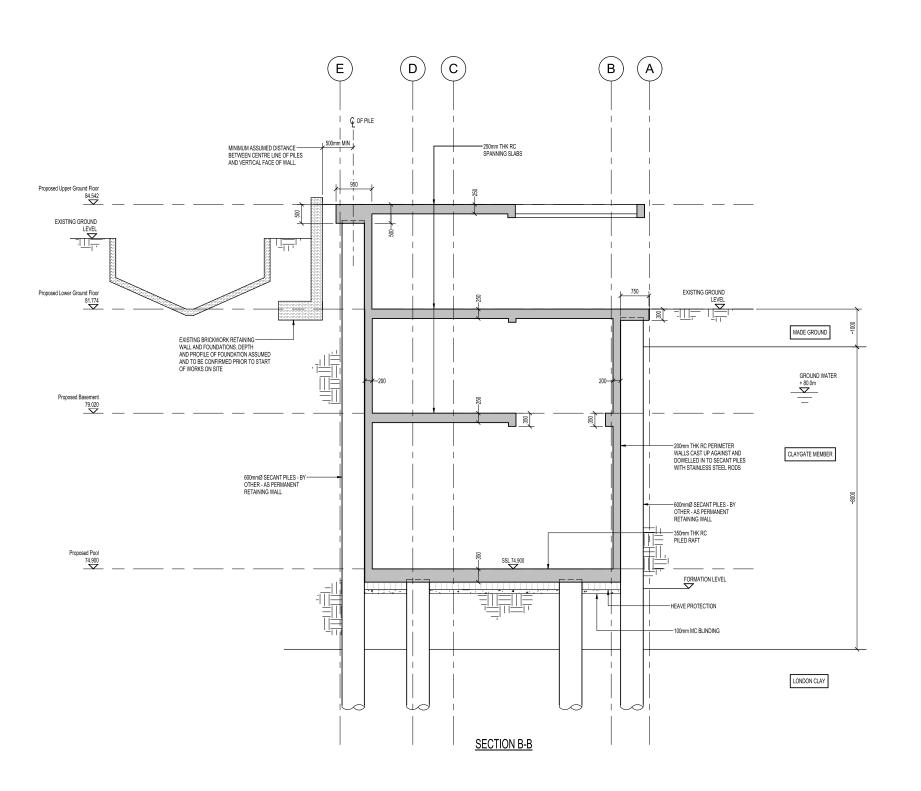
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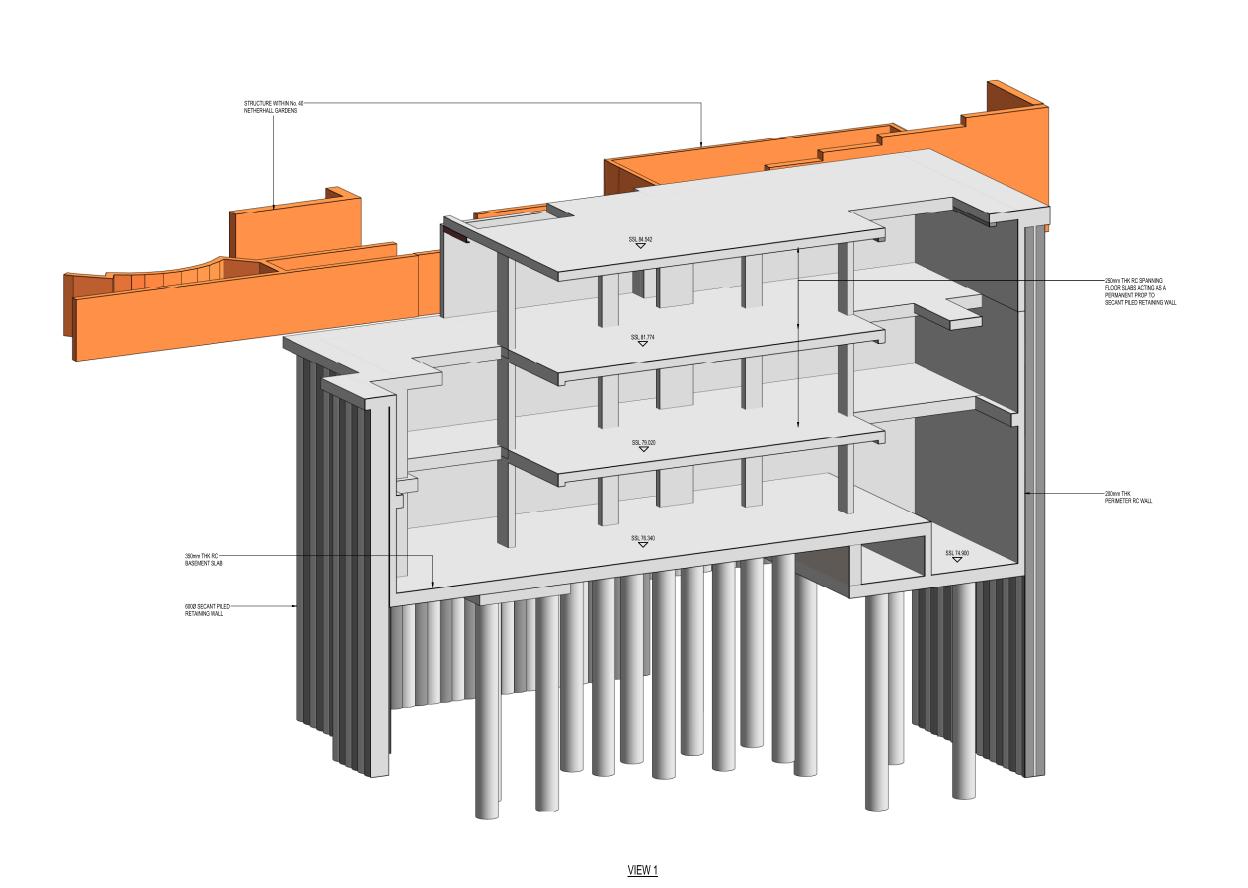
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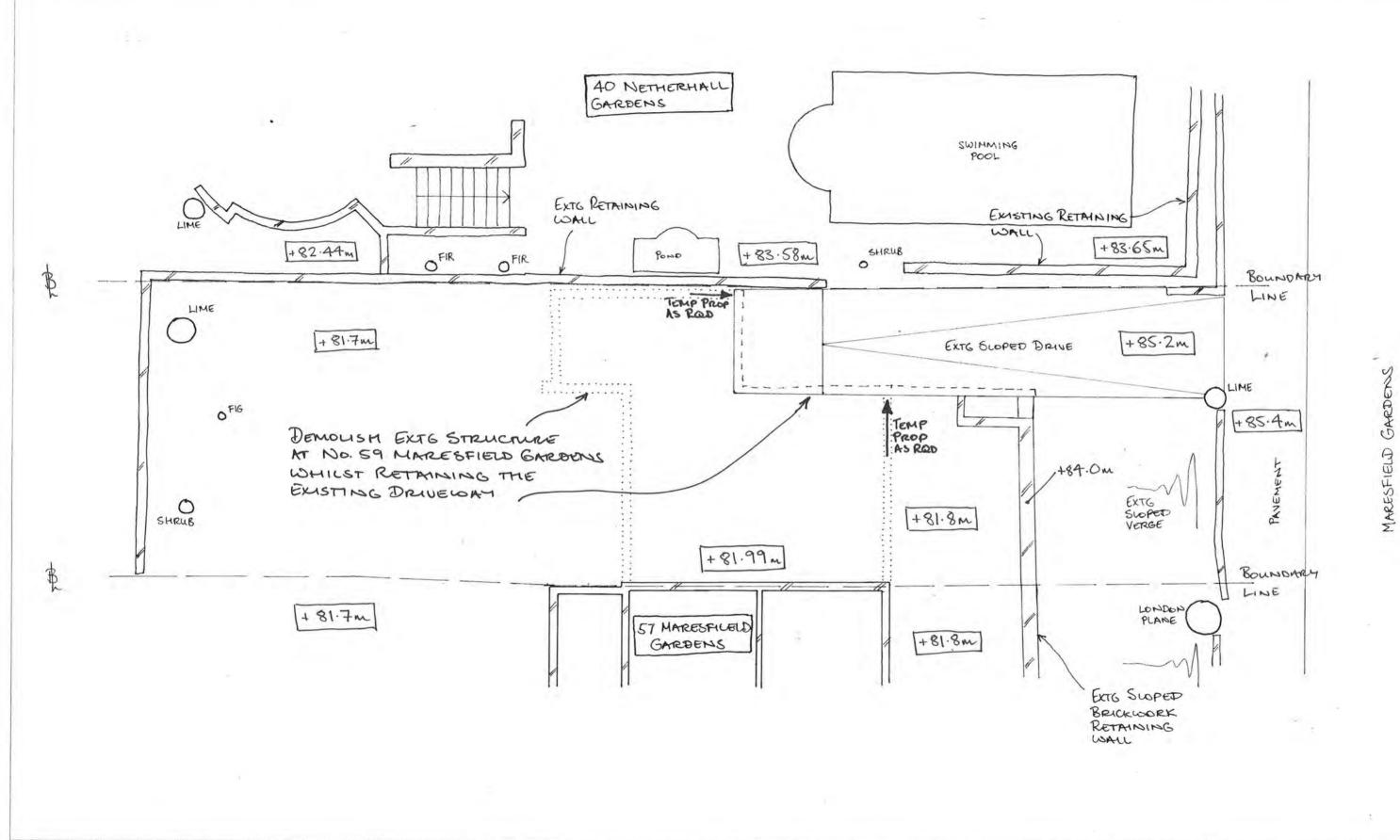
### Appendix 2.2: Assumed Sequence of Construction

Appendix 2.2.1: Plan Sequencing (SK.100 – SK.115)

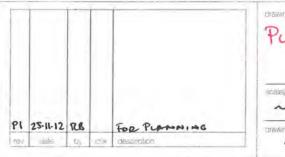
Appendix 2.2.2: Long Section 1 Sequencing (SK.200 – SK.216)

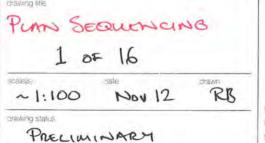
Appendix 2.2.3: Long Section 2 Sequencing (SK.300 – SK.315)

Appendix 2.2.4: Short Section Sequencing (SK.400 – SK.417)



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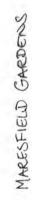


