PRICE&MYERS

19 East Heath Road, NW3

Structural Engineer's Report (Planning)

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Apr 2008
14061

STRUCTURES GEOMETRICS SUSTAINABILITY

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Introduction

This document outlines the structural engineering approach to the Architect's proposals for review at Planning Stage. At this stage some site investigation results are awaited, as are detailed contributions from other Consultants, and the scheme will require further development in the next stages, based on the principles outlined here and in the accompanying drawings.

1 The Site

The site for the new development is on ground to the rear of the existing building at 19 East Heath Road. East Heath Road is on a hill so that although the site itself is flat, the neighbouring gardens are higher and lower. This means there is a retaining wall retaining the higher ground in the neighbouring garden on one side and on the other, the ground floor level is lower. Some trial pits and a geotechnical investigation have been done for a previous scheme. Further trial pits are required to investigate the footings of the existing building and the boundary wall foundation detail on the boundary with No. 19 squires Mount.

2 Ground Conditions

The Geotechnical Investigation revealed that the ground conditions are stiff brown sandy clay from near to the surface to a depth of 10m underlain by medium dense brown clayey sand. These strata are commonly called the Claygate Beds.

3 Proposed Structure

Substructure

The majority of the building is a single storey basement, requiring an excavation approximately 3.75m deep. The excavation will be deeper (approximately 5.5m) under the swimming pool. The walls of the basement will be formed by a contiguous bored piled wall on three sides.

The piling method will be either continuous flight auger or cased bored piles, depending on the loads and the contractor's preferred method. Steel sheet piling has been avoided because piling will be close to existing buildings susceptible to the vibration associated with this method.

The remaining basement wall will be formed by underpinning the neighbouring boundary wall to the building of No. 19 Squires Mount and casting a facing wall against it. This method is not as economical as using a contiguous bored pile wall in this location but was adopted because of the extra space it allows. Vertical loads at basement level will be supported by piled foundations. The piles within the footprint of the building will be designed to act as tension piles to resist hydrostatic uplift pressure and heave pressure (the latter if further geotechnical advice dictates).

The basement will have a drained cavity. The basement slab will be designed to resist uplift loads due to water. If, as is likely, there is insufficient weight in the structure above the swimming pool and gym section of the basement, tension piles will be required to resist the uplift.

Superstructure

The limited superstructure will be an Insitu reinforced concrete frame with some of the roof formed in timber.

4 Construction Sequence

To maintain the stability of the excavation and the surrounding ground and buildings, the construction sequence will be carefully controlled. Temporary propping will be required at or close

to ground level to prop the top of the retaining structure in the temporary case. The substructure can then be constructed followed by the ground floor/ Garden slab. The ground floor slab will then do the job of the temporary propping in the permanent case.

The capping beam for the piled wall will be designed so that where there is a void in the ground floor slab, it will be able to span between points of support to prop the tops of the piles in the permanent case.

The first operation will be to install the piles for the contiguous piled wall and to construct the piled wall capping beam constructed. The underpinning to the boundary wall of 19 Squires Mount will need to be done before excavation can start.

The ground inside the footprint of the basement will be reduced by approximately a metre and the temporary propping installed.

The excavation will then be dug down to the bottom slab level. Depending on the detailed pile design and the contractor's preferred temporary works scheme, a second layer of temporary propping may be required with a waler just above the basement slab level. Once the excavation has been completed, the basement slab, walls and columns can be constructed. The ground floor slab will then be constructed in sequence with the removal of temporary propping so that the retaining wall is suitably propped at all times. The superstructure RC frame can then be constructed.

5 Building Near Trees and Tree Protection

An arboriculturalist's report has been prepared by ACS consulting. Regarding the structural aspects of building near trees, the use of a contiguous piled wall means that the ground inside the footprint of the building will be protected from the effects of the trees varying water demand (either seasonal or due to a reduction in the root system due to the construction of the new building). There is therefore no requirement for special measures to be taken against heave.

