

STRUCTURAL ENGINEER'S DESIGN STATEMENT IN SUPPORT OF PLANNING APPLICATION

Form

Structural Design

First Floor
82 Clerkenwell Road
London
EC1M 5RF

T:
020 7253 2893

F:
020 7253 2809

E:
studio@form-sd.com

W:
www.form-sd.com

**Kay Court, 368-372 Finchley Road
London, NW3.**

Job no. 111590

- New Build
- Refurbishment
- Conversions
- Historical

- Residential
- Commercial
- Retail
- Leisure
- Community
- Art

Architect: 21st Architecture Ltd

Engineer: Rob Markovits CEng MStructE

Date: August 2011

Registered office:

Form Structural
Design Limited

Onega House,
112 Main Road
Sidcup, Kent
DA14 6NE

Company No.4504240

Job No.: 10 1371

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Document Verification
Page 1 of 1

Job title	368-372 Finchley Road	Job number
		111590
Document title	STRUCTURAL ENGINEER'S DESIGN STATEMENT	File reference
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PREAMBLE

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TERMS OF REFERENCE

FORM SD were appointed on June 28th 2011 by Jeff Andrews on behalf of Jewish Care- "the client", to prepare a supporting Structural Design Statement in support of a Planning Submission for the proposed new works at Kay Court, 368-372 Finchley Road London NW3.

Introduction

This report has been prepared as a supporting document to the planning application for the proposed works at Kay Court front basement works. It outlines the approach to the structural design of the project and is to be read in conjunction with all other planning application documents.

The Site

The project is located at 368-372 Finchley Road and involves the demolition of the existing buildings on the site to make way for a new housing development.

The proposals in simple terms consist of the following key elements of building work:

- Construction of a new basement structure that will house the new car park, plant room and landlord storage areas.
- New residential floor levels at Ground, First, Second and Third.

The site is located on a busy road at the junction of Finchley Road and Hendon Way (A41). The site is bounded on the North and South by existing properties and the East (rear) of the site has garden area abutting adjacent gardens.

The site entrance is located at approximately +82.00 AOD, the site steadily rises to +82.500 at the Eastern boundary

Ground Conditions/Geology

The 1:50,000 scale Geological maps of England and Wales show the site directly underlain by the London Clay.

A site investigation including boreholes and trial holes will need to be carried out to ascertain the soil design parameters for the sub-structure design. A desk study combined with archive material has shown the expected soil sequence to be as follows:

- 0-1.00m below ground = Made ground
- 0.8m-1.60m = Soft becoming firm orange/brown mottled with grey clay
- 1.6m to depth = Firm –becoming Stiff light brown clay (London Clay)

Expected bearing pressure at basement level= approximately 200 kN/M²

No ground water expected, but perched water tables maybe encountered during excavations

Watercourses and Existing Trees

No known watercourses are known to exist, though reference to Lost River's of London shows two small brooks approximately 2km away which are sourced from the Hampstead Heath ponds and appear to run towards The River Brent and associated reservoir. The site is not located in a flood risk zone according to the Environment Agency website. It is understood that the site locality has been affected by surcharging of sewers in recent times, refer to Civil Engineers design statement in this respect.

There are a number of trees to the North East corner of the plot to 370-372 Finchley Road, the trees may need protection during the works. Due to the depth of the proposed basement it is not anticipated that any special measures will be necessary to alleviate clay heave and shrinkage effects.

Existing Utilities and Underground services

No information was available at the time of the report on any existing sewers, drainage runs, and gas or electricity services within the site. These will need to be established at an early stage to allow appropriate

measures to be taken for build over notices (Sewers) and any diversions for drains and existing service - runs. Refer to drainage (Civil) engineer's statement in connection with this and also the Flood Risk Assessment

SUB-TERRANEAN DEVELOPMENT PROPOSALS – NEW BASEMENT

Introduction to proposals

It is proposed to construct a new reinforced concrete basement to form car parking below and plant room areas and support the new reinforced concrete framed residential development above.

Boundary Conditions

The site is located on a busy road at the junction of Finchley Road and Hendon Way (A41). The site is bounded on the North and South by existing properties and the East (rear) of the site has garden area abutting adjacent gardens.

On both the North and South boundaries exist adjacent properties which will need to be considered during the basement temporary works design. It is anticipated that either contiguous piling methods, propped kingposts or steel sheet piling could be used to main maintain support to the soil and adjacent structures during the basement excavations. If the installation is designed and installed adequately the movements associated with the works should be minimal and within limits.

To the rear of the site, the boundary at its closest point is some 5.00m metres away and battering back of the excavation could be considered, however, this may have an impact on the root protection areas required for the remaining trees which would necessitate a contiguous piled wall or kingpost system.

Sub-Structure & Basement Construction

Temporary Works

The proposals for the basement construction take account of the development proposals as indicated on the architect's drawings/survey and the anticipated ground conditions, the stability of the neighbouring properties, health and safety considerations and the physical constraints of the site. (See drawings appendix A for proposed structural arrangement).

It is proposed that to safely allow the basement construction, a contiguous piled wall or Kingpost retention system will be installed on the 3 sides of the excavations these are designed by a specialist temporary works engineer and will allow the works to be carried out safely whilst safeguarding all neighbouring properties.

The contiguous piled wall retention system can be designed as either as a free cantilever or as a propped cantilever with a capping beam. For the propped cantilever design option, temporary propping will need to be installed until such time as the ground floor slab is cast and can resist the horizontal forces. A system of horizontal whaler beams, struts and bracing corner props would be designed to resist lateral earth pressures in the temporary condition and maintain integrity of the excavation.

