GEOTECHNICAL INVESTIGATION REPORT

33 – 35 CHURCH STREET, RANDWICK NSW

PREPARED FOR
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1 PROJECT INFORMATION

1.1 INTRODUCTION AND OBJECTIVE

Geo-Environmental Engineering Pty Ltd (GEE) was commissioned by Couvaras Architects, on behalf of Siew Leng Kiang, to undertake a geotechnical investigation at 33 - 35 Church Street, Randwick NSW (herein referred to as the 'site').

The investigation was required to support a development application with Randwick Council for a multi-storey residential development and to address the requirements of Part 6, Clause 6.2 of the Randwick Local Environment Plan 2012 because earthworks proposed as part of the proposed development have the potential to impact on adjoining developments. The investigation was also required to provide relevant geotechnical information to assist with the structural design and construction of the development by others.

This report presents the factual and interpreted results of the field investigations and provides interpretation and recommendations regarding the ground conditions at the site, in accordance with client requirements and the agreed scope of work.

1.2 PROPOSED DEVELOPMENT

According to the architectural plans provided, a copy of which is provided in **Appendix A**, the proposed development will involve the demolition of the existing dwelling and associated structures before constructing a new four-level building over a single level basement. The basement level will also incorporate a mechanical car stacker.

The design finished floor level (FFL) for the basement is proposed to be 66.07m above Australian Height Datum (AHD). Considering the existing surface levels across the site and allowing for a 0.2m thick floor slab, excavation of between approximately 3.5m and 4.0m depth will be required. Although deeper excavation of approximately 3.0m will be required locally to accommodate the lift shaft and car-stacker. The basement is proposed to be setback between 0.6m and 1.0m from the side boundaries and approximately 4.0m from the front and rear boundaries.

1.3 SCOPE OF WORK

The scope of work undertaken by GEE, to satisfy the above objectives, was as follows:

- ◊ Dial Before You Dig (DBYD) desktop search for underground services,
- ◊ Visual appraisal of the site conditions and locality,

- ◊ Review of the geological and soils maps for the area,
- ◊ The drilling of boreholes and the performance of Dynamic Cone Penetrometer (DCP) tests in accessible parts of the site to assess the subsurface conditions,
- ◊ Collection of representative soil samples from the boreholes,
- ◊ Analysis of selected soil samples for the preliminary assessment of soil salinity and aggressivity, and
- ◊ Engineering assessment and reporting.

2 SITE INFORMATION

2.1 SITE DESCRIPTION

The site is located on the eastern side of Church Street and is surrounded by similar low level residential dwellings to the north and east with a four storey apartment block located to the south. The site covers an area of 587.88m^2 and is legally described as Lot 1 in Deposited Plan (DP) 937810 and Lot 3 in Deposited Plan 650404.

At the time of the investigation there was a single storey brick dwelling occupying the majority of the site. The front yard has been partly retained by a low brick retaining wall with the small area between the dwelling and the front boundary covered in lawn The side passages adjacent to both dwellings comprised concrete pathways and some small garden beds. The rear yard was mostly paved with established garden beds containing some small trees and shrubs located along the rear boundary.

Existing site features are shown on the architectural plans, which are provided in **Appendix A**, while photographs taken during the field investigations are provided below in **Plates 1** to **Plate 8**.

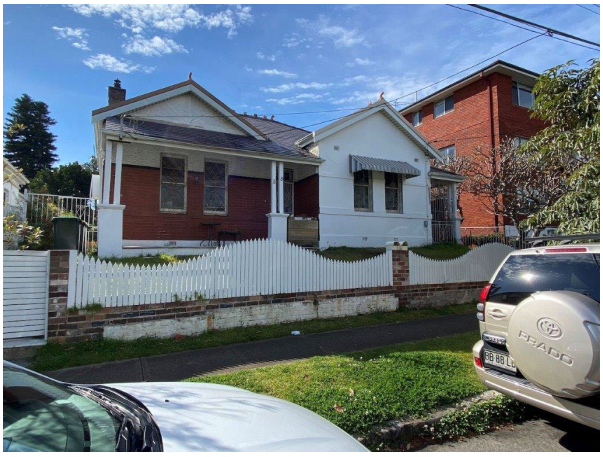

Plate 1 – Front of site viewed to the east.

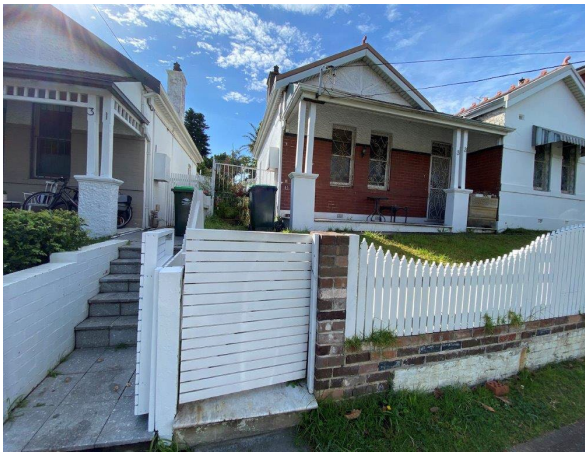

Plate 2 – Boundary between No.31 and No.35 viewed to east

Plate 3 – Boundary between No.31 and No.35 viewed to west.

Plate 4 – Apartment block to south, viewed to east.

Plate 5 – Boundary between No.35 and apartment block to south.

Plate 6 – Boundary between No.35 and apartment block to south.

Plate 7 – Rear yard viewed to the south.

Plate 8 – Front boundary viewed to the north.

2.2 TOPOGRAPHY

The site is located on a gentle westerly dipping slope and according to the spot heights shown on the architectural plans (**Appendix A**), the surface elevation along the eastern (rear) boundary is approximately 70.6m AHD falling to approximately 68.2m AHD along the footpath adjacent to the western (front) boundary.

2.3 GEOLOGY AND SOILS

A review of the regional geological map (reference 1) indicates that the site is underlain by Quaternary aged sediments typically comprising "*...medium to fine-grained 'marine' sand with podsols".* These unconsolidated sediments form what is more commonly known as the 'Botany Sands' formation and comprise a sequence of marine and aeolian (dune) sands contained in the Botany Basin. The thickness of the 'Botany Sands' formation ranges from less than 10m (around the perimeter of the Botany Basin) to in excess of 60 m (in the central parts of the basin).

The Botany Sands generally mantle Triassic aged bedrock which is expected to comprise the Hawkesbury Sandstone Formation at this location. The Hawkesbury Sandstone Formation typically comprises "*…Medium to coarse-grained quartz sandstone, very minor shale and laminite lenses*".

A review of the regional soils map indicates that the site is located within the Newport Soil Landscape Group (reference 2), recognised by gently undulating plains to rolling rises of sand over other soil materials or bedrock. Local reliefs are up typically less than 10m and slopes are usually less than <10% in gradient, but occasionally up to 35%. Soils of the Newport Group typically comprise Aeolian sands, have very low soil fertility and form a very high soil erosion hazard.

Soils identified onsite were consistent with the published mapping.

2.4 REGIONAL HYDROGEOLOGY

Based on the geological information it was anticipated that permanent groundwater is likely to be unconfined and present within the Quaternary aged sediment formation (i.e. the Botany Sand formation). The direction of groundwater flow is generally in a southerly and south-westerly direction, discharging to Botany Bay (reference 4). If not within the soil profile then it will be confined, or partly confined, within discrete water-bearing zones within the underlying sandstone bedrock formation. However, intermittent 'perched' water seepage is likely to occur at the soil-bedrock interface following heavy and prolonged rainfall events.

2.5 ACID SULFATE SOIL RISK

Acid Sulfate Soil is naturally occurring sediments and soils containing iron sulfides (principally iron sulfide, iron disulfide or their precursors). Oxidation of these soils through exposure to the atmosphere or through lowering of groundwater levels results in the generation of sulfuric acid.

Land that may contain potential acid sulfate soils was mapped by the NSW Department of Land and Water Conservation (DLWC) and based on these maps local Councils produced their own acid sulfate soil maps to be used for planning purposes.

The DLWC Acid Sulfate Soil Risk Map (reference 4), indicates that the site lies within an area with no known occurrences of acid sulphate soil and land activities within this area are "...*not likely to be affected by acid sulphate soil materials*".

The ASS Planning Map produced by the NSW Department of Planning and Environment for Randwick Council, and available via interactive online mapping, indicates that the site lies outside of areas defined as 'Class 1' to 'Class 5.' In this regard, an acid sulphate soil assessment or management plan is not warranted.

3 METHOD OF INVESTIGATION

Fieldwork was undertaken on the 30th September 2021 by Matthew Kilham and Zachary Ziesel from GEE and the work comprised:

- ◊ A visual site inspection of site conditions,
- ◊ The drilling and logging of two boreholes (BH1 and BH2) in accessible areas of the site to assess the soil conditions and depth to bedrock, and
- ◊ The performance of DCP tests adjacent to each borehole to assess the consistency and/or relative density of the soil profile, and
- ◊ The collection of representative soil samples from the boreholes, for laboratory testing.

3.1 BOREHOLE DRILLING AND DCP TESTING

Prior to commencement of the bores, an inspection for potential underground services and utilities was completed and cross-checked with the results of a Dial Before you Dig (DBYD) search.

The boreholes were drilled using an 85mm diameter, hand operated auger, while the DCP tests were performed in accordance with Australian Standard Test Method AS1289.6.3.2-1997 (reference 5). During drilling, the encountered fill and natural soils were geologically logged by an experienced geotechnical engineer, taking care to describe the presence and depth of fill material / previously disturbed ground, the natural stratum, moisture, seeps or water bearing zones, and the elevation of the water level/hydraulic head.

Each of the boreholes were advanced through a aeolian sand soil profile and clayey sand before refusing on weathered sandstone bedrock or bands of ironstone in proximity to the weathered bedrock at depths of 1.30m below ground surface (bgs) at BH1 and 2.00m bgs at BH2. The corresponding DCP tests were terminated due to practical refusal at similar depths to the boreholes which support the conclusion that the weathered bedrock had been encountered.

The location of the boreholes and DCP tests were estimated using measurements from existing site features and are shown on **Figure 1** along with other site features. A copy of the borehole logs, including DCP test results, is provided in **Appendix B**.

3.2 SOIL SAMPLING

Soil samples were collected at regular intervals from borehole (BH1) and selected samples were submitted to Eurofins laboratory for the following NATA accredited testing as part of a preliminary assessment of soil salinity and soil aggressivity towards buried concrete and/or unprotected steel. These results are provided in Section 4.2.

4 INVESTIGATION RESULTS

4.1 SUBSURFACE CONDITIONS

The subsurface conditions, as observed in the boreholes typically comprised minor surface topsoil materials over sandy aeolian soils which was underlain by residual clayey sand overlying weathered sandstone bedrock which was consistent with the Hawkesbury Sandstone formation.

Detailed descriptions of the subsurface conditions on site are provided in the borehole logs (including DCP test data) in **Appendix B**, while a summary of the subsurface conditions encountered across the rear of the site are provided in **Table 1**.

Table 1: Summary of Subsurface Conditions

Layer / Unit	Description	Depth to base of Layer (m)[1]	Consistency / Relative Density[1]
NATURAL SOIL	SAND: dark brown, fine to medium grained, moist with a trace of silt.	0.30	Very loose
	Clayey SAND: orange white, fine to medium grained, moist. Note: An upper iron indurated weathered crust observed in BH1.	1.35 – 2.35	Loose to medium dense
BEDROCK	SANDSTONE: orange red, fine to coarse grained, extremely weathered to highly weathered.	--	-

Note 1: Estimated from DCP tests and borehole observations.

Adverse aesthetics, specifically odours associated with potential contamination, were not noted during the fieldwork. Additionally, no potentially Asbestos Containing Materials (ACM) was observed in the bores during the drilling.

4.1.1 Groundwater

Permanent groundwater (i.e. the water table) was not encountered during the drilling of the boreholes which extended to the bedrock formation. However, some seepage water was observed on the interface of the residual soil and bedrock formation in BH1. The seepage water is directly recharged by rainfall events and therefore its presence and quantity will vary significantly.

The permanent groundwater is expected to be confined, or partly confined, within discrete water-bearing zones within the underlying sandstone bedrock formation. Groundwater flow is dominated by water movement through fractures (or joints), where stress has caused partial loss of cohesion in the rock and evidence of potential water bearing fractures is usually the presence of clay or iron-staining along the face of the joints.

4.2 LABORATORY TEST RESULTS

A limited number of soil samples were collected during the fieldwork and were submitted to Eurofins Laboratory Services for the following tests:

- ◊ Electrical Conductivity (EC) to provide a preliminary assessment of the salinity potential of the soil profile, and
- ◊ Resistivity, Sulphate, Chloride and pH to determine the exposure classification of the soil with respect to buried structural concrete or unprotected steel.

The laboratory test results are presented in **Appendix C**, while a summary of the results is provided in the following sections.

4.2.1 Soil Salinity Testing

An assessment of soil salinity conditions has been undertaken with reference to guidance published by the Department of Land and Water Conservation NSW (reference 6). In this regard, selected samples of natural soil were submitted to Eurofins for NATA accredited testing of Electrical Conductivity (EC), which is the primary indicator of salinity. The raw EC results and the EC_e results are provided in **Table 2**.

Table 2: Electrical Conductivity Results

Sample ID	Sample Location / Depth	Sample Description	EC (dS/m)	Multiplication Factor[1]	EC_e (dS/m)
ZZ200921-01	BH2 / 0.1 – 0.2	SAND	0.019	17	0.32
ZZ200921-02	BH1 / 0.5 – 0.6	SAND	<0.01	17	<0.17
ZZ200921-03	BH1 / 1.2 – 1.3	Clayey SAND	<0.01	14	<0.14

[1] EC_e results are EC data multiplied by a conversion factor which depends upon the soil texture / type.

According to the Department Land and Water Conservation NSW (reference 6) the soil salinity classes are as follows:

ECe (dS/m)	Class
<2	Non Saline
2 – 4	Slightly Saline
4 – 8	Moderately Saline
8 – 16	Very Saline
>16	Highly Saline

The above test data indicate that the fill/natural soil profile is non-saline.

4.2.2 Exposure Classification Tests

Selected soil samples of natural and fill, sandy and clayey soils were submitted to Eurofins, for NATA accredited testing of pH, sulphate, chloride and resistivity to provide a preliminary assessment of the exposure classification (or aggressiveness/corrosiveness potential) of the soil with respect to future buried steel and/or concrete (e.g. footings).

To determine the aggressiveness of the soil and water environment on concrete or steel, the chemical test results are compared to Tables 6.4.2(C) and 6.5.2(C) from Section 6 of the Australian Standard AS 2159 (reference 7). This section provides assessment criteria to assess the 'exposure classification' for a concrete or steel pile. The Standard has two classes of soil conditions:

(A) high permeability soils below groundwater; and
(B) low permeability soils and all soils above groundwater.

For this site, soil samples above the water table are considered to be condition 'B'. Based on the chemical testing results, the standard provides a range of 'exposure classifications' from non-aggressive to very severe. For the range of chemical conditions in the soil surrounding the structure, the condition leading to the most severe aggressive conditions is adopted.

A summary of the soil results is provided in **Table 3**.

Table 3: Exposure classification (aggressivity) test results

Sample ID	**Location / Depth** (m bgs)	**Soil Condition**	**pH**	**Sulphate** (SO_4) mg/kg	**Chloride** (Cl) mg/kg	**Resistivity** Ohm.cm
ZZ200921-01	BH2 / 0.1 – 0.2	B	6.4	<10	<10	53,000
ZZ200921-02	BH1 / 0.5 – 0.6	B	6.6	<10	<10	170,000
ZZ200921-03	BH1 / 1.2 – 1.3	B	5.8	<10	<10	130,000

The aggressivity potential of the environment on concrete is dependent on the sulphate and pH levels of the soil and the chloride and sulfate concentration of the groundwater. Based on the limited number of test results and according to AS2159-2009 (reference 7) the subsurface profile is non-aggressive towards concrete. According to Australian Standard AS 3600-2009 (reference 8), specifically Table 4.8.1 this equates to an exposure classification of 'A1'. However, a classification of 'A1' is appropriate for the salinity levels encountered and this corresponds to a moderate aggressivity.

The corrosive potential of an environment on unprotected steel is normally dependent on pH, chloride, and resistivity levels of the soil. Based on the limited number of test results above and with reference to AS2159-2009, the subsurface profile is considered to be non-aggressive/non-corrosive.

5 DISCUSSION AND RECOMMENDATIONS

5.1 SITE PREPARATION

Following demolition work and prior to construction of the new development, topsoil with organic matter and any pavement materials should be removed from the proposed building areas.

Material removed from site will need to be managed in accordance with the provisions of current legislation and may include segregation by material type classification in accordance with NSW EPA (2014) *Waste Classification Guidelines* (reference 9) and disposal at facilities appropriately licensed to receive the particular materials. GEE notes that the natural soil and bedrock may be classified as Virgin Excavated Natural Material (VENM) and re-used on other sites rather than disposed at a landfill, although it must be proven to be free of contamination.

Also, considering the proximity of adjoining buildings, care must be taken during demolition works to ensure that the adjoining footings, or the zone of influence of these footings, are not disturbed.

5.2 DILAPIDATION SURVEY

It is recommended that prior to demolition, bulk excavation and construction that a detailed dilapidation survey be carried out on all adjacent buildings and associated structures. The purpose of a dilapidation report is to confirm that demolition, excavation and construction works, are not causing damage and therefore may prevent future claims of damage arising from the works. Preferably these surveys should be agreed to, and the report signed, by the owners of the adjacent building prior to work commencing.

5.3 EARTHWORKS

Earthworks at the site are expected to comprise excavation to a depth of approximately 3.5m and 6.0m to accommodate the basement level, the lift shaft and car stacker. The basement is proposed to be setback between 0.6m and 1.0m from the side boundaries and approximately 4.0m from the front and rear boundaries.

5.3.1 Expected Excavation Conditions

Based on the fieldwork completed by GEE, the excavation will predominately encounter a very loose to medium dense sandy soil profile and the underlying sandstone bedrock formation.

The strength of the bedrock has not been accurately assessed as part of this investigation and was not part of the scope of works. However, GEE anticipates that the sandstone within the depth of the proposed excavation will be low to medium strength becoming medium to high strength shortly thereafter. To confirm the strength of the bedrock within the depth of proposed excavation would require more detailed investigations including the coring and strength testing of the bedrock formation.

The excavation of the soil profile, and any extremely low to very low strength bedrock, is expected to be readily excavated using standard equipment such as excavators. However, the use of an impact hammer is expected to be required upon encountering the sandstone bedrock, particularly if combined with unfavourable rock-defect geometry. Preferably, the rock excavation will be undertaken using a hydraulic hammer, in combination with a rock saw which will minimise vibration (refer to section 5.3.3).

5.3.2 Groundwater / Seepage Inflow

Permanent groundwater was not encountered during the drilling of each borehole, although some intermittent perched seepage water did exist on the surface of the bedrock formation and seeps should also be expected to occur from defects/joints within the bedrock mass that typically has a low permeability (hydraulic conductivity) in the order of 10^{-8} and 10^{-7} m/sec – reference 10. In this regard, the volume of groundwater required to be withdrawn during excavation works, and long term, is expected to be significantly less that the 3ML/year and according to Clause 7 of Schedule 4 in the Water Management (General) Regulation 2018 the site should also be exempt from needing a water access licence. As detailed in a Fact Sheet provided by Water NSW (reference 11), 3ML/year is similar to the volume taken by landholders in accordance with domestic and stock rights held under Section 52 of the Water Management Act 2000 for which a water access licence is not required to be held.

The flow of seepage water is expected to be sufficiently managed during the earthworks phase by pumping from a sump at the base of the excavation. In the long term, it is recommended that sufficient permanent drainage be provided beneath and around the outside of the subsurface structures to ensure the dissipation of any hydrostatic forces which may result from the accumulation of any seepage water. This will also mean that the basement will not require tanking.

5.3.3 Construction / Excavation Induced Vibration

Structures and utilities adjacent to the excavation area are potentially sensitive to vibrations above certain threshold levels (regarding potential for cracking). When using a hydraulic hammer, vibrations will be transmitted through the ground and potentially impact

on adjoining structures. Where possible, the use of other techniques not involving impact (*e.g.* rock saws), should be adopted as they would reduce or possibly eliminate risks of damage due to vibrations.

Where vibration intensive works such as hydraulic hammering of competent rock is proposed, contractors should assess the potential impact of their works based on the borehole logs and local knowledge of similar bedrock formations. Monitoring of construction induced vibration should be undertaken at the commencement of such activities at the nearest vibration receptor and in consultation with the project superintendent and geotechnical engineer so that excessive vibration effects are not generated.

Peak Particle Velocity (PPV) is usually the adopted measure of ground vibration, and the safe limits depend on the sensitivity of the adjoining structures. There are several Australian and overseas publications which provide vibration velocity guideline levels (or safe limits) including:

- Australian Standard AS2187.2-2006 Explosives - Storage and use - Use of explosives - Appendix J: Ground Vibrations and Airblast Overpressure (reference 12).
- Australian Standard AS2670.2-1990 Evaluation of human exposure to whole-body vibration - Part 2: Continuous and shock-induced vibration in buildings (1 to 80 Hz) (reference 13).
- DIN 4150 – Part 3 – 1999. Effects if Vibration on Structures (reference 14).
- Department of Environment and Conservation NSW, 2006. Assessing Vibration: a technical guideline (reference 15).
- British Standard BS 7385-1:1990. Evaluation and measurement for vibration in buildings. Guide for measurement of vibrations and evaluation of their effects on buildings (reference 16).
- British Standard BS 7385-2:1993. Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration (reference 17).

