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23091/R1/BC/RevP3

Tuesday, 23 April 2024

Land adjacent to 63 Netherall Gardens

Stage 2 structural report – Basement impact assessment

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Constant Structural Design

This report has been prepared for the sole benefit, use, and information for the client. The liability of Constant Structural Design Limited (CSD) with respect to the information contained in the report will not extend to any third party. Our report is provided for the sole use of the named client and is confidential to the client and his professional advisors. All parts of the property that were covered, unexposed or inaccessible were not inspected and therefore we are unable to report that such parts are free from defects.
It should be read in conjunction with all other Consultants reports and specifications and CSD drawings.

AUTHOR	SIGNATURE	DATE
Thomas Ashton MEng (hons) CEng MIStructE Senior Engineer		23/04/2024

REVIEWED	SIGNATURE	DATE
Brian Constant BEng CEng MIStructE MIEI Director		23/04/2024

TABLE OF CONTENTS

CONSTANT

1 Non-technical summary

With good workmanship, the basement for the new build house can be constructed safely, with negligible damage to the building or neighbouring structures.

The proposed basement excavation will be approximately 1.5m below the existing underground car park to be demolished.

A possible structural sequence of works (and temporary propping), has been outlined in this report. Movement monitoring is recommended as a precaution to ensure that works stop, and issues can be rectified should the movement exceed what has been predicted.

For screening and scoping assessments for surface water/groundwater flooding, refer to the separate report issued by H Fraser Ltd.

For the screening and scoping assessment for slope stability, refer to the separate report issued by Ground and Project Ltd.

2 Introduction

Constant Structural Design has been engaged to provide structural advice and a report to accompany the planning submission for this proposed new build with single storey basement in the London Borough of Camden.

The purpose of this report is to review the impact of the basement excavation and construction. It includes a desk study of the site and refers to intrusive ground investigations to assess ground movements, flooding and the ongoing stability of the surrounding buildings.

Based on these assessments we establish an outline method statement to carry out the proposals safely. This is followed by more detailed scheming for key elements and conclusions.

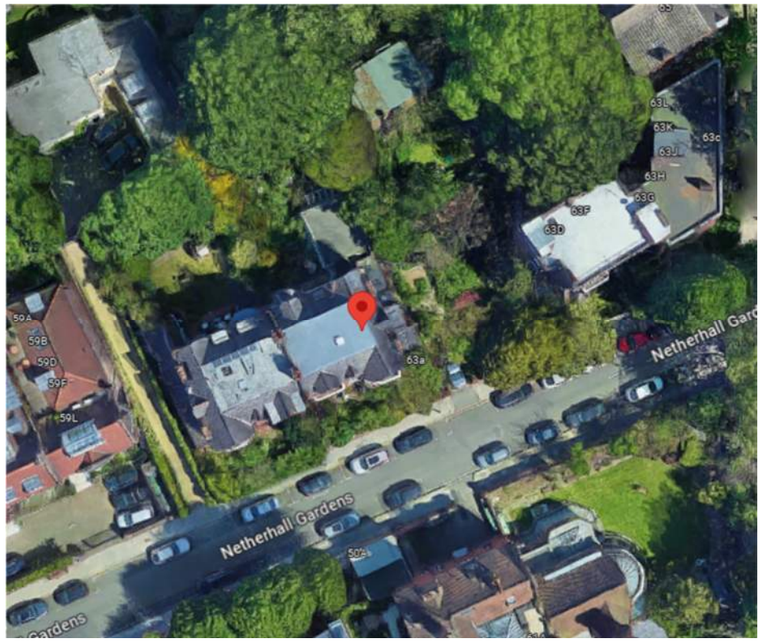


Figure 2.1 – Aerial view

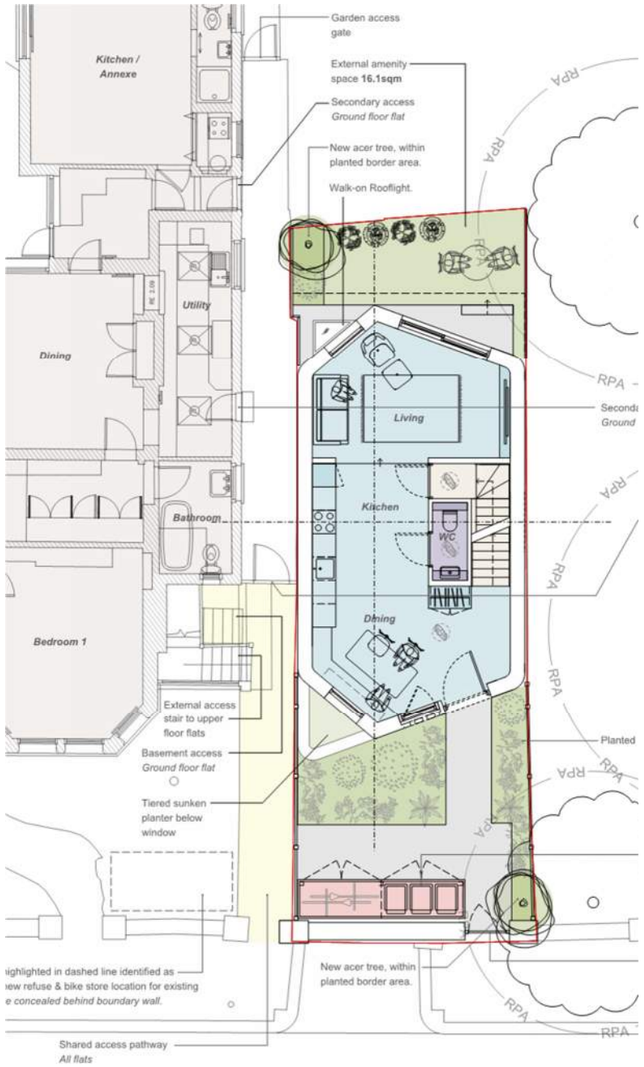


Figure 2.2 – New build plan adjacent to existing building

3 Desk study

3.1 Site history & existing structure

The site is within the Fitzjohns Netherall conservation area.

The property is not a nationally listed building. The nearest listed building is on the opposite side of Netherall Gardens, approximately 20m away.

There is a slight slope down the road to the west.

There is an existing reinforced concrete basement garage on the site.

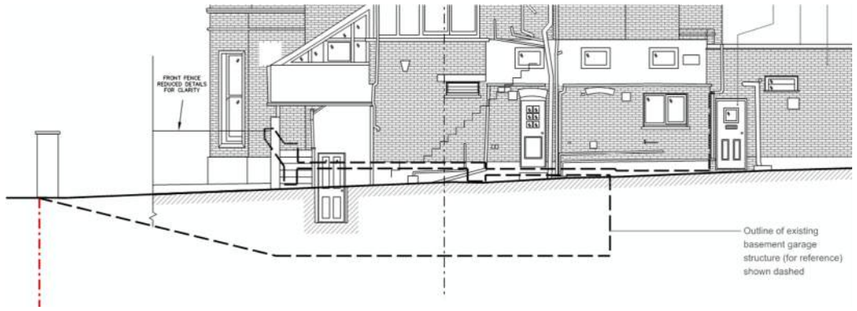


Figure 3.1 – Section outline of garage to be demolished

3.2 Neighbouring structure

63 Netherall Gardens is a semi detached period building adjacent to the site to the west, and includes a part plan basement to the rear.