Refer to **Figure 1 and 2** showing similar basement construction at Chepstow Villas W11 with contiguous piled walls designed as propped in the temporary condition until the ground slab has been cast.

Sub-structure

The new basement box structure will be supported on an arrangement of piles that will be placed under the main basement wall lines and under all columns. The CFA or rotary bored piles are expected to be in the order 450-600mm in diameter and up to 20.0+m long depending on the load they are carrying. The piles under column positions will be arranged in groups of 4,6 or 8 and surrounded in deeper reinforced concrete piles caps.

The basement slab will be designed as suspended and spanning between the groups of piles. The basement slab will be designed for car parking loading and hydro-static pressure. The supporting piles where necessary will be designed for tensile and heave forces where necessary.

The retaining walls are to be in the order of 300mm thick and these would be linked with reinforcement to the base slab and to the ground floor slab. The retaining walls would be designed as a propped cantilever in the permanent condition.



Figure 1- Contiguous piled wall at a similar project at Chepstow Villas W11.
Note bracing props in picture to resist lateral forces until basement box structure has been cast.

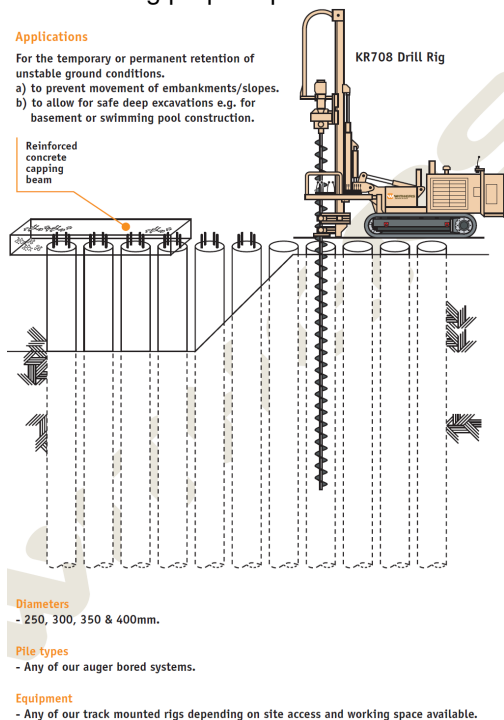


Figure 2 – Typical piling rig to form the temporary contiguous piled wall- Courtesy of Withers Ltd.

Basement Waterproofing

It is expected that the basement car park, plant rooms and landlord storage areas would be classed as a Grade 2 basement according to BS 8102 – “*No water penetration acceptable, damp areas tolerable; ventilation might be required*’. It would therefore be proposed that a waterproofing additive is prescribed for the concrete mix (RC40) to minimise the risk of water ingress. Manufacturer’s such as Caltite, Pudlo and Xypex or all possible suppliers of the waterproofing additive.

An alternative to waterproof concrete is a tanked approach on the rear face of the basement wall. Manufacturers of systems such as Grace, FOSROC and RIW are considered appropriate and have a good range of suitable systems.

Super-structure

The super-structure is proposed as a flat slab construction of minimum 250mm thick supported on an arrangement of blade concrete columns that are located at various positions to suit the Architectural layout. Subject to final detail design, down-stand beams may be provided around the perimeter to form the window head and provide additional stiffness to the perimeter

The Third floor will be the last level of the concrete floor structure at which point a steel frame is proposed to form the top storey. Various shear walls may be extended through to the roof to give the stability of the braced frame and the roof steelwork is to be a wind moment resisting framework.

The roof structure will be either a timber joisted roof with plywood to create a diaphragm or cold formed purlins with a bracing system. The roof will need to be robust enough to support any PV panels that may be required as part of the project.

Stability

Stability of the building will be provided by shear wall elements that extend up from the basement levels to create a braced frame these are generally located around the stair core and service riser location, the final disposition of the walls will be subject to a final stability analysis.

Transfer Structure

Due to the arrangement of the columns supporting the upper levels and the required open plan area of the basement there will need to be for a transfer structure located at Ground floor level. The slab will be thickened in these areas and beam strips created to support the columns that are located off the basement structural grid.

General

All of the structural works, particularly the sub-structure are to be carried out in a manner in which minimises any noise and vibration that may affect the neighbouring properties. The ground works and piling contractors will provide detailed calculations method statements for the works and temporary propping to the basement for approval by the engineer and, if necessary, party wall surveyors prior to commencement of the works.

Cladding

The external cladding will be a mixture of materials as shown on the Architects drawings, generally brickwork is proposed for the main elevations. The inner wall construction is to be a lightweight masonry or cold formed steel framing system. An internal head restraint system will be required that also allows deflection of the upper floors and transfers lateral loads into the structure. Externally, masonry support systems will be required at designated levels.

Internal walls to dwellings

As is required with flat slab construction the dead weight of all partitions and separation walls between dwellings is to be kept to a minimum. It is anticipated that partitions built off the slabs are lightweight block work and separation walls are constructed using cavity walls formed using gyproc cold formed steel channels and layers of acoustic insulation and staggered C-channels with appropriate levels of soundboard to achieve the required mass to suit the acoustic requirements.