Furthermore, the owners of adjoining assets/utilities sometimes have their own limits. In the absence of PPV guidelines from affected asset owners, GEE recommends that a limit of 5 mm/s is adopted for the adjoining structures and utilities.

If vibration levels are found to be unacceptable during the earthworks, it may be necessary to adopt vibration mitigation measures such as:

- The use of smaller excavation plant and hydraulic hammers,

- ◊ The use of a rock sawing or grinder adjacent to the site boundaries. GEE notes that this equipment also reduces the possibility of over-break and loosening of the rock mass.
- ◊ Hammering at 50% capacity in short bursts to prevent the buildup of resonant frequencies,
- ◊ The use of low vibration techniques such as rotary grinders or chemical rock splitting,
- ◊ Progressive breakage from open excavated faces,
- ◊ Selective breakage along open joints, where present, and
- ◊ Orientation of the rock hammer pick away from property boundaries and into the existing open excavation.

Finally, human discomfort levels caused by vibration are typically less than the levels that are likely to cause cosmetic or structural damage to structures. Therefore, complaints may be lodged by neighbours before any cosmetic or structural damage occurs. In this regard, consideration may be given to adopting more stringent vibration limits recommended for human amenity or, as a minimum, ensuring that vibration monitoring is undertaken as reassurance to confirm that vibrations are within safe limits. Acceptable vibration limits for human comfort caused by construction and excavation equipment are provided in DEC (2006) (reference 15). Specifically, maximum acceleration limits as specified in Table 2.2 of the guideline should be adopted.

5.3.4 Excavation Support

The excavation for the basement is expected to extend to within proximity to the site boundaries and therefore, temporary and permanent support (as part of the final basement structure) will be required to prevent damage to the adjoining structures.

Given the ground conditions encountered, a contiguous pile wall (where the gaps between piles are progressively filled with grout / concrete) is recommended. The depth of socket into the sandstone formation will depend on the type of pile adopted and capacity of the rig. If a suitable socket cannot be achieved, and in the unlikely scenario that the piles are founded above the depth of excavation, anchors will need to be installed in the toe of each pile to provide lateral restraint. Ultimately, the choice of support should be discussed with an experienced contractor and will primarily depend on cost, although other factors such as the aesthetics of the final wall, whether it can function as a structural support. Furthermore, the piling contractor complete any investigation necessary to determine the drillability of the rock.

For piles, concrete injected Continuous Flight Auger (CFA) piles, are recommended as the sandy soil has the potential to collapse. This potential for collapse will also be exacerbated by any seepage water present at the interface of the soil and bedrock formations.

The design of the retention system should be done by a suitably experienced structural engineer in accordance with AS4678-2002 Earth Retaining Structures (reference 18) with consideration of both the short- and long-term configurations. In the short term, should the shoring walls be cantilevered or supported by a single row of anchors and some movement behind the walls can be tolerated, earth pressures acting on the shoring walls can be calculated using a triangular earth pressure distribution.

When internal props, such as the ground floor slab restrain retaining wall movement, or where significant movements cannot be tolerated (rigid wall), an 'at-rest' earth pressure coefficient (Ko) is recommended with either a uniform or trapezoidal pressure distribution. It should be noted that shoring which is designed for this 'at rest' coefficient will still undergo some lateral movements, depending on the final configuration of the wall and construction sequence. Additionally, a factor of safety should be applied in considerations of the wall movement needed to fully mobilise passive pressure.

The design of any retaining structures should make allowance for all applicable surcharge loadings including construction activities around the perimeter of the excavation and adjacent buildings.

Finally, computer aided analysis may be carried out to assess potential ground movements based on different wall designs and construction sequence, so as to control deflections to within tolerable limits. It is also considered prudent to carry out surveys before and after installation to measure the actual movement of the wall or soil.

Preliminary geotechnical parameters for retaining wall design are provided below in **Table 4**. However, the additional investigations are recommended following demolition to confirm the depth, strength and quality of the bedrock formation beneath the entire development.

Table 4: Preliminary Geotechnical Design Parameters – Retaining Walls / Shoring

Material		Natural Soil Profile	Sandstone
Bulk Unit Weight (kN/m^3)		18	22
Earth Pressure Coefficients	Active (Ka)	0.4	0.25
	At Rest (Ko)	0.55	0.4
	Passive (Kp)	2.5	3.5
Elastic Modulus (MPa)		5	100
Drained Cohesion c' (kPa)		0	40
Drained Friction Angle ϕ' (°)		30	32
Poisson's Ratio		0.35	0.3

Note 1: Unit weights are based on visual assessment only – order of accuracy approximately ±10%.
Note 2: The passive earth pressure coefficients for rock have been reduced to allow for potential defects in the rock mass.

5.4 SALINITY RISK

The testing carried out on the soil profile (refer to Section 4.2.1) indicate that non-saline soil conditions exist beneath the site and therefore a salinity management plan is not warranted.

5.5 FOUNDATIONS

Following the required excavation work for the proposed basement levels, the subgrade is expected to comprise the sandstone bedrock formation. The shoring piles, if doubling as foundations, will also extend well into the sandstone formation.

The sandstone bedrock formation is capable of providing a minimum allowable end bearing capacity of 800kPa (reference 10). However, to allow for a less conservative structural design it is recommended that additional investigation be completed following demolition to confirm the depth, strength and quality of the bedrock beneath the entire development. As previously mentioned, grout or concrete injected Continuous Flight Auger (CFA) piles are recommended as the sandy soil has the potential to collapse. Particularly if seepage water is encountered at the soil and bedrock interface.

Finally, footing systems should be designed by a suitably qualified and experienced structural engineer, and GEE recommends that inspection by a geotechnical engineer is

undertaken during the footing excavation stage, to confirm that the design founding conditions have been achieved.

5.5.1 Aggressivity / Exposure Classification

Based on the limited exposure classification test results (Section 4.2.2), and in accordance with AS 2159-2009 (reference 7), the subsurface concrete structures (*e.g.* footings) should be designed based on non-aggressive soil conditions for concrete. According to Australian Standard AS 3600-2009 (reference 8), the equivalent exposure classification is 'A1'. With respect to unprotected steel, the natural soil profile is considered to be non-aggressive / non-corrosive.

6 CONCLUSION AND RECOMMENDATIONS

GEE considers that sufficient information has been gained to be confident of the subsurface conditions across the site and to provide Council with assurances regarding the geotechnical feasibility of the proposed development.

Based on the results of the investigation, the proposed development is considered feasible. Additionally, GEE concludes that the existing rock formation can withstand the proposed loads to be imposed, and standard shoring works (provided they are designed by a structural engineer), will ensure the stability of the excavation and provide protection and support of the adjoining properties. However, further investigations are recommended (preferably following DA consent and after demolition of existing structures) to better define the quality of the bedrock formation to better inform the final structural design and to minimise the uncertainty for earthworks contractors. Permanent groundwater was also not encountered within the boreholes and is expected to be confined, or partly confined within the sandstone bedrock formation. In this regard, the volume of groundwater required to be withdrawn during excavation works, and long term, is expected to be significantly less that the 3ML/year and according to Clause 7 of Schedule 4 in the Water Management (General) Regulation 2018 the site should also be exempt from needing a water access licence. A tanked basement will also not be necessary.

The geotechnical issues associated with the proposed development have been addressed by the investigation and are discussed in this report. If, during construction, any conditions are encountered that vary significantly from those described or inferred in the above report, it is a condition of the report that we be advised so that those conditions, and the conclusions discussed in the report, can be reviewed and alternative recommendations assessed, if appropriate.

GEE will be pleased to assist with any further advice or geotechnical services required in regard to the proposed development.

7 GENERAL LIMITATIONS

Soil and rock formations are variable. The logs or other information presented as part of this report indicate the approximate subsurface conditions only at the specific test locations. Boundaries between zones on the logs or stratigraphic sections are often not distinct, but rather are transitional and have been interpreted.

The precision with which subsurface conditions are indicated depends largely on the frequency and method of sampling, and on the uniformity of subsurface conditions. The spacing of test sites also usually reflects budget and schedule constraints. Groundwater conditions described in this report refer only to those observed at the place and under circumstances noted in the report. The conditions may vary seasonally or as a consequence of construction activities on the site or adjacent sites.

Where ground conditions encountered at the site differ significantly from those anticipated in the report, either due to natural variability of subsurface conditions or construction activities or changes to the design of the development, it is a condition of this report that GEE be notified of any variations and be provided with an opportunity to review the recommendations of this report. Recognition of changed soil and rock conditions requires experience and it is recommended that a suitably experienced geotechnical engineer be engaged to visit the site with sufficient frequency to detect if conditions have changed significantly.

The comments given in this report are intended only for the guidance of the design engineer, or for other purposes specifically noted in the report. The number of boreholes or test excavations necessary to determine all relevant underground conditions which may affect construction costs, techniques and equipment choice, scheduling, and sequence of operations would normally be greater than has been carried out for design purposes. Contractors should therefore rely on their own additional investigations, as well as their own interpretations of the borehole data in this report, as to how subsurface conditions may affect their work.

8 REFERENCES

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2. Department of Land and Water Conservation (DLWC), 2004: *Sydney 1:100 000 Soil Landscape Series Sheet 9130 (second edition).*
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10. Pells et al, 2019: *Classification of Sandstones and Shale in the Sydney Region: A Forty Year Review.* Australian Geomechanics Society, 2019.
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14. DIN 4150 – Part 3 – 1999. Effects if Vibration on Structures.
15. Department of Environment and Conservation NSW, 2006. Assessing Vibration: a technical guideline.
16. British Standard BS 7385-1:1990. Evaluation and measurement for vibration in buildings. Guide for measurement of vibrations and evaluation of their effects on buildings.

17. British Standard BS 7385-2:1993. Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration.

18. Australian Standard AS4678-2002: Australian Standard, 2002: *Earth Retaining Structures.*

FIGURES

1 – Site Plan

Sastellite Imasge from Sixmaps

geo-environmental ENGINEERING
82 BRIDGE STREET
LANE COVE NSW 2066
P - 61 (2) 9420 3361
E - info@geoenvironmental.com.au
www.geoenvironmental.com.au

TITLE: SITE PLAN 33 - 35 Church Street, Randwick NSW	SCALE: **N.T.S**	DATE: **24 June 2023**	FIGURE No.: **1**
	DRAWN: **S. McC**	JOB No.: **G21095RAN**	REVISION: **A**

APPENDIX A

Architect Plans (33 Sheets)

Sheet List

Number	Name	Current Revision	Current Revision Date
00	Cover Sheet	AD	11/03/24
01	Site Plan	AD	11/03/24
02	Basement	AD	11/03/24
03	Ground Floor Plan	AD	11/03/24
04	Level 1	AD	11/03/24
05	Level 2	AD	11/03/24
06	Level 3	AD	11/03/24
07	Roof Plan	AD	11/03/24
08	Elevations	AD	11/03/24
09	Elevations	AD	11/03/24
10	Sections	AD	11/03/24
11	Sections	AD	11/03/24
12	Area calculation Plan	AD	11/03/24
13	Landscape Area Calculations	AD	11/03/24
15	Shadow Diagrams - Sheet 2	AD	11/03/24
15.1	Shadow Diagrams - North Elevation Neighbour 21 June 1	AD	11/03/24
15.2	Shadow Diagrams - North Elevation Neighbour 21 June 2	AD	11/03/24
15.3	Shadow Diagrams - North Elevation Neighbour 21 June 3	AD	11/03/24
16	ADG Compliance	AD	11/03/24
17	Construction Management Plan	AD	11/03/24
18	Waste Management Plan	AD	11/03/24
19	Materials & Finishes	AD	11/03/24
20	Street View	AD	11/03/24
21a	Suns Eye diagrams - June 21	AD	11/03/24
21b	Suns Eye diagrams - June 21	AD	11/03/24
21c	Suns Eye diagrams - June 21	AD	11/03/24
21d	Suns Eye diagrams - June 21	AD	11/03/24
21e	Suns Eye diagrams - June 21	AD	11/03/24
21f	Suns Eye diagrams - June 21	AD	11/03/24
21g	Suns Eye diagrams - June 21	AD	11/03/24
21h	Suns Eye diagrams - June 21	AD	11/03/24
21i	Suns Eye diagrams - June 21	AD	11/03/24
NN	Neighbour Notification	AD	11/03/24

DEVELOPMENT SUMMARY

Site Area	=	587.88m²
Zone	=	R3 - Medium Density Residential
Max FSR	=	0.9:1 (523m²)
ARHSEPP bonus	=	0.2 - 0.5 :1
Affordable provided	=	40% (303m²)
Allowable bonus	=	0.4:1
Proposed FSR	=	1.29 :1 (756m²)
Min landscaping (DCP)	=	293.9m² (50%)
Min deep soil	=	176.4m² (30%)
Min deep soil (ARHSEPP)	=	88.2m² (15%)
Provided landscaping (DCP)	=	271m² (46.1%)
Provided deep soil	=	154.2m² (26.3%)
Provided deep soil (ARHSEPP)	=	93m² (15.8%)

PARKING (ARHSEPP)

Min. Visitors	=	Nil
Min. Residents	=	(5x1) + (2x1.5) = 8
Provided Total	=	7 (+3 carstackers)

Location Plan (Not to Scale)

Street View

Issue	Description	Date
Z	revised for council	03/11/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

SECTION 4.56 APPLICATION

couvaras >ARCHITECTS

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>E architect@couvaras.com **>W** www.couvaras.com
Nominated Architect: Peter Couvaras Reg No.7344

North

Drawing Name: Cover Sheet

33-35 Church St, Randwick

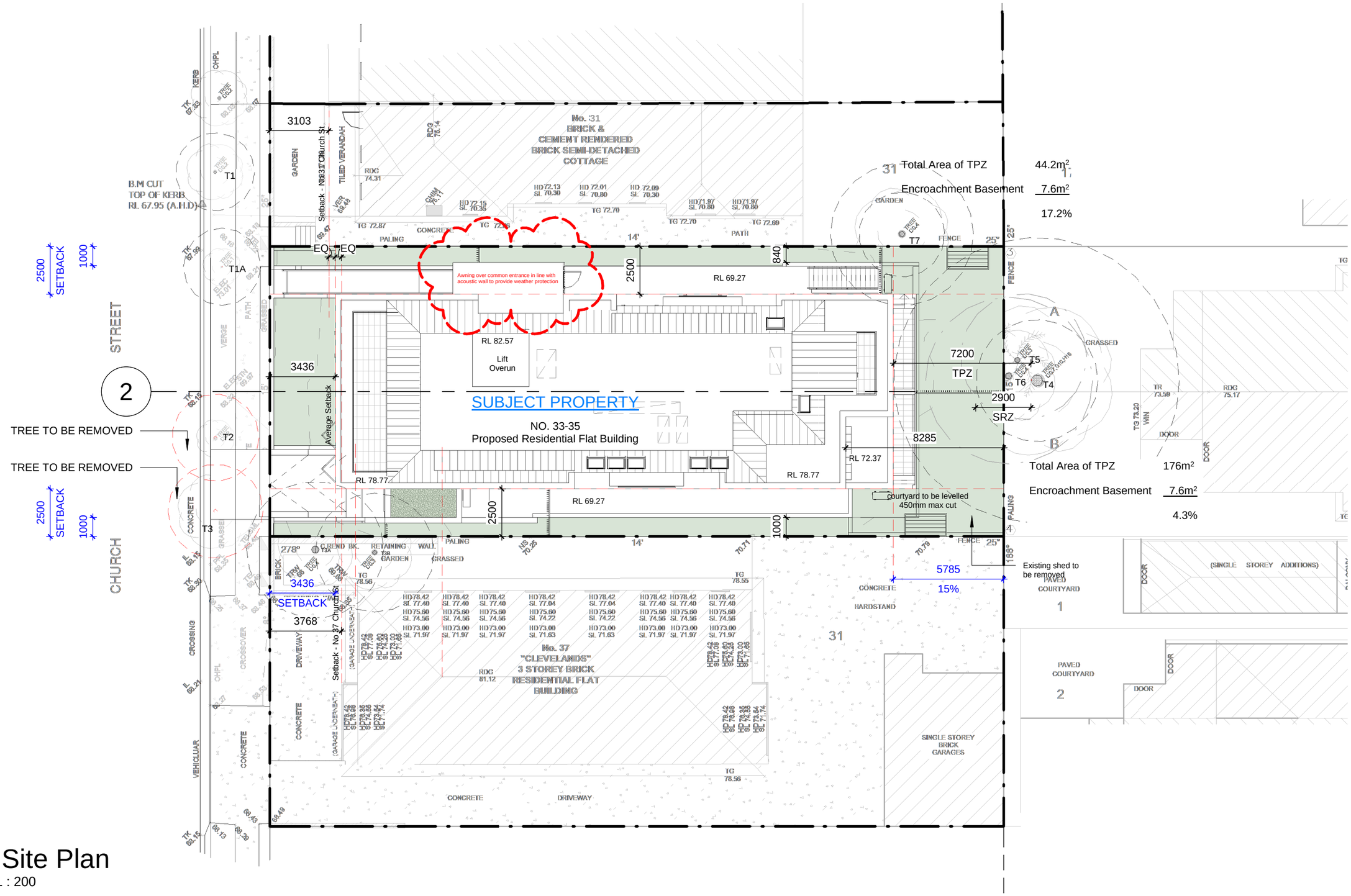
Scale @ A3

11 July 2023

Project 21004

Issue Issue AD

Sheet 00



1. Site Plan

Scale 1 : 200

Issue	Description	Date
Y	S4.55 Issue	09/08/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

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North

Drawing Name: Site Plan

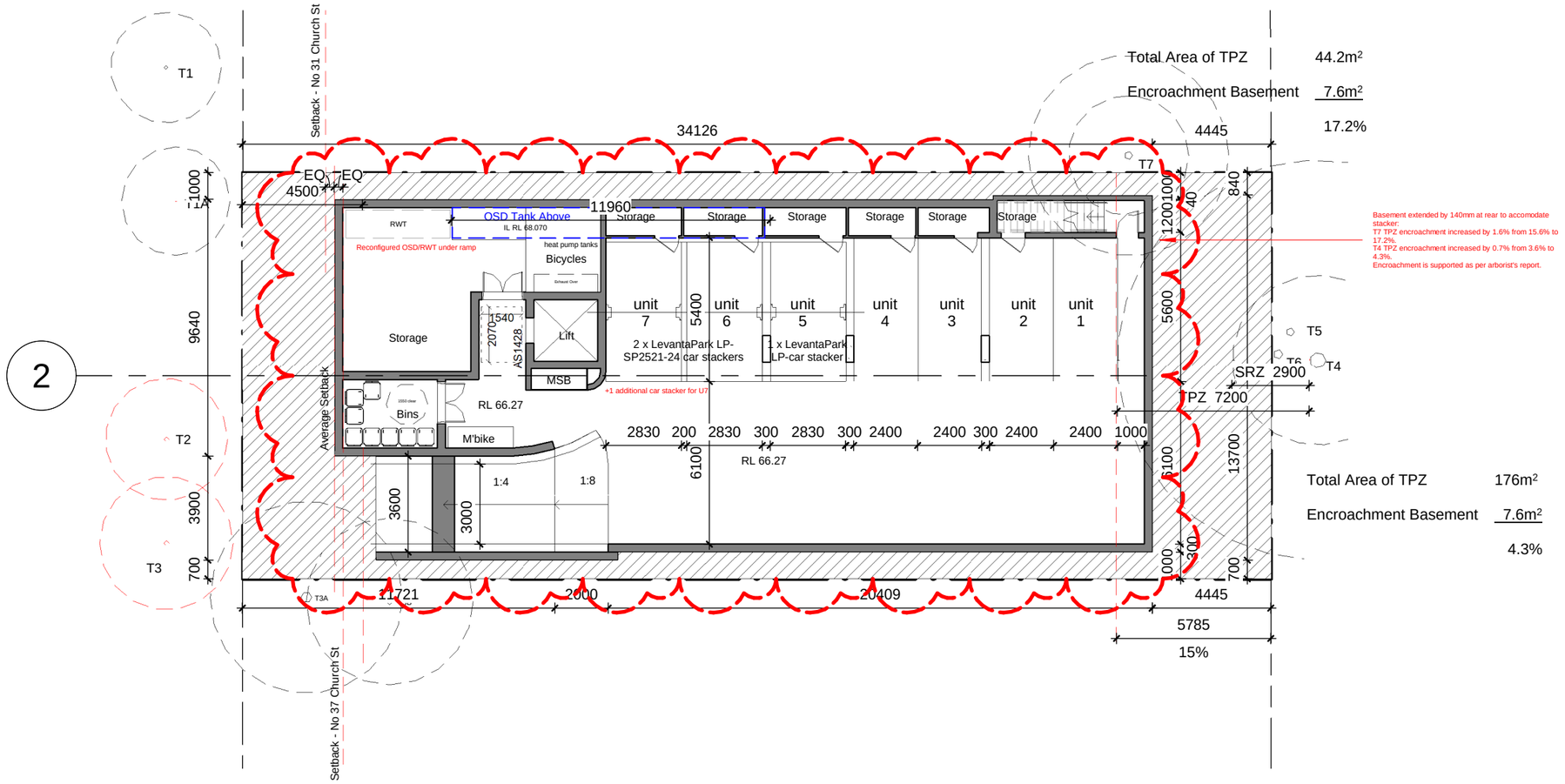
33-35 Church St, Randwick

Scale 1 : 200 @ A3 | 11 July 2023

Project 21004

Issue Issue AD

Sheet 01



2

1. Basement

Scale 1 : 200

Issue	Description	Date
Z	revised for council	03/11/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