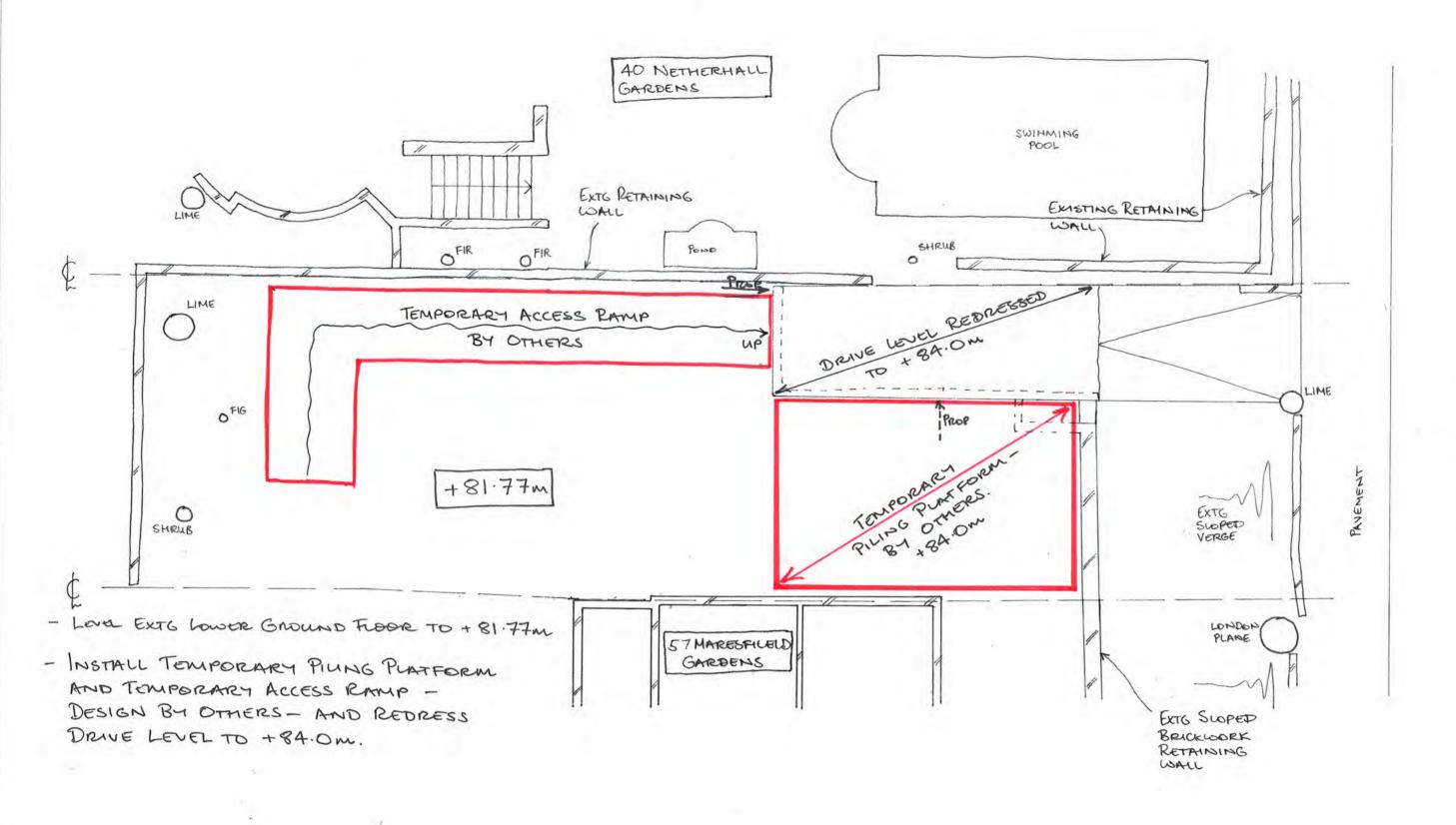


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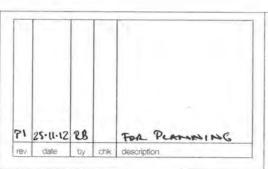
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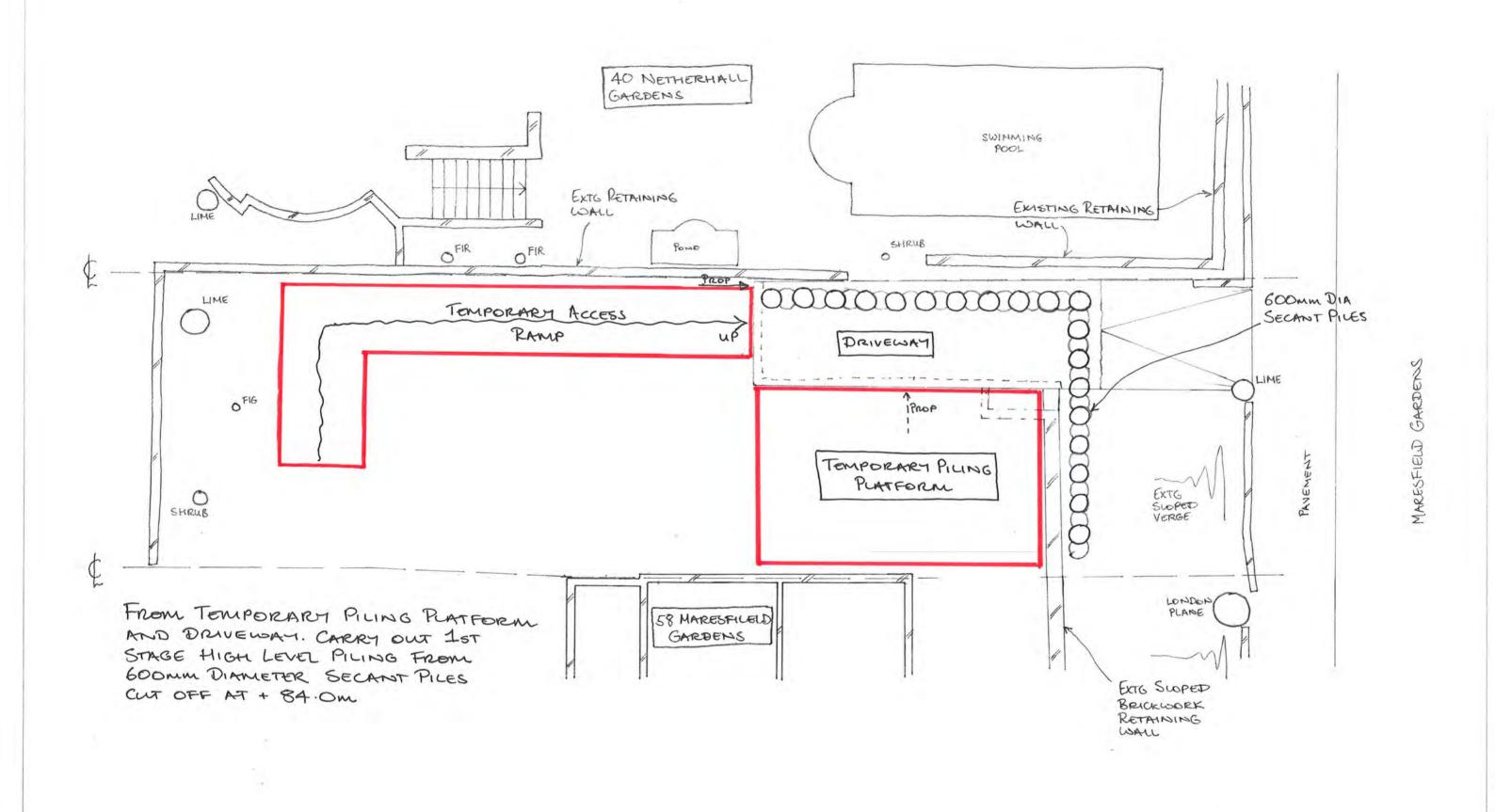
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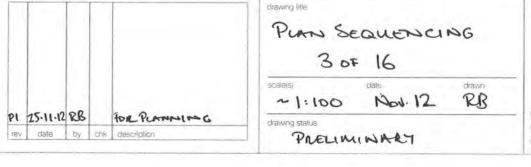
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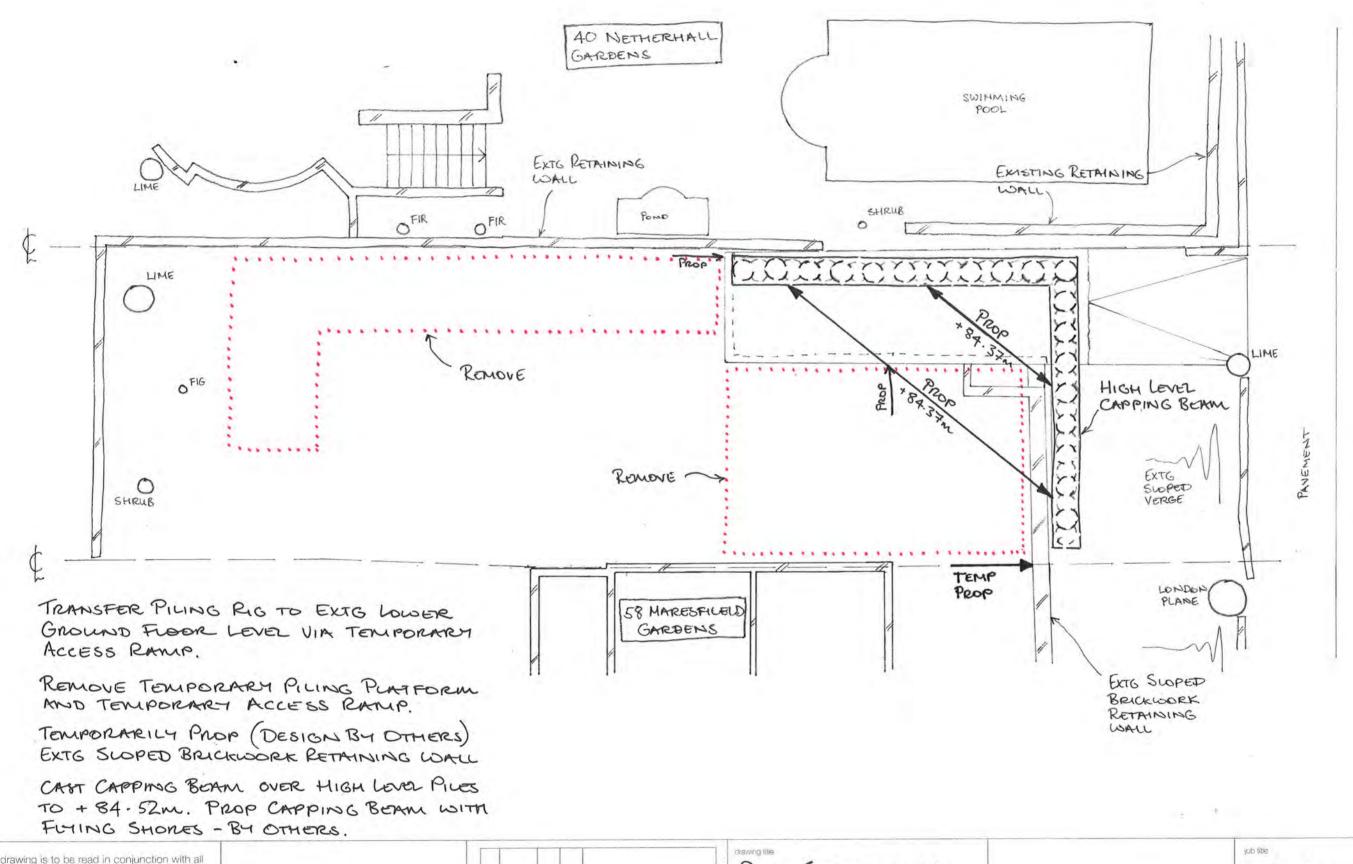


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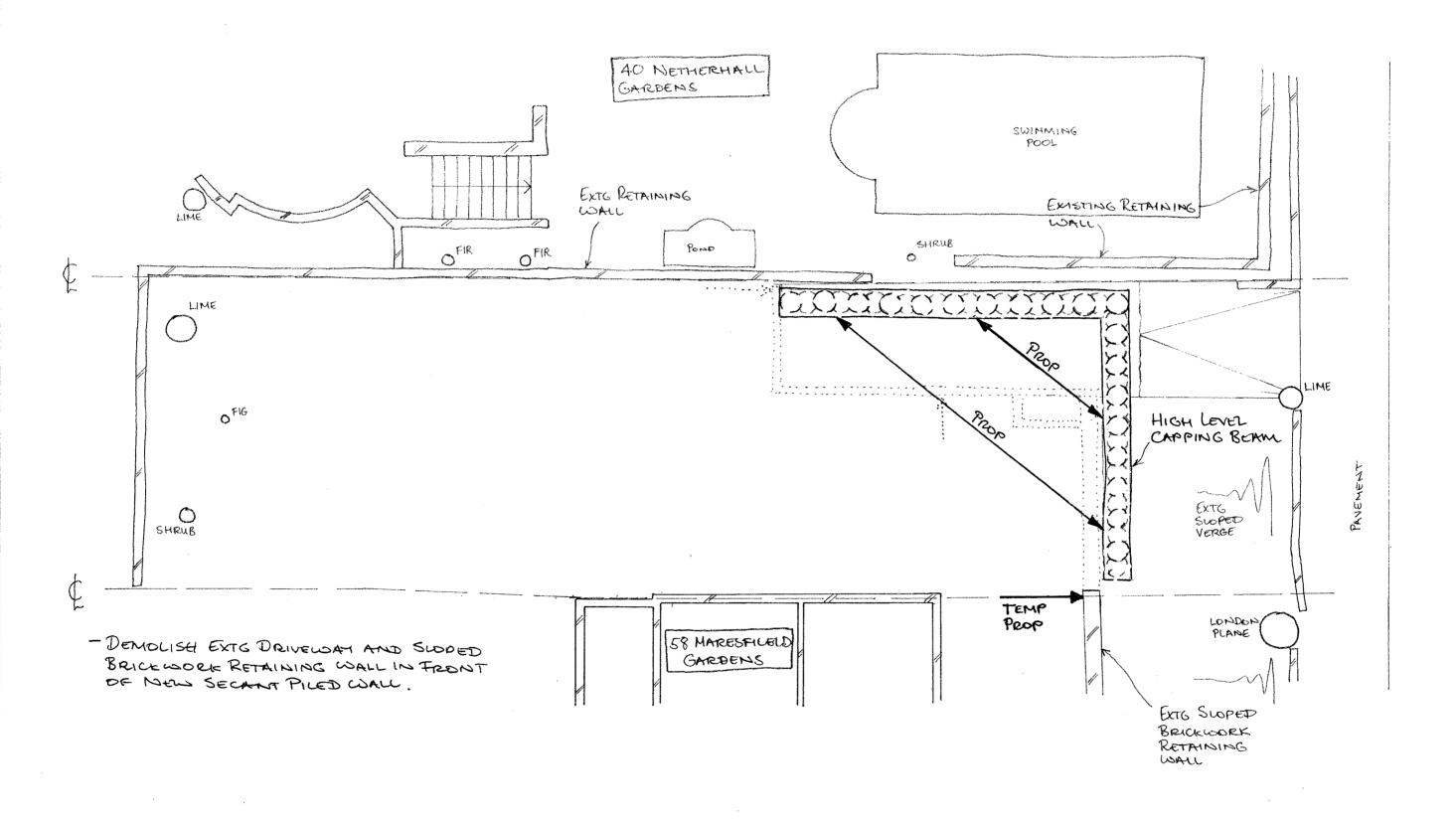
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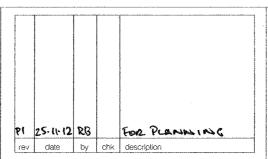
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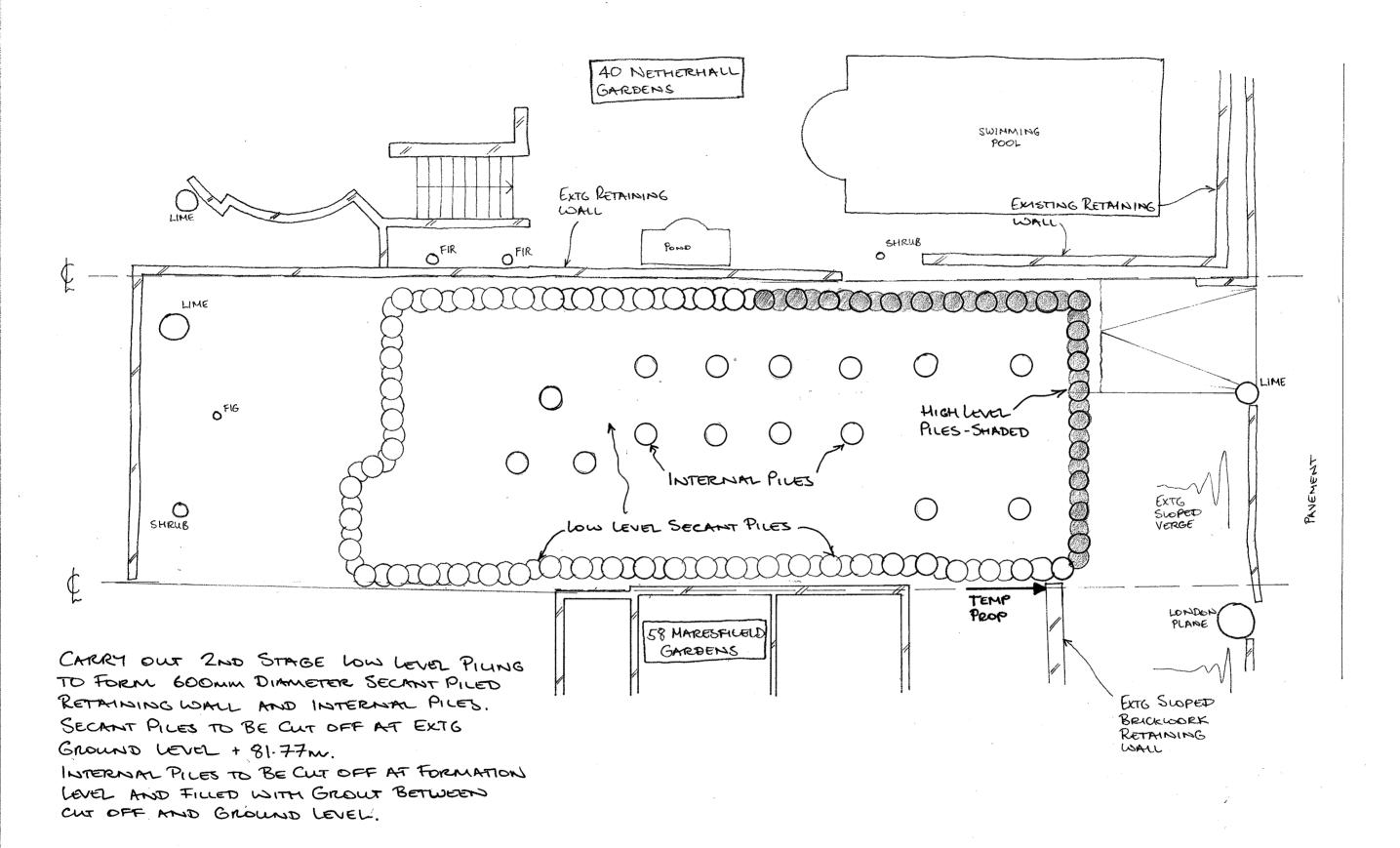
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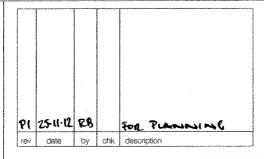
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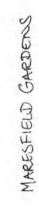
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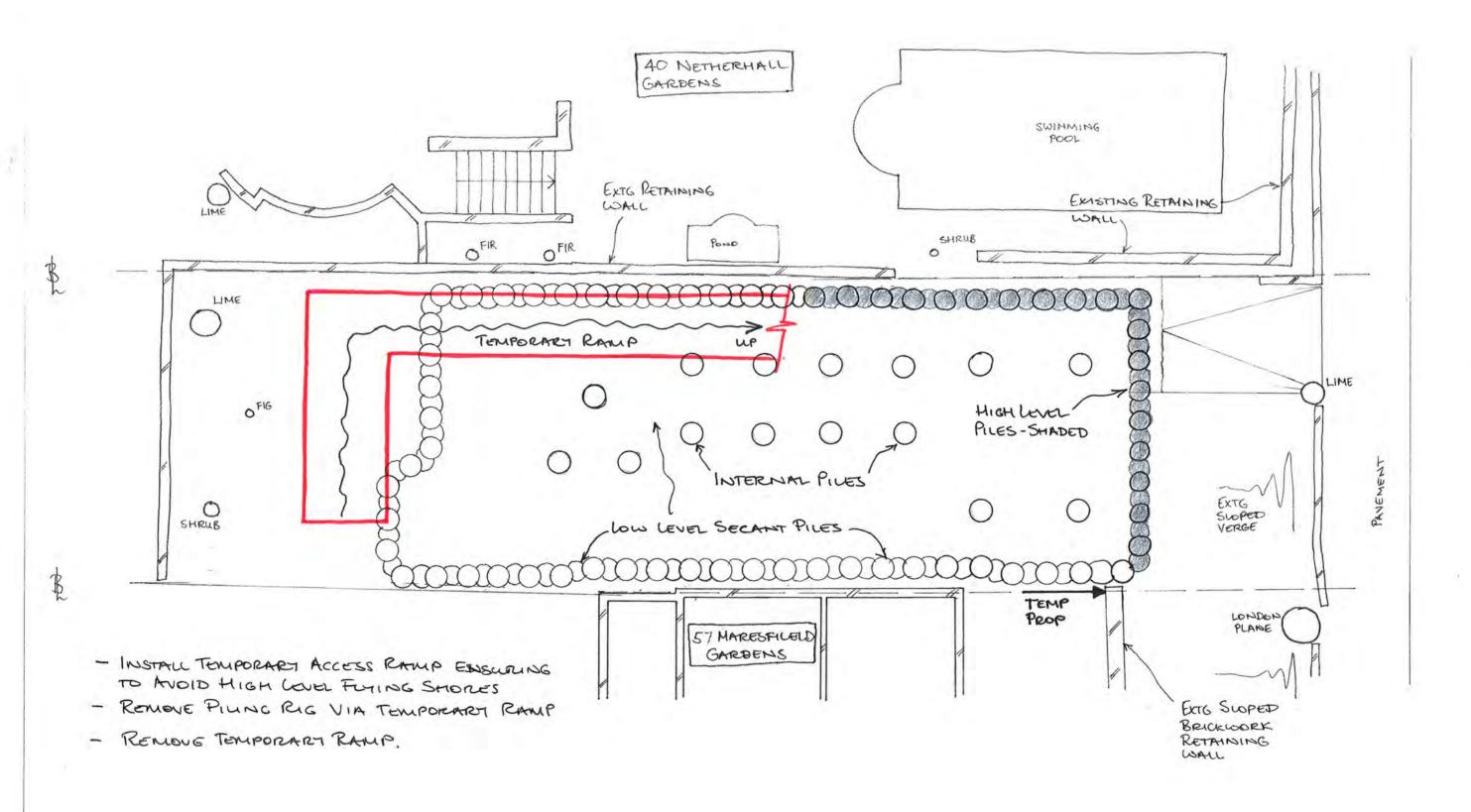
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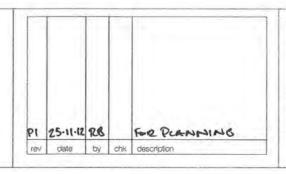
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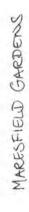
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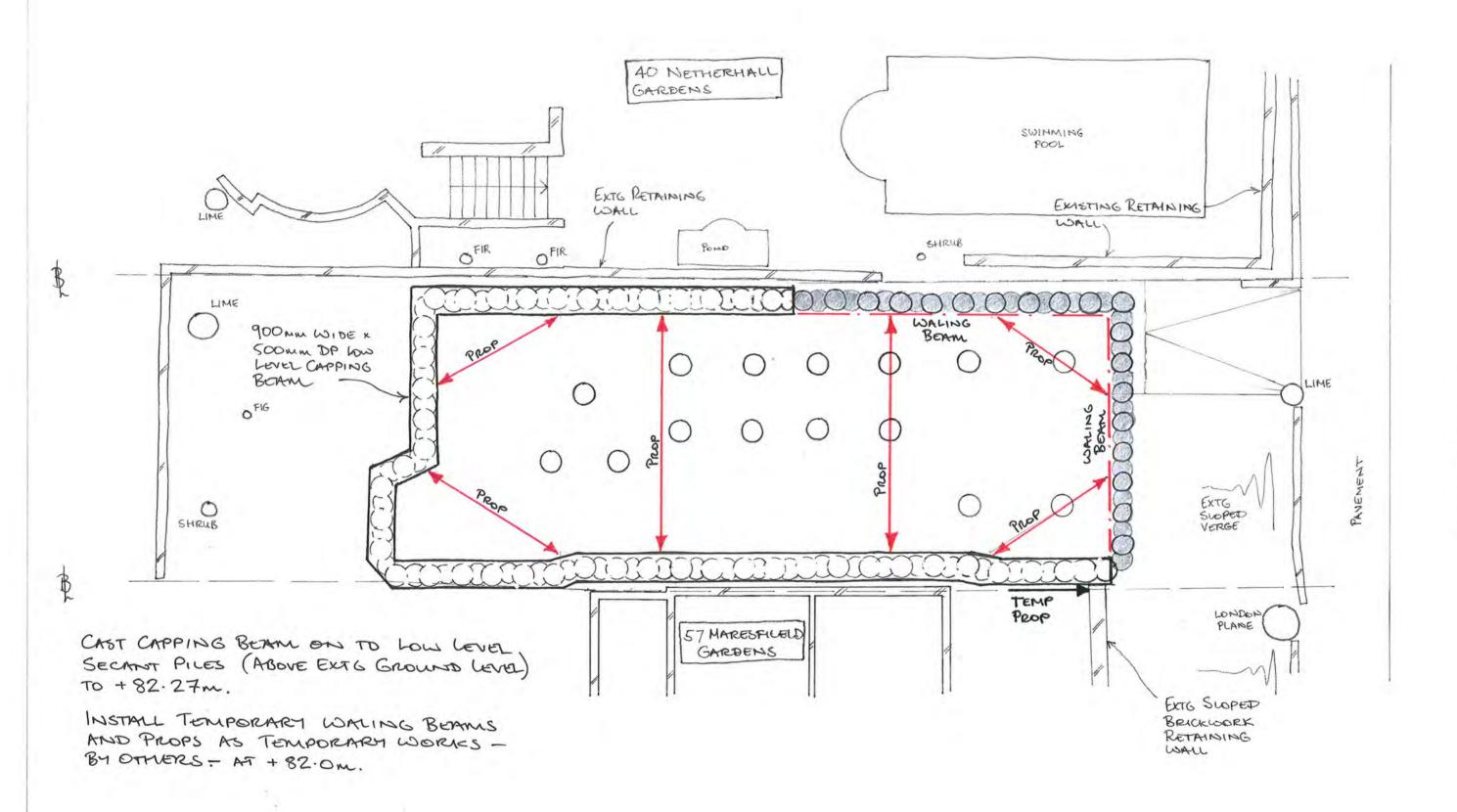
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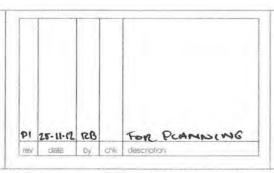
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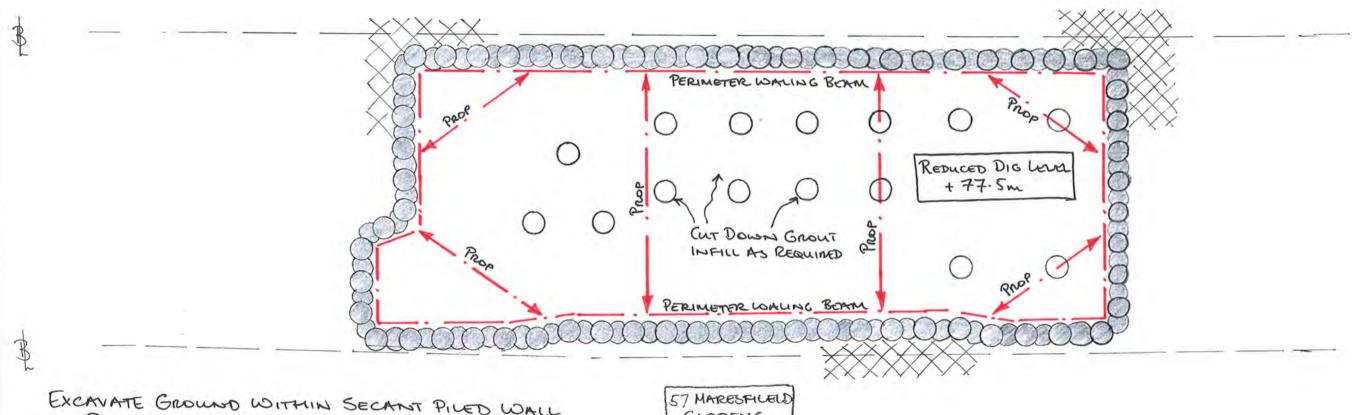
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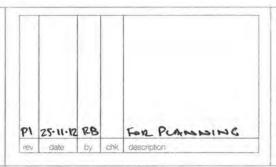
EXCAVATE GROUND WITHIN SECANT PILED WALL TO REDUCED DIG LEVEL AT +77.5m.