Design Loads

- Car Park areas = 2.5kN/M²
- Dwellings = 1.5kN/M²
- Common Parts, stairs etc = 3.0kN/M²
- Partition allowance = 1.5kN/M²
- Roof = 1.5kN/M²
- Flat slabs to have separation wall lines loads taken into account.

Service distribution and structure

Due to the nature of the proposed flat slab there should be no problems with running services within the ceiling void, it is anticipated that the distribution for the pipe-work from the riser would be located in suspended ceiling void in the corridors at each level of the development.

The penetrations in the flat slab floor plate should be kept to a minimum and established as early in the design as possible to help reduce shear concentrations around column heads.

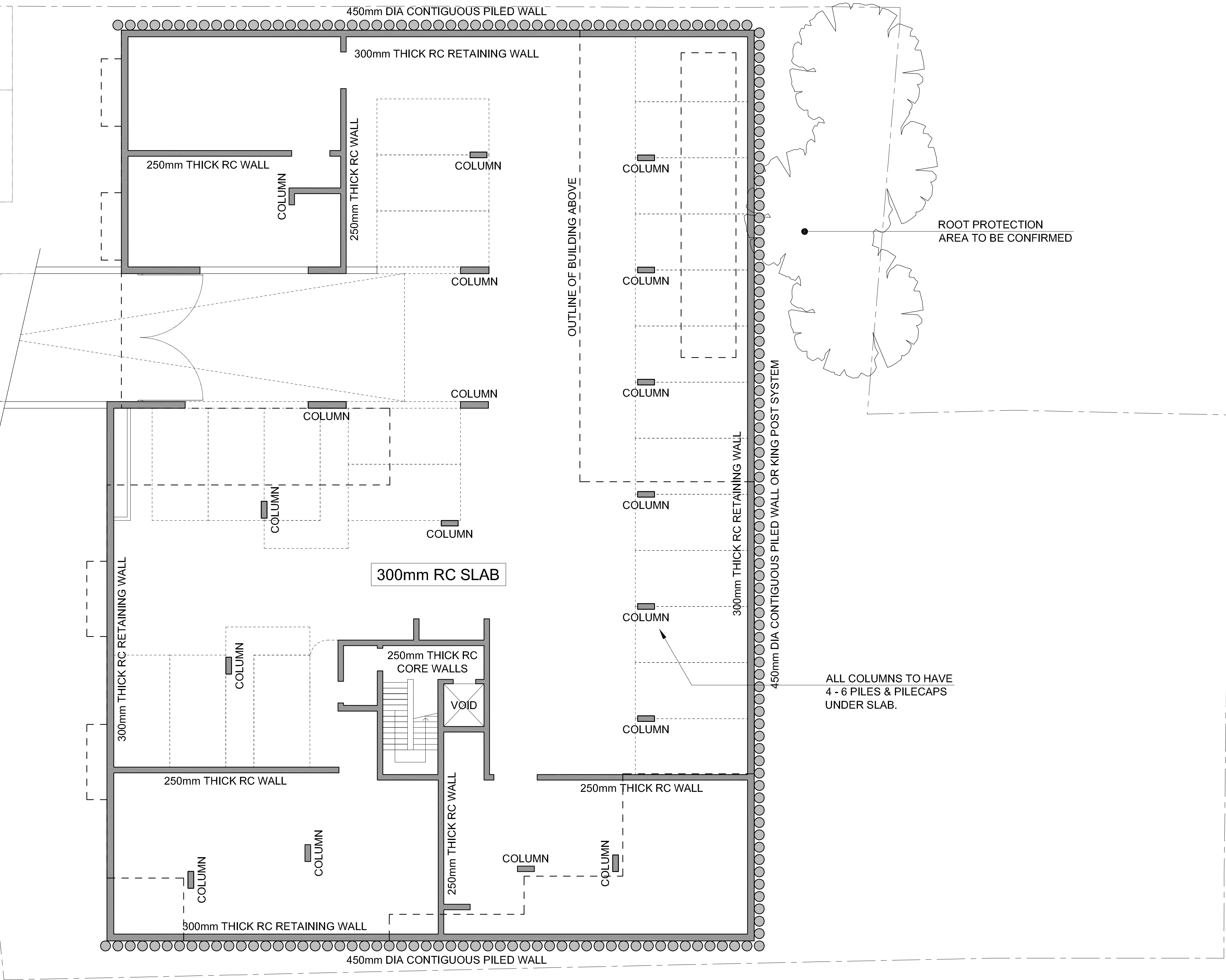
APPENDIX A

PRELIMINARY FORM STRUCTURAL DRAWINGS ATTACHED

Document No.	Title	Revision
111590 L(23)01	Proposed Basement Plan	P1
111590 L(23)02	Proposed Ground Plan	P1
111590 L(23)03	Proposed First Floor Plan	P1
111590 L(23)04	Proposed Second Floor Plan	P1
111590 L(23)05	Proposed Third floor Plan	P1
111590 L(23)06	Proposed Roof Plan	P1

FINCHLEY ROAD

ADJACENT PROPERTY



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P1	18.08.11	PRELIMINARY ISSUE	AMJ	RJM
Rev.	Date	Amendment	Drawn	Chkd

Drawing Status	PRELIMINARY
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Form

Job Title

KAY COURT,
368 - 372 FINCHLEY ROAD,
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Drawing Title