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Nominated Architect: Peter Couvaras Reg No.7344

North

Drawing Name
Basement

33-35 Church St, Randwick

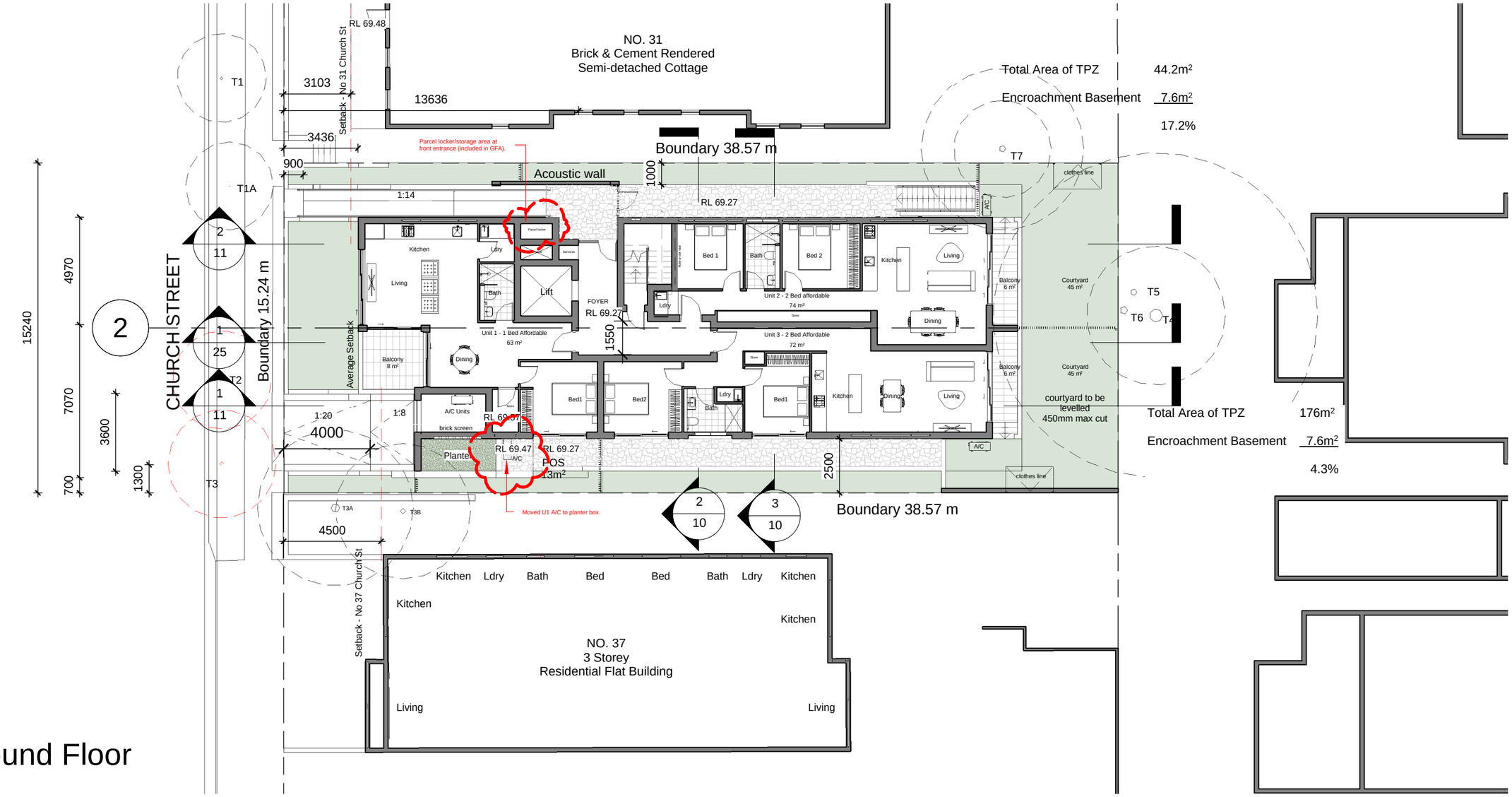
Scale 1 : 200 @ A3

11 July 2023

Project 21004

Issue Issue AD

Sheet 02



1. Ground Floor

Scale 1 : 200

Issue	Description	Date
Y	S4.55 Issue	09/08/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

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>E architect@couvaras.com **>W** www.couvaras.com
Nominated Architect: Peter Couvaras Reg No.7344

North

Drawing Name: Ground Floor Plan

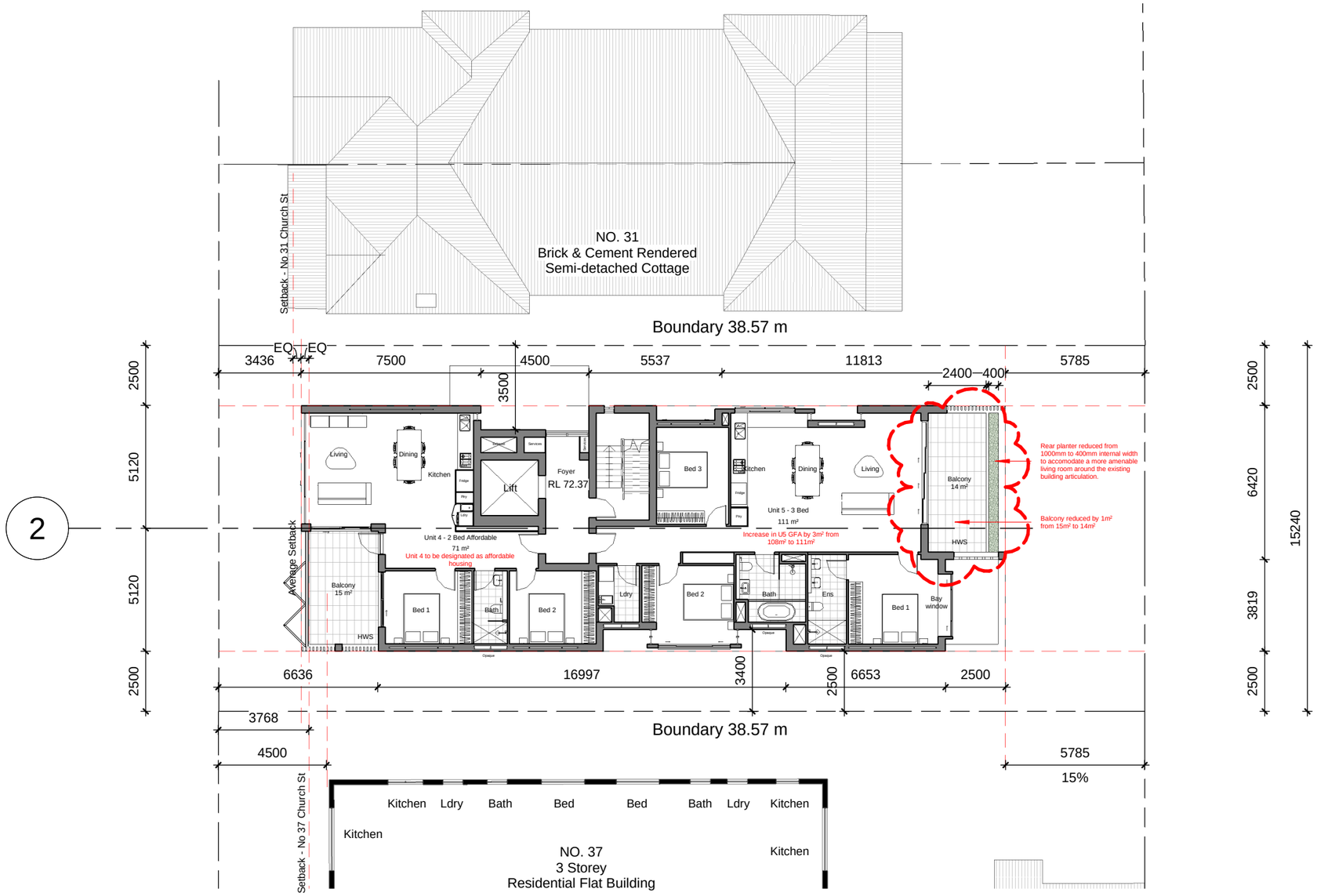
33-35 Church St, Randwick

Scale 1 : 200 @ A3 | 11 July 2023

Project 21004

Issue Issue AD

Sheet 03



2

1. Level 1

Scale 1 : 200

Issue	Description	Date
Z	revised for council	03/11/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

SECTION 4.56
APPLICATION

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>E architect@couvaras.com **>W** www.couvaras.com
Nominated Architect: Peter Couvaras Reg No.7344

North

Drawing Name
Level 1

33-35 Church St, Randwick

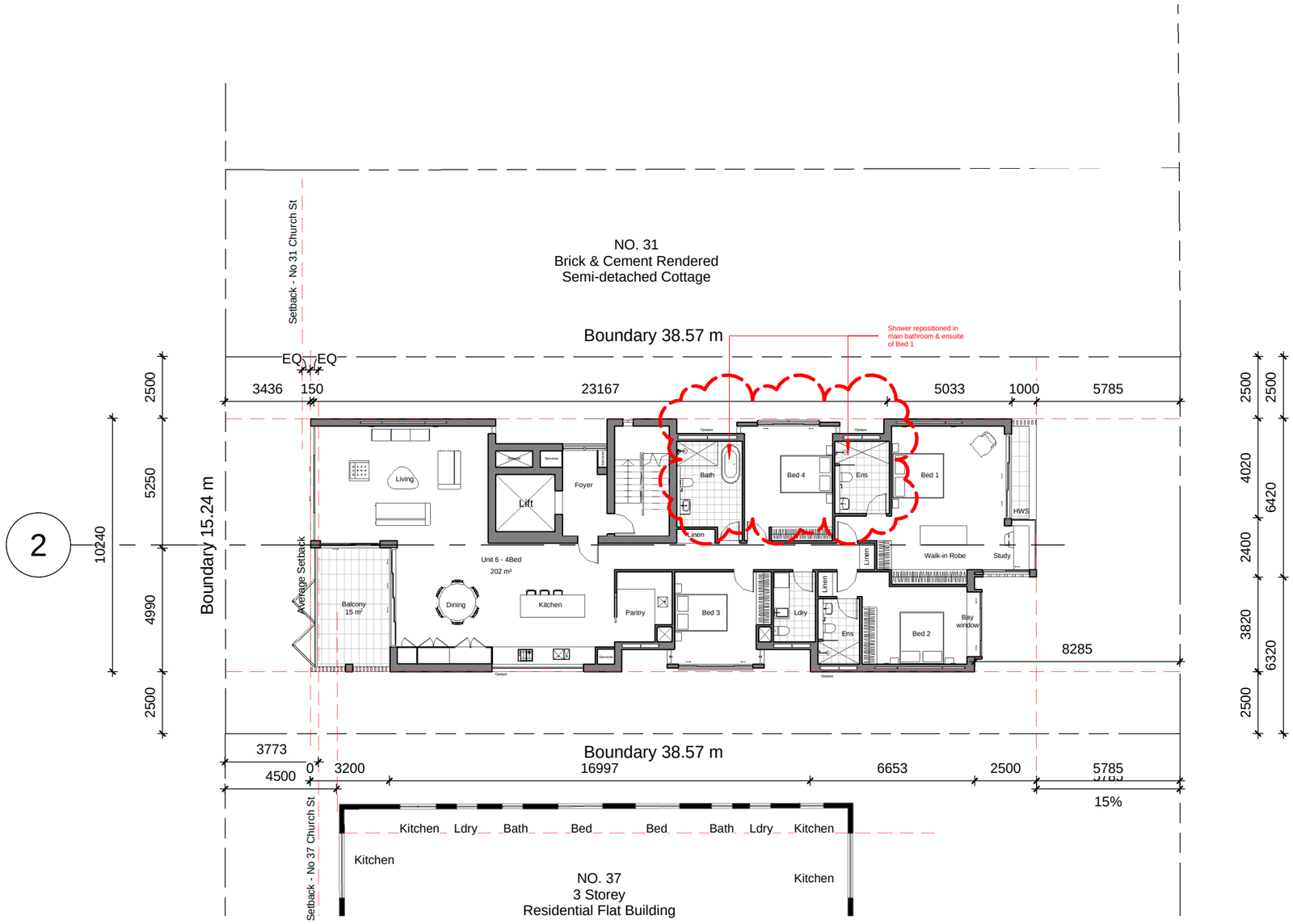
Scale 1 : 200 @ A3

11 July 2023

Project 21004

Issue Issue AD

Sheet 04



1. Level 2

Scale 1 : 200

Issue	Description	Date
Z	revised for council	03/11/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

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North

Drawing Name
Level 2

33-35 Church St, Randwick

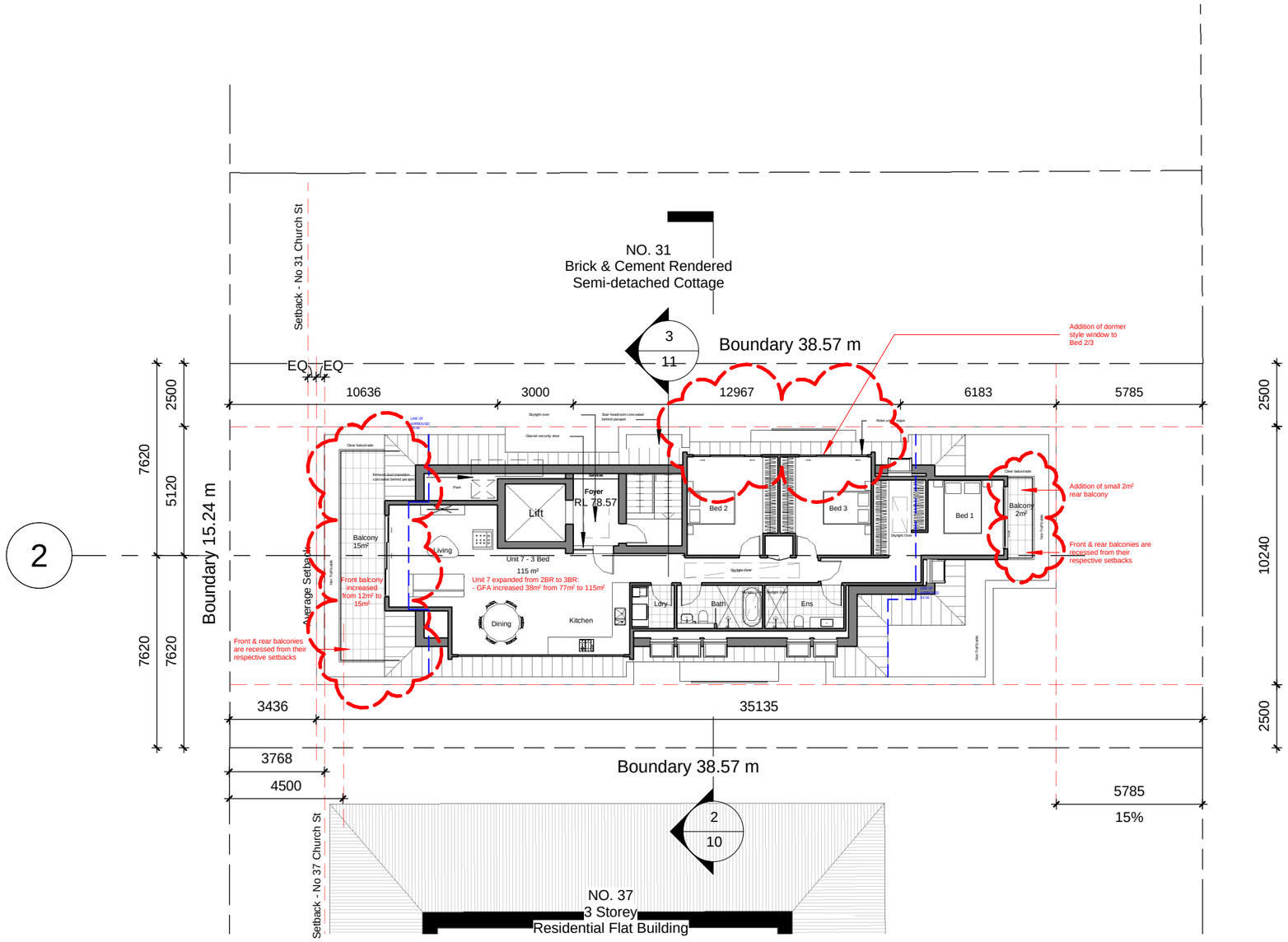
Scale 1 : 200 @ A3

11 July 2023

Project 21004

Issue Issue AD

Sheet 05



1. Level 3

Scale 1 : 200

Issue	Description	Date
Y	S4.55 Issue	09/08/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

SECTION 4.56
APPLICATION

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North

Drawing Name
Level 3

33-35 Church St, Randwick

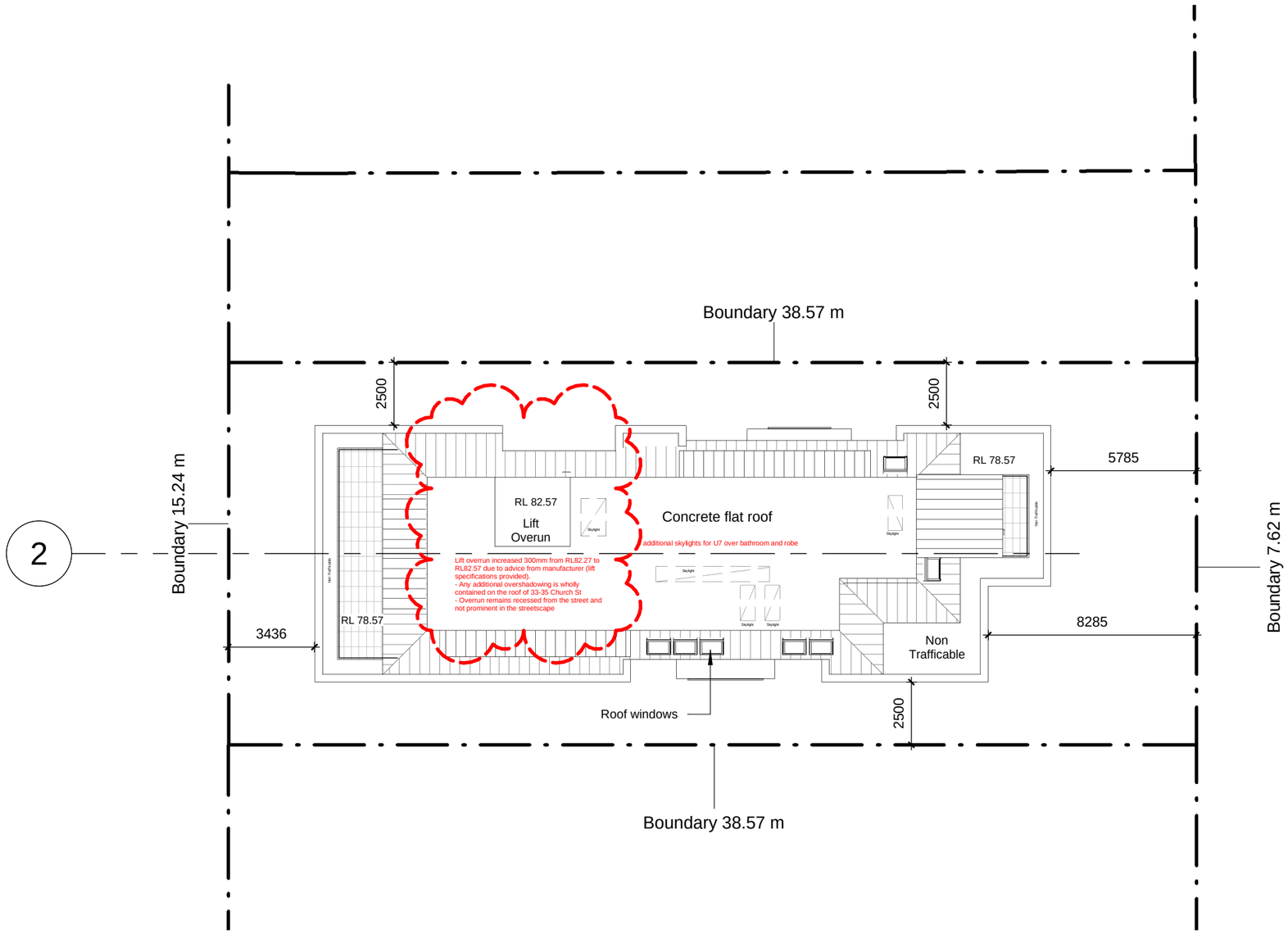
Scale 1 : 200 @ A3

11 July 2023

Project 21004

Issue Issue AD

Sheet 06



Issue	Description	Date
Y	S4.55 Issue	09/08/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