INSTALL PERIMETER WALING BEAMS AND PROPS AS TEMPORARY WORKS - DESIGN BY OTHERS - AT + 78.0m

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

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PRELIMINARY

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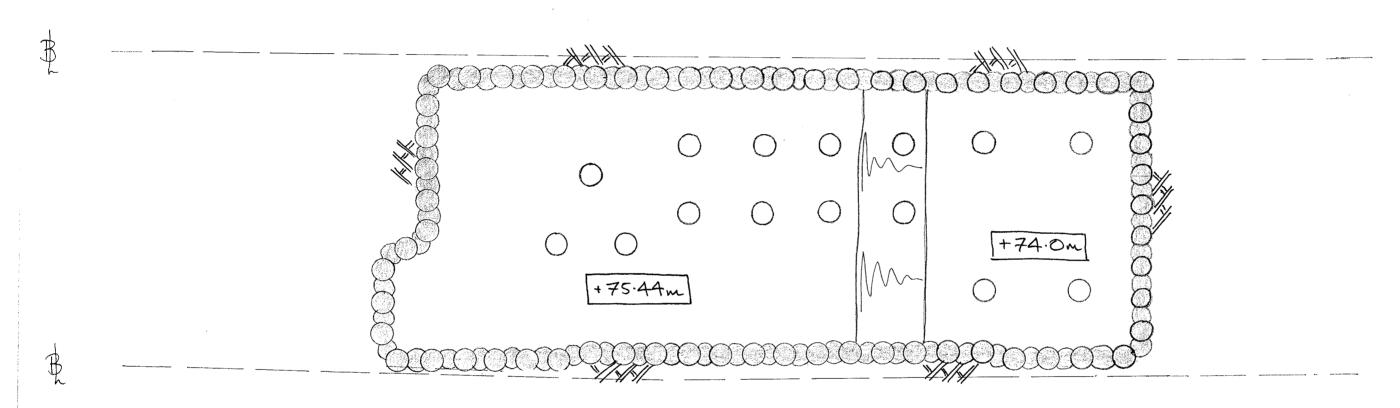
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59 MARESFIELD

GARDENS, LONDON

job no	drawing no-	revision	
211590	Sk.108	PI	

40 NETHERHALL GARDENS

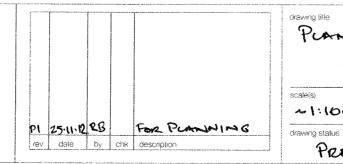


EXCAVATE TO FORMATION LEVEL; ~ +74m AT POOL AND ~ + 75.44m AT LOWER BASEMENT AND EXPOSE TOPS OF INTERNAL PILES.

57 MARCESFIELD GARDENS

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PLAN SEQUENCING 10 of 16 ~1:100 Nov 12

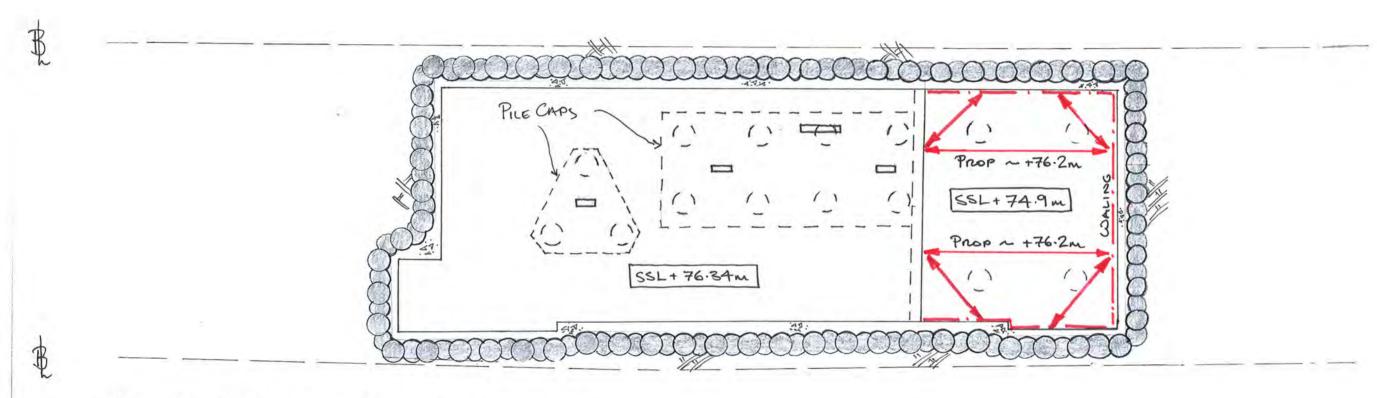
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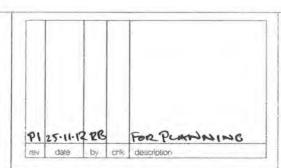
59 MARESFIELD GARDENS, LONDON

PI Sk.109 211590



- CAST PILE CAPS AND 350 MM THE RC SLABS (INCLUDING CRANK BETWEEN LEVELS) WITH HEAVE PROTECTION
- CAST PERIMETER RETAINING WALLS FO + 77.0m AND INTERNAL COLUMNS TO UNDER SIDE OF UPPER BASEMENT SLAB LEVEL.
- INSTALL TEMPORARY PROPS AND WALING BEAM AT LOWER BASEMENT SLAB LEVEL (~+76.2m) TO PROP FRONT RETAINING WALL

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PLAN SEQUENCING

11 OF 16

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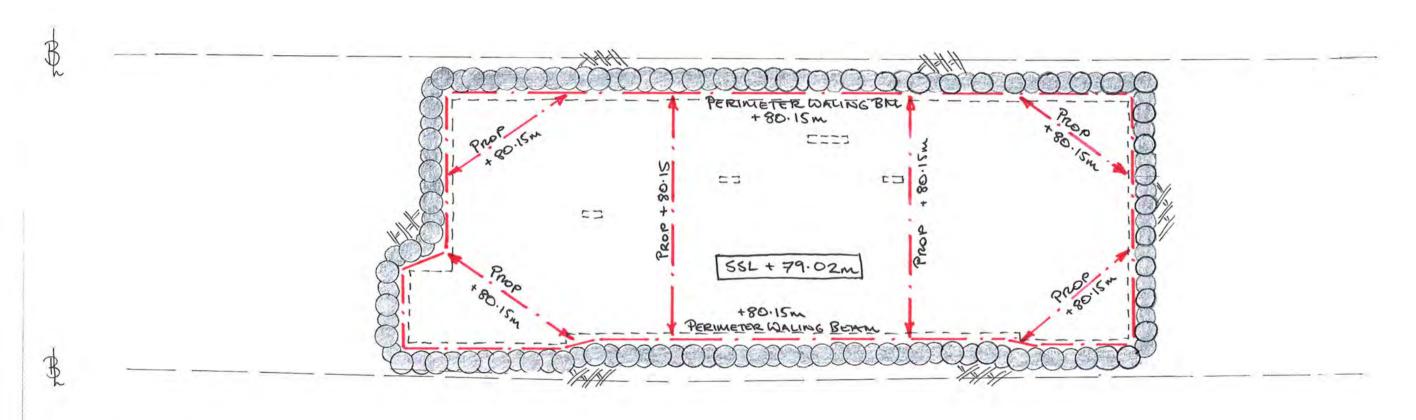
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job no drawing no revision Sk.110 Pl



- INSTALL TEMPORARY WALLING BEAMS AND PROPS AT + 80.15m.
- REMOVE TEMPORARY WALING BEAMS AND PROPS AT + 78.0m
- TO U/S OF UPPER BASEMENT SLAB LEVEZ.
- CAST UPPER BASEMENT SLAND (TO FORM A PERMANENT PROP)

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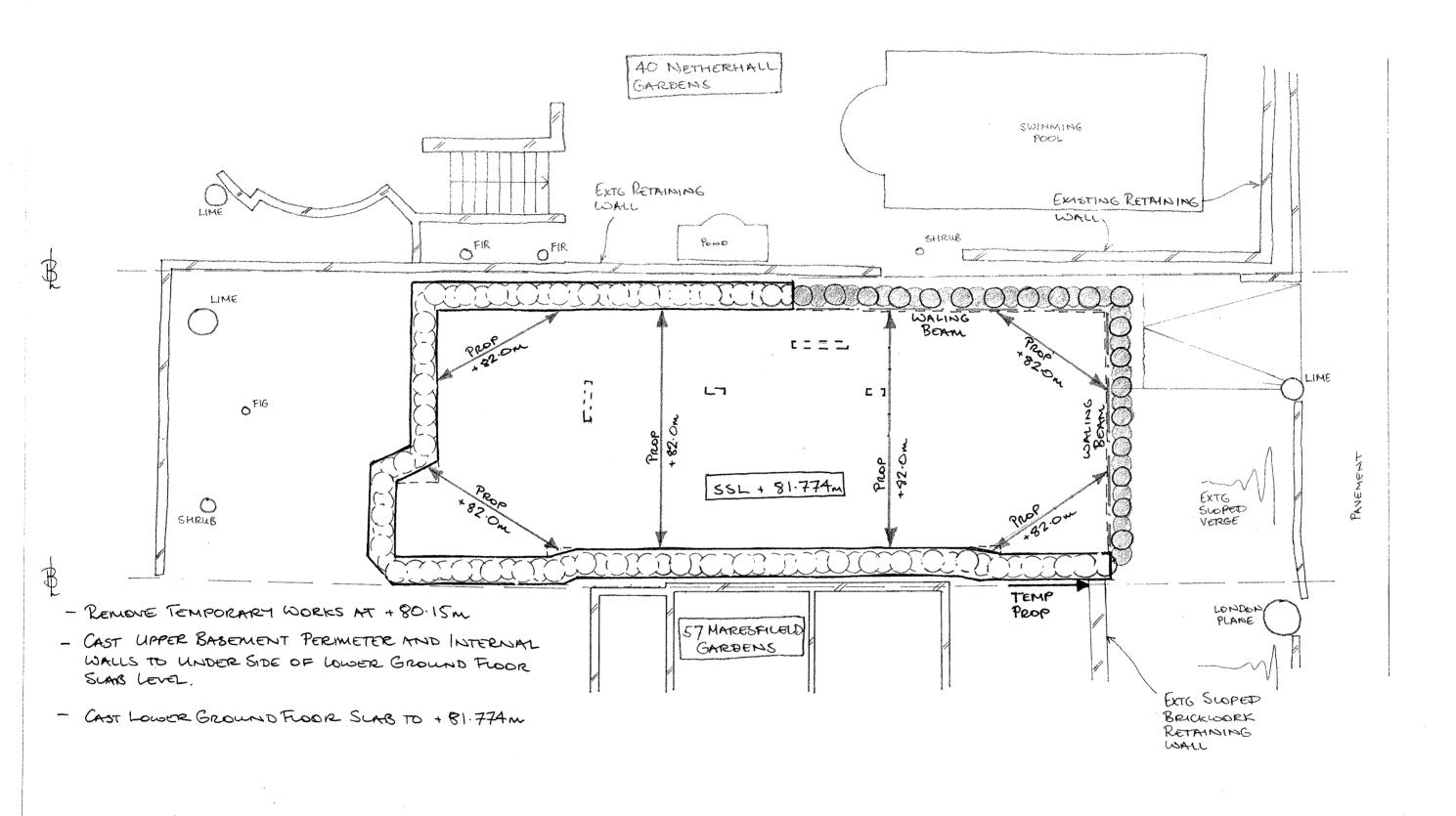
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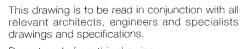
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GARDENS, LONDON