The gardens of 63 Fitzjohn's Avenue are to the east.

3.3 Ground conditions

According to British Geological Survey (BGS) mapping, the local ground conditions are assumed to be Claygate Member with overlying made ground.

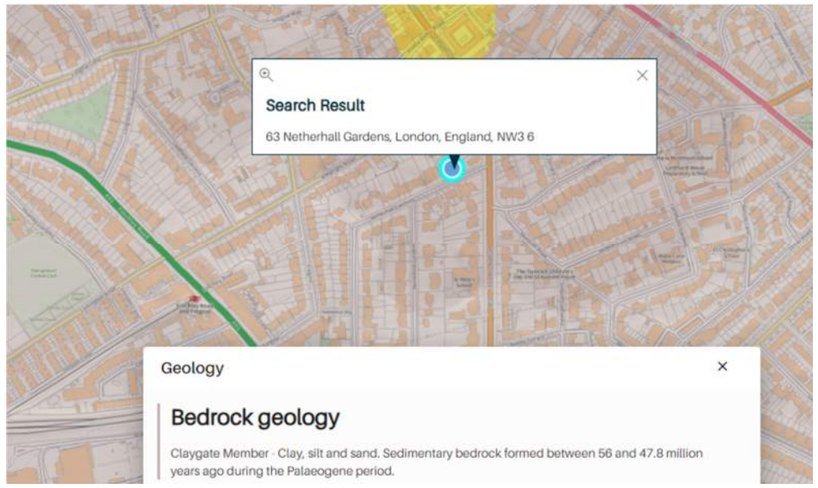


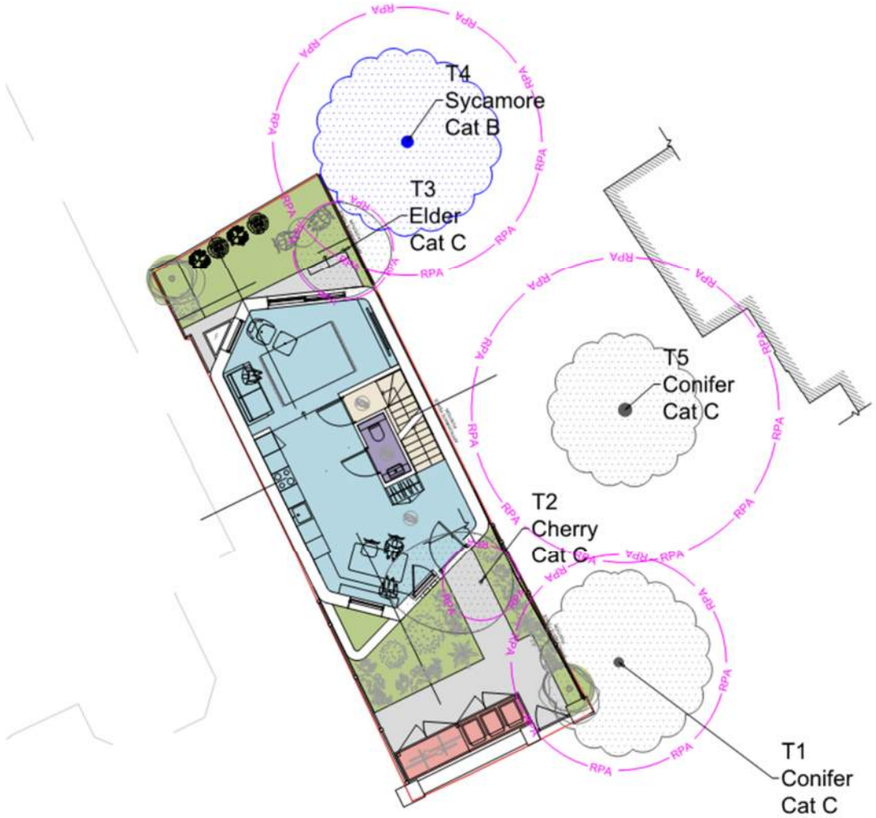
Figure 3.2 – BGS map extract

Refer to section 6.1 for the ground investigation summary.

3.4 Trees

An arboricultural report has been carried out by Central London Tree Surveys.

The following trees were recorded onsite:



TREE	MATURE HEIGHT	DISTANCE FROM FOOTING	NHBC SUGGESTED FOOTING DEPTH
Cherry	3m (current)	0m (M)	2.0 m
Fir	20	5m (M)	1.0 m
Sycamore	22	4m (M)	1.8 m
Elder	4m (current)	0m (L)	1.5 m

Table 3.1 – Tree influence on foundation depth

3.5 Archaeological/UXO risk

The site is not within an archaeological priority area.

The UXO risk is low to medium.

A UXO risk assessment should be carried out by the contractor prior to excavation.

3.6 Underground infrastructure

Any existing services local to the excavation will be confirmed prior to construction.

An Overground line tunnel between Finchley Road & Frognal, and Hampstead Heath, runs beneath Netherall Gardens.

3.7 Current/historical water courses

Tributaries of the Westbourne and the Tyburn underground rivers run close to the site.

Figure 3.3 – Extract indicating ‘lost rivers of London’ with the site highlighted

3.8 Flood risk and surface water considerations

The site is in flood zone 1 and therefore no further flood risk assessment has been carried out.

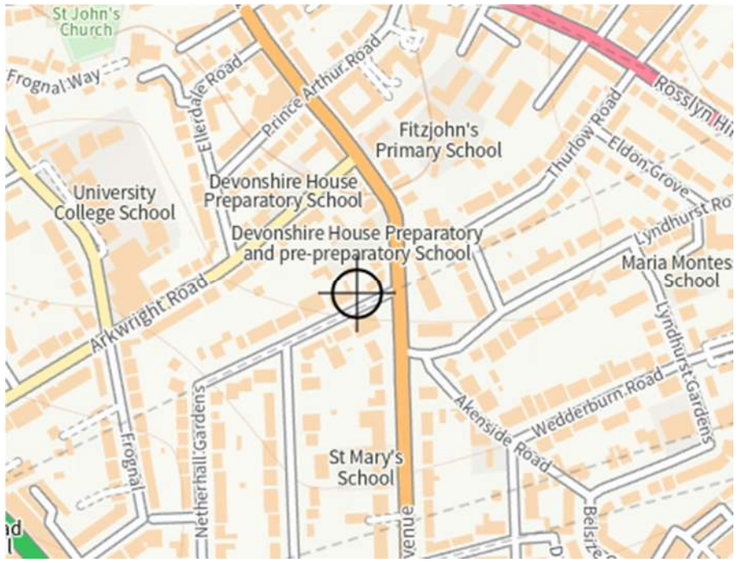


Figure 3.4 – Environment Agency – Flood zone

Figure 3.5 – Environment Agency – Surface water flood risk

Figure 3.6 – Environment Agency – Reservoir flood risk

The site is between Camden Critical Drainage areas Group3_005 and Group3_010.