PROPOSED BASEMENT PLAN
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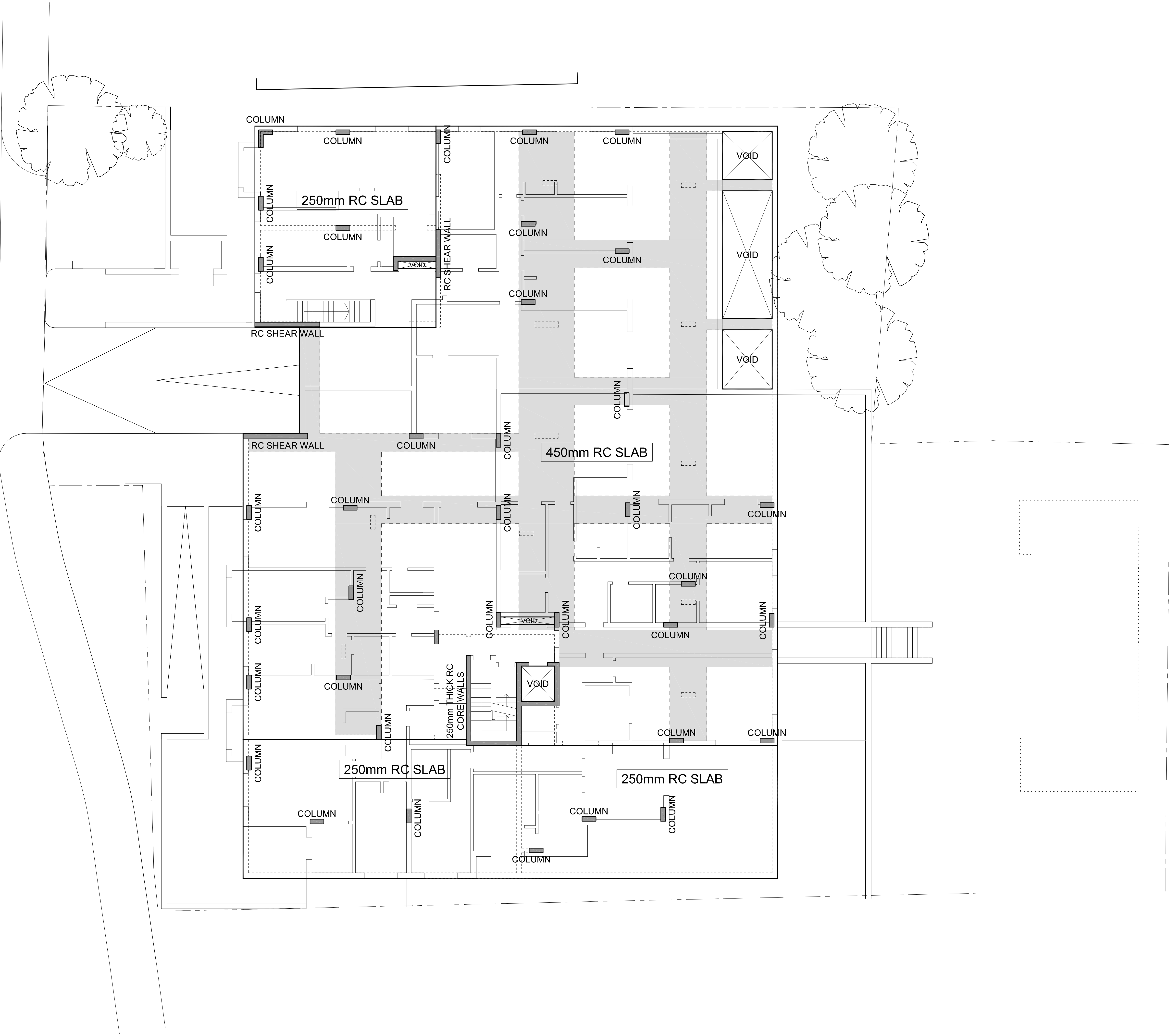
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PROPOSED GROUND FLOOR PLAN
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