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North

Drawing Name
Roof Plan

33-35 Church St, Randwick

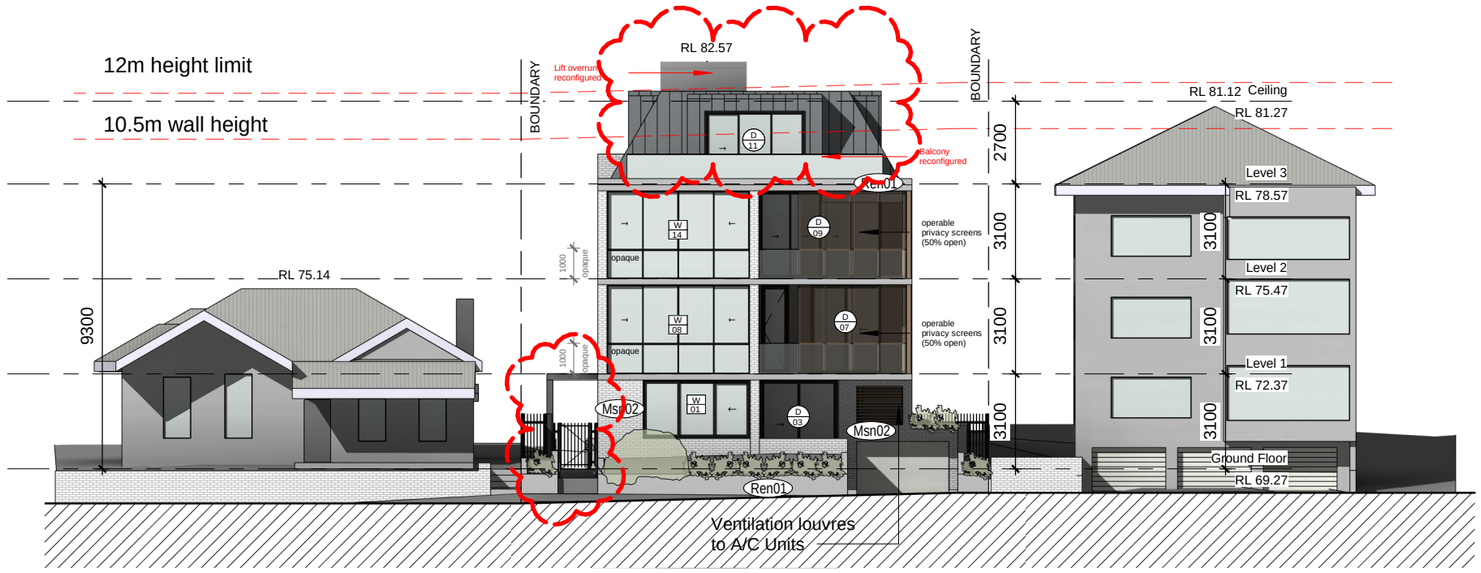
Scale 1 : 200 @ A3

11 July 2023

Project 21004

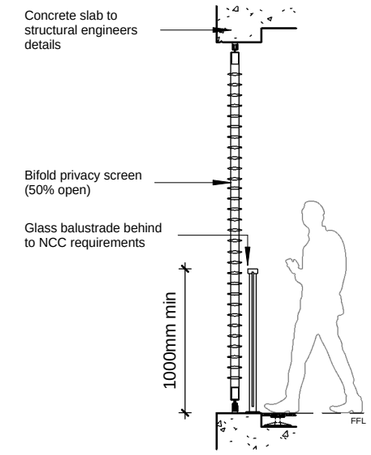
Issue Issue AD

Sheet 07



1. West

Scale 1 : 200



3. Screen Detail

Scale 1 : 50

2. South

Scale 1 : 200

Issue	Description	Date
Y	S4.55 Issue	09/08/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

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North

Drawing Name
Elevations

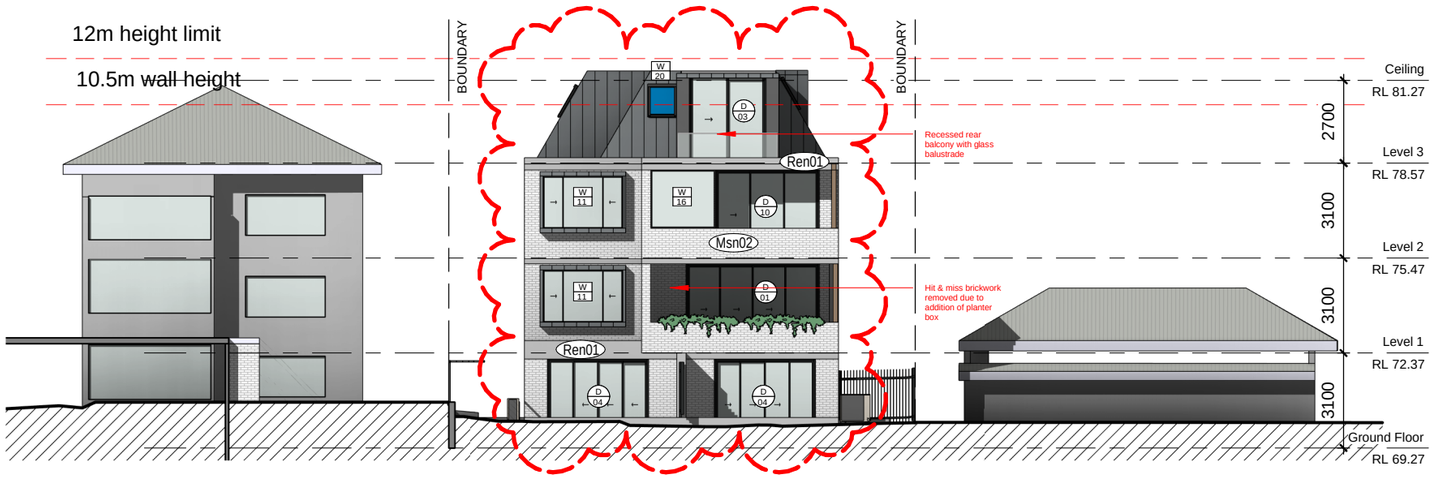
33-35 Church St, Randwick

Scale As indicated @ A3 | 11 July 2023

Project 21004

Issue Issue AD

Sheet 08



1. East

Scale 1 : 200

2. North

Scale 1 : 200

Issue	Description	Date
Y	S4.55 Issue	09/08/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

SECTION 4.56 APPLICATION

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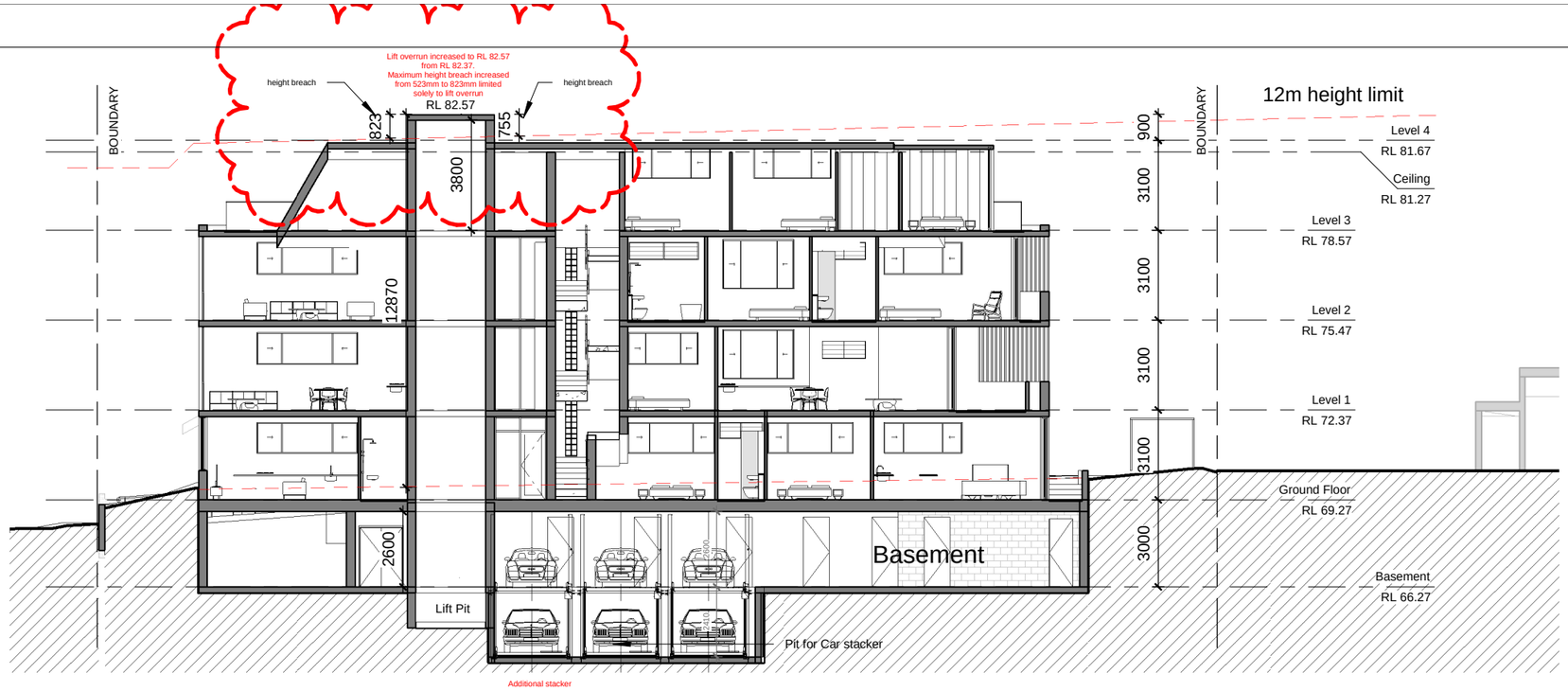
Drawing Name
Elevations

33-35 Church St, Randwick

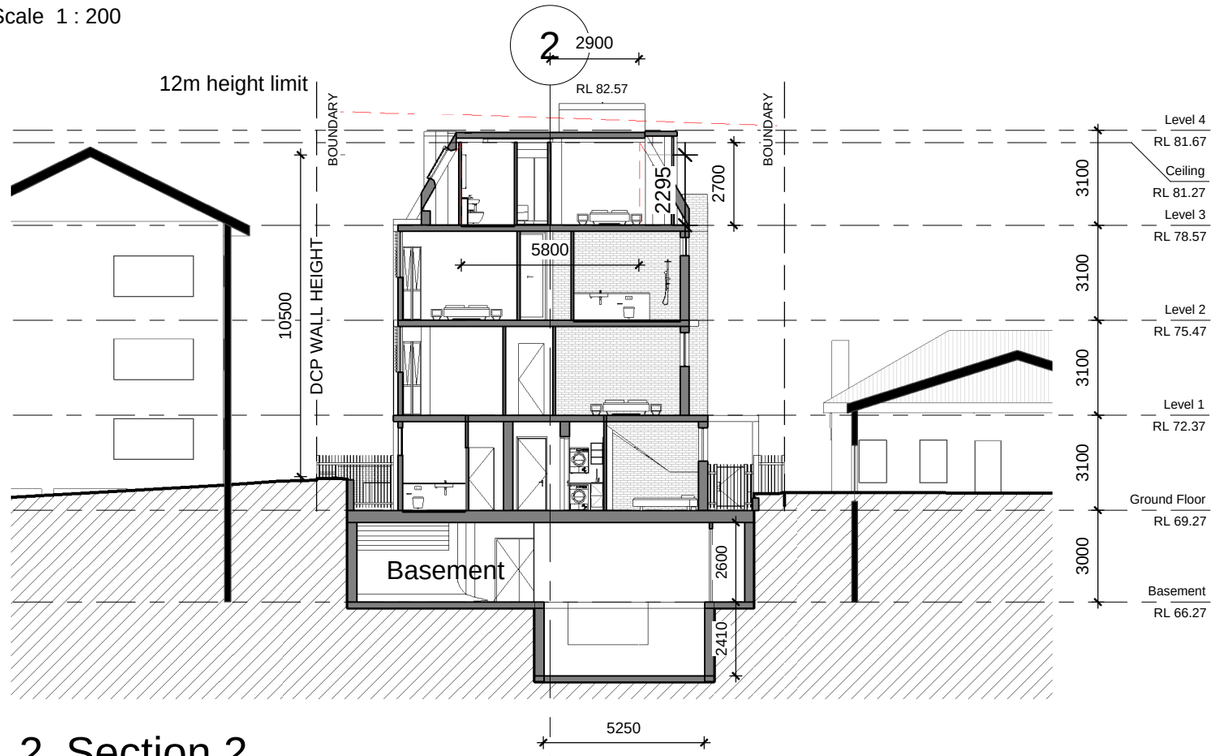
Scale 1 : 200 @ A3 | 11 July 2023

Project 21004
Issue Issue AD
Sheet 09



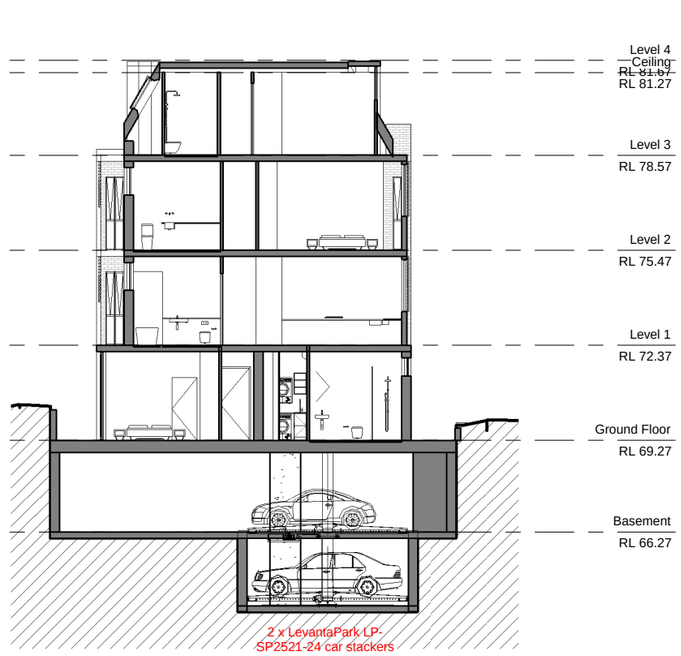
1. Section 1

Scale 1 : 200



2. Section 2

Scale 1 : 200



3. Section 9

Scale 1 : 200

Issue	Description	Date
Y	S4.55 Issue	09/08/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

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Drawing Name
Sections

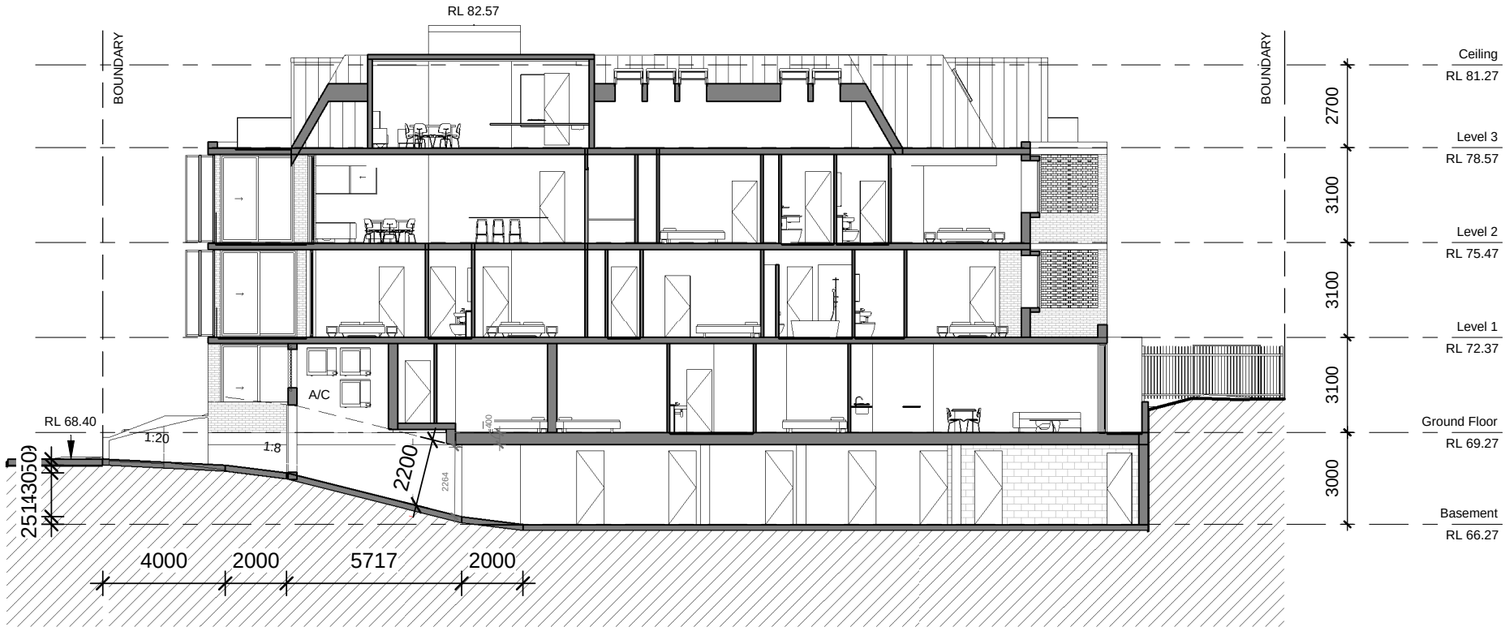
33-35 Church St, Randwick

Scale 1 : 200 @ A3 | 11 July 2023

Project 21004

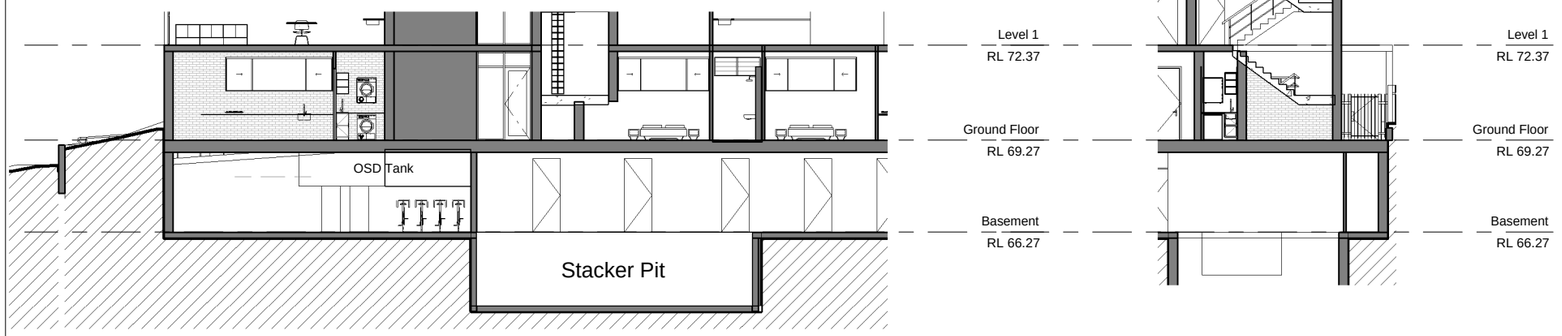
Issue Issue AD

Sheet 10



1. Section 8

Scale 1 : 200



2. Section 10

Scale 1 : 200

3. Section 11

Scale 1 : 200

Glazed Door Schedule

Type Mark	Description	Height	Width
01		2900 mm	4345 mm
02		2375 mm	825 mm
03		2900 mm	2500 mm
04		2900 mm	3300 mm
05		2900 mm	2500 mm
06		2900 mm	900 mm
07		2900 mm	2300 mm
08		2900 mm	2400 mm
09		2900 mm	4000 mm
10		2900 mm	3400 mm
11		2400 mm	3280 mm

Window Schedule

Type Mark	Description	Height	Width
01		1900	3495
02	Residential Sliding Window	1100	3500
03	Residential Sliding Window	1100	3000
04	Designer LouvreMASTER Adjustable Louvre Window	900	1500
05	Residential Sliding Window	1100	2700
06	Residential Sliding Window	1100	3700
07	Architectural Awning Window	900	1000
08	Residential Sliding Window	2900	4650
09	Architectural Awning Window	2400	300
10	Residential Sliding Window	1100	2400
11	Residential Sliding Window	1700	2600
12	Residential Sliding Window	1500	3000
14	Residential Sliding Window	2900	4650
16	Fixed Corner Window	1900	2100
19	Residential Fixed Window	700	3700
20	Velux operable skylight	1180	940
22	Glass bricks	7610	410
23	Designer LouvreMASTER Adjustable Louvre Window	600	1400
24	Residential Sliding Window	1700	2500
25	Residential Window	900	6600
28	Designer LouvreMASTER Adjustable Louvre Window	600	2400
29	Residential Sliding Window	1700	1900
30	Designer LouvreMASTER Adjustable Louvre Window	600	1500

Issue	Description	Date
Y	S4.55 Issue	09/08/23
AA	Client Review	18/01/24
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AC	Client Review	30/01/24
AD	Client Review	11/03/24

SECTION 4.56 APPLICATION

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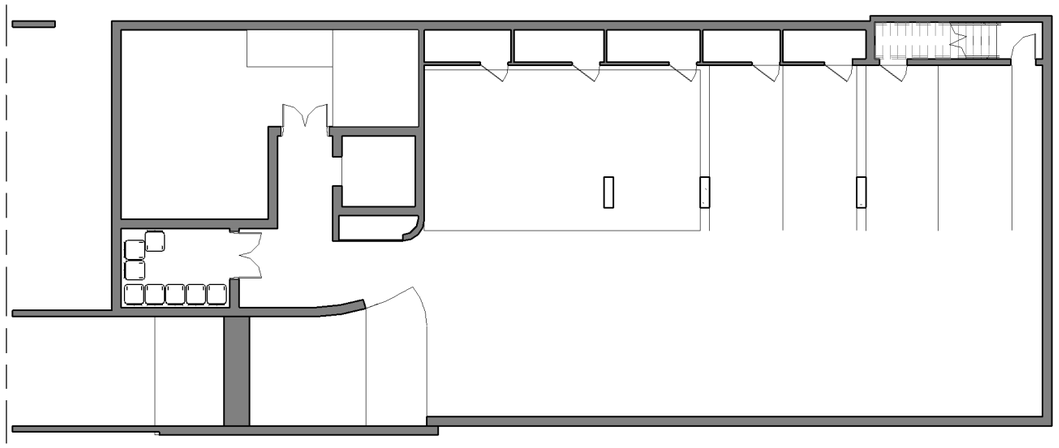
Drawing Name
Sections