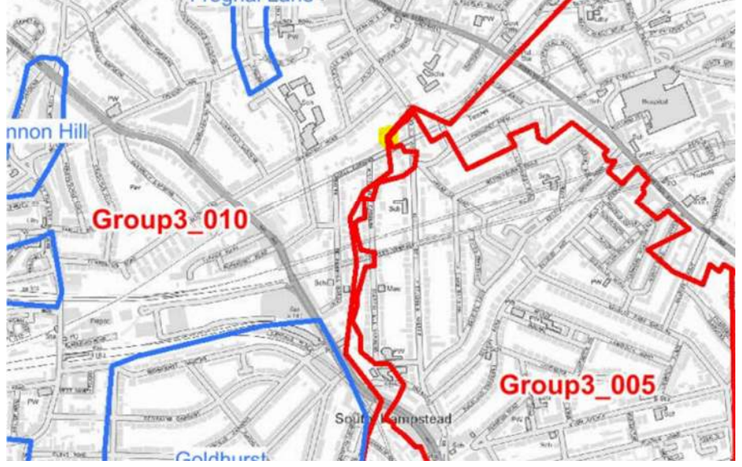


Figure 3.7 – Camden Critical Drainage Areas

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4 Outline proposals

The new 2 storey property will have a single storey basement below.

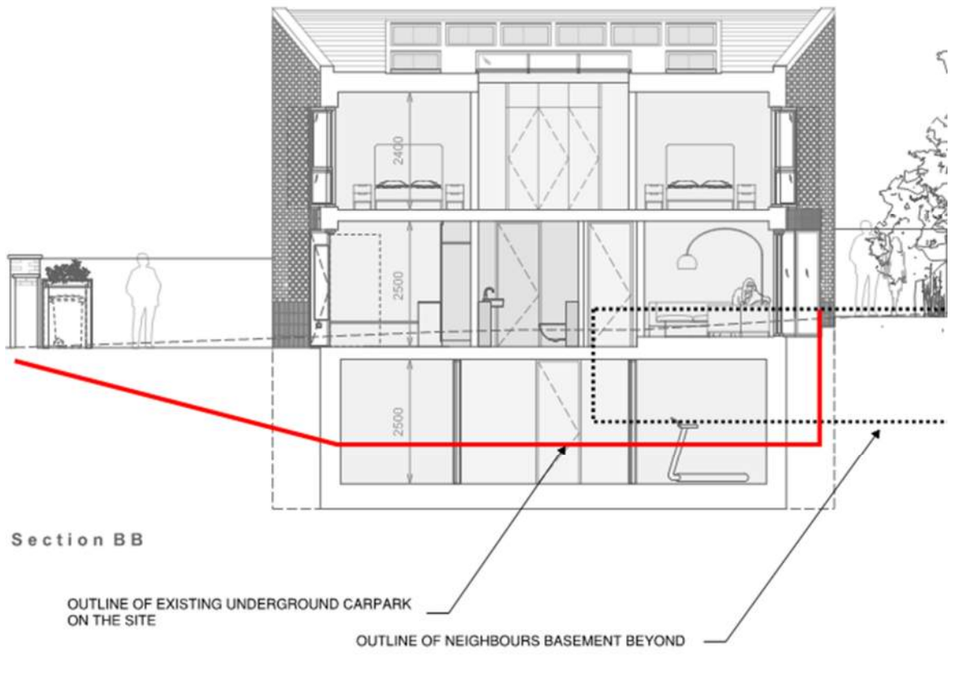


Figure 4.1 – Proposed section indicating the highway level, the existing garage depth and neighbours basement beyond

5 Basement screening & scoping

Refer to HFraser/Ground and Project reports for screening and scoping.

6 Site investigations and additional assessments

6.1 Ground investigation

An intrusive soil survey has been carried out by Paddock Geo-Engineering. The following summarises the report:

Results:

- The made ground is underlain by the Claygate Member, which is variable in strength and coarse to fine grained soils.
- The bottom of the Claygate member was not confirmed and extends to at least 8m bgl.
- The borehole struck water at approximately 3m bgl.
- The trial pits confirmed the existing footings extended to between 1.35m and 1.5m bgl into the Claygate Member.
- The Claygate Member allowable bearing capacities range between 20-75kPa.

6.2 Additional assessments

A groundwater and surface water assessment has been carried out by H Fraser Consulting.

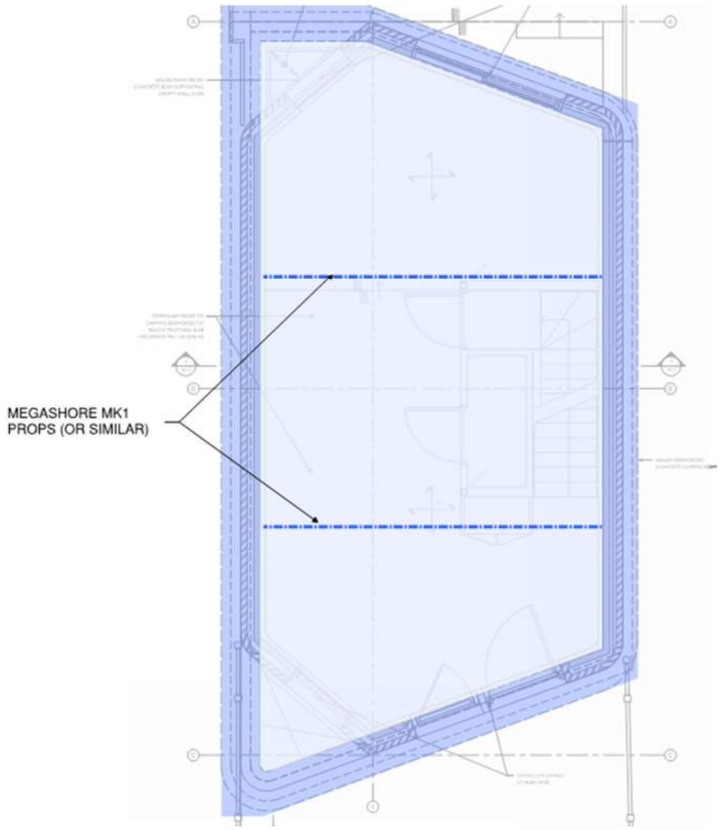
A land stability and ground movement assessment has been carried out by Ground and Project Consultants.

7 Structural method statement

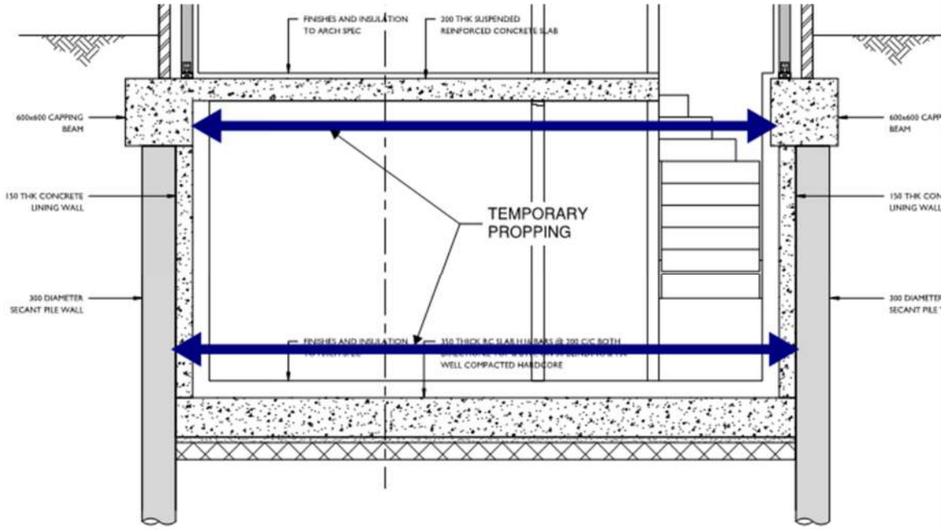
7.1 Brief sequence of works

The following method statement outlines one possible sequence of works. This will be superseded by the information submitted by the contractor prior to construction.