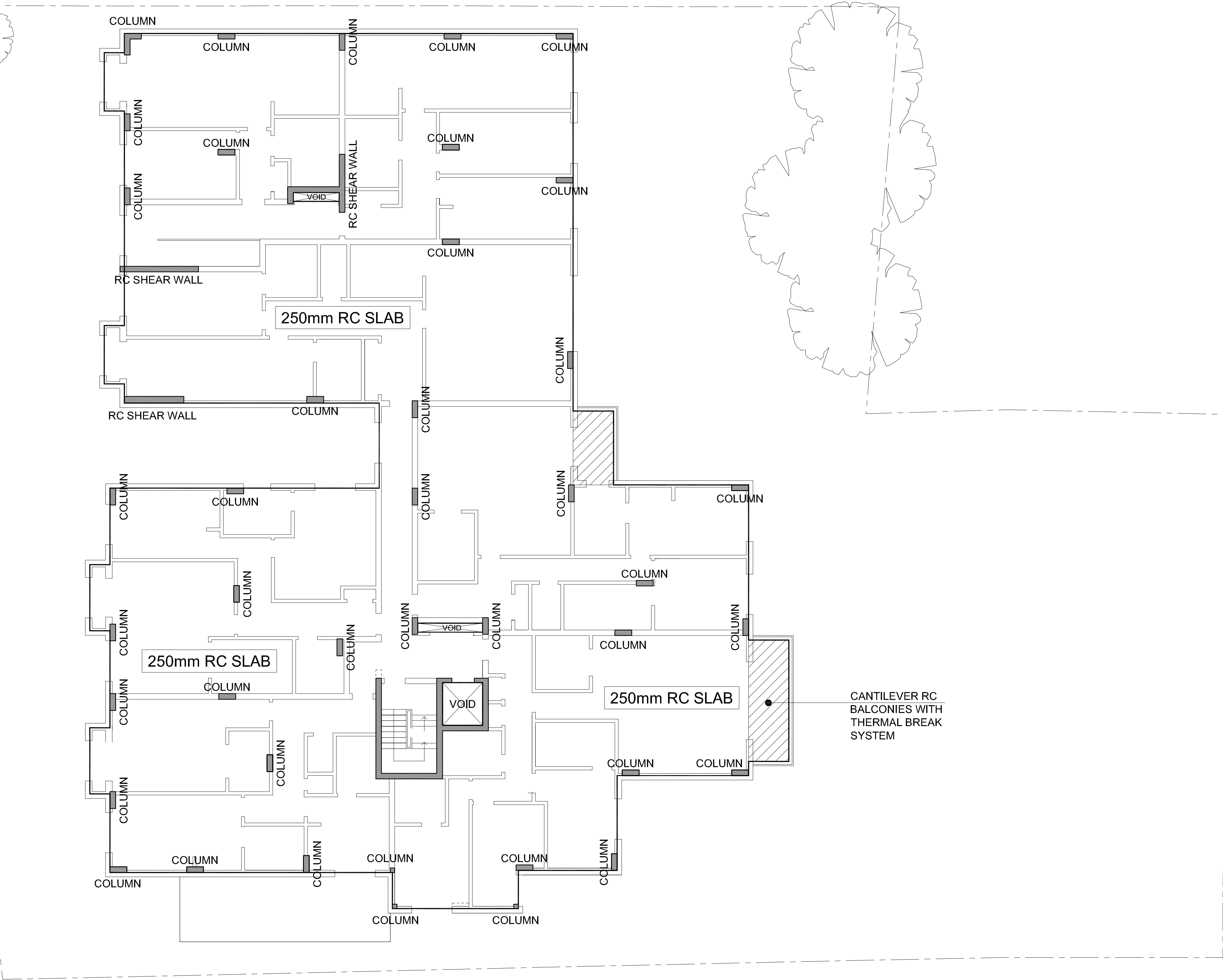
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Drawing Title
**PROPOSED FIRST FLOOR PLAN
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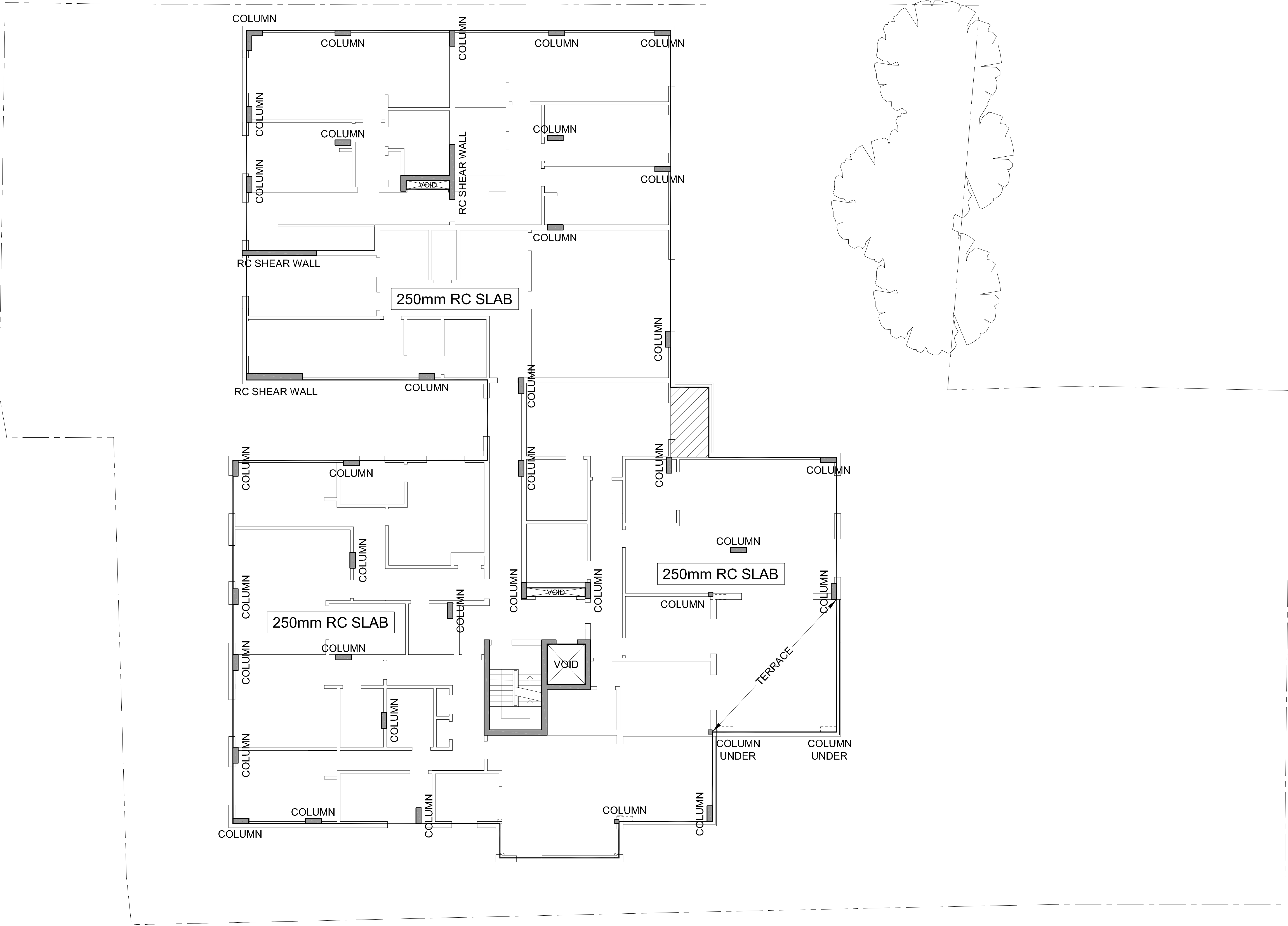