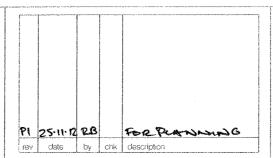
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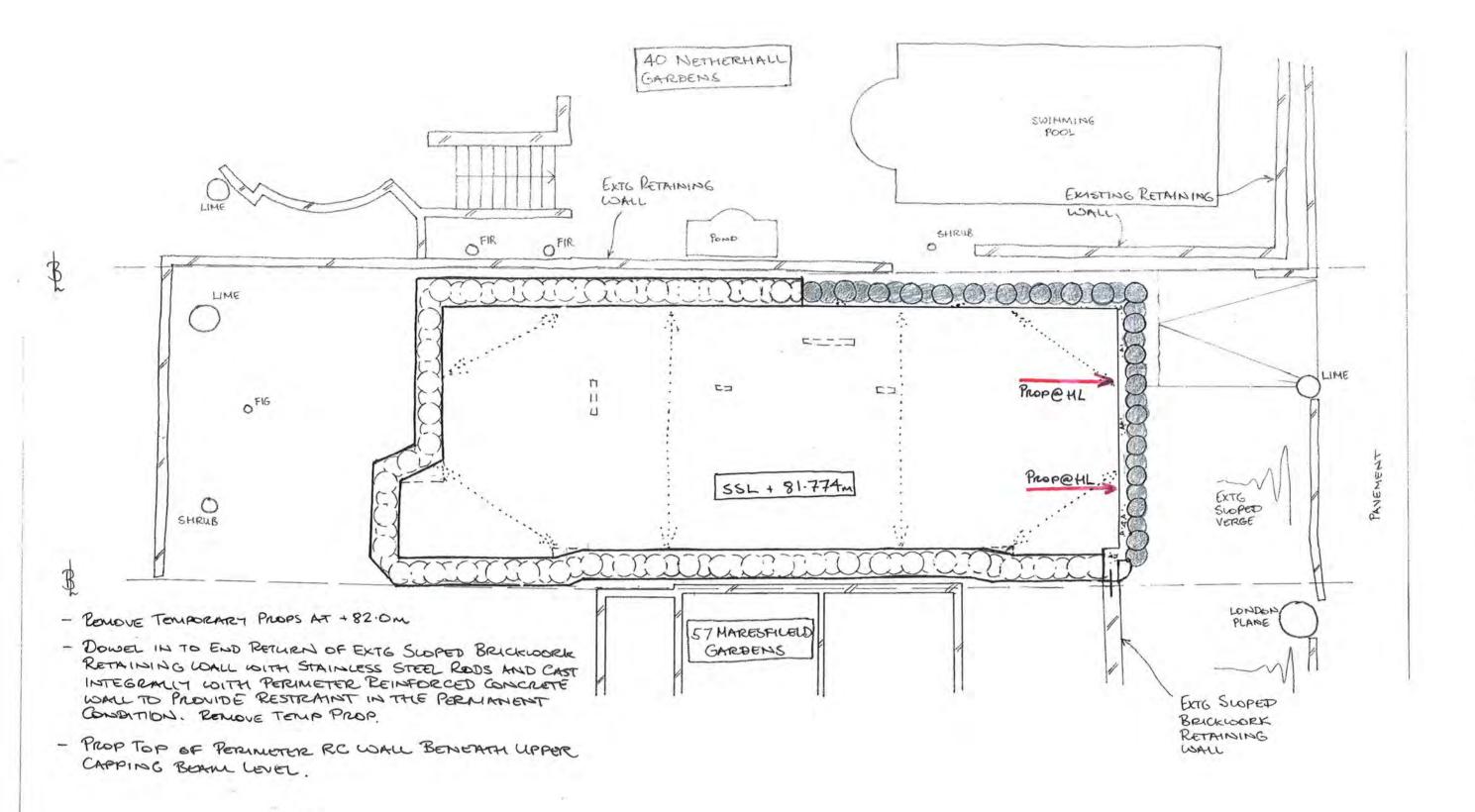
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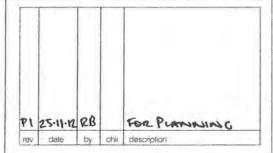
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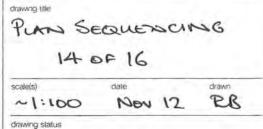




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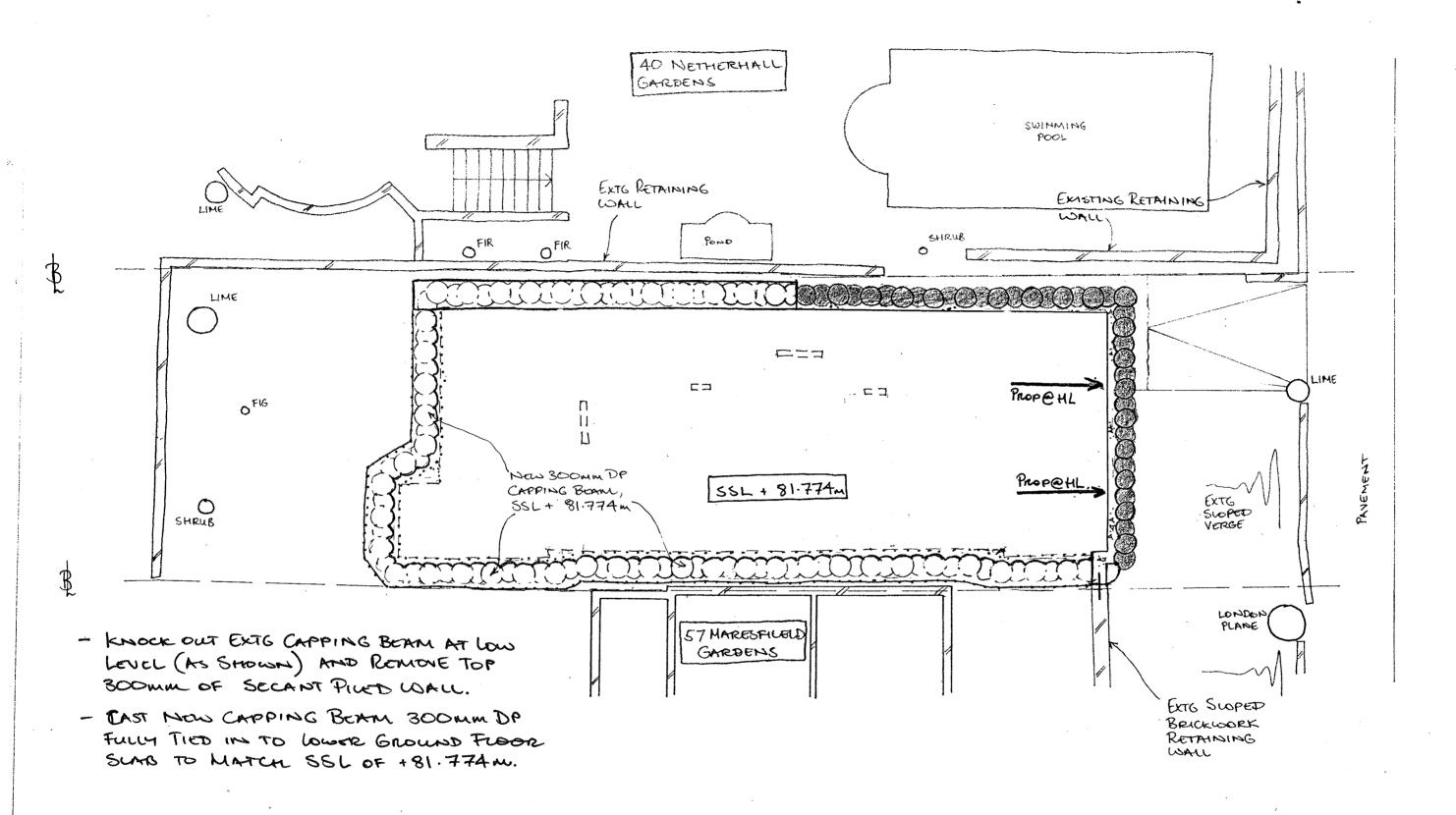
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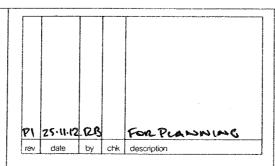
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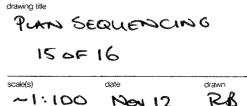
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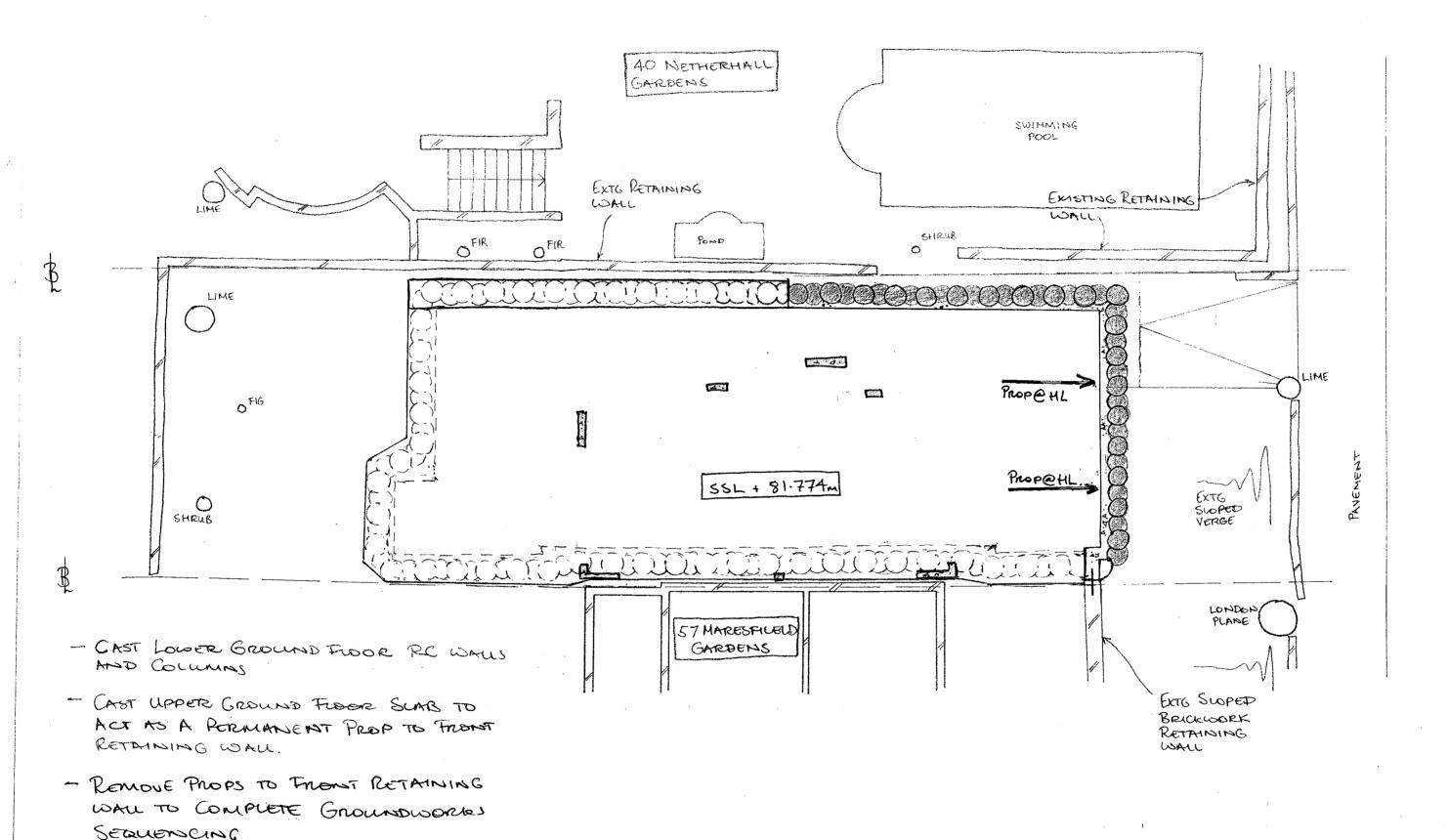
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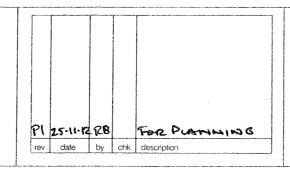
59 MARESFIELD GARDENS, LONDON

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16 OF 16

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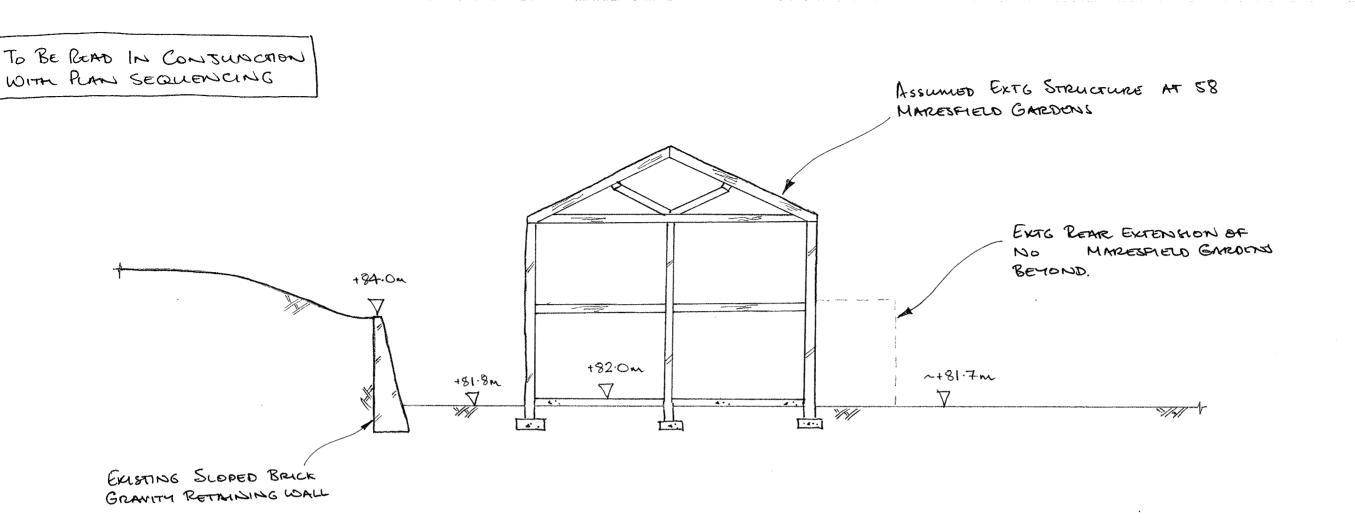
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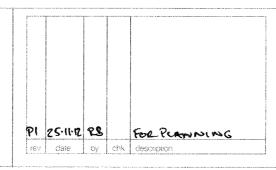
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LONG SECTION I SEQUENCING - 1 OF 17

Nov 12 RB ~1:100

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59 MARESFIELD GARDENS, LONDON

Sk: 200 Pl 211590

DEMOUSH EXTS STRUCTURE AT S

MARKESFIELD GARDENS ENSURING THAT

LATERAL STABILITY OF ADBACEINT

STRUCTURE IS PROVIDED THROUGH

TEMPORARY WORKS AS REQUIRED

PENDING FURTHER INVESTIGATIONS

EXTS OUTLING OF BUILDING AT

NO 57 MARKESFIELD GARDONS

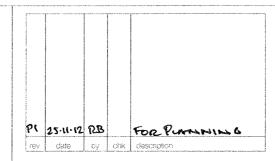
BETOND

LEVE EXTS GROUND LEVEL

TO 181.77m

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LONG SECTION I SEQUENCING - 20F 17

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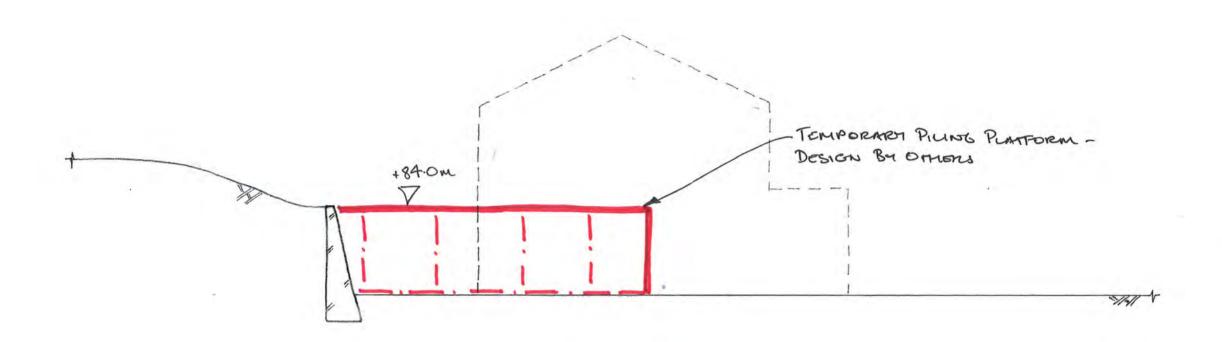
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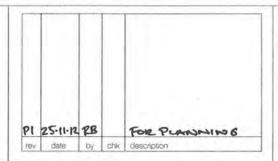
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- INSTAU TOMPORARY PIUNG PLATFORM AND TOMPORARY ACCESS RAMP -NOT SHOWN.