1. Erect site hoarding with skip adjacent to highway.
2. Demolish existing garage and construct piling mat.
3. Install secant piled wall.
4. Cast capping beam
5. Install high level temporary props.



6. Excavate to basement formation level.
7. Install below ground drainage and groundwater drainage layer
8. Cast the new basement raft throughout.
9. Cast reinforced concrete lining wall.
10. Cast ground floor slab.



11. Remove temporary propping.

8 Permanent works proposals

8.1 Basement

The piled retaining walls will be propped by the suspended ground floor slab and basement raft foundation in the permanent condition. Therefore the maximum depth would be 10m.

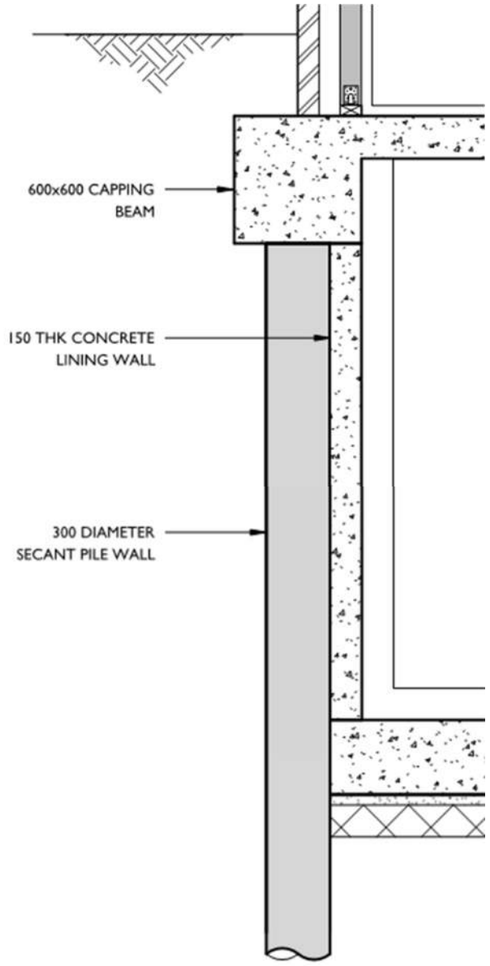


Figure 8.1 – Proposed piled retaining wall section

Internal steel posts will provide additional support to the suspended slab.

The formation level for the basement will be below the zone of influence for the surrounding trees.

8.2 Superstructure framing

Above ground floor the house will be formed with load bearing timber stud walls and timber joists, with some isolated steel framing.

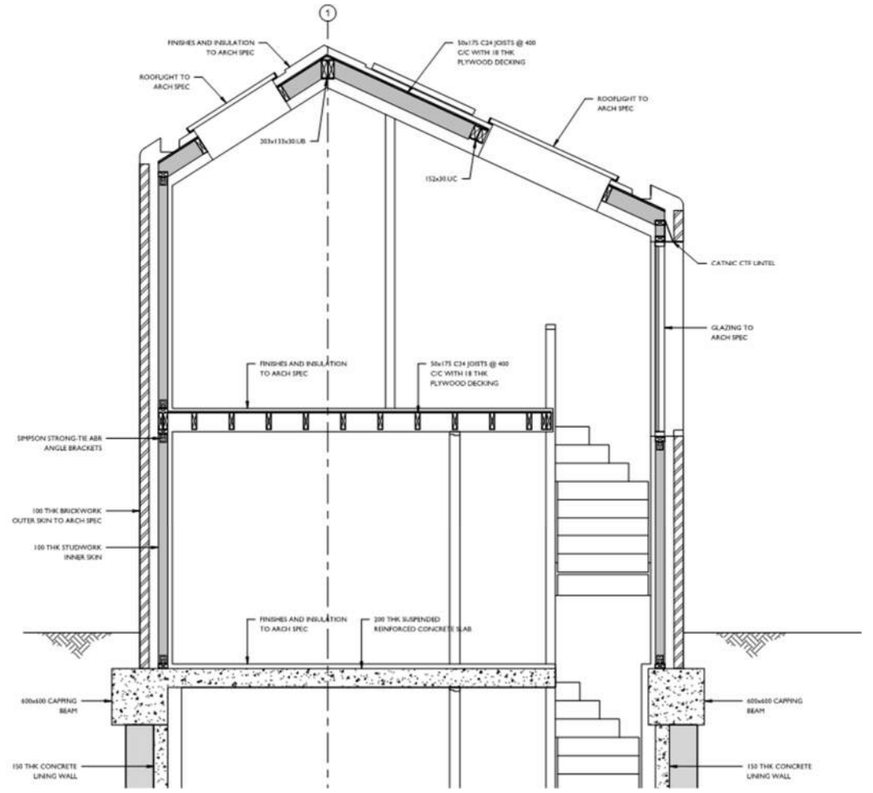


Figure 8.2 – Proposed superstructure section

Stability will be ensured with each floor acting as a stiff diaphragm transferring lateral loads back to the perimeter walls.

8.3 Below ground drainage/SUDS

The contractor will be responsible for the proposed below ground drainage, which should comply with the requirements of SUDS. They will need to liaise with Thames Water to obtain approvals for increased discharge into the sewer system.

The drainage design will take into account the risk of surface water flooding. A sump will be installed at basement level within a reinforced concrete surround, and pumping will be required from basement level to a manhole at ground floor level. There will then be a new connection to the main sewer in the road.

A one-way valve will be used when connecting to the existing sewer to prevent the sewer flooding the property.

9 Construction management

9.1 Contractor qualifications

The client should appoint a contractor with suitable experience in basement construction within the London area. They should be a member of the Considerate Contractors Scheme.

The underpinning contractor should be a registered member of the Association of Specialist Underpinning Contractors.

9.2 Construction waste and traffic management

Refer to CTMP provided by TTP.

9.3 Noise, vibration and dust

The demolition will take place within a hoarded area. Any scaffolding will be clad in monarflex to limit noise and the spread of dust.

All concrete and masonry demolition work will be regularly watered down to reduce airborne dust. The pavement adjacent to the site will be cleaned daily.

Concrete to be broken out using non percussive techniques.

Working hours to be restricted as required by the Local Authority.

9.4 Construction monitoring

The excavation will be overseen by the project engineer at key stages (the excavation of the first underpin and the installation of the temporary propping).

The following monitoring is recommended during the construction period:

Contractor to allow for weekly monitoring at 8 no façade points throughout the basement excavation works. Minimum 2 locations to be set out on each neighbouring façade, front and rear. Final regime/locations to be confirmed with SE.

- Monitoring to be carried out by an approved independent monitoring company.
- Readings to be taken at the same time of day.
- Superstructure movement of +/- 4mm recorded at any of the predefined locations to be communicated to SE immediately.
- Superstructure movement of +/- 8mm recorded to result in the works stopping and being made safe. SE to be notified immediately.

10 Basement impact assessment

10.1 Slope stability

Based on the topography there is negligible risk of slope instability below the proposed slab/retaining wall construction.

Refer to Ground and Project report for more detail.

10.2 Ground movement assessment

Refer to Ground and Project report.

10.3 Hydrogeology assessment and surface water flooding

Refer to H Fraser report.