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PROPOSED SECOND FLOOR PLAN
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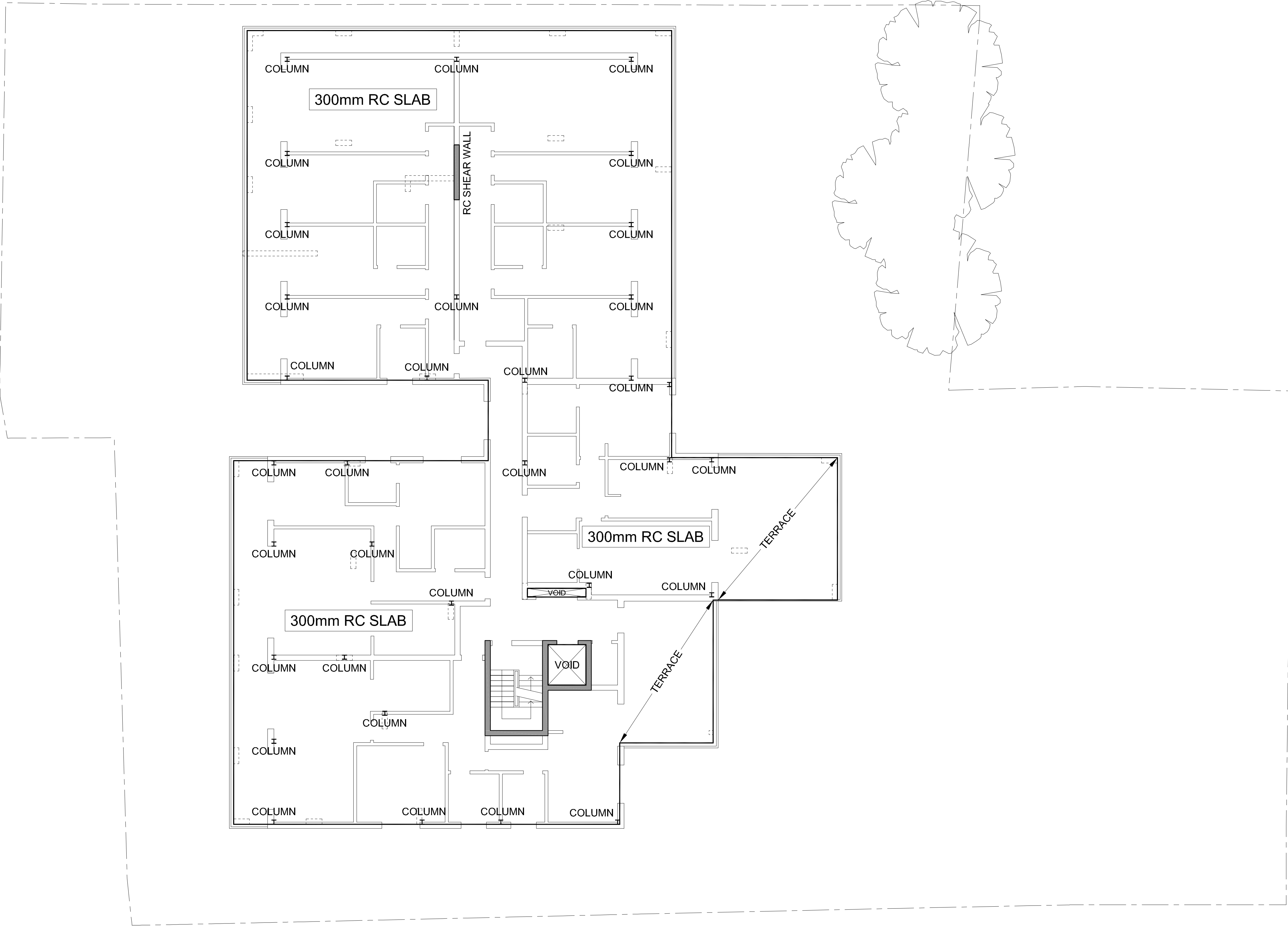
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PROPOSED THIRD FLOOR PLAN
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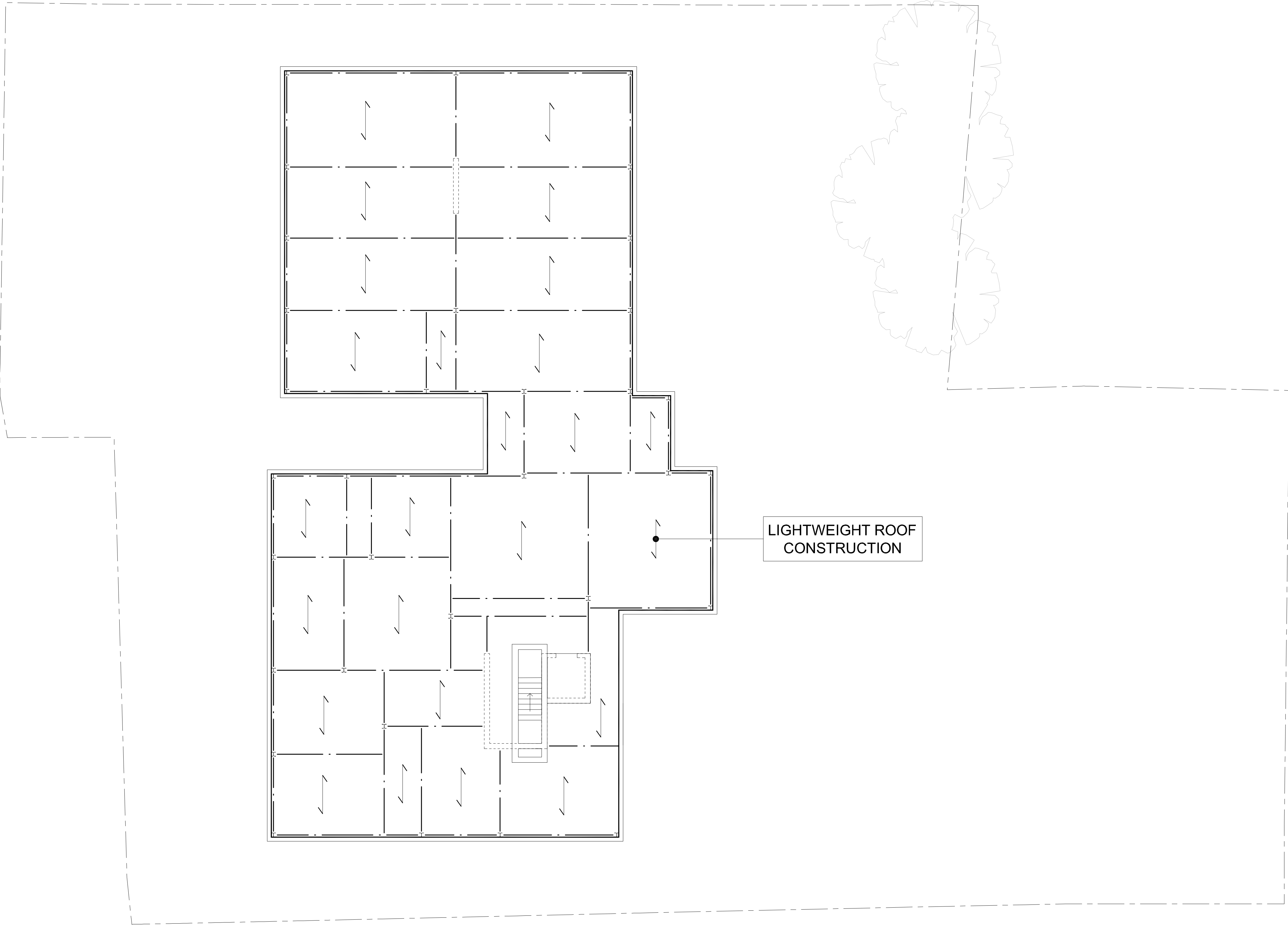
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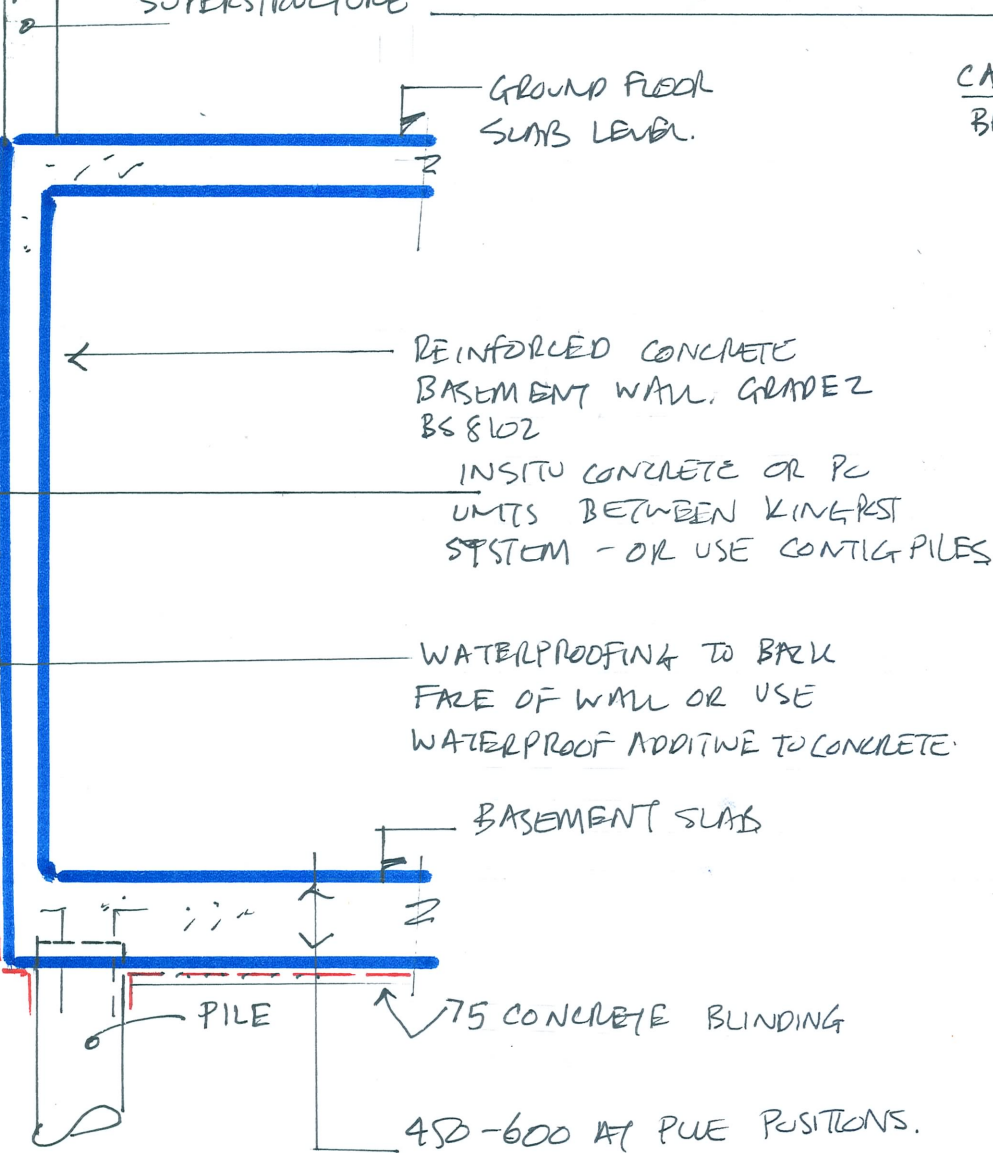
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APPENDIX B

Sketch cross sections showing:

- Typical basement wall perimeter detail – 2 OPTIONS

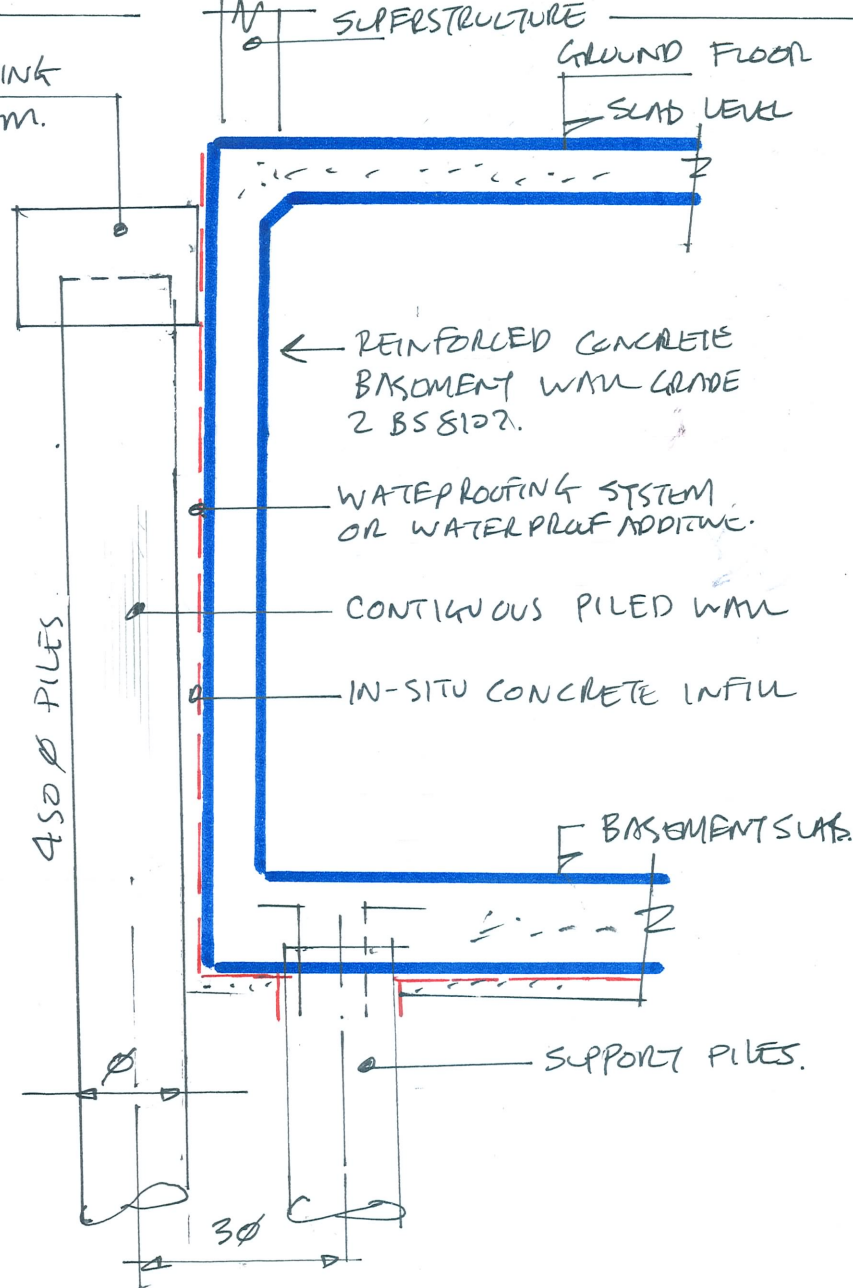
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ALTERNATIVELY
HYDRAULIC SHEET PILES
INSTALLED

KINGPOST OPTION

CAPPING
BEAM.



CONTIG PILED OPTION.