The arboriculturalist's report states that during trial pitting on the boundary of the proposed buildings the largest roots found emanating from trees 1 and 2 were 20mm and therefore concluded that new structure along this footprint would not cause significant damage to these trees. The Engineer and Architect have received confirmation from the Arboriculturalist that the tree report has been compiled on the understanding that a contiguous bored pile wall is to be used and that it has been assumed by the design team that no roots will survive within and under the footprint of the building.

5 Structural Scheme Drawings

Attached to this report are the following drawings describing the structural scheme for planning:

14061/SK/08
14061/SK/09
14061/SK/10
14061/SK/11
14061/SK/20
14061/SK/21

NEIGHBOURING BUILDING

NEIGHBOURING BUILDING

B

250 WIDE RC COLS (UNDER)

TIMBER ROOF

BOUNDARY WALL

250 THK RC ROOF SLABS

UPSTANDS AROUND SKYLIGHT EXTND TO EDGE UPSTANDS TO FORM TRIMMING BEAMS ~ 300 WIDE

EXISTING BUILDING

A

VOID FOR ROOF LIGHT

A SK/P/5

COL (UNDER)

250 WIDE RC UPSTANDS FORMING PERIMETER ROOF BEAMS

BOUNDARY WALL

BOUNDARY RETAINING WALL

MIN 300 THK RC WALL CAST UP AGAINST EXISTING GARDEN RETAINING WALL. (UNDER)

B SK/P/6

TOP OF WALL

ROOF PLAN (1:100)

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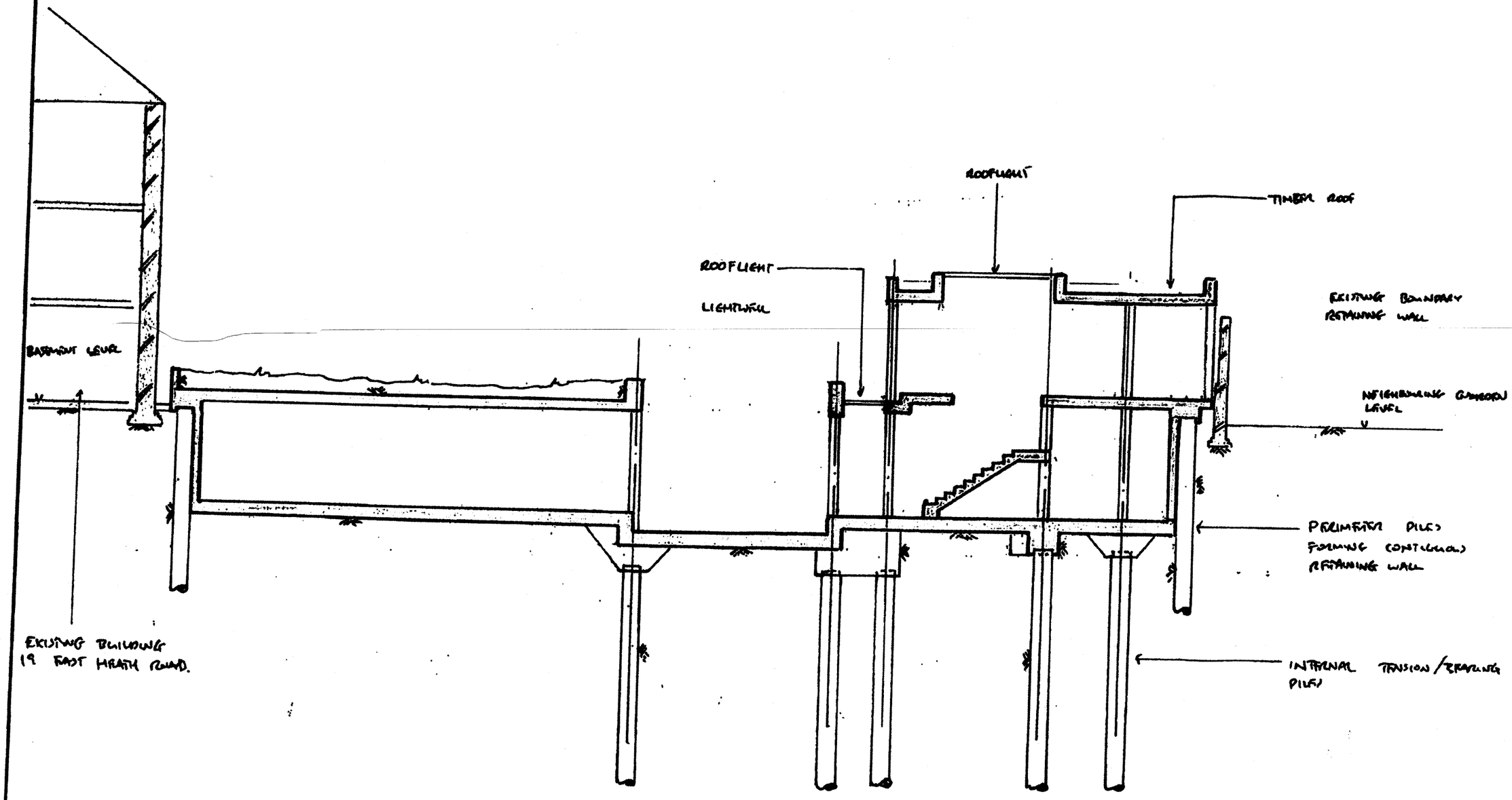
Job No 14061	Page SK/P/4	Rev
Date MAY 08.	Eng. ML	Chd.
Job. 19 EAST HEATH ROAD		