10.4 Flood risk, river and tidal flooding

The site is located within Environment Agency flood zone 1. As the site is below 1 hectare in size a Flood Risk Assessment is not recommended.

10.5 Trees

Refer to the Arboriculturalist report.

11 Conclusions

Primarily based on the ground investigation results, it is our opinion that the proposed excavation can be carried out safely in the sequence described.

The permanent works have been designed to accommodate all vertical, lateral loads and combinations in line with the latest Eurocodes. A suitable temporary works proposal has been established and going forward this will be fully designed and detailed by a qualified structural engineer employed by the contractor.

The engineering design described here has been advanced to Developed Design Stage (RIBA Stage 3). Refer to the Stage 3 structural drawings attached.

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Appendices

Appendix A – Stage 3 structural drawings

WALLS LEGEND

NEW BLOCK WALL FORMED IN MIN. GRADE 7.3 N BLOCKS.

NEW BRICK WALL TO MATCH EXISTING U.N.O. BY ARCHITECT.

NEW RC WALL/RETAINING WALL.

STUD WALLS

- 75x100 C24 STUDS @ 400 C/C.
- 12 THK PLYWOOD SHEATHING TO BOTH FACES.
- STUDS TO BE DOUBLED UP AT CORNERS, OPENINGS & UNDER BEAM BEARINGS.

PILE DESIGN

- PILES TO BE DESIGNED BY SPECIALIST SUBCONTRACTOR.
- REFER TO CONSTANT SPECIFICATION.
- REFER TO SITE INVESTIGATION REPORT (AVAILABLE ON REQUEST.)
- CONTRACTOR IS RESPONSIBLE FOR ENSURING THE DESIGN. ANY FURTHER INVESTIGATION REQUIRED SHOULD BE ALLOWED FOR IN THE TENDER.
- CONTRACTOR TO ALLOW FOR PILNG MAT DESIGN AND INSTALLATION.

FLOOR DECK - BRITTLE FINISHES

ALL NEW FLOOR AREAS WITH STONE, TILE OR OTHER BRITTLE FINISHES TO HAVE 2No. SHEETS OF 18mm PLYWOOD DECKING CROSS LAID, GLUED & SCREWED TO ALL JOISTS AND TEK SCREWED TO THE TOP OF ALL STEEL BEAMS.

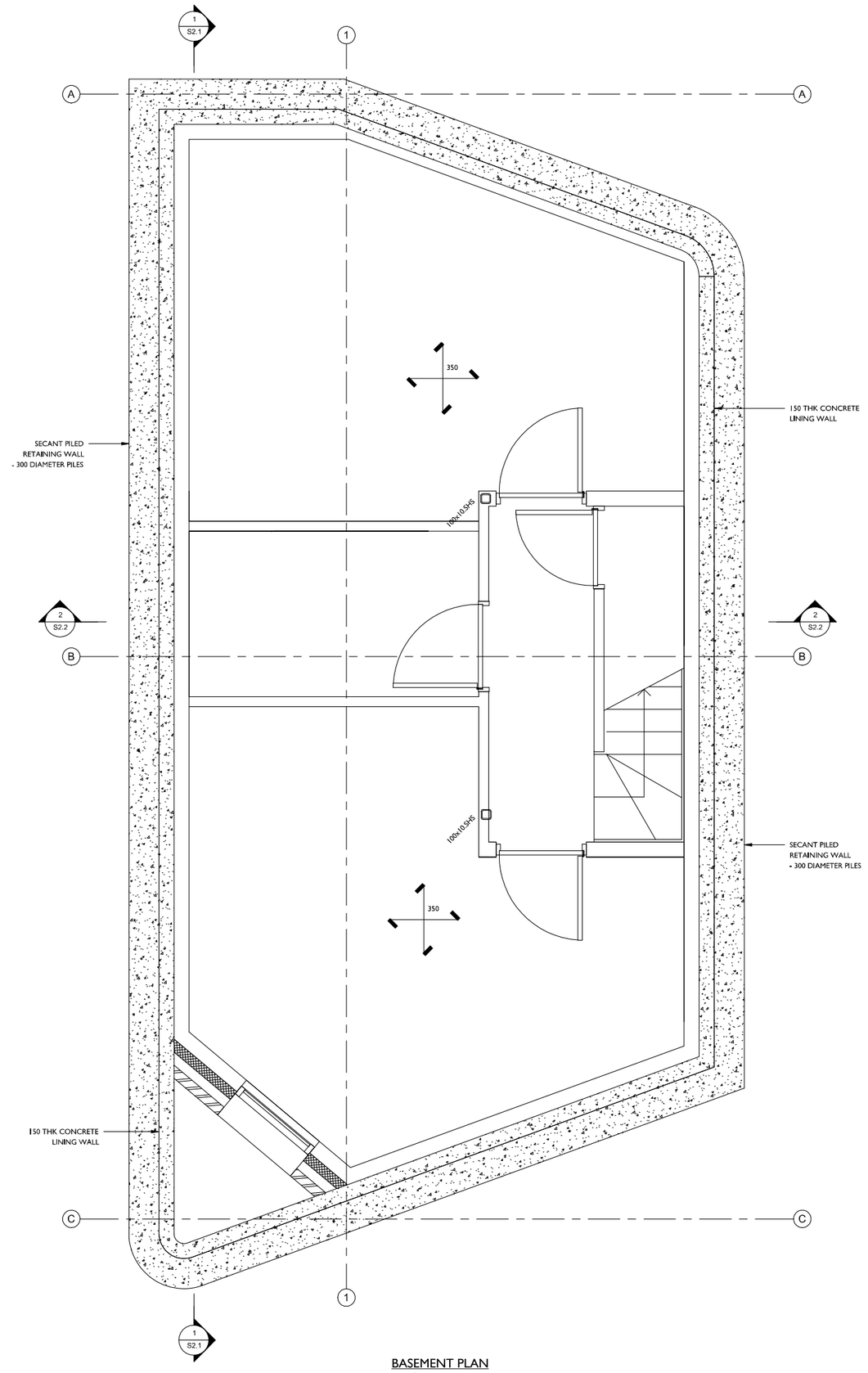
FLOOR & ROOF DECK - GENERALLY

ALL FLOOR & ROOF AREAS TO HAVE 18mm PLYWOOD DECKING SCREWED TO ALL JOISTS, RAFTERS & NOGGINS & TEK SCREWED TO THE TOP OF ALL STEEL BEAMS. SCREW SPACING TO BE 150mm CENTRES ALONG EDGES & 300mm CENTRES ELSEWHERE.

CLADDING DESIGN AND SECONDARY SUPPORT TO SPECIALIST SUBCONTRACTOR DESIGN.

SLABS LEGEND

350 THICK RC SLAB H16 BARS @ 200 C/C BOTH DIRECTIONS, TOP & BTM, ON 50 BLINDING & 150 WELL COMPACTED HARDCORE.



BASEMENT PLAN

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NOTES

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3. DO NOT SCALE FROM THIS DRAWING.
4. WATERPROOFING TO ARCHITECTS DETAILS.

TEMPORARY WORKS

- CONTRACTOR IS FULLY RESPONSIBLE FOR ALL TEMPORARY WORKS DESIGN, SEQUENCE OF WORKS, PREPARATION OF METHOD STATEMENTS, ETC.

- CONTRACTOR IS FULLY RESPONSIBLE FOR ALL ASPECTS OF TEMPORARY STABILITY OF GROUND AND BUILDINGS DURING THE WORKS.