33-35 Church St, Randwick

Scale 1 : 200 @ A3 | 11 July 2023

Project 21004
Issue Issue AD
Sheet 11



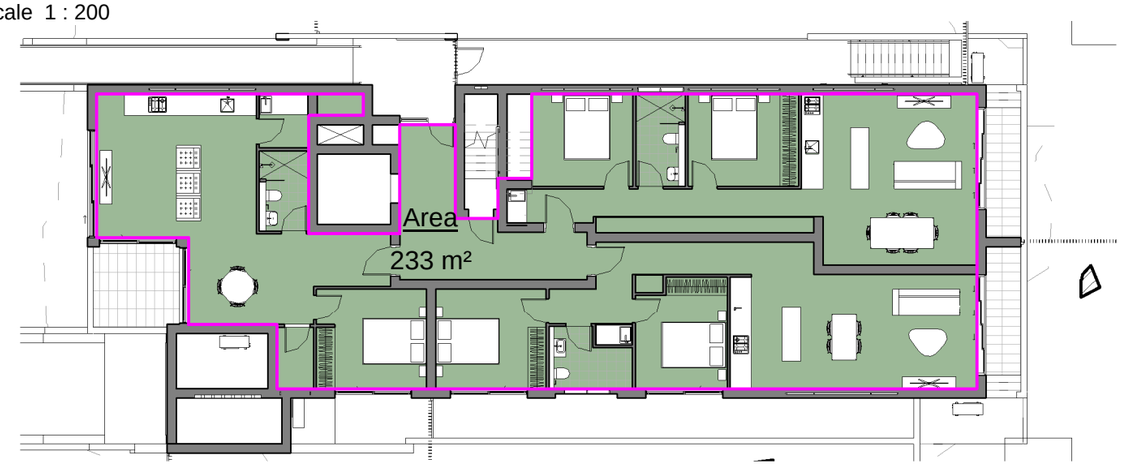
Site Area	587.88 m²
FSR achieved GFA	1.29 : 1 756m²
FSR Max (0.9+0.4)	1.3 : 1
FSR achieved 30% affordable required -	1.29 : 1 212.1m²
40% provided	303m²

Total GFA increase of 44 sqm from 712 sqm to 756 sqm
- Affordable GFA increased 71 sqm from 232 sqm to 303 sqm
- Non-affordable GFA decreased 27 sqm from 453 sqm to 480 sqm
- Affordable housing is provided in U1, 2, 3 and 4

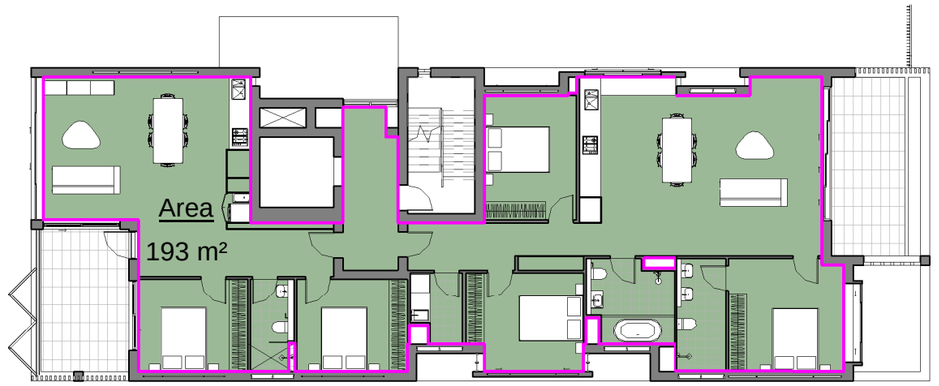
Area Schedule (Gross Building)

Name	Area	Level
Area	233 m²	Ground Floor
Area	193 m²	Level 1
Area	209 m²	Level 2
Area	121 m²	Level 3
Grand total: 4	756 m²	

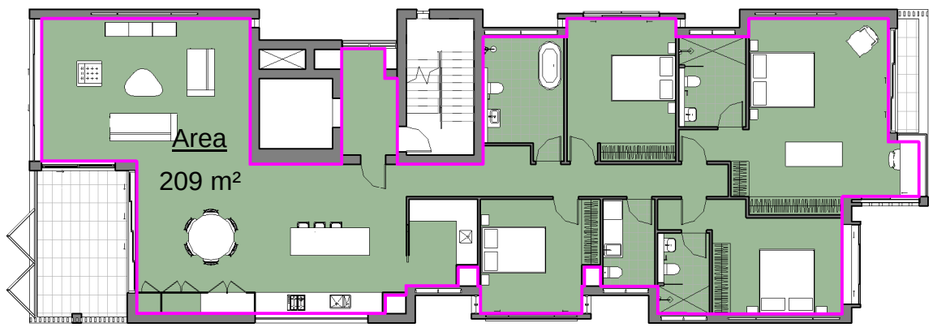
5. Basement
Scale 1 : 200



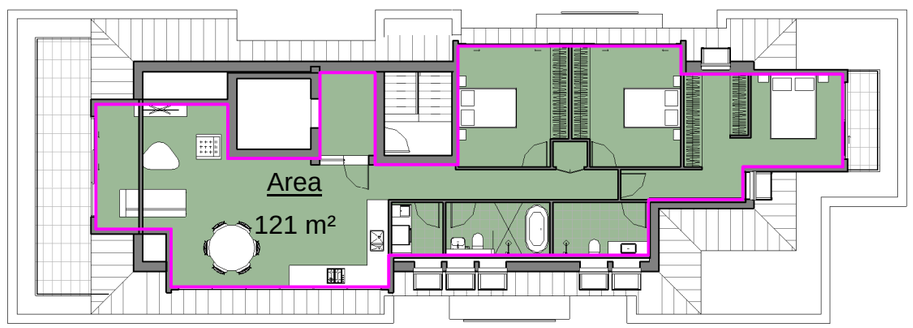
1. Ground Floor
Scale 1 : 200



2. Level 1
Scale 1 : 200



3. Level 2
Scale 1 : 200



4. Level 3
Scale 1 : 200

Issue	Description	Date
Z	revised for council	03/11/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

SECTION 4.56
APPLICATION

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Nominated Architect: Peter Couvaras Reg No.7344

North

Drawing Name
Area calculation Plan

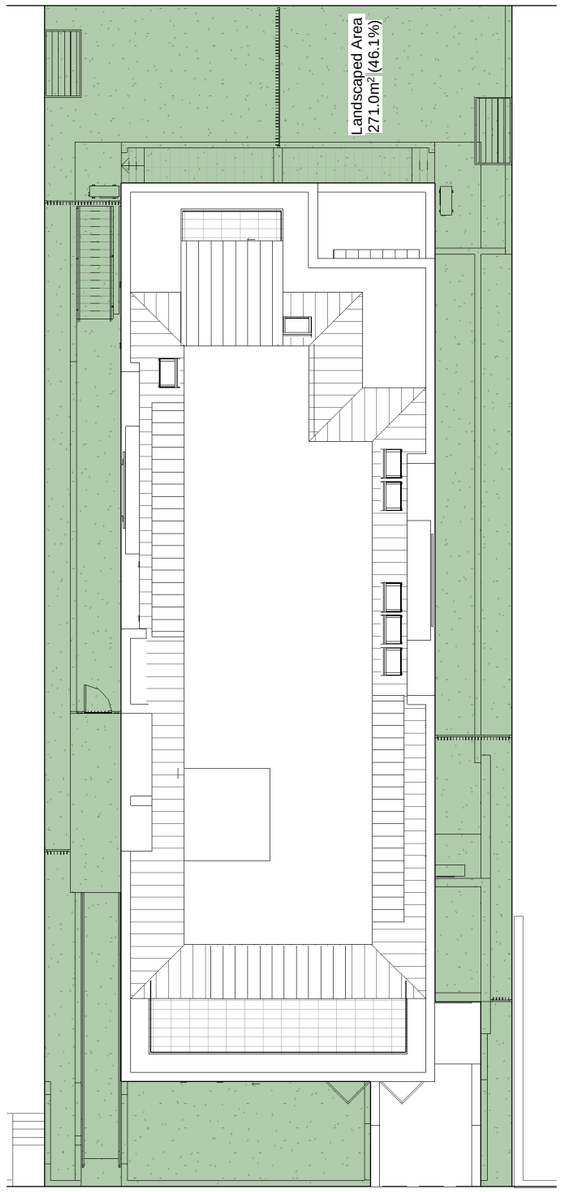
33-35 Church St, Randwick

Scale 1 : 200 @ A3 | 11 July 2023

Project 21004
Issue Issue AD
Sheet 12

Site Area 587.88 m²

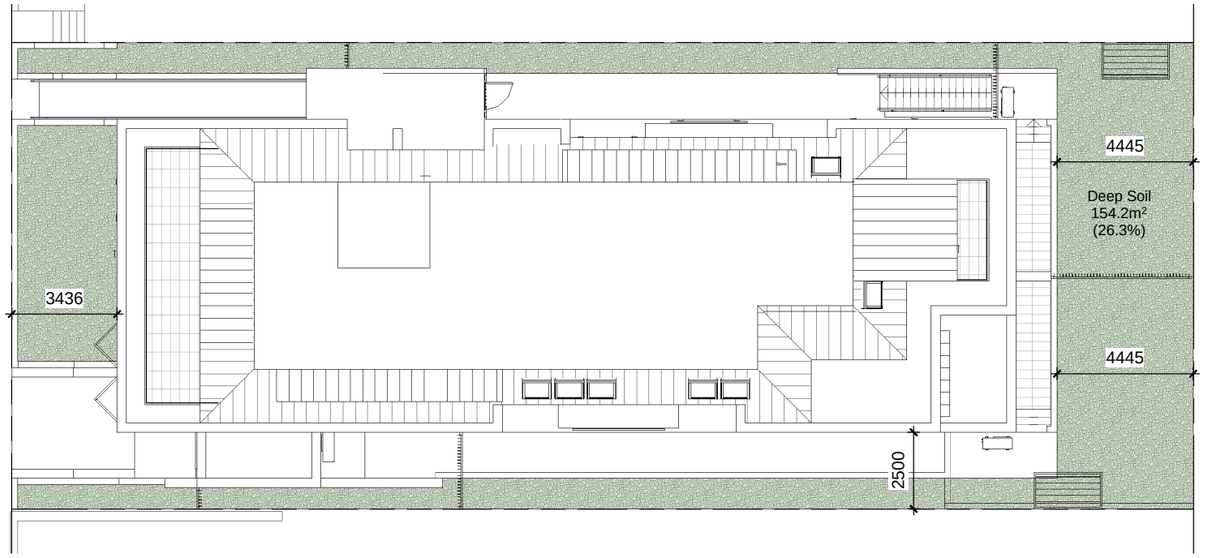
- No change to landscape under RDCP calculation
- Marginal landscape decrease by 0.2% under ADG calculation from 26.5% to 26.3%
- Marginal deep soil decrease by 0.3% under ARHSEPP calculation from 16.1% to 15.8%



3. Landcaped Area - DCP 50% Calculation

Scale 1 : 200

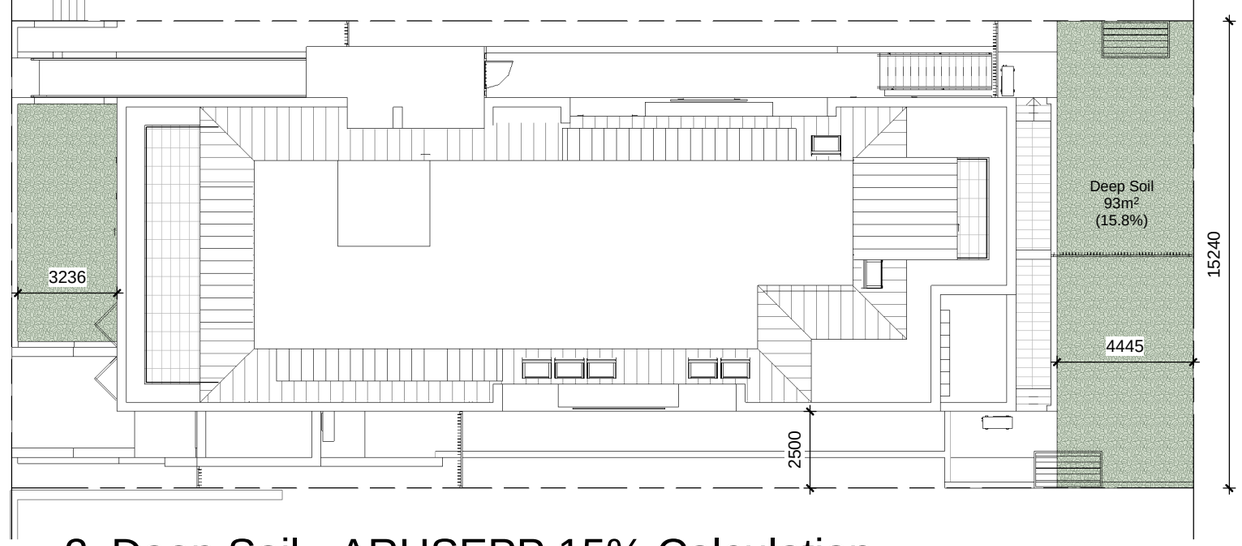
26.3% achieved



1. Landscaped - Design Guide 30% Calculation

Scale 1 : 200

15.8% achieved



2. Deep Soil - ARHSEPP 15% Calculation

Scale 1 : 200

Issue	Description	Date
Y	S4.55 Issue	09/08/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

SECTION 4.56 APPLICATION

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North

Drawing Name
Landscape Area Calculations

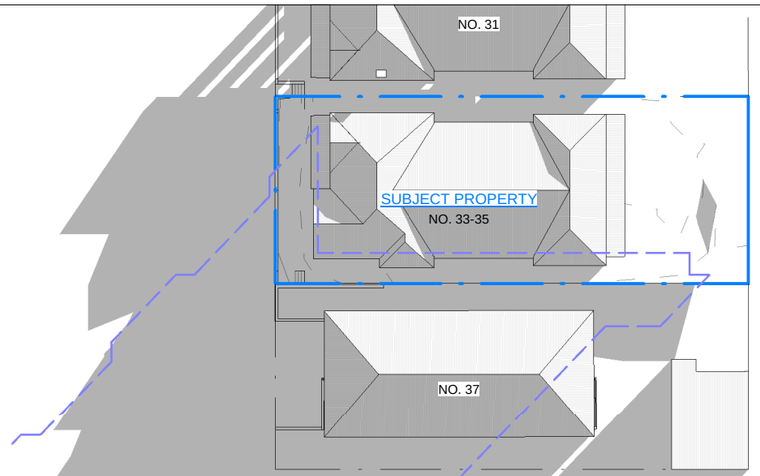
33-35 Church St, Randwick

Scale 1 : 200 @ A3 | 11 July 2023

Project 21004

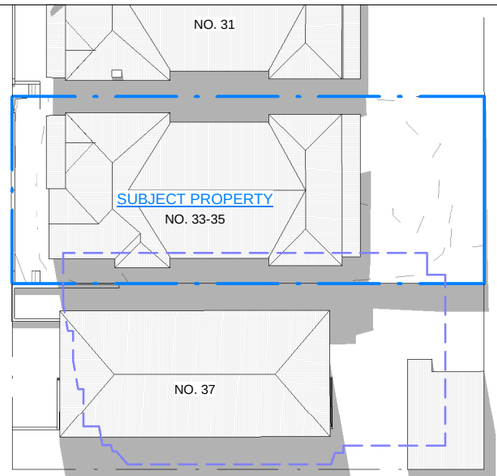
Issue Issue AD

Sheet 13



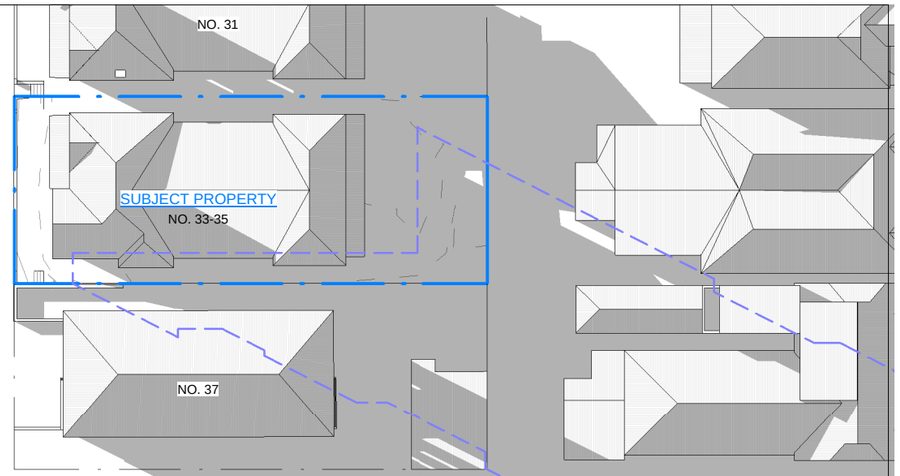
1. Existing - Winter 8am

Scale 1 : 500



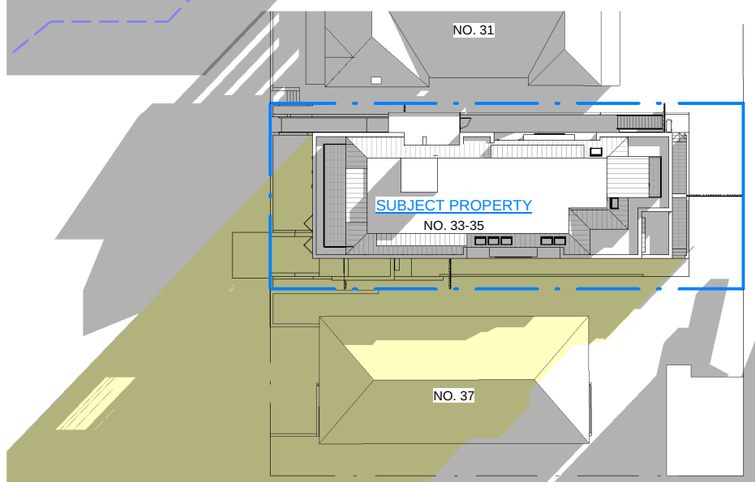
2. Existing - Winter 12pm

Scale 1 : 500



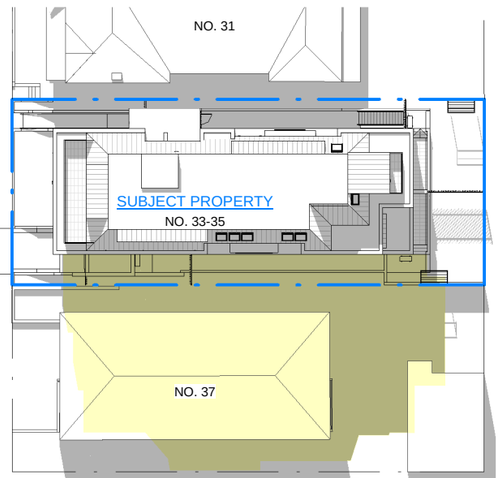
3. Existing - Winter 4pm

Scale 1 : 500



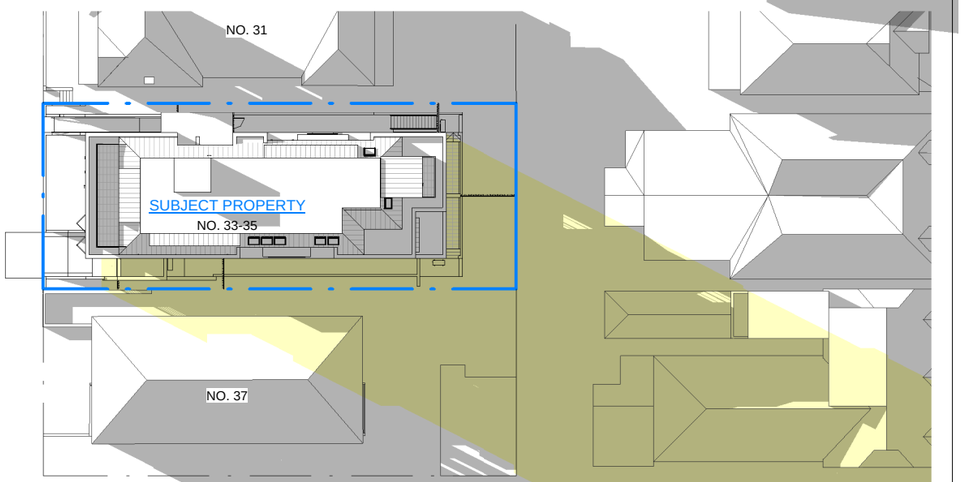
4. Proposed - Winter 8am

Scale 1 : 500



5. Proposed - Winter 12pm

Scale 1 : 500



6. Proposed - Winter 4pm

Scale 1 : 500

As Approved Shadows

S4.56 Proposed Shadows

Negligble additional over shadowing vs. approved

Issue	Description	Date
Y	S4.55 Issue	09/08/23
AA	Client Review	18/01/24
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AD	Client Review	11/03/24