SECTION A-A

(1:100)

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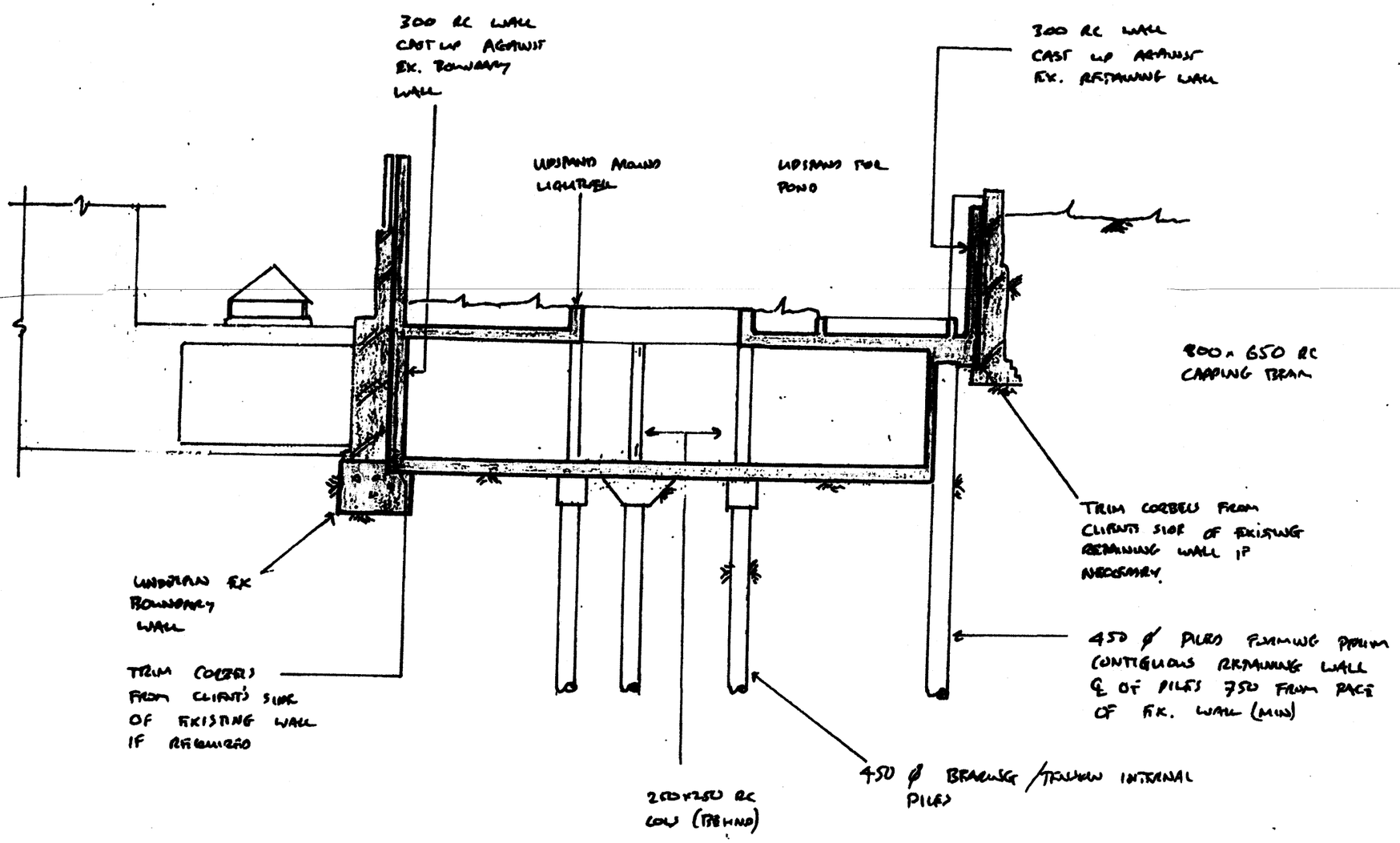
Date MAY 68	Eng. ML	Chd.
Job. 19 EAST HEATH ROAD		



SECTION B-B

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Date MAY/09	Eng. ML	Chd.
Job. 19 FAT HEATH ROAD.		

SITE BOUNDARY

B

UNDERPINNING TO BOUNDARY / PARTY WALL

EXISTING BUILDING BASEMENT FOOTPRINT

PILES NO CLOSER THAN 750 FROM FACE OF EXISTING WALL AT NEAREST POINT

A

350 THK RC POOL RAFT SLAB

300 THK RC WALLS TO POOLS

450 dia CAST IN SITU PILES FORMING CONTIG PILED WALL. ℄ NOT CLOSER THN 750 FROM FACE OF BOUNDARY WALL

A
SK/P/5

450 dia CAST IN SITU PILES FORMING CONTIGUOUS WALL. PILES APPROX 660 CTS ALONG PERIM. ℄ OF PILES IN CONTIG WALL NOT CLOSER THAN 750 FROM FACES OF BOUNDARY WALLS

INTERNAL 450 ⌀ PILES UNDER COLUMNS / SWIMMING POOL

B
SK/P/6

FOUNDATION PLAN
(1:100)

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Job. 19 EAST HEATH ROAD.		

UNDERPINNING TO NEIGHBOURING BOUNDARY / PARTY WALL

B

MIN 300 TH RC WALL CAST UP AGAINST EX. BOUNDARY PARTY WALL

ISOLATED PILES TO HAVE SLAB THICKENINGS WHERE THEY JOIN THE BASEMENT SLAB (TYP)

SITE BOUNDARY

EXISTING BUILDING 19 EAST HEATH ROAD.

A

A
SK/P/5

350 THK RC BASEMENT SLAB

INSITU RC STAIRS

250 x 200 RC COL (TYP)

450 CAISSON INSITU PILED WALL WITH PILES @ 600 CNTS, WITH 150 (NOM) THICK RC FACING WALL

SWIMMING POOL

2 PILE PILE CAPS

3 PILE PILE CAP

B
SK/P/6

BASEMENT PLAN

(1:100)

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Date MAY 08	Eng. ML	Chd.
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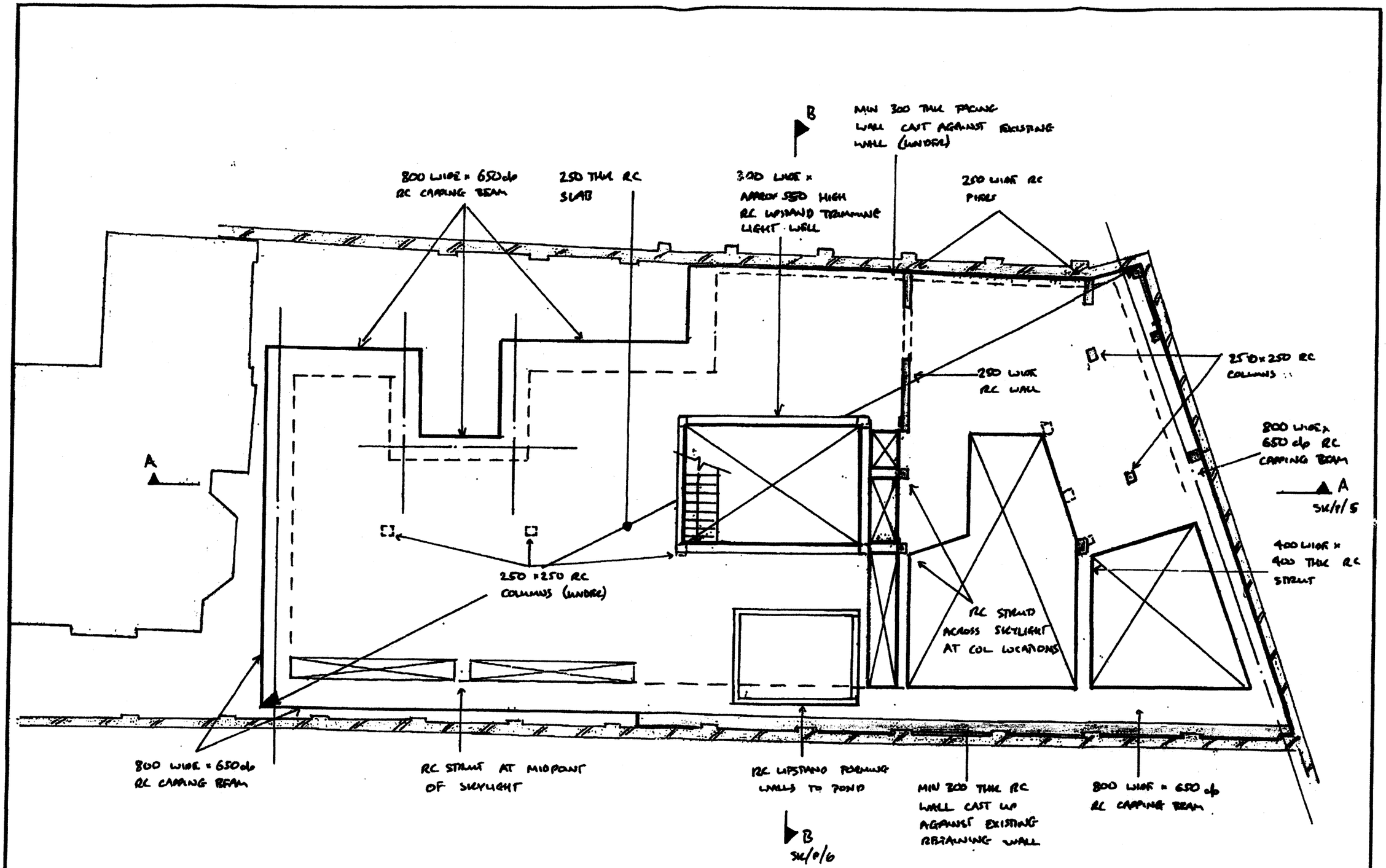

GROUND FLOOR PLAN
(1:100)

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Date MAY/08	Eng. ML	Chd.
Job. 19 EAST HEATH ROAD		