- CONTRACTOR IS TO ENGAGE A SPECIALIST TEMPORARY WORKS ENGINEER TO CARRY OUT ALL TEMPORARY WORKS DESIGN & SEQUENCING.

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PROJECT NUMBER	DRAWING NUMBER	REVISION
23091	S1.0	P1

WALLS LEGEND

NEW STUD WALL.

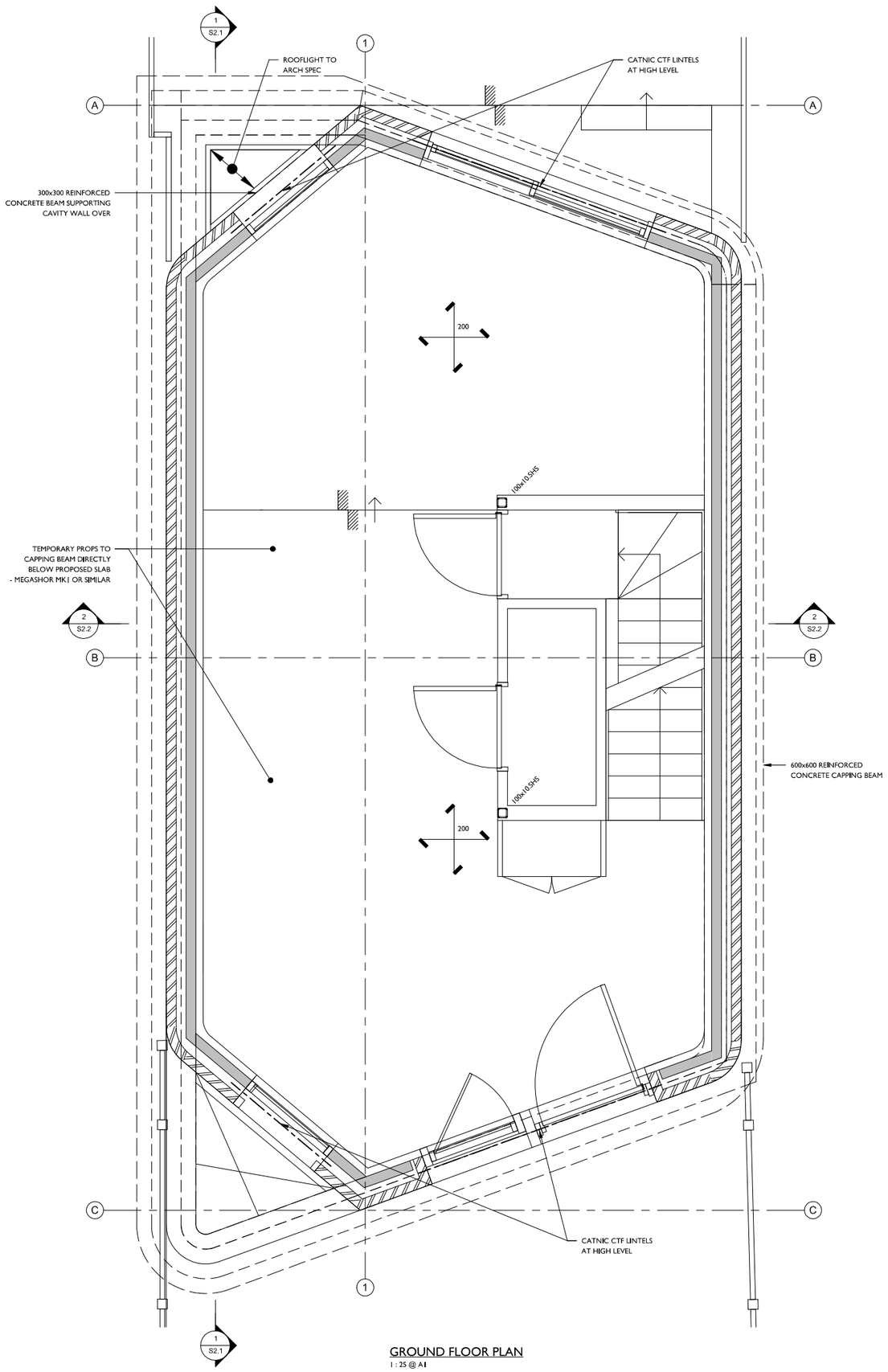
NEW BRICK WALL TO MATCH EXISTING U.N.O. BY ARCHITECT.

STUD WALLS

- 75x100 C24 STUDS @ 400 C/C.
- 12 THK PLYWOOD SHEATHING TO BOTH FACES.
- STUDS TO BE DOUBLED UP AT CORNERS, OPENINGS & UNDER BEAM BEARINGS.

SLABS LEGEND

200 THICK SUSPENDED RC SLAB



GROUND FLOOR PLAN

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P1	08.04.24	PRELIMINARY ISSUE

CONSTANT

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DRAWING
GROUND FLOOR PLAN

PROJECT NUMBER	DRAWING NUMBER	REVISION
23091	S1.1	P1

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NEW BRICK WALL TO MATCH EXISTING U.N.O. BY ARCHITECT.

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FLOORS LEGEND

175 — 50x175 C24 JOISTS/RAFTERS @ 400 C/C.

FLOOR DECK - BRITTLE FINISHES

ALL NEW FLOOR AREAS WITH STONE, TILE OR OTHER BRITTLE FINISHES TO HAVE 2No. SHEETS OF 18mm PLYWOOD DECKING CROSS LAID, GLUED & SCREWED TO ALL JOISTS AND TEK SCREWED TO THE TOP OF ALL STEEL BEAMS.