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LONG SECTION 1 SEQUENCING - 30 F 17

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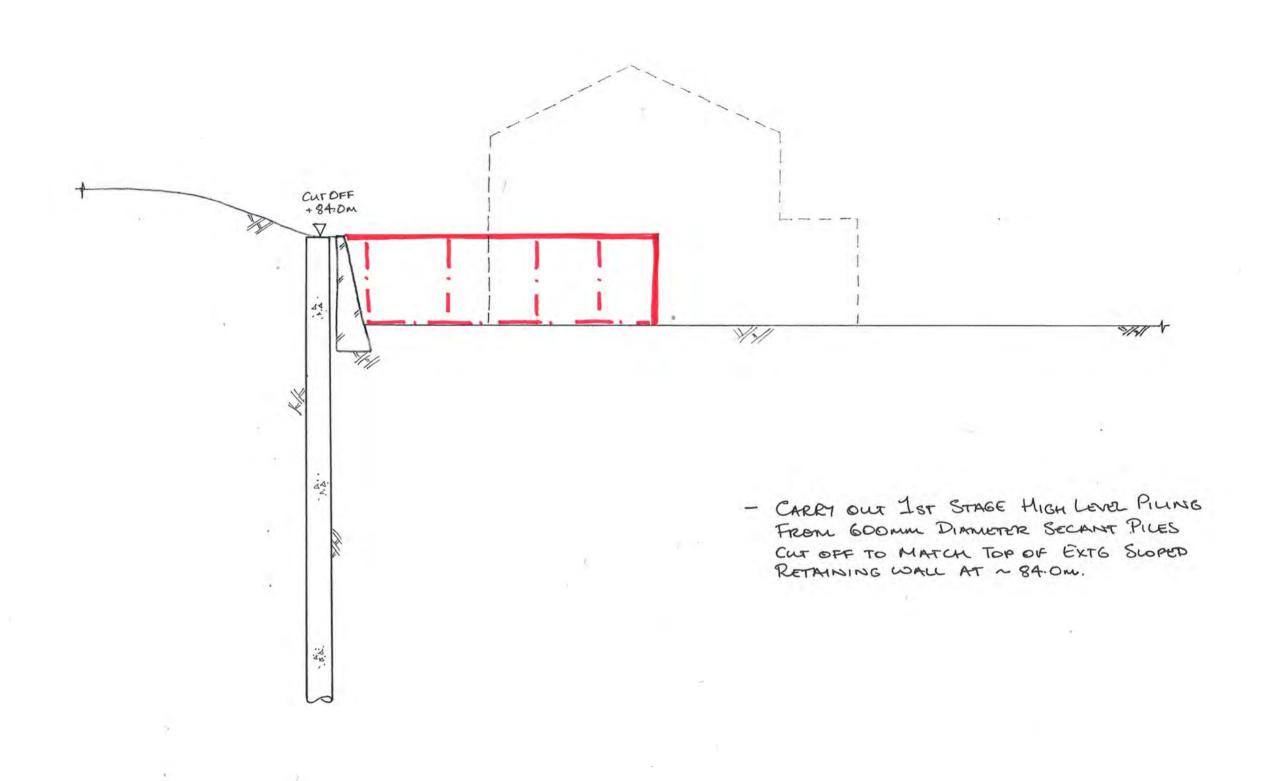
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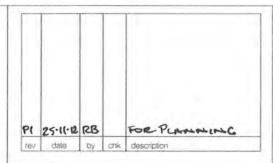
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GARDENS, LONDON

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### LONG SECTION I SEQUENCING - 4 OF 17

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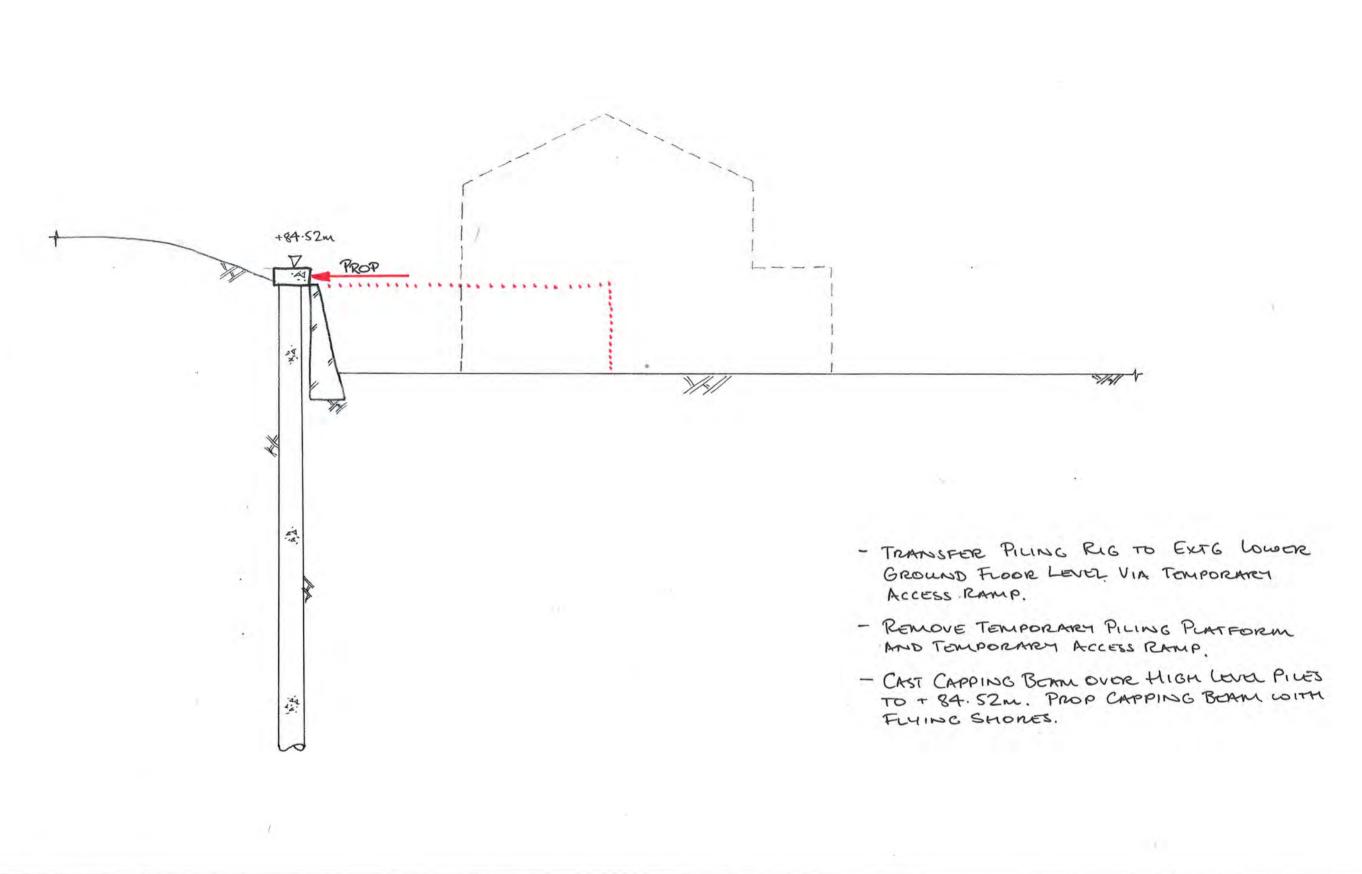
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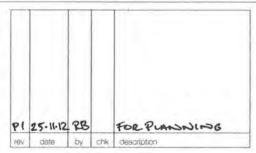
59 MARRESFIELD GARDONS, LONDON

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LONG SECTION I SEQUENCING-SOF 17

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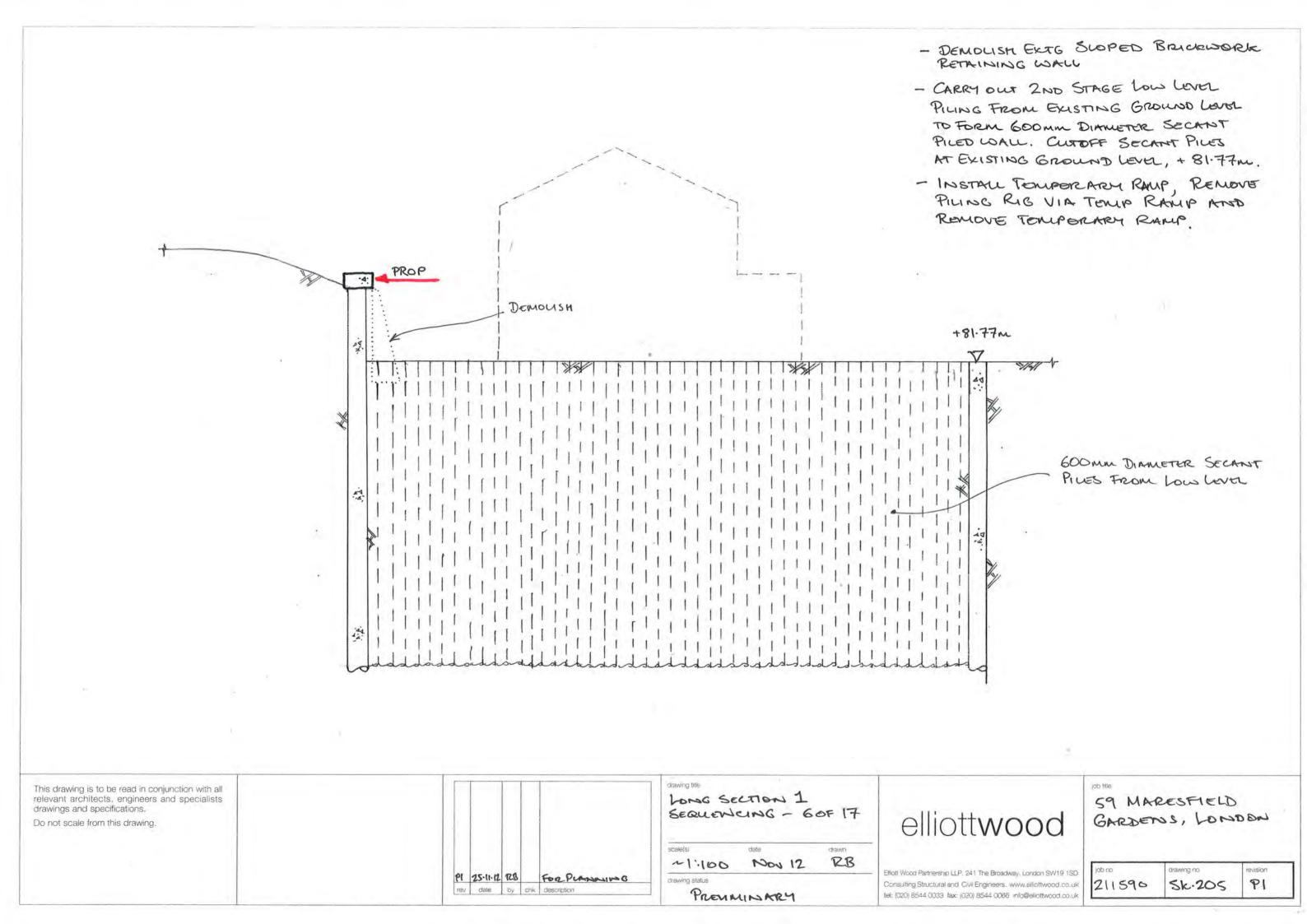
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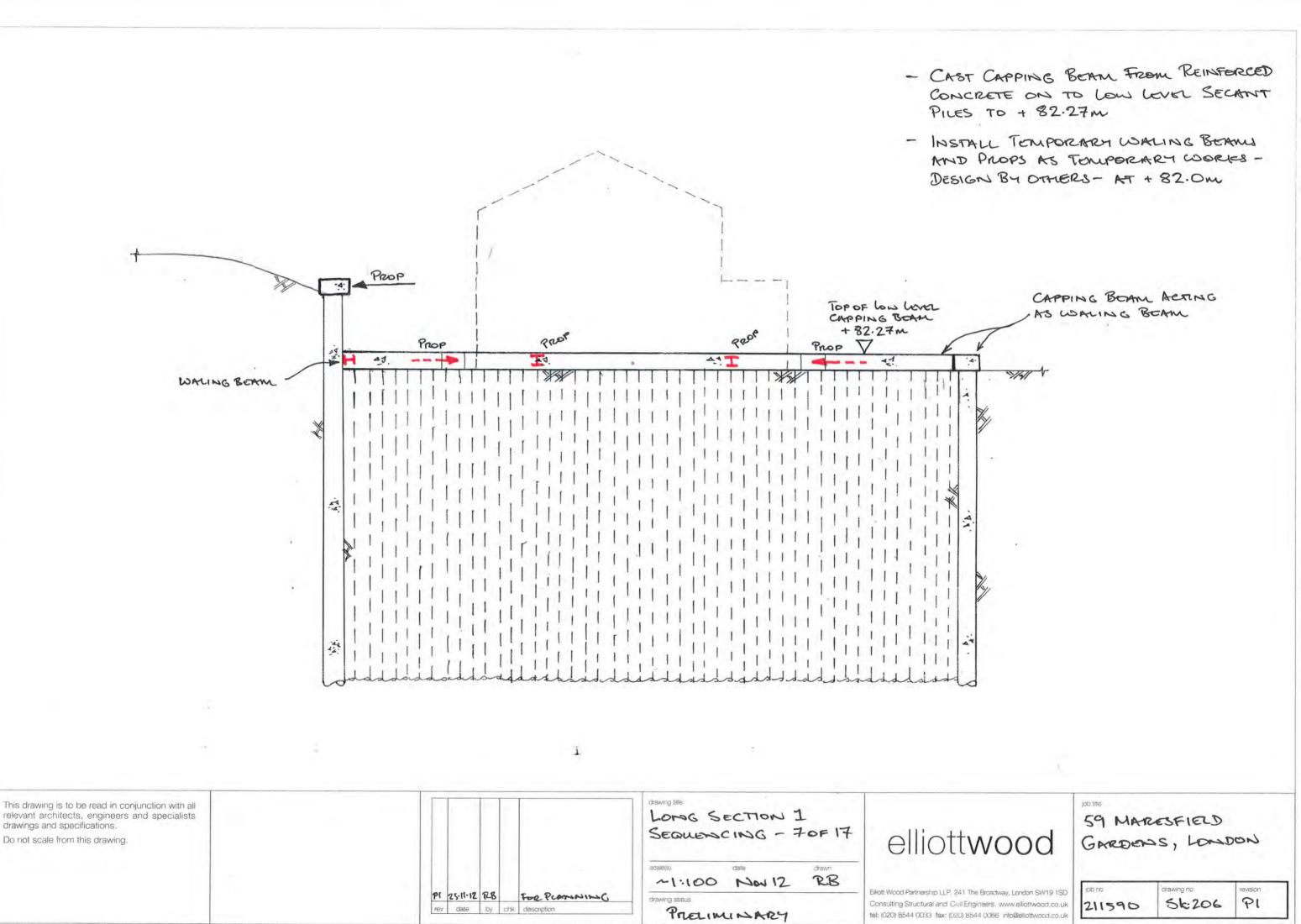
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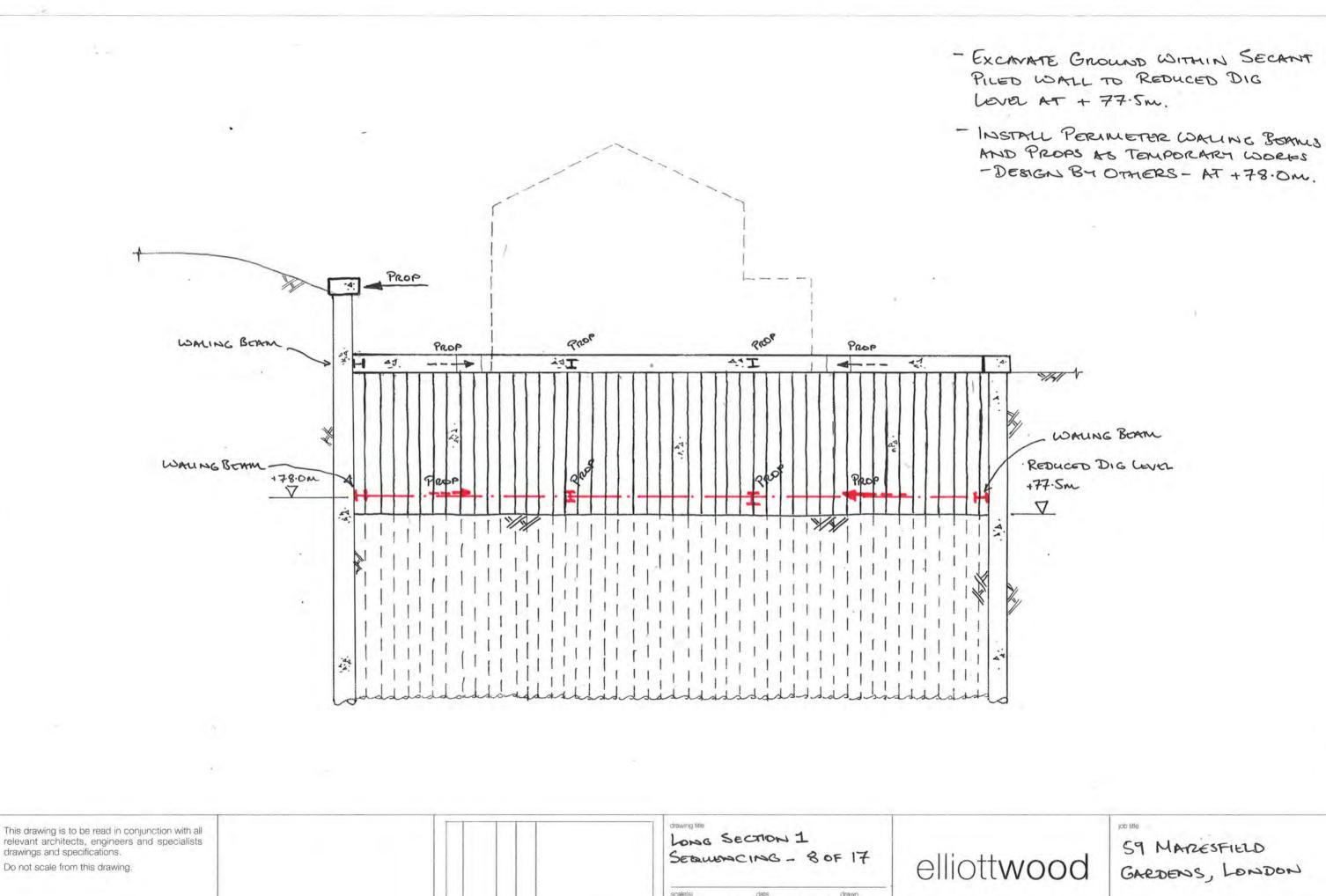
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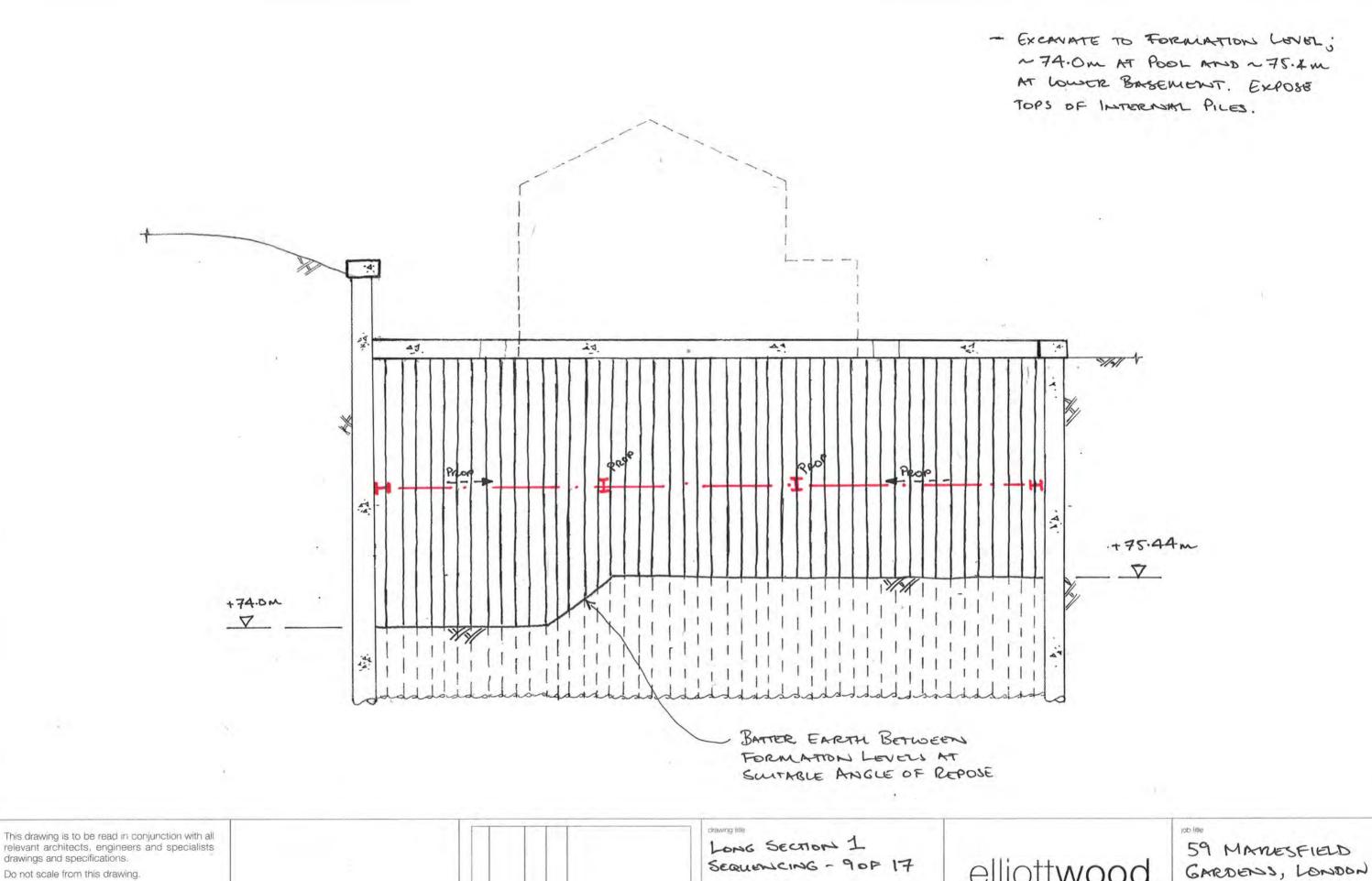
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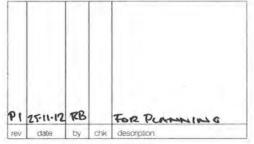
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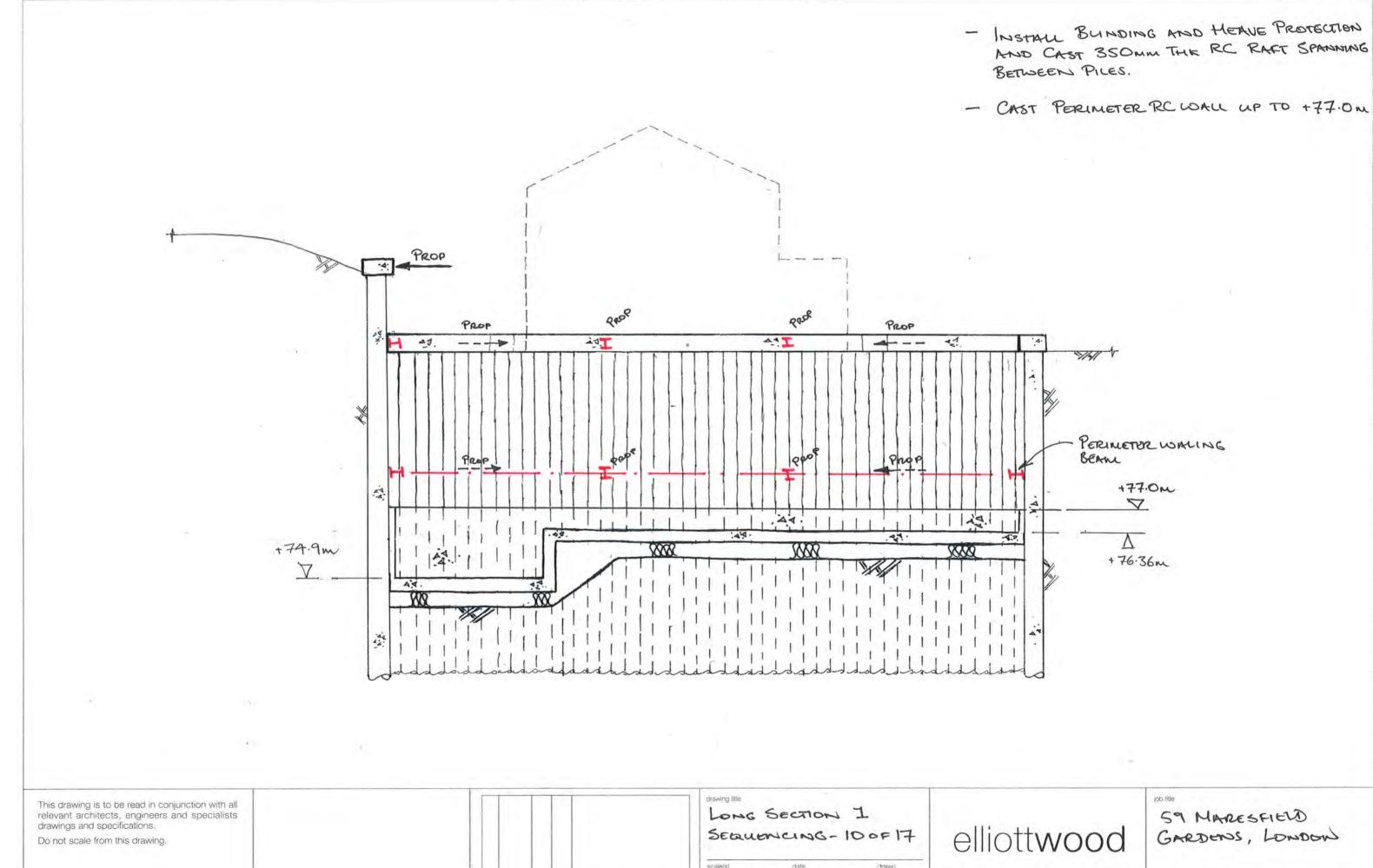
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59 MANUESFIELD

drawing no PI 211590 Sk-208



PI 25-11-12 RB FOR PLANING

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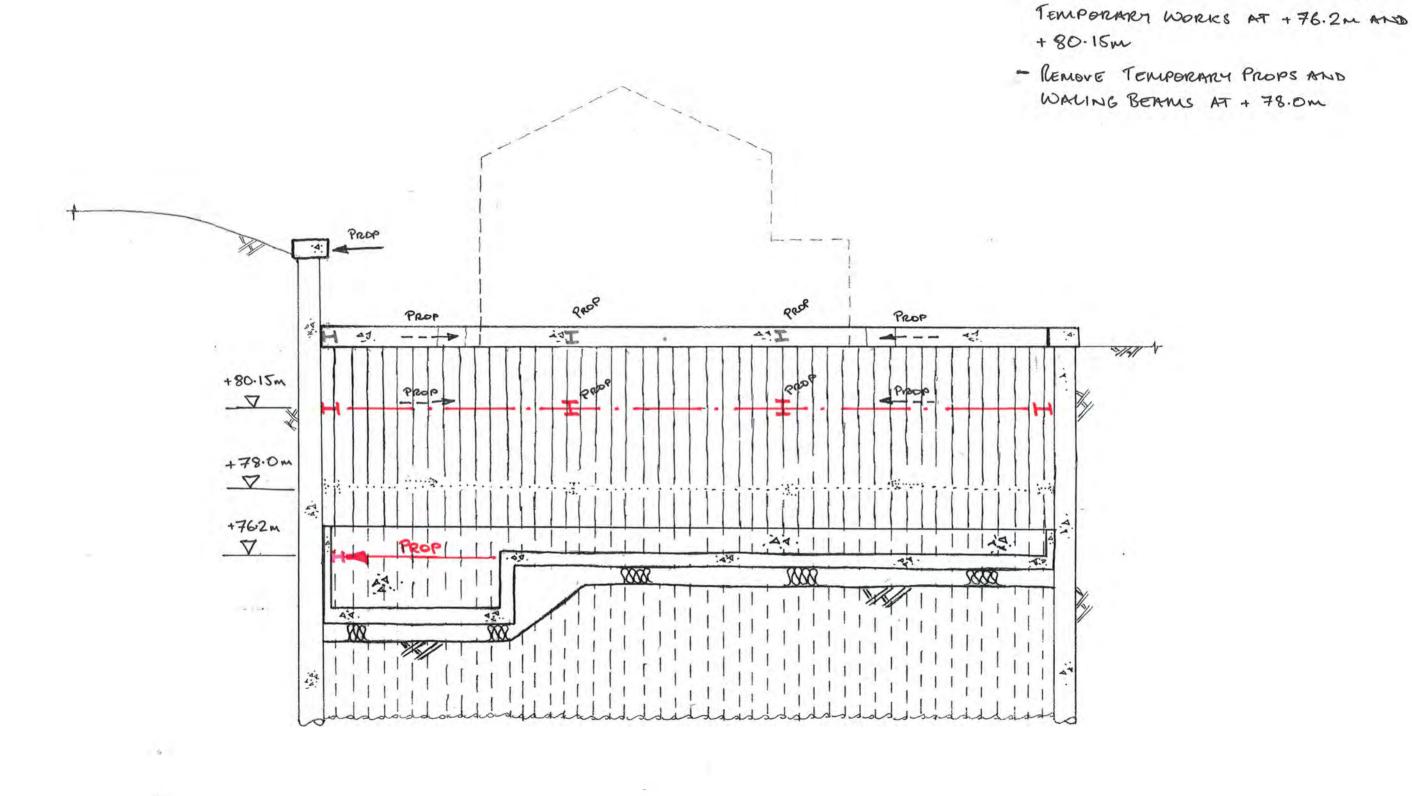
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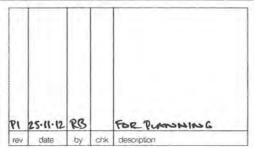
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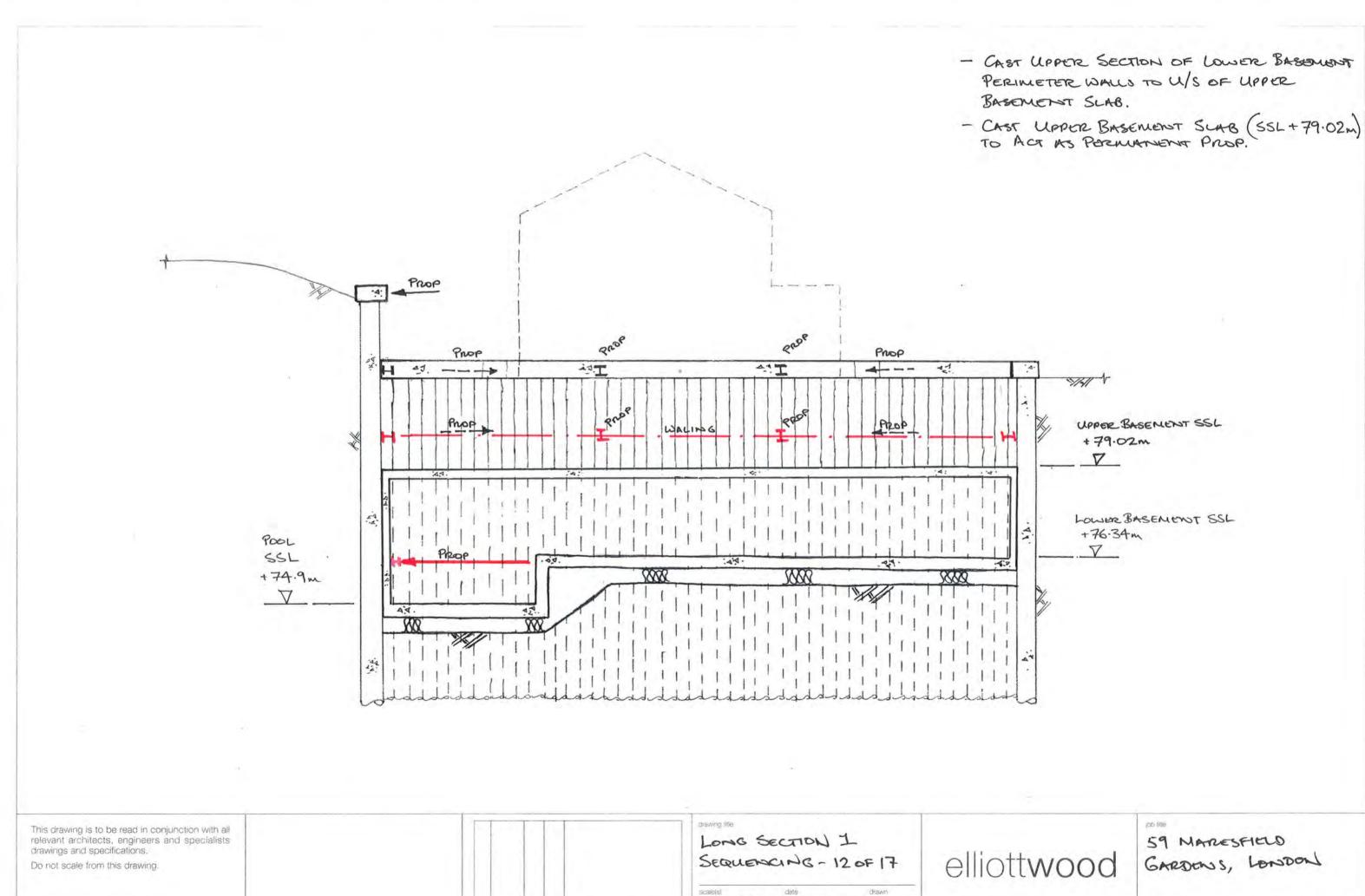
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59 MARESFIELD GARDENS, LONDON