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North

Drawing Name
Shadow Diagrams - Sheet 1

33-35 Church St, Randwick

Scale 1 : 500 @ A3

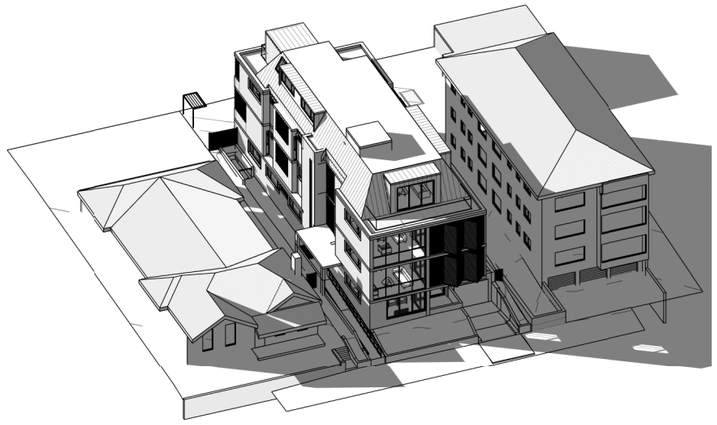
11 July 2023

Project 21004

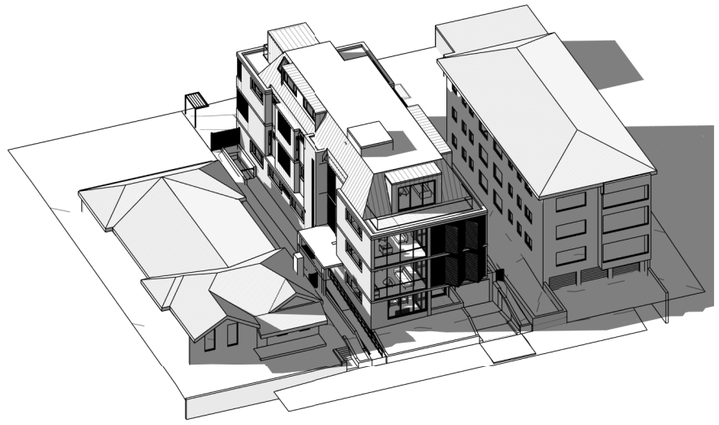
Issue Issue AD

Sheet 14

No. 37 North Windows 8am



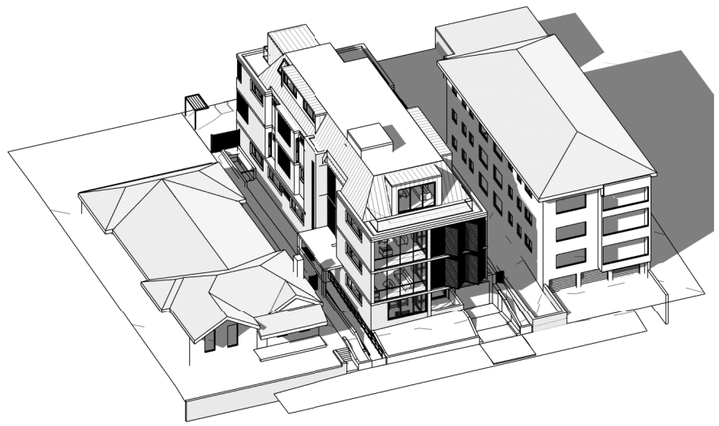
No. 37 North Windows 9am



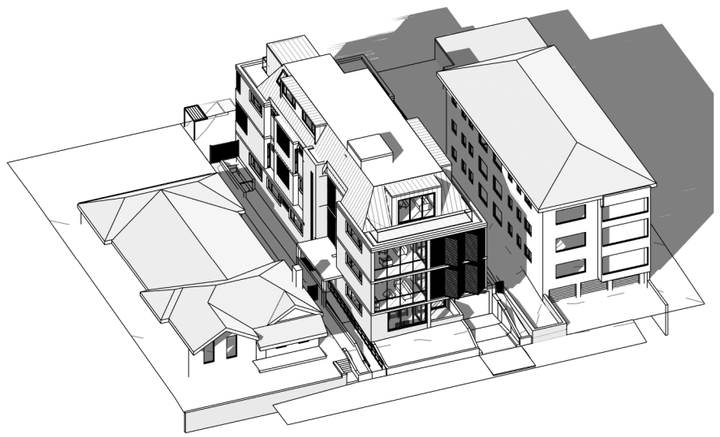
No. 37 North Windows 10am

No. 37 North Windows 11am

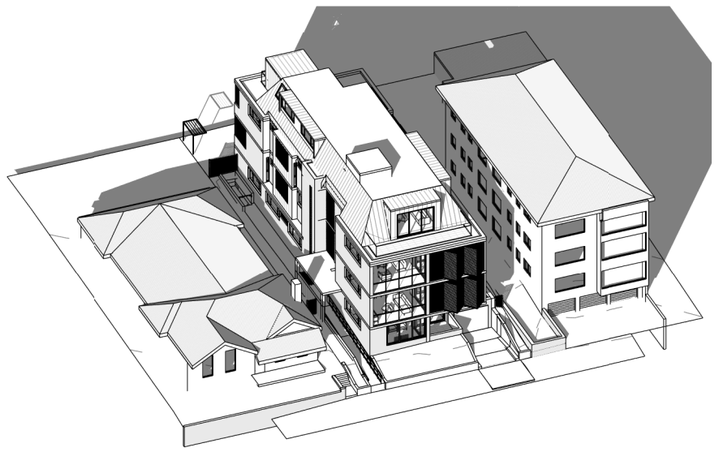
No. 37 North Windows 12pm



No. 37 North Windows 1pm



No. 37 North Windows 2pm



No. 37 North Windows 3pm

No. 37 North Windows 4pm

Issue	Description	Date
Y	S4.55 Issue	09/08/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

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North

Drawing Name: Shadow Diagrams - Sheet 2

33-35 Church St, Randwick

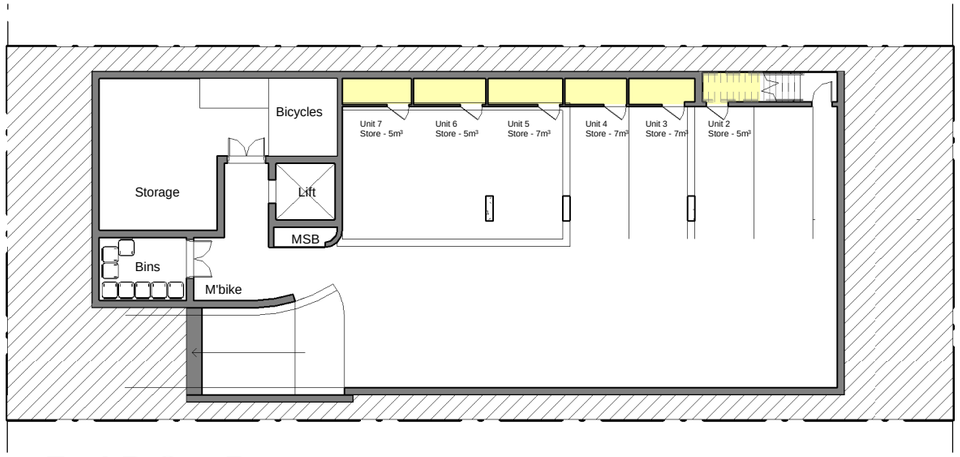
Scale @ A3

11 July 2023

Project 21004

Issue Issue AD

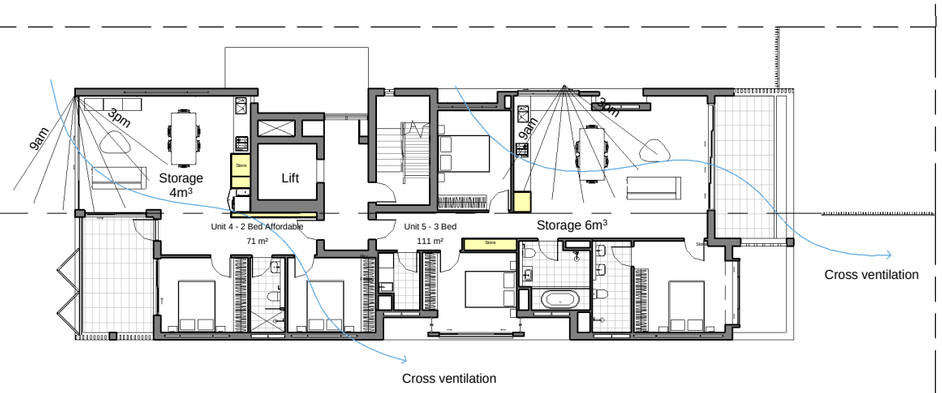
Sheet 15



5. ADG - Basement

Scale 1 : 250

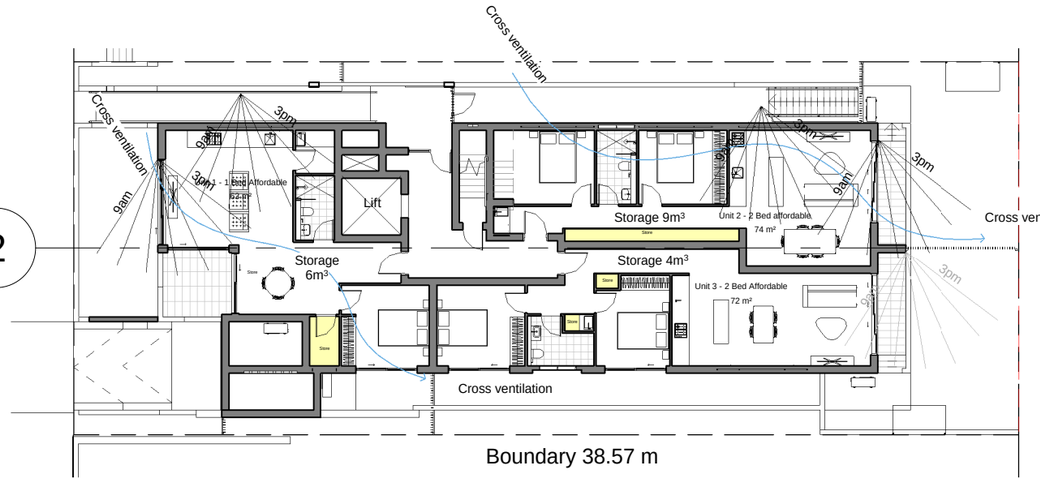
2



2. ADG - Level 1

Scale 1 : 250

2

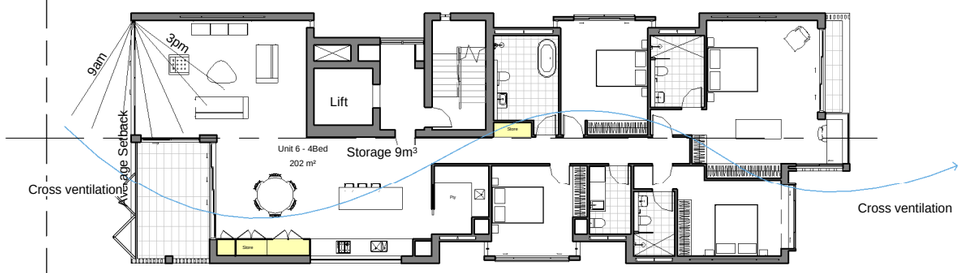


1. ADG - Ground Floor

Scale 1 : 250

Boundary 38.57 m

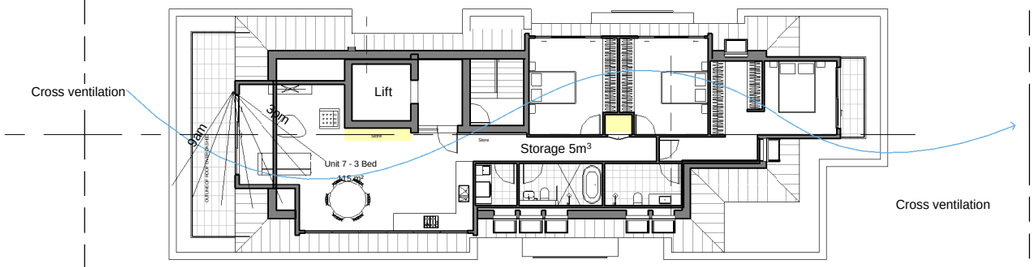
2



3. ADG - Level 2

Scale 1 : 250

2



4. ADG - Level 3

Scale 1 : 250

ADG Compliance Table

Name	Cross Ventilation	Solar Access	Storage	Basement	Internal	
Unit 1 - 1 Bed Affordable	Yes	Yes	Yes	0	6	=6m³
Unit 2 - 2 Bed affordable	Yes	Yes	Yes	5	9	=14m³
Unit 3 - 2 Bed Affordable	Yes	No	Yes	7	4	=11m³
Unit 4 - 2 Bed Affordable	Yes	Yes	Yes	7	4	=11m³
Unit 5 - 3 Bed	Yes	Yes	Yes	7	6	=13m³
Unit 6 - 4Bed	Yes	Yes	Yes	5	9	=14m³
Unit 7 - 3 Bed	Yes	Yes	Yes	5	5	=10m³
	7/7 - 100%	6/7 - 85%	7/7 - 100%	plus storage room (Unit 6)		

Issue	Description	Date
Y	S4.55 Issue	09/08/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
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AD	Client Review	11/03/24

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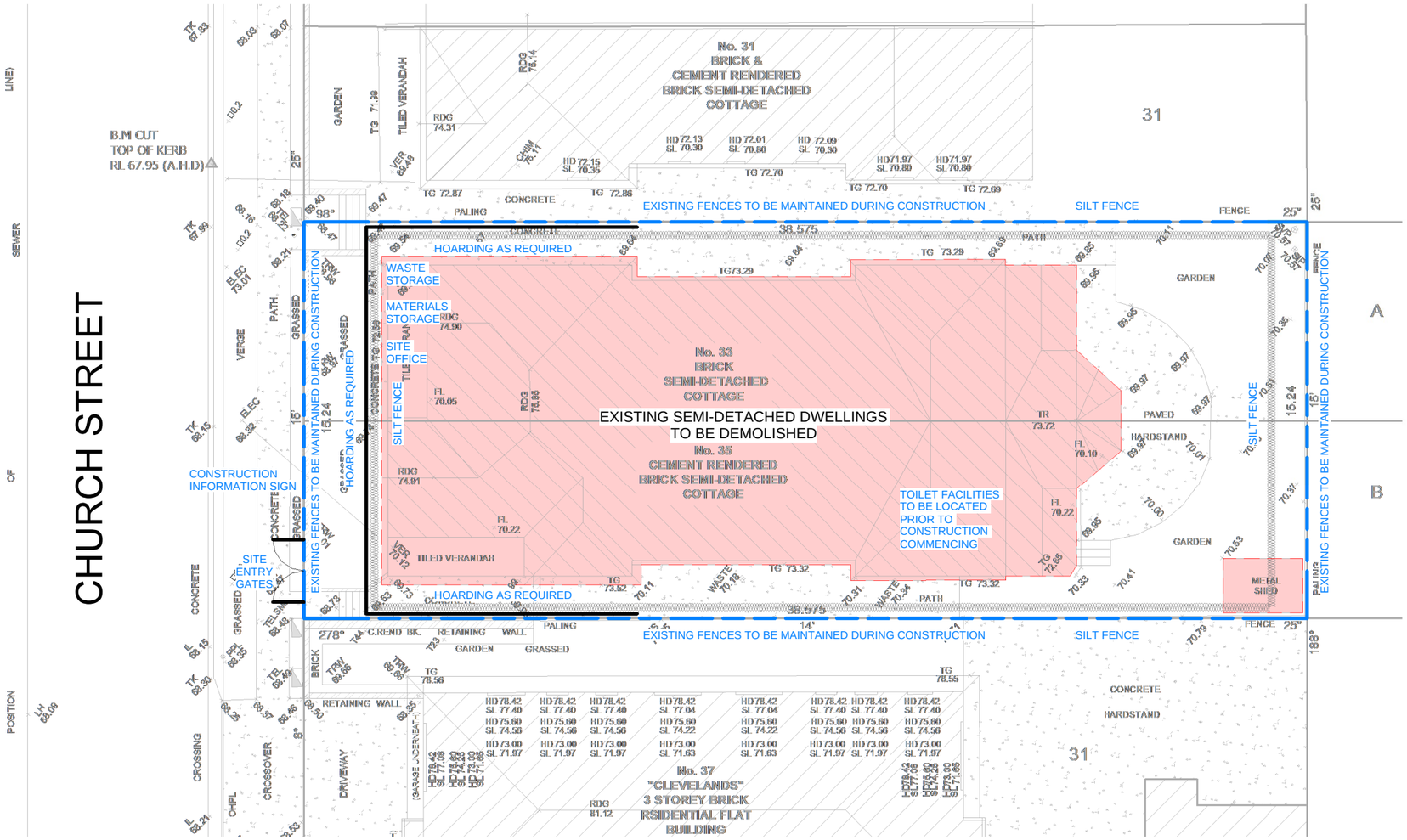
North

Drawing Name
ADG Compliance

33-35 Church St, Randwick

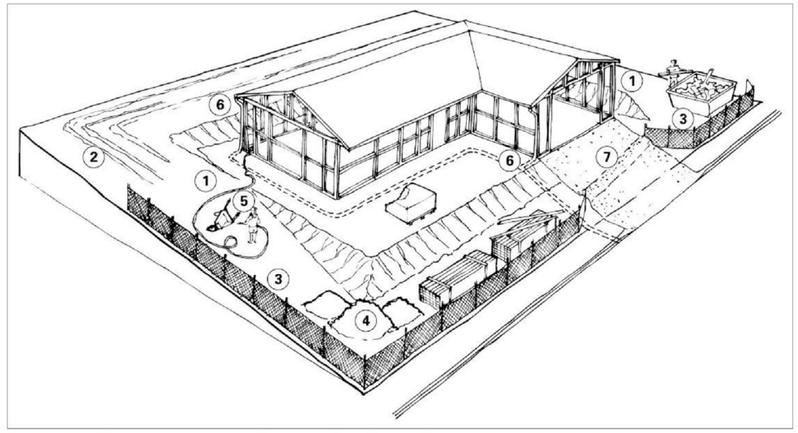
Scale 1 : 250 @ A3 | 11 July 2023

Project 21004
Issue Issue AD
Sheet 16



1. Construction Management - DA

Scale 1 : 200



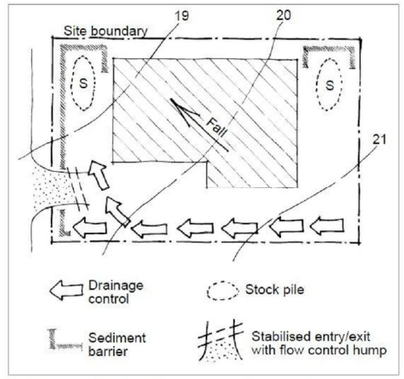
Erosion and sediment control measures: 1 minimise disturbance, 2 diversion devices, 3 sediment barriers, 4 secure stockpiles, 5 other containments, 6 early stormwater connection, 7 controlled access point.

Soil and Water Management:

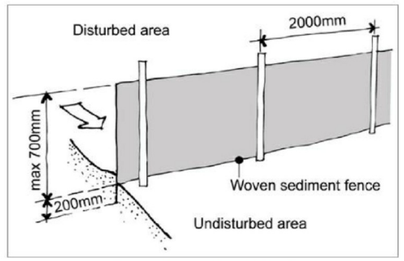
1. Install a silt fence as shown on plan prior to any on site earthworks commencing.
2. Instal temporary sediment barriers to all inlet pits likely to collect silt-laden water until regrassed.
3. All silt fences and barriers are to be maintained in good construction and desilted during construction.

Construction Management:
1. Waste Materials are to be stockpiled or loaded into bins.

All protection works to be carried out in accordance with Randwick Council Environmental Site Management DCP



Sediment control layout on a compact urban site.



Woven sediment fences trap sediment but allow water through.

Issue	Description	Date
Y	S4.55 Issue	09/08/23
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AD	Client Review	11/03/24

SECTION 4.56 APPLICATION

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North

Drawing Name: Construction Management Plan

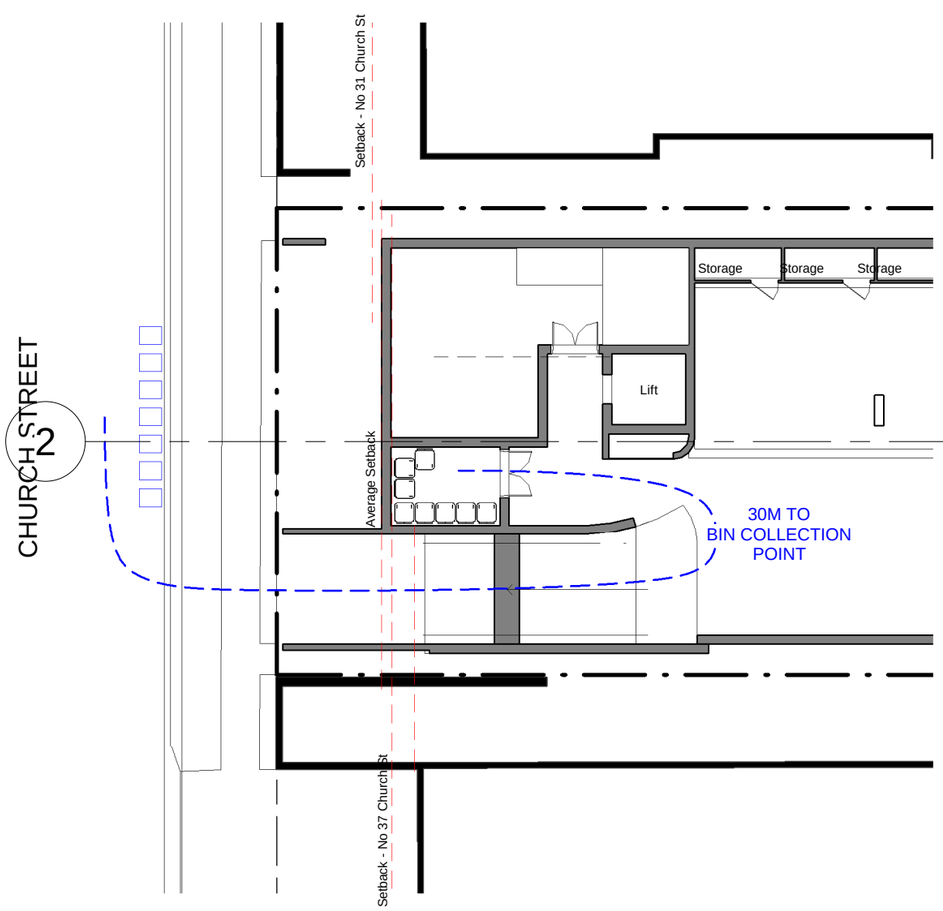
33-35 Church St, Randwick

Scale 1 : 200 @ A3 | 11 July 2023

Project 21004

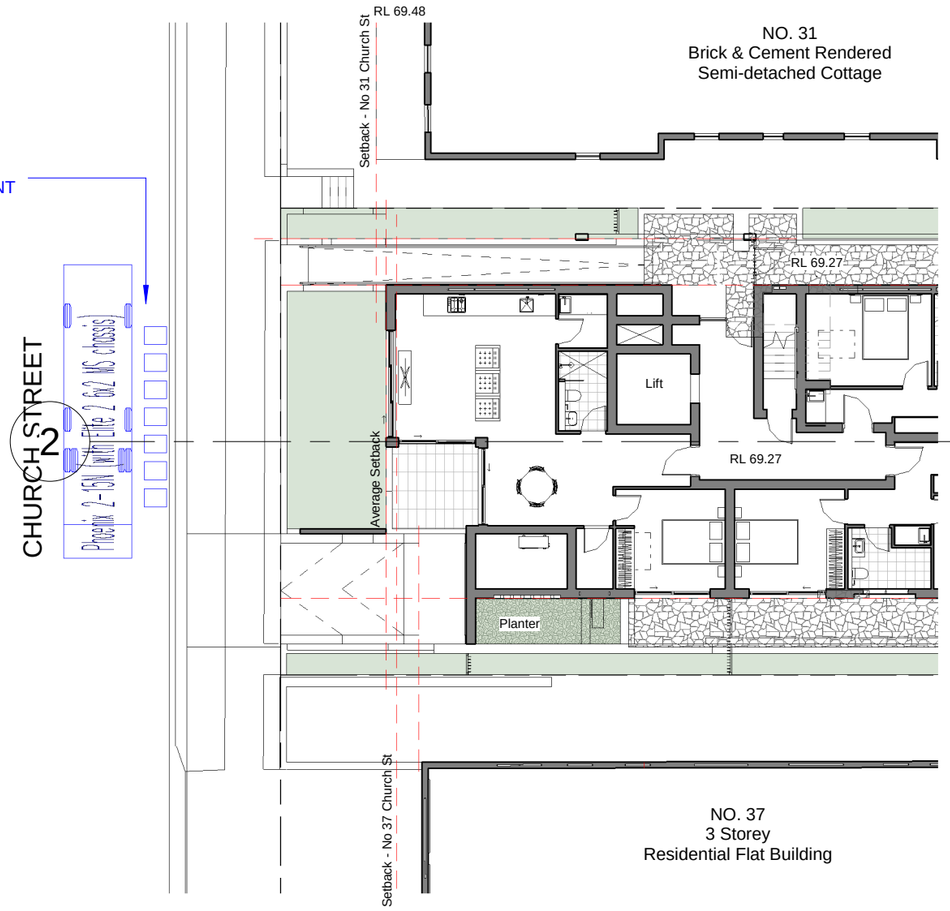
Issue Issue AD

Sheet 17



1. Waste Management Plan - Basement

Scale 1 : 200



2. Waste Management Plan - Ground

Scale 1 : 200

Issue	Description	Date
Y	S4.55 Issue	09/08/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

SECTION 4.56
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North

Drawing Name
Waste Management Plan

33-35 Church St, Randwick

Scale 1 : 200 @ A3

11 July 2023

Project 21004

Issue Issue AD

Sheet 18

1. Refer to Cover Sheet 00 for current building facade. Photomontage from original Oct 2021 submission has been provided for reference only. Refer to elevations for exact locations of finishes

Hit & miss brick screening

Bifold privacy screening

Frameless Galss Balustrade - GB01

Sheet Metal Roofing - Colourbond 'Astro' - CB

Metal Roofing Profile - Lysaught Klip Lok or similar

Light Face Brickwork - Austral "Honed Concrete" or similar - Msn02

White Rendered Slab Edges - Ren01

Timber Look Aluminium Batten Screens - Covet Everart 'Neikiddo Moku' or similar - Sc01

Aluminium Framed Doors & Windows - Grey/Light Finish

Feature Planter Boxes

Issue	Description	Date
Y	S4.55 Issue	09/08/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

SECTION 4.56 APPLICATION

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North

Drawing Name
Materials & Finishes

33-35 Church St, Randwick

Scale @ A3

11 July 2023

Project 21004

Issue Issue AD

Sheet 19

Illustrative only for materials & finishes see overleaf

Issue	Description	Date
AD	Client Review	11/03/24

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Drawing Name
Street View

33-35 Church St, Randwick

Scale @ A3

11 July 2023

Project 21004

Issue Issue AD

Sheet 20

1. Suns Eye View - 8am

Scale

Issue	Description	Date
Y	S4.55 Issue	09/08/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

SECTION 4.56
APPLICATION

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North

Drawing Name
Suns Eye diagrams - June 21

33-35 Church St, Randwick

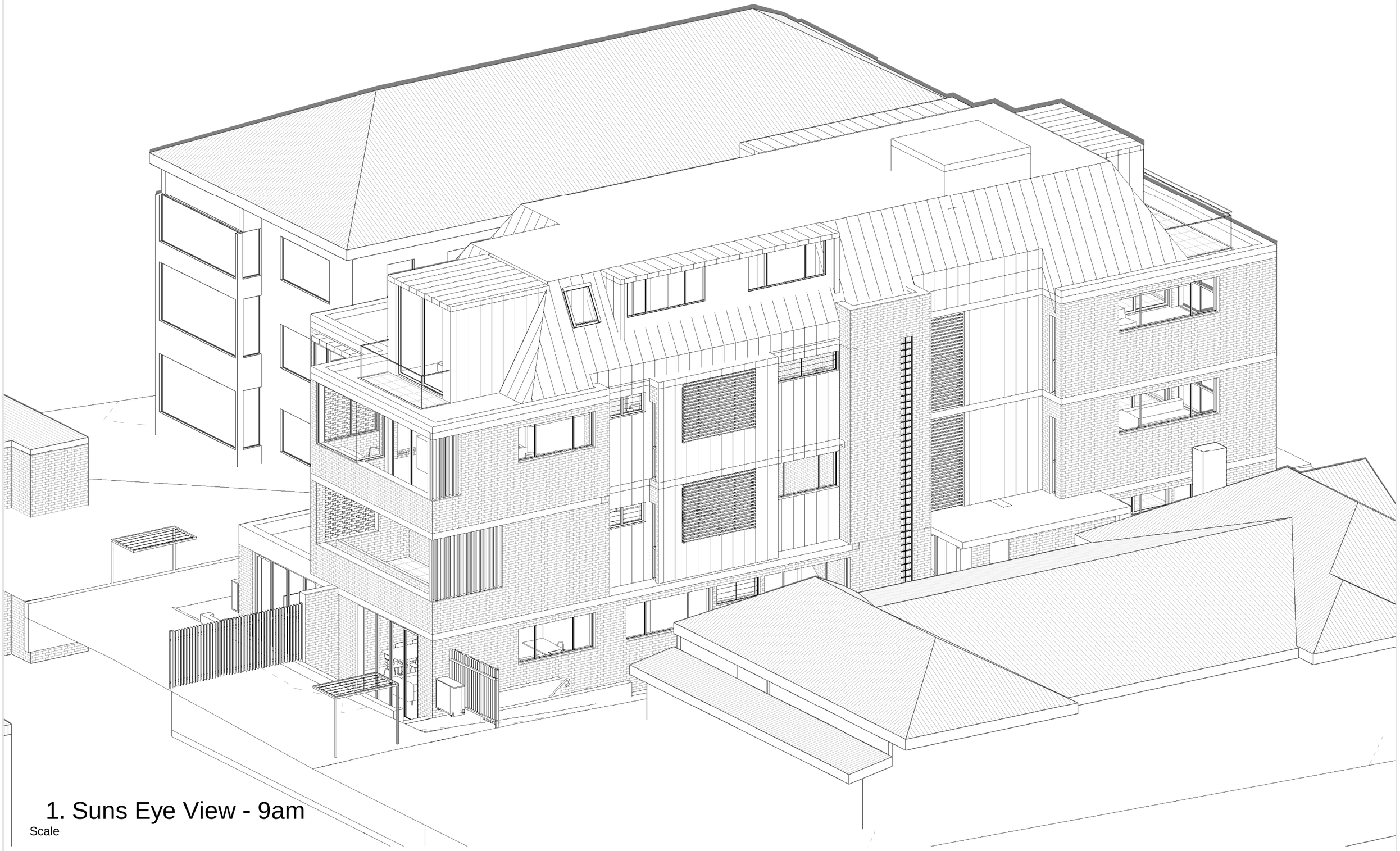
Scale @ A3

11 July 2023

Project 21004

Issue Issue AD

Sheet 21a



1. Suns Eye View - 9am

Scale

Issue	Description	Date
Y	S4.55 Issue	09/08/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

SECTION 4.56 APPLICATION

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North

Drawing Name
Suns Eye diagrams - June 21

33-35 Church St, Randwick

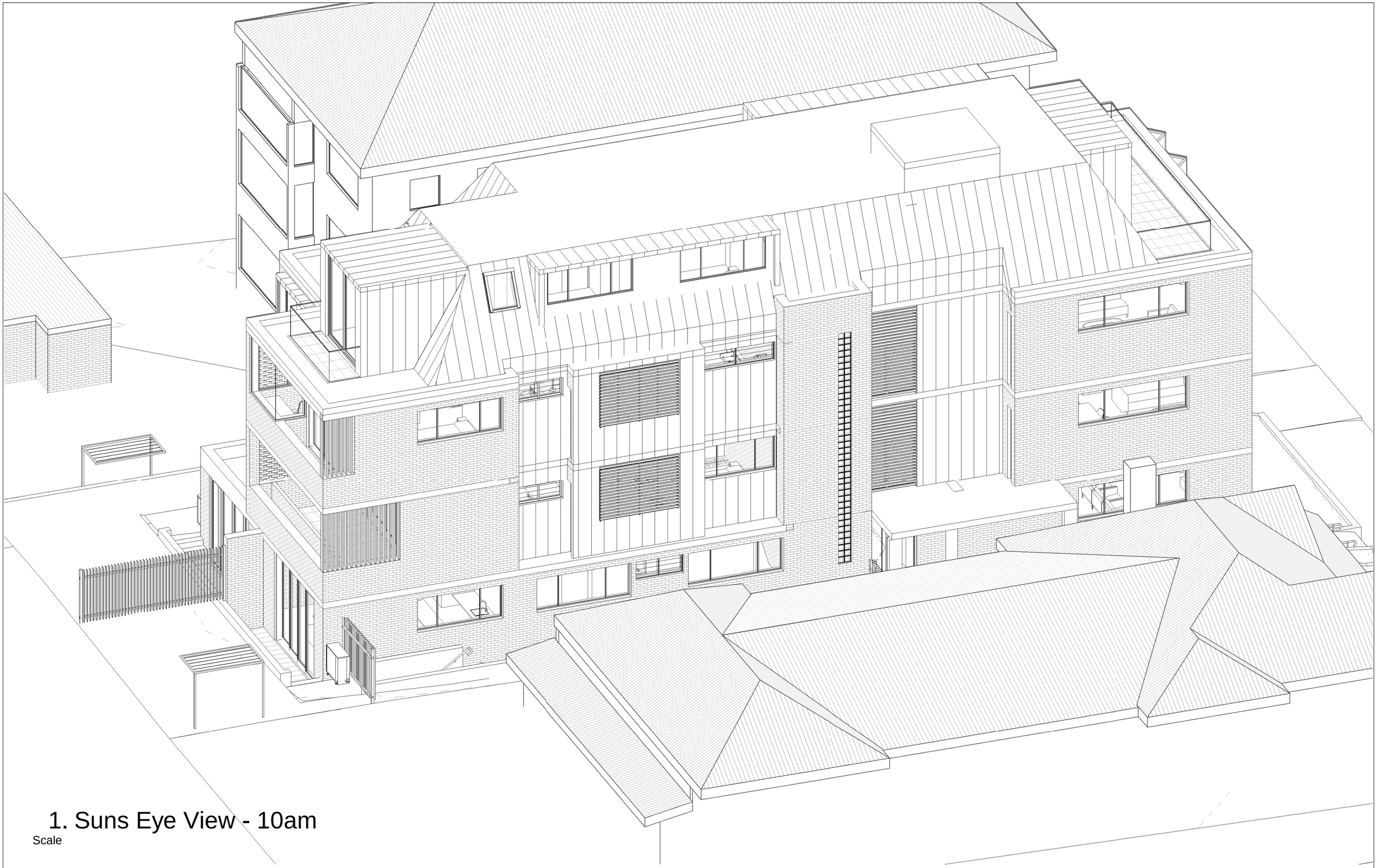
Scale @ A3

11 July 2023

Project 21004

Issue Issue AD

Sheet 21b



1. Suns Eye View - 10am

Scale

Issue	Description	Date
Y	S4.55 Issue	09/08/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

SECTION 4.56
APPLICATION

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North

Drawing Name
Suns Eye diagrams - June 21

33-35 Church St, Randwick

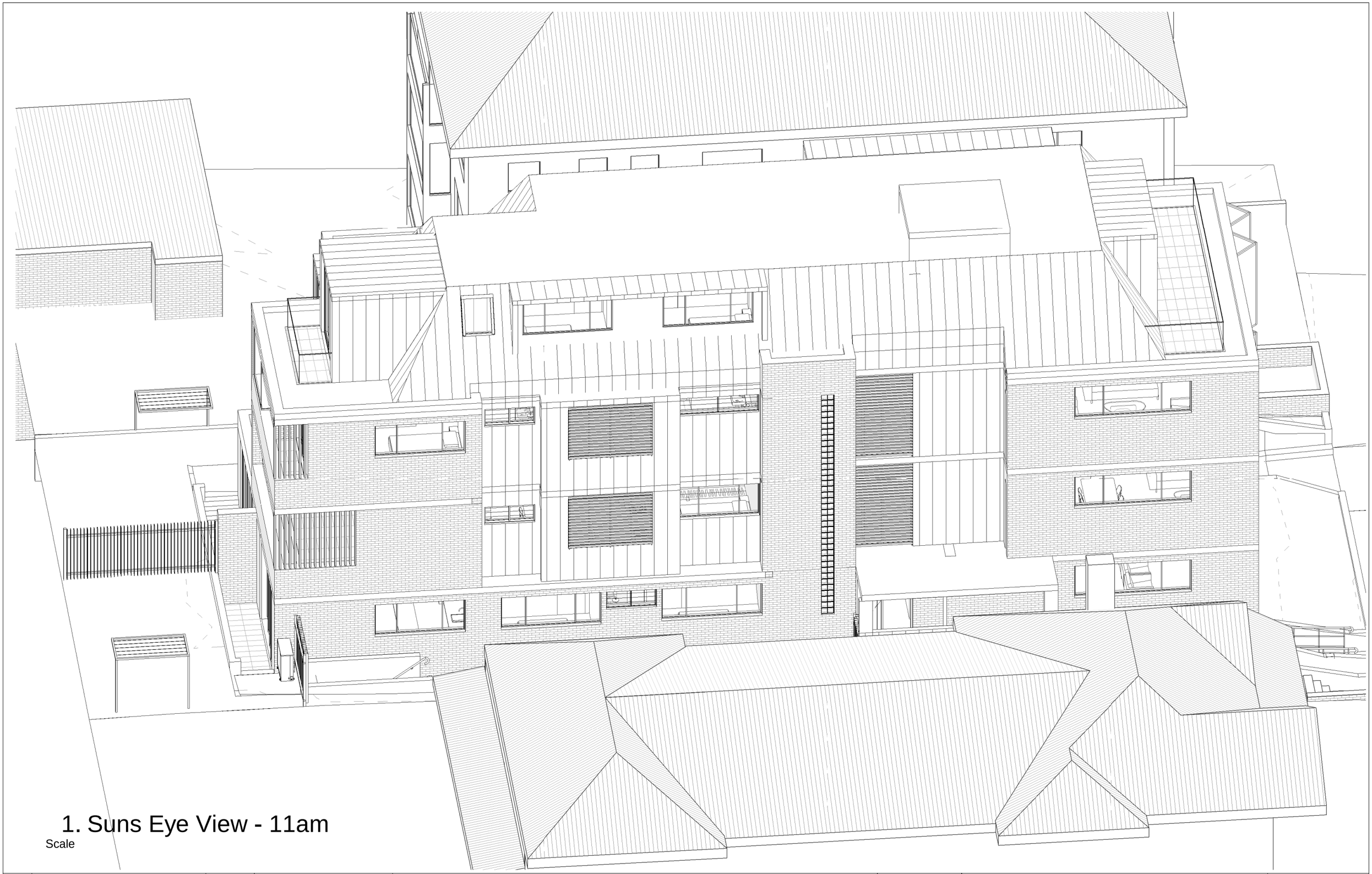
Scale @ A3

11 July 2023

Project 21004

Issue Issue AD

Sheet 21c



1. Suns Eye View - 11am

Scale

Issue	Description	Date
Y	S4.55 Issue	09/08/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

SECTION 4.56
APPLICATION

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North

Drawing Name
Suns Eye diagrams - June 21

33-35 Church St, Randwick

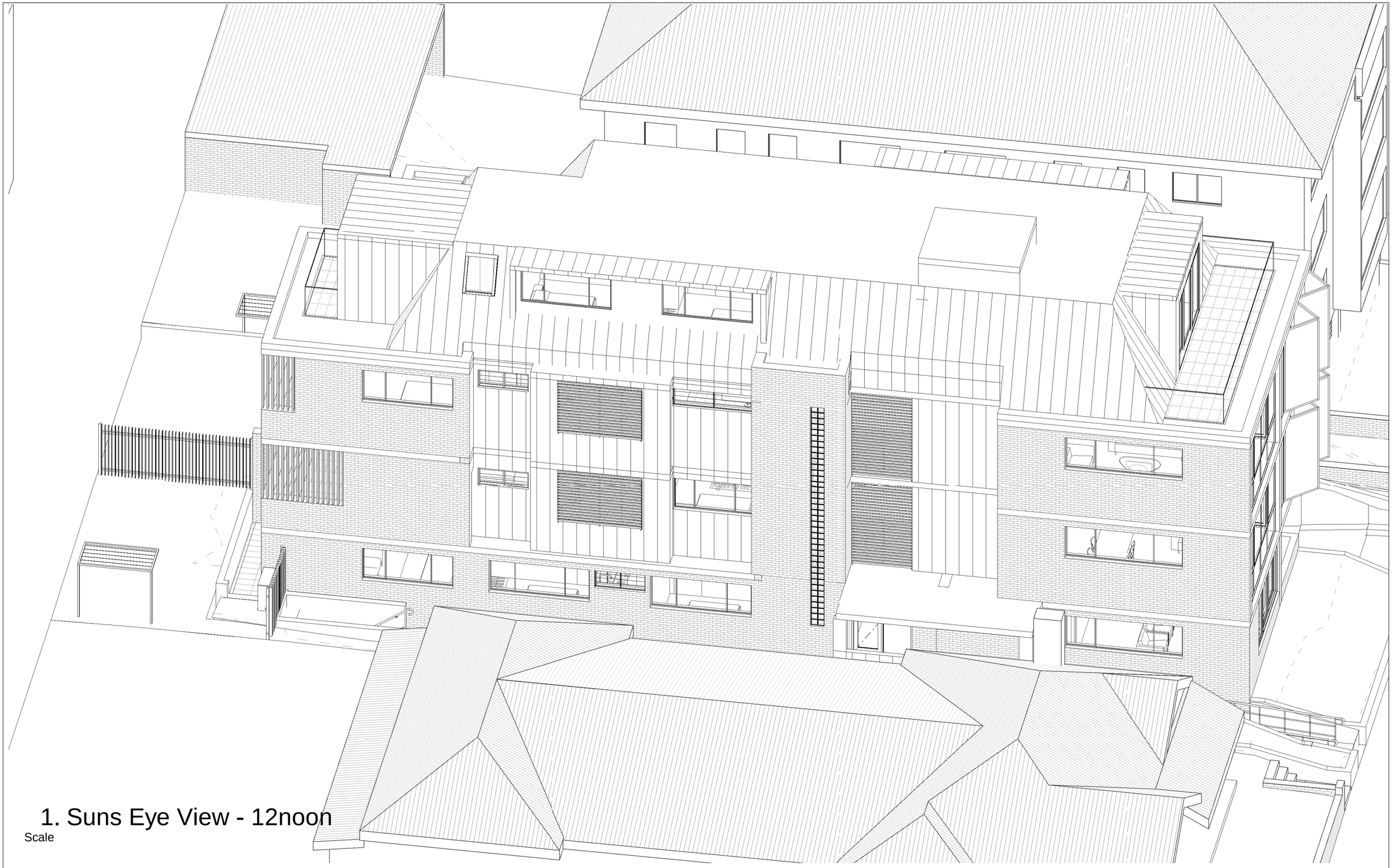
Scale @ A3

11 July 2023

Project 21004

Issue Issue AD

Sheet 21d



1. Suns Eye View - 12noon

Scale

Issue	Description	Date
Y	S4.55 Issue	09/08/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

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North

Drawing Name
Suns Eye diagrams - June 21

33-35 Church St, Randwick

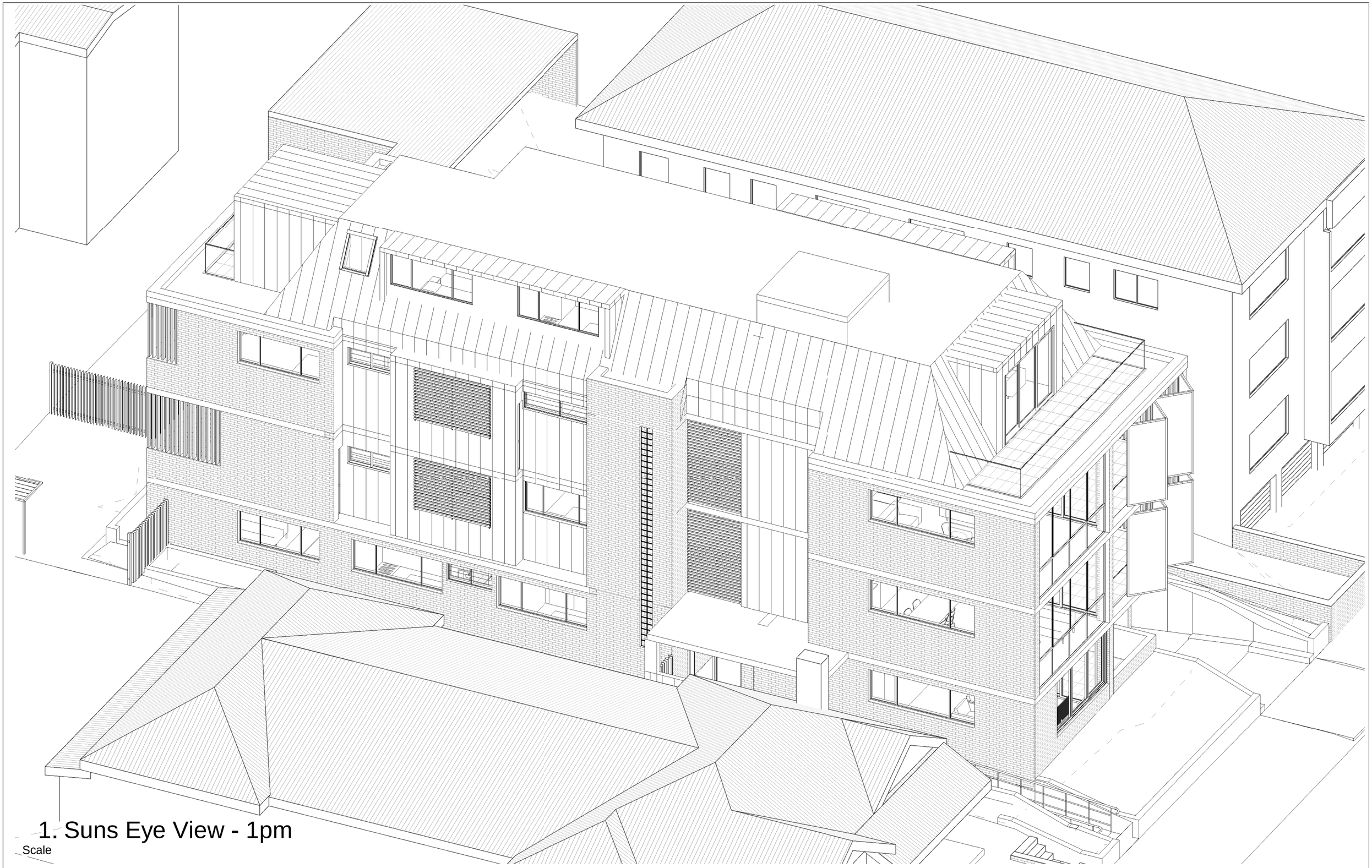
Scale @ A3

11 July 2023

Project 21004

Issue Issue AD

Sheet 21e



1. Suns Eye View - 1pm

Scale

Issue	Description	Date
Y	S4.55 Issue	09/08/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

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North

Drawing Name
Suns Eye diagrams - June 21

33-35 Church St, Randwick

Scale @ A3

11 July 2023

Project 21004

Issue Issue AD

Sheet 21f

1. Suns Eye View - 2pm

Scale

Issue	Description	Date
Y	S4.55 Issue	09/08/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

SECTION 4.56 APPLICATION

couvaras >ARCHITECTS

>A Level 1, 95 Cronulla Street, Cronulla NSW 2230
>ABN 86 660 152 198 **>T** 02 9527 7459
>E architect@couvaras.com **>W** www.couvaras.com
Nominated Architect: Peter Couvaras Reg No.7344

North

Drawing Name
Suns Eye diagrams - June 21

33-35 Church St, Randwick

Scale @ A3

11 July 2023

Project 21004

Issue Issue AD

Sheet 21g

1. Suns Eye View - 3pm

Scale

Issue	Description	Date
Y	S4.55 Issue	09/08/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

SECTION 4.56
APPLICATION

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North

Drawing Name
Suns Eye diagrams - June 21

33-35 Church St, Randwick

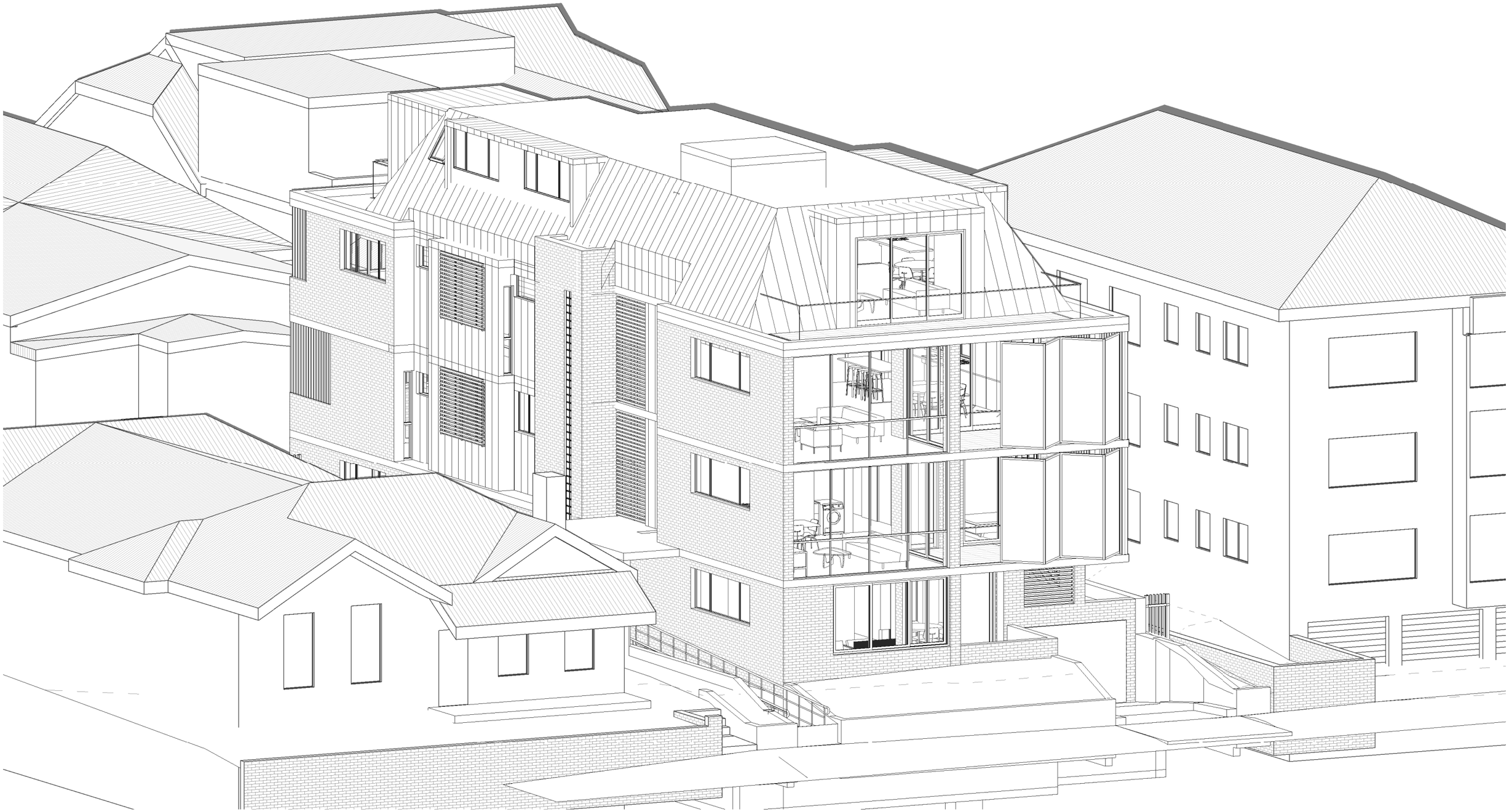
Scale @ A3

11 July 2023

Project 21004

Issue Issue AD

Sheet 21h



1. Suns Eye View - 4pm

Scale

Issue	Description	Date
Y	S4.55 Issue	09/08/23
AA	Client Review	18/01/24
AB	Client Review	29/01/24
AC	Client Review	30/01/24
AD	Client Review	11/03/24

SECTION 4.56 APPLICATION

couvaras >ARCHITECTS

>A Level 1, 95 Cronulla Street, Cronulla NSW 2230
>ABN 86 660 152 198 **>T** 02 9527 7459
>E architect@couvaras.com **>W** www.couvaras.com
Nominated Architect: Peter Couvaras Reg No.7344

North

Drawing Name
Suns Eye diagrams - June 21

33-35 Church St, Randwick

Scale @ A3

11 July 2023

Project 21004

Issue Issue AD

Sheet 21i

APPENDIX B

Borehole / DCP Logs (3 Sheets)

Borehole Log Report

Geo Environmental Engineering Pty Ltd
82 Bridge Street
Lane Cove NSW 2066
T 02 9420 3361

Hole ID. **BH1**
Hole Depth: **1.30 m**
Sheet: **1 of 1**

Project Name: **Geotechnical Investigation** Project Number: **G21095RAN**
Location / Site: **33 - 35 Church Street, Randwick NSW** Client: **Siew Leng Kiang**

Drilling Company: **Geo Environmental Engineering** Date Started: **30-SEP-21** Ground Level: **RL69.74m** (approx)
Drill Method: **Hand Auger** Date Completed: **30-SEP-21** Latitude: **----------**
Equipment: **Manual** Longitude: **----------**

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Consistency / Density	Moisture	Samples / Tests ID No.	Samples / Tests DCP blows/100mm (5 10 15)	Observations / Comments
							Surface: Front Lawn					
85 and 50mm Handauger/ crowbar	1.3m Slight seepage 30-Sep-21				SM	Aeolian	**SAND trace Silt**- dark brown, fine to medium grained, roots.	very loose	m	ZZ300921-01 0.10-0.20m		
					SP	Aeolian	**SAND**- becoming grey brown, fine to medium grained. becoming brown white.	loose	m	ZZ300921-02 0.50-0.60m		
		1.0	69.0			Residual Soil	**Iron indurated sandstone (weathered crust)**- red brown, fine to coarse grained.	dense				
					SC	Residual Soil	**Clayey SAND**- orange white, fine to coarse grained.	loose to medium dense	m to w	ZZ300921-03 1.20-1.30m		
		2.0	68.0				**Refusal at 1.30m** Practical refusal on weathered sandstone bedrock				>>	1.35m DCP Bouncing

Moisture	
D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Matthew Kilham** Date: **30-Sep-21** Checked By: **Stephen McCormack** Date: **01-OCT-21**

GEE DAVIES BH LOG G21095RAN.GPJ GEE.GDT 4-10-21 9:38:38 AM

Borehole Log Report

Geo Environmental Engineering Pty Ltd
82 Bridge Street
Lane Cove NSW 2066
T 02 9420 3361

Hole ID. **BH2**
Hole Depth: **2.00 m**
Sheet: **1 of 1**

Project Name: **Geotechnical Investigation**
Project Number: **G21095RAN**
Location / Site: **33 - 35 Church Street, Randwick NSW**
Client: **Siew Leng Kiang**

Drilling Company: **Geo Environmental Engineering**
Date Started: **30-SEP-21**
Ground Level: **RL70.31m** (approx)
Drill Method: **Hand Auger**
Date Completed: **30-SEP-21**
Latitude: ----------
Equipment: **Manual**
Longitude: ----------

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Consistency / Density	Moisture	Samples / Tests: DCP blows/100mm	Observations / Comments
							Surface: Rear Lawn			5 10 15	
85mm Handauger			70.0		SM		**SAND trace Silt**- dark brown, fine to medium grained, roots.	very loose	m		
		1.0	69.0		SP	Aeolian	**SAND**- becoming grey brown, fine to medium grained. becoming grey white.	very loose to loose	m		
					SP		**SAND**- yellow brown, weakly cemented.	loose to medium dense	m		
		2.0			SC	RS	**Clayey SAND**- orange white, fine to coarse grained, with bands ironstone.	medium dense	m		
			68.0				**Refusal at 2.00m** Practical refusal on ironstone	medium dense to dense			2.35m DCP bouncing

Moisture

D	Dry
Dp	Damp
SM	Slightly Moist
M	Moist
VM	Very Moist
W	Wet
Sd	Saturated

Additional Comments

Logged By: **Matthew Kilham** Date: **30-Sep-21**
Checked By: **Stephen McCormack** Date: **01-OCT-21**

GEE DAVIES BH LOG G21095RAN.GPJ GEE.GDT 4-10-21 9:38:39 AM

Geo Environmental Engineering
82 Bridge Street
Lane Cove NSW 2066
E info@geoenvironmental.com.au

Log Report Legend

MATERIAL SYMBOL

FILL	CONCRETE	ASPHALT	TOPSOIL
ORGANICS	ESTUARINE MUD		

CLAY	SAND	SILT	GRAVEL
Sandy CLAY	Clayey SAND	Clayey SILT	Clayey GRAVEL
Silty CLAY	Silty SAND	Sandy SILT	Sandy GRAVEL
Gravelly CLAY	Gravelly SAND	Gravelly SILT	Silty GRAVEL
CLAY & SAND	SAND & CLAY	SILT & CLAY	GRAVEL & CLAY
CLAY & SILT	SAND & SILT	SILT & SAND	GRAVEL & SAND
CLAY & GRAVEL	SAND & GRAVEL	SILT & GRAVEL	GRAVEL & SILT
Sandy Silty CLAY	Clayey Silty SAND	Sandy Clayey SILT	Sandy Clayey GRAVEL
Silty Sandy CLAY	Silty Clayey SAND	Clayey Sandy SILT	Clayey Sandy GRAVEL
Sandy Gravelly CLAY	Clayey Gravelly SAND	Sandy Gravelly SILT	Silty Clayey GRAVEL
Silty Gravelly CLAY	Silty Gravelly SAND	Clayey Gravelly SILT	Clayey Silty GRAVEL
Gravelly Silty CLAY	Gravelly Silty SAND	Gravelly Clayey SILT	Sandy Silty GRAVEL
Gravelly Sandy CLAY	Gravelly Clayey SAND	Gravelly Sandy SILT	Silty Sandy GRAVEL

SANDSTONE	SHALE	GRANITE	BASALT	SHALE / SANDSTONE
PORCELLANITE	GNEISS	SHALE / CLAYSTONE	MUDSTONE	
CLAYSTONE	MUDSTONE / CLAYSTONE	SHALE / SILTSTONE	IRONSTONE	

WATER LEVELS

Encountered Water

Standing Water

ABBREVIATIONS

PT	Pushtube
SFA	Solid Flight Auger
PWS	Percussion Window Sampler
HA	Hand Auger
HFA	Hollow Flight Auger

WELL GRAPHICS

Cuttings	Bentonite	Screen
Gravel Pack	Grout	Cave-in

GEE LEGEND * * 29/10/09 5:04:07 PM

APPENDIX C

Lab Report (7 Sheets)

Geo-Environmental Engineering Pty Ltd
82 Bridge St
Lane Cove
NSW 2066

Attention: **ALL INVOICES Stephen McCormack**

Report **829161-S**
Project name RANDWICK SI
Project ID G21095RAN
Received Date Oct 01, 2021

Client Sample ID			**G300921RAN-01**	**G300921RAN-02**	**G300921RAN-03**
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S21-Oc03290**	**S21-Oc03291**	**S21-Oc03292**
Date Sampled			**Sep 30, 2021**	**Sep 30, 2021**	**Sep 30, 2021**
Test/Reference	LOR	Unit			
Chloride	10	mg/kg	< 10	< 10	< 10
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	19	< 10	< 10
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	6.4	6.6	5.8
Resistivity*	0.5	ohm.m	530	1700	1300
Sulphate (as SO4)	10	mg/kg	< 10	< 10	< 10
% Moisture	1	%	6.2	4.1	15

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chloride	Sydney	Oct 07, 2021	28 Days
- Method: In-house method LTM-INO-4270 Anions by Ion Chromatography			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Sydney	Oct 07, 2021	7 Days
- Method: LTM-INO-4030 Conductivity			
pH (1:5 Aqueous extract at 25°C as rec.)	Sydney	Oct 07, 2021	7 Days
- Method: LTM-GEN-7090 pH by ISE			
Sulphate (as SO4)	Sydney	Oct 07, 2021	28 Days
- Method: In-house method LTM-INO-4270 Sulphate by Ion Chromatograph			
% Moisture	Sydney	Oct 01, 2021	14 Days
- Method: LTM-GEN-7080 Moisture			

eurofins | Environment Testing

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261 Site # 1254

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool WA 6106
Phone : +61 8 6253 4444
NATA # 2377 Site # 2370

Eurofins Environment Testing NZ Limited
NZBN: 9429046024954

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Geo-Environmental Engineering P/L
Address: 82 Bridge St
Lane Cove
NSW 2066

Project Name: RANDWICK SI
Project ID: G21095RAN

Order No.:
Report #: 829161
Phone: 02 9592 0218
Fax: 02 9519 9140

Received: Oct 1, 2021 3:12 PM
Due: Oct 7, 2021
Priority: 3 Day
Contact Name: ALL INVOICES Stephen

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Aggressivity Soil Set	Moisture Set
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217						X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
Perth Laboratory - NATA # 2377 Site # 2370							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	G300921RAN-01	Sep 30, 2021		Soil	S21-Oc03290	X	X
2	G300921RAN-02	Sep 30, 2021		Soil	S21-Oc03291	X	X
3	G300921RAN-03	Sep 30, 2021		Soil	S21-Oc03292	X	X
Test Counts						3	3

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs..

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM where no positive PFAS results have been reported have been reviewed and no data was affected.

.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Chloride	mg/kg	< 10			10	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	< 10			10	Pass	
Sulphate (as SO4)	mg/kg	< 10			10	Pass	
LCS - % Recovery							
Chloride	%	90			70-130	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	%	101			70-130	Pass	
Resistivity*	%	101			70-130	Pass	
Sulphate (as SO4)	%	87			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Chloride	S21-Oc02913	NCP	%	90			70-130	Pass	
Sulphate (as SO4)	S21-Oc02913	NCP	%	89			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Chloride	S21-Oc02903	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	S21-Oc03234	NCP	uS/cm	20	22	11	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	S21-Oc03234	NCP	pH Units	5.1	5.2	<1	30%	Pass	
Resistivity*	S21-Oc03234	NCP	ohm.m	510	460	11	30%	Pass	
Sulphate (as SO4)	S21-Oc02903	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
% Moisture	S21-Oc03234	NCP	%	5.2	5.0	5.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Emma Beesley	Analytical Services Manager
Charl Du Preez	Senior Analyst-Inorganic (NSW)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

☐ **Sydney Laboratory**
Unit F3 Bld,F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☐ **Brisbane Laboratory**
Unit 1 21 Smallwood Place Murarrie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory**
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Geo Environmental Engineering	Project №	G21095RAN	Project Manager	Stephen McCormack
Address		Project Name	RANDWICK ST.	EDD Format (ESdat, EQuIS etc)	
Contact Name	Stephen McCormack				
Phone №	0431480980				
Special Directions	EMAIL. stephen@geoenvironmental.com.au				
Purchase Order					