FLOOR & ROOF DECK - GENERALLY

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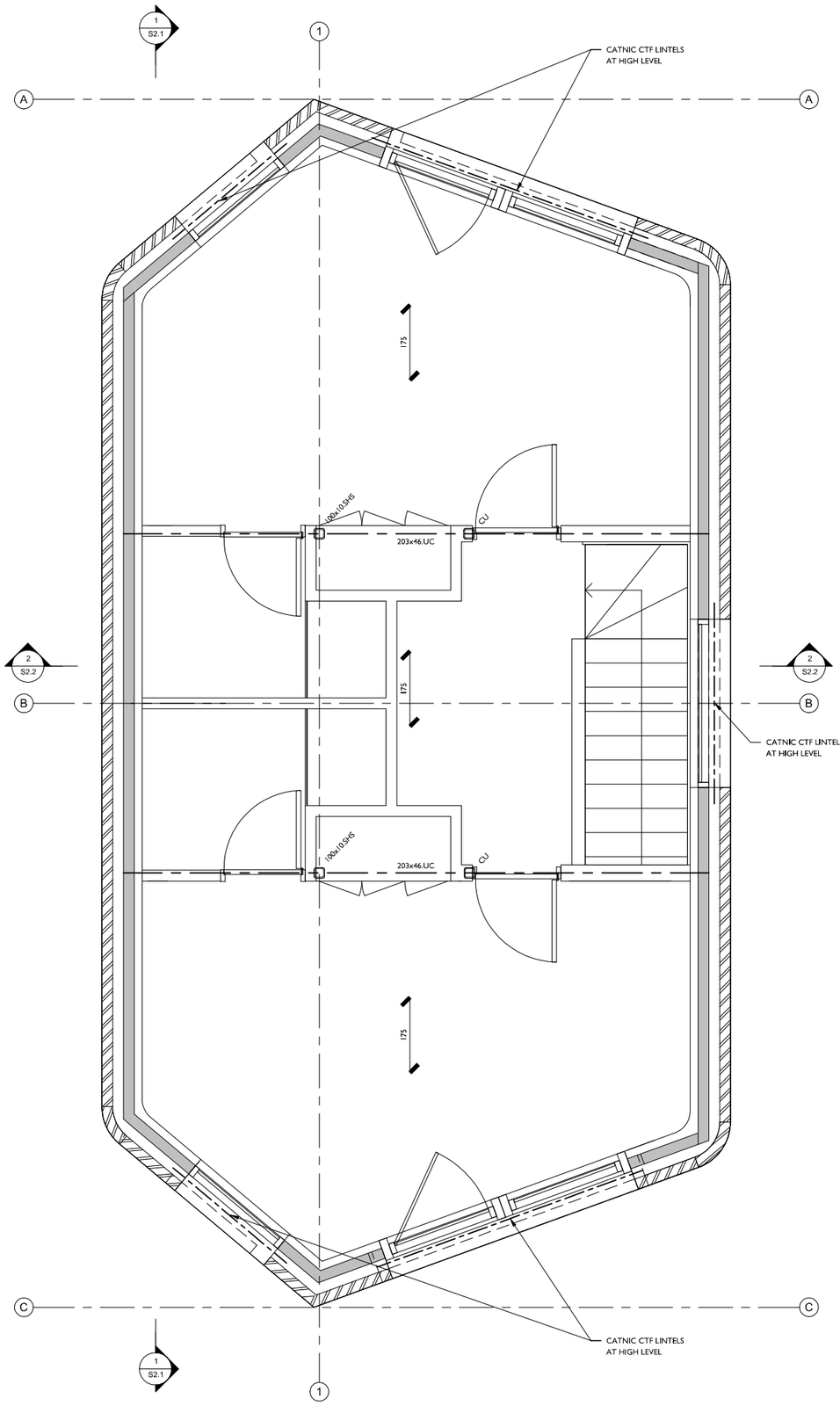

FIRST FLOOR PLAN

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P1	08.04.24	PRELIMINARY ISSUE

CONSTANT

constantsd.com

PROJECT
NETHERALL GARDENS

DRAWING
FIRST FLOOR PLAN

PROJECT NUMBER	DRAWING NUMBER	REVISION
23091	S1.2	P1

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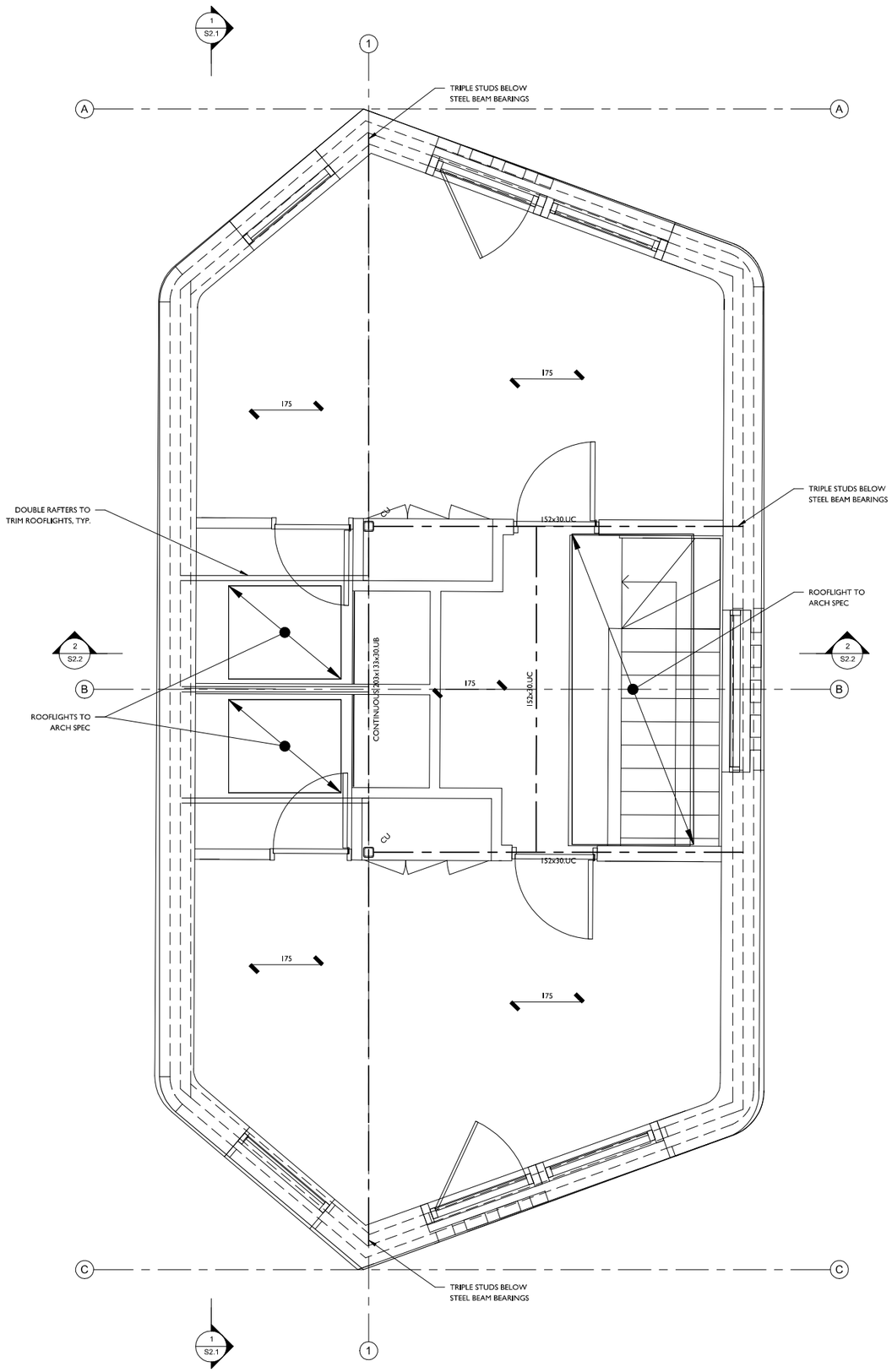

ROOF PLAN

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REV	DATE	AMMENDMENTS
P1	08.04.24	PRELIMINARY ISSUE