- INSTALL PROPS AND WALINGS AS

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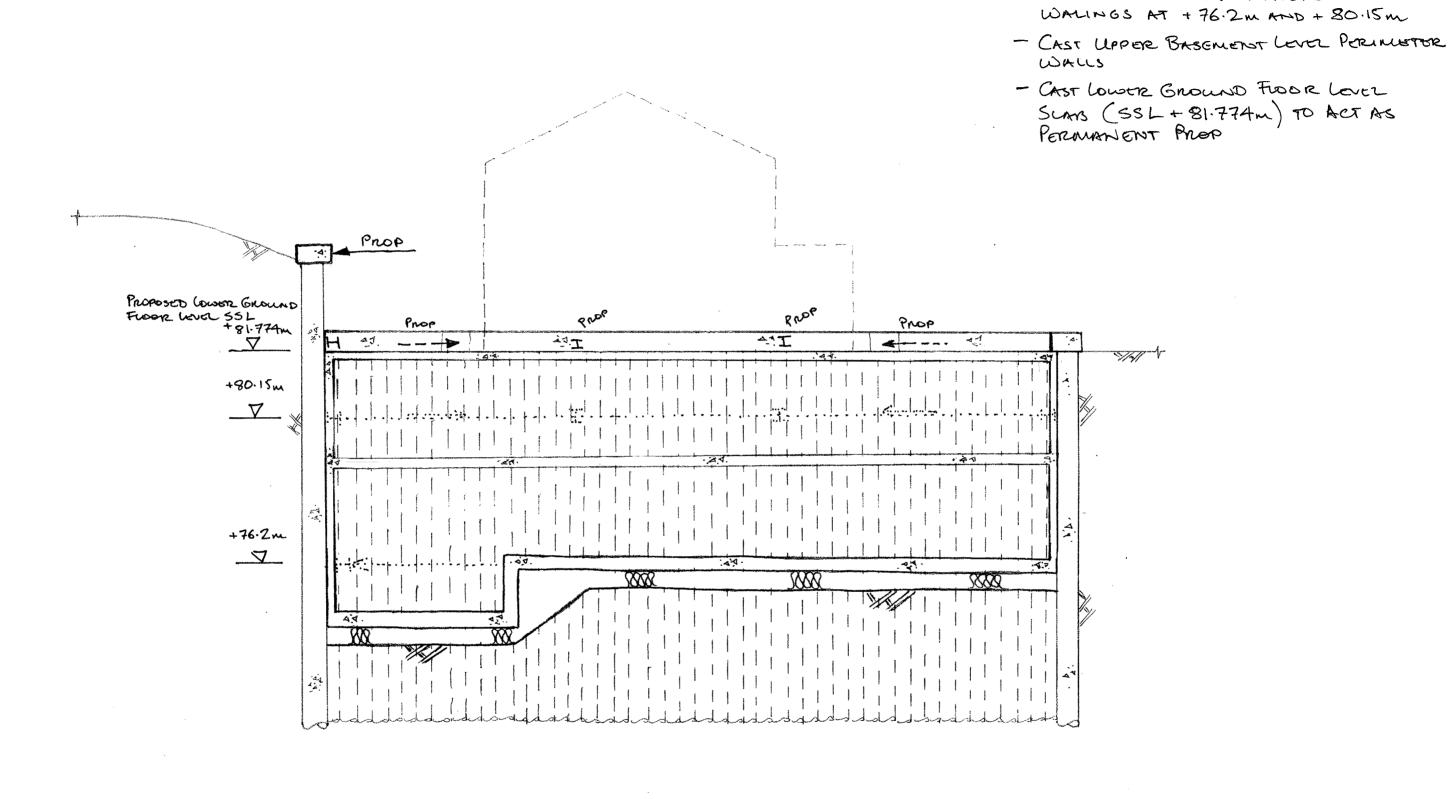
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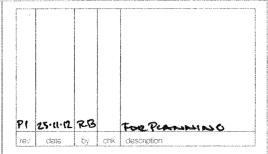
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LONG SECTION I SEQUENCING - 13 OF 17

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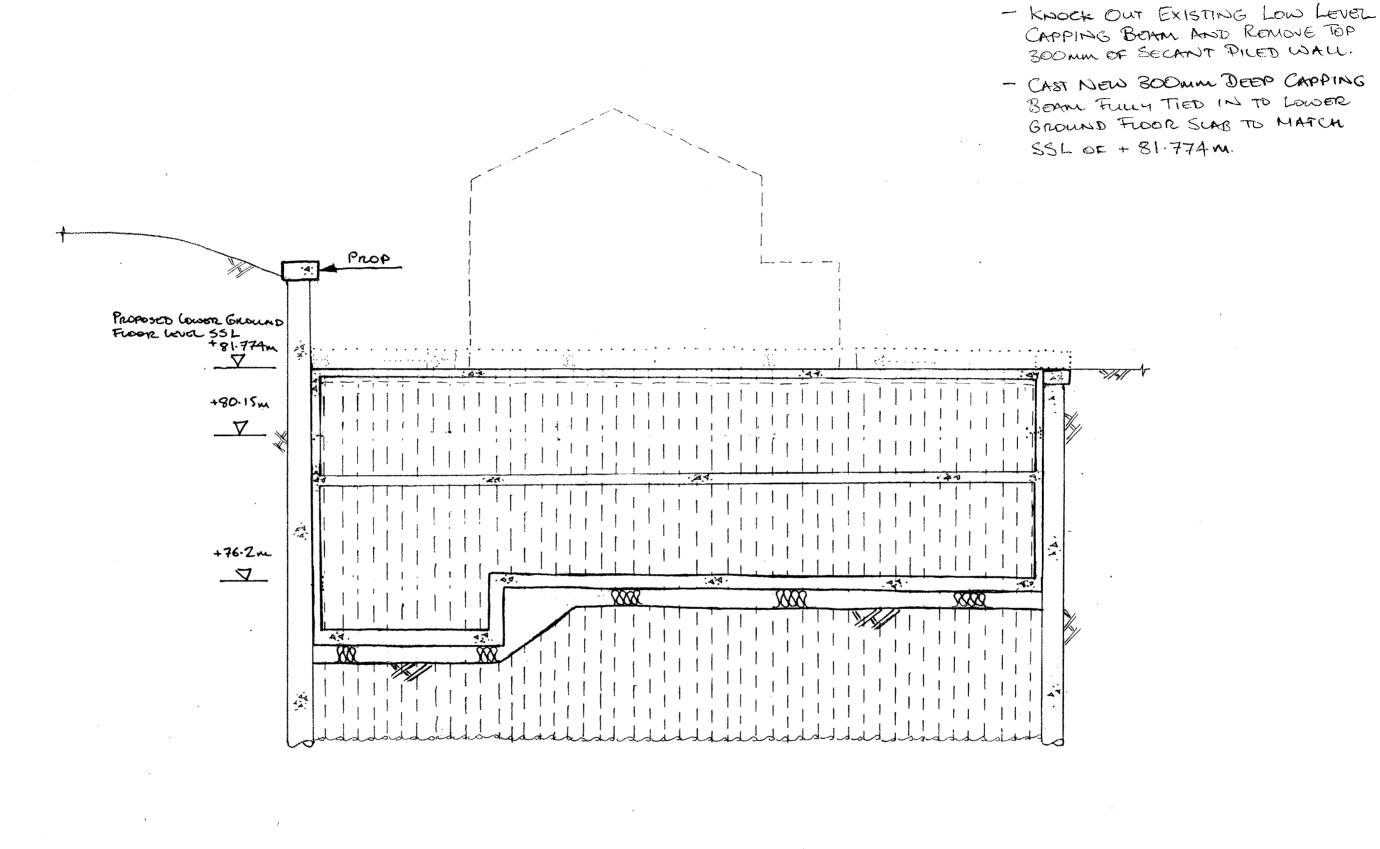
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59 MARKESFIELD
GARDENS, LONDON

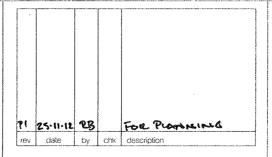
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- REMOVE TEMPORARY PROPS MAD

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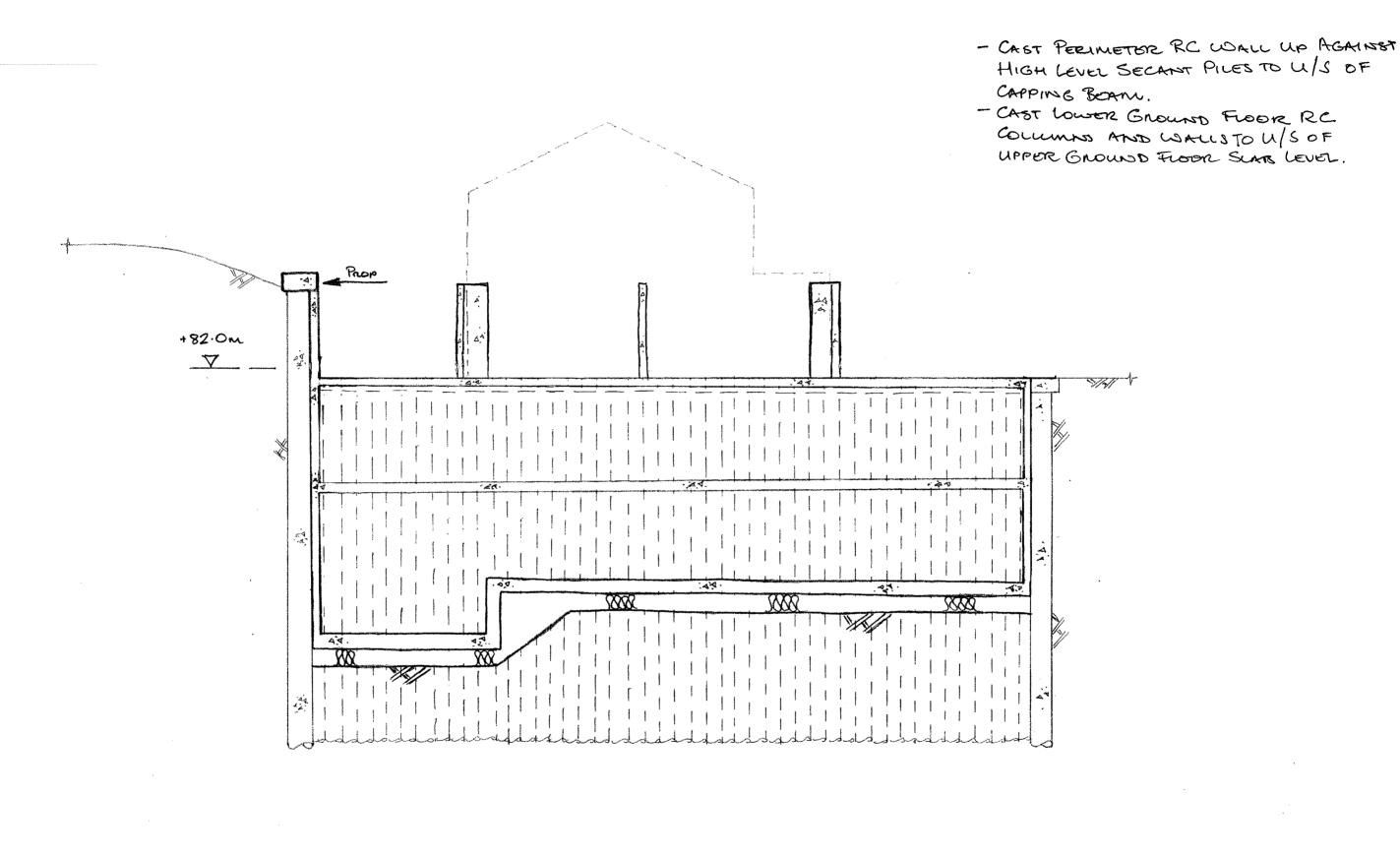
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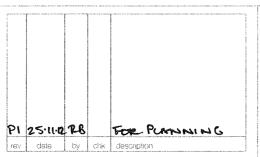
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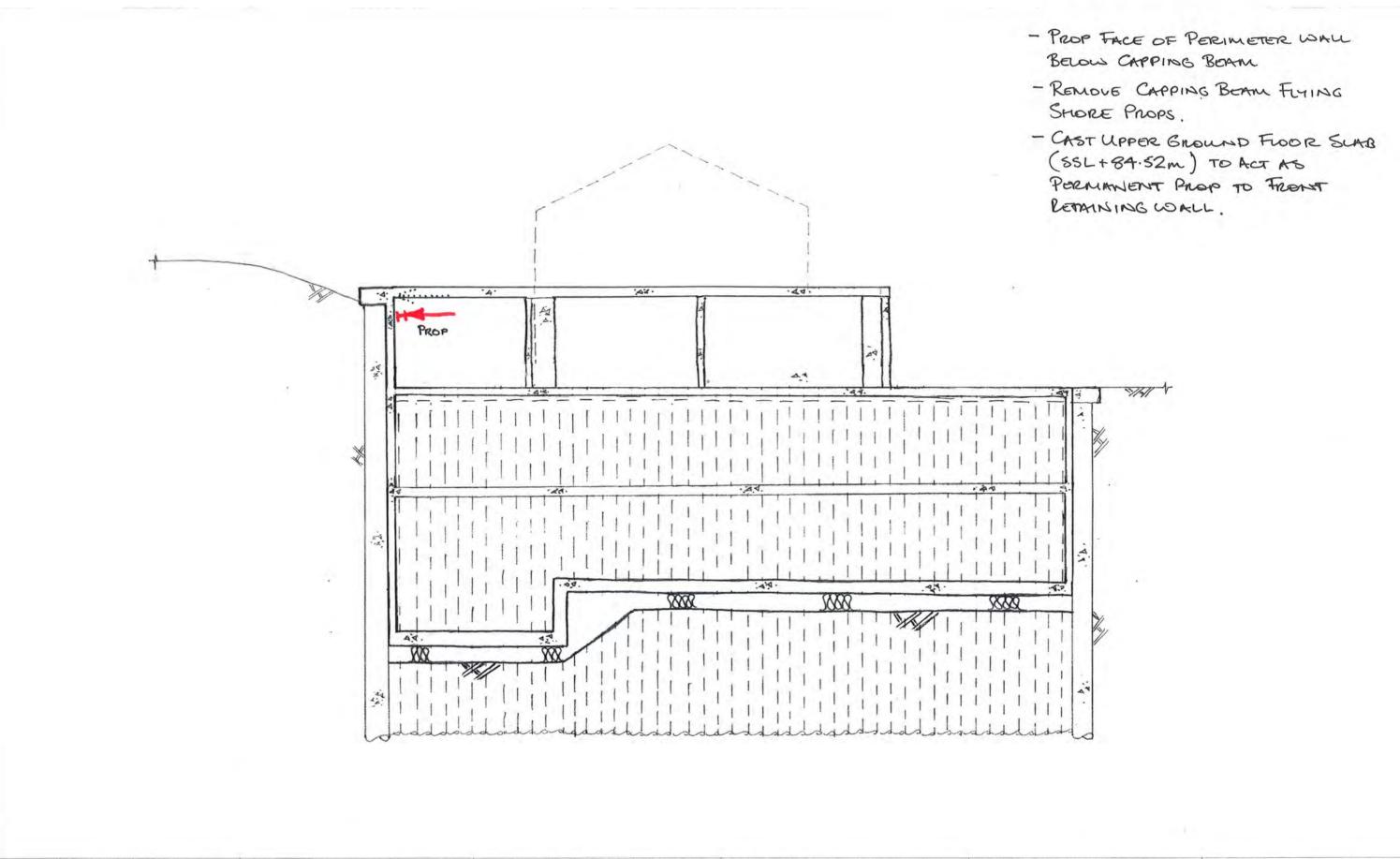
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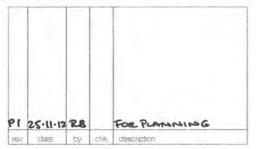
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LONG SECTION I SEQUENCING - 16 OF 17

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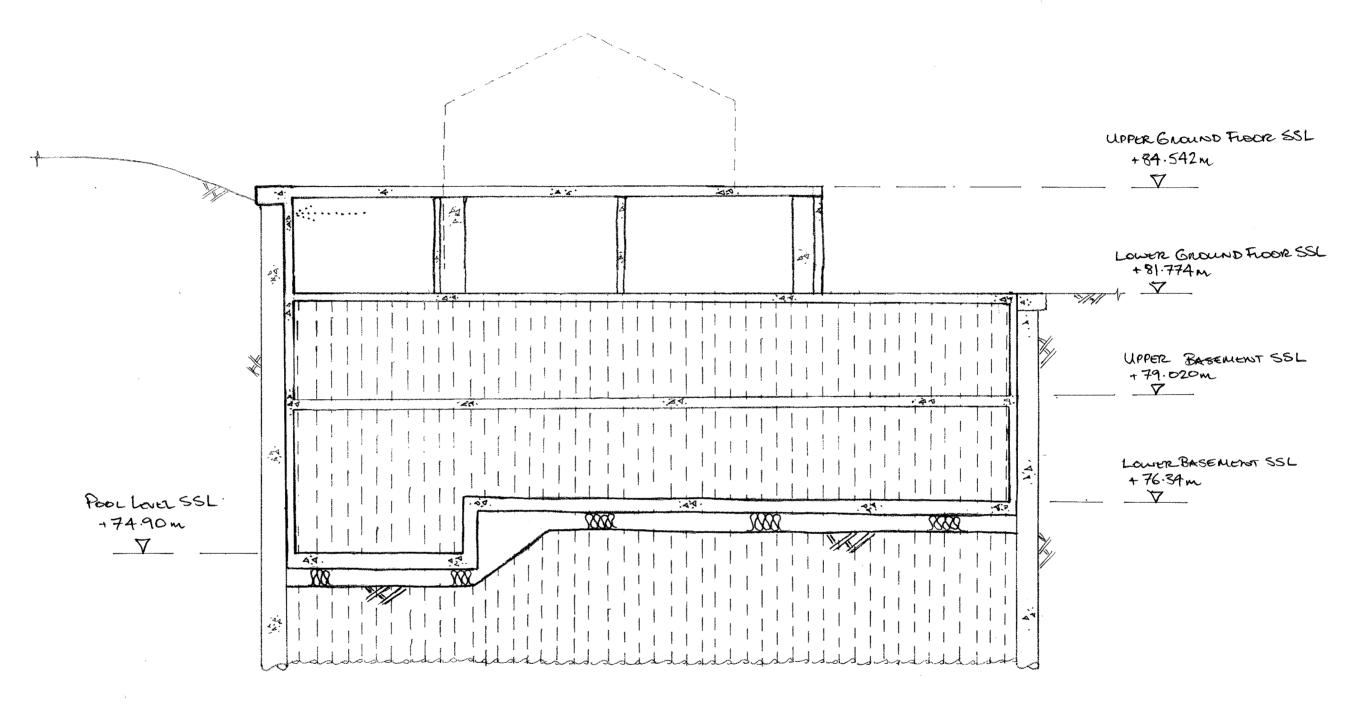
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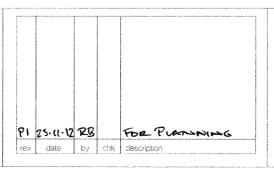
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- REMOVE PROP TO TOP OF FRONT PERIMETER RC WALL
- GROUNDWORKS SEQUENCING COMPLETE.



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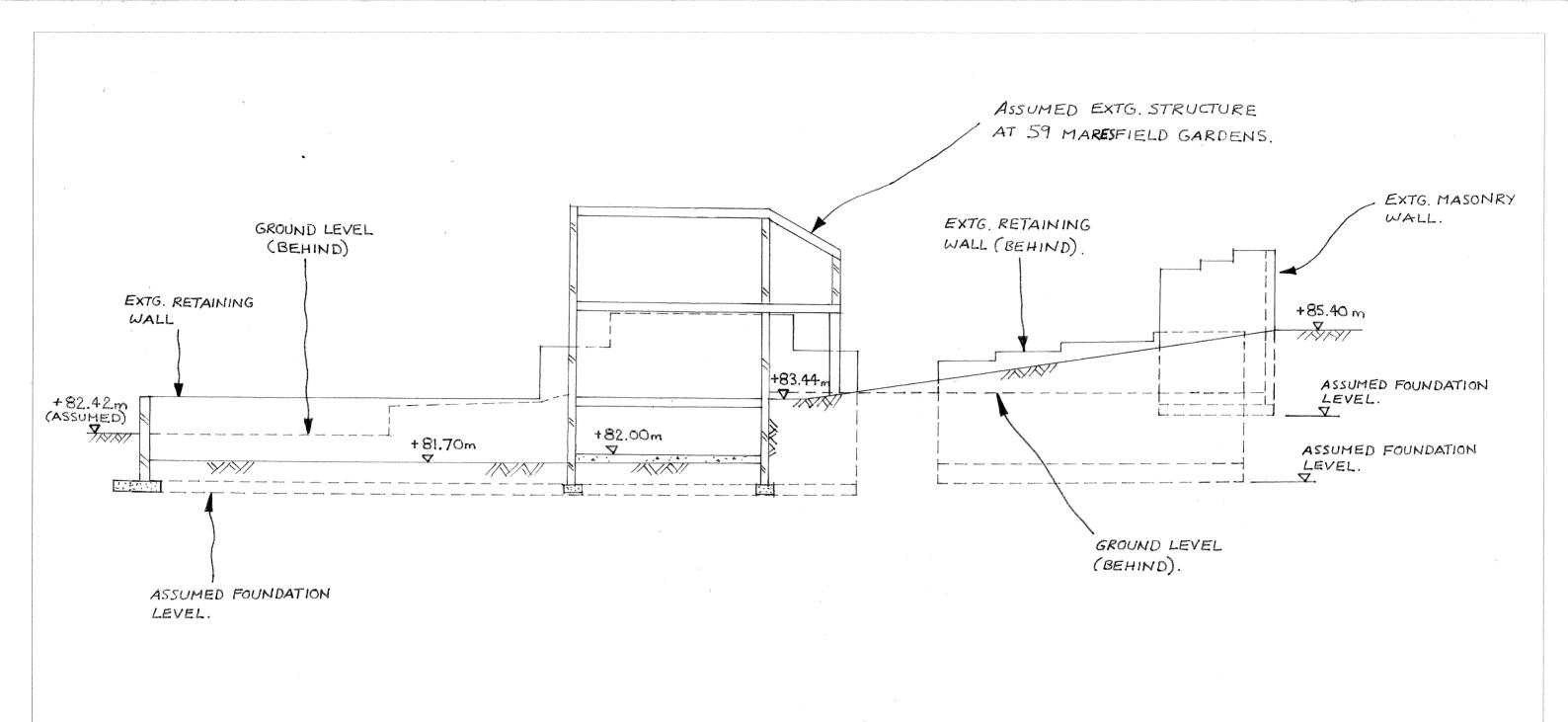
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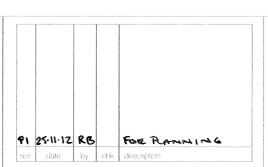
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Long Section 2 Sequencing - 1 of 16

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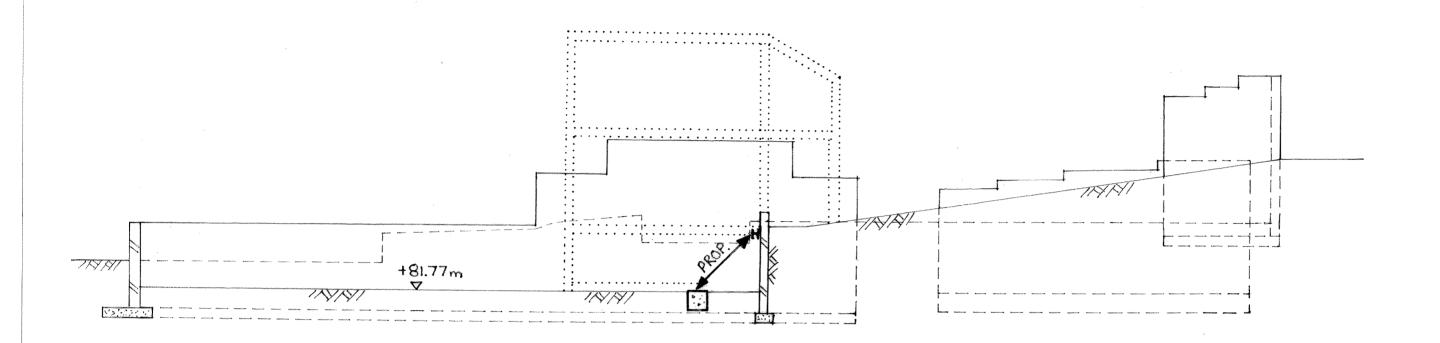
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59 MARESFIELD GARDENS, LONDON

job no drawing no revision \$211590 Sk.300 P1



- PROP FACE OF BRICKWORK RETAINING WALL (RETAINING DRIVEWAY) AS REQUIRED WITH WALING BEAMS, PROPS AND THRUST BLOCKS.
- DEMOLISH EXISTING STRUCTURE AT No.59 MARESFIELD GARDENS ENSURING THAT LATERAL STABILITY OF ADJACENT STRUCTURE IS PROVIDED THROUGH TEMPORARY WORKS AS REQUIRED PENDING FURTHER INVESTIGATIONS.
- LEVEL EXISTING LOWER GROUND FLOOR LEVEL To +81.77m.

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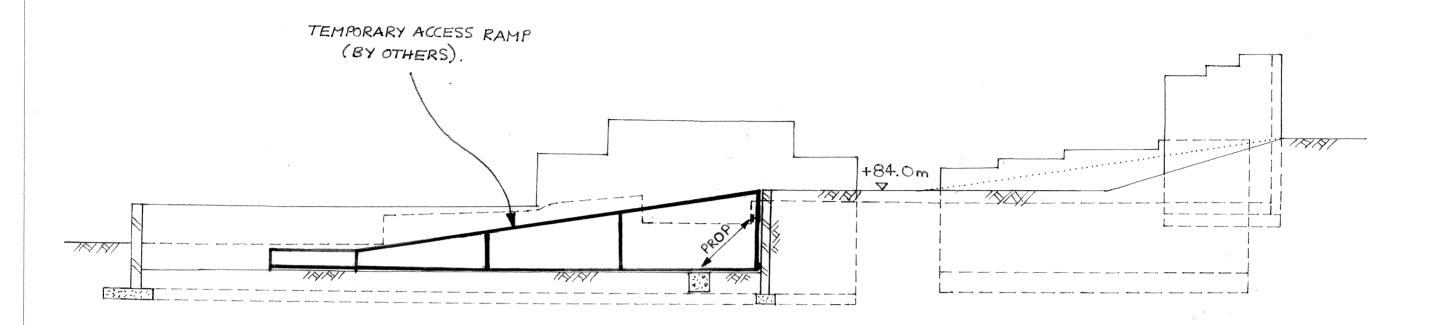
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59 MARESFIELD GARDENS, LONDON

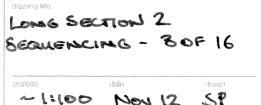
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- INSTALL TEMPORARY PILING PLATFORM (NOT SHOWN)
  AND TEMPORARY ACCESS RAMP. (DESIGN BY OTHERS).
- REDRESS DRIVE LEVEL TO +84.0m.

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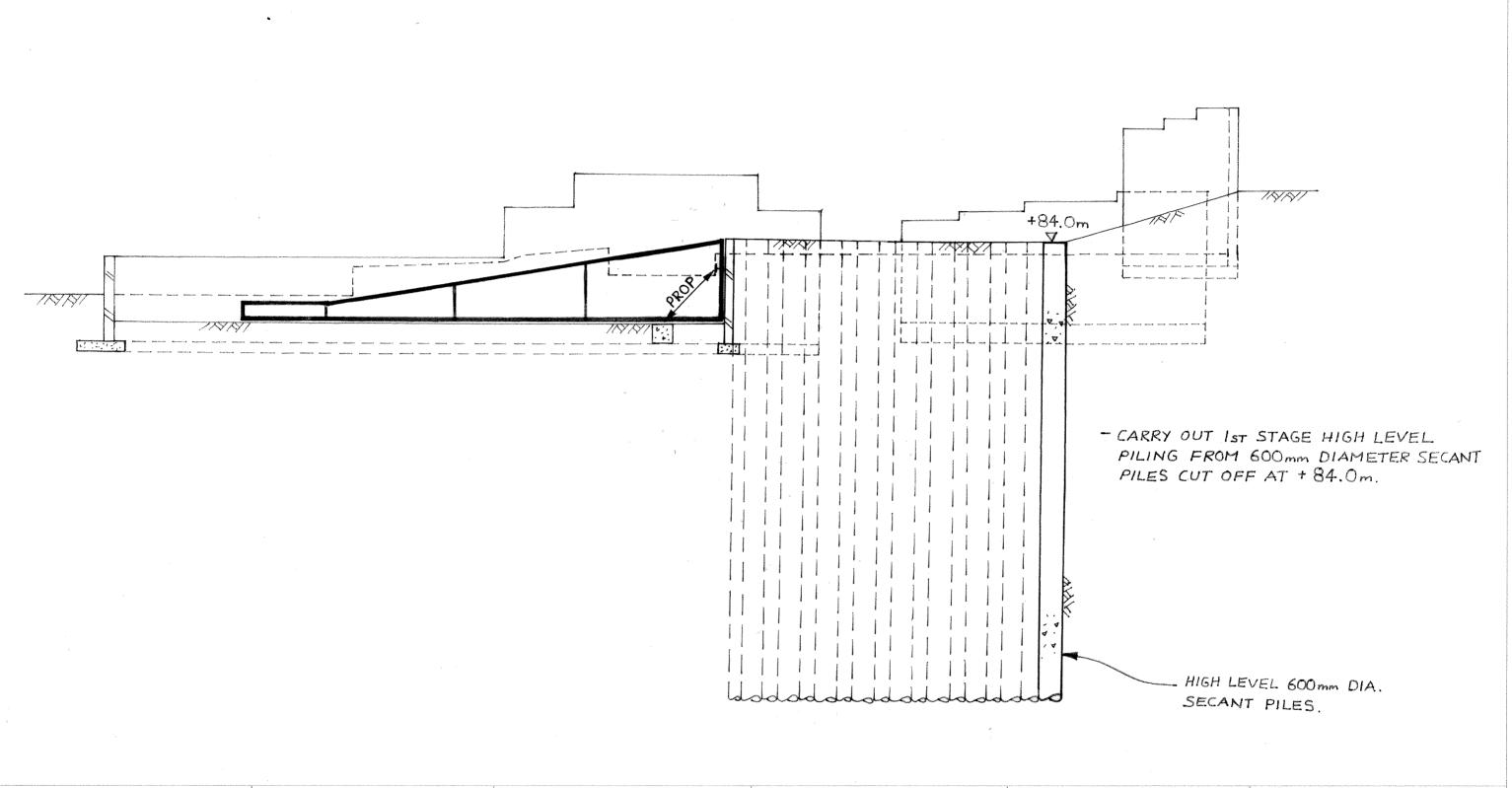
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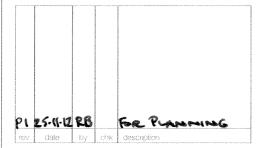
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59 MARESFIELD GARDENS, LONDON

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