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PROJECT
NETHERALL GARDENS

DRAWING
ROOF PLAN

PROJECT NUMBER	DRAWING NUMBER	REVISION
23091	S1.3	P1

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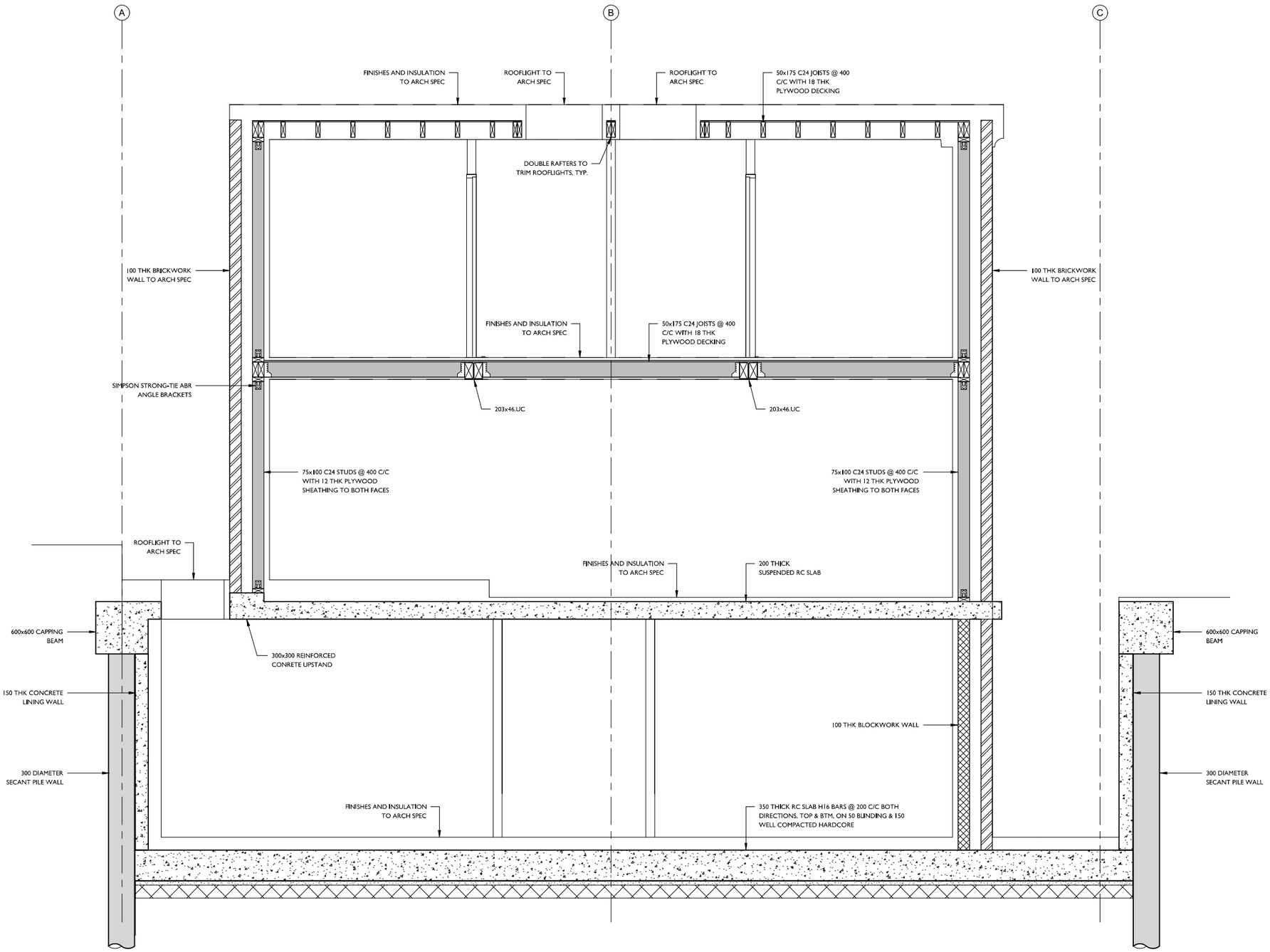

SECTION 1-1
1 : 25 @ A1

REV	DATE	AMMENDMENTS
P1	08.04.24	PRELIMINARY ISSUE

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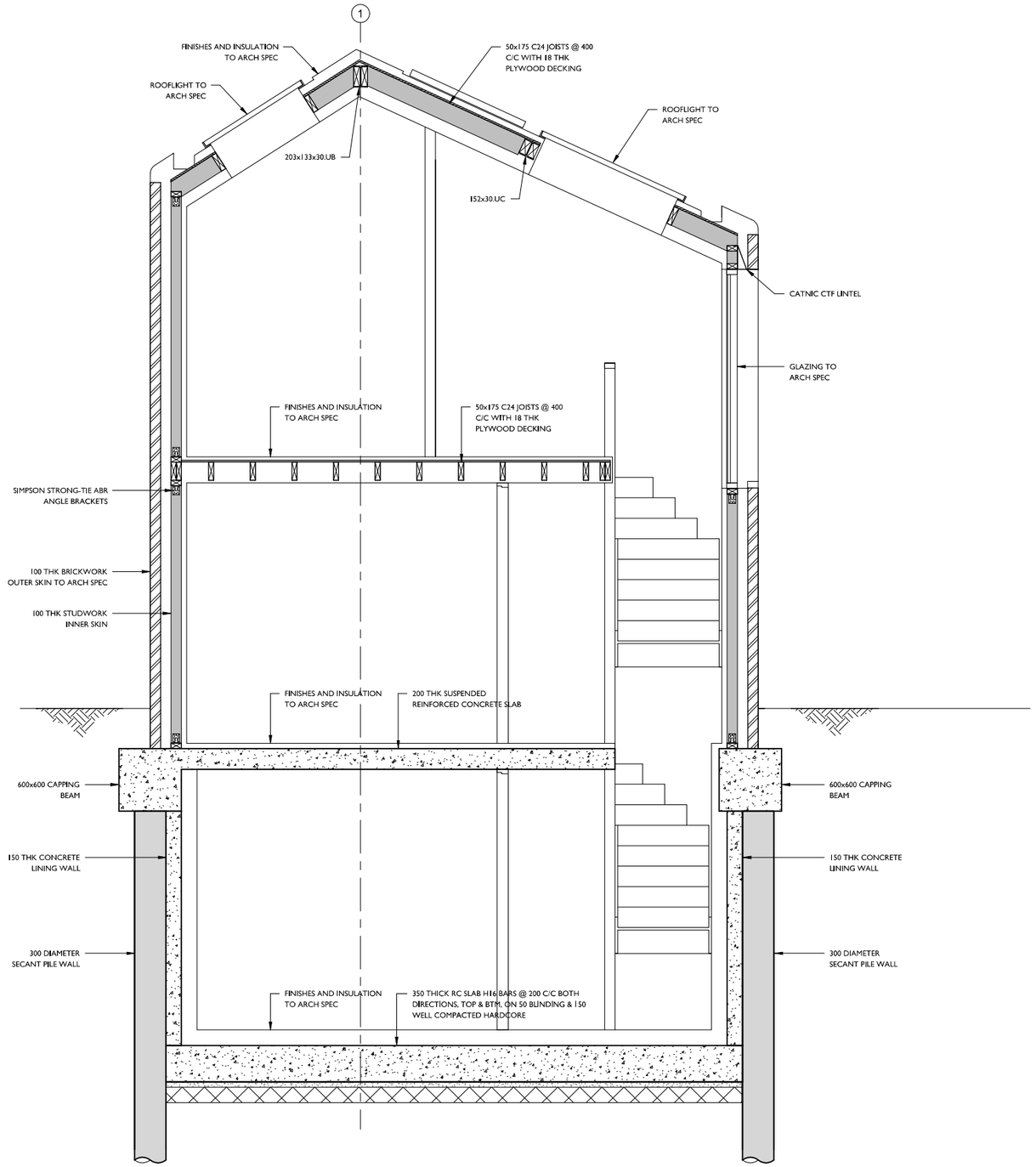
PROJECT NUMBER	DRAWING NUMBER	REVISION
23091	S2.1	P1



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NETHERALL GARDENS

DRAWING
SECTION 2

PROJECT NUMBER	DRAWING NUMBER	REVISION
23091	S2.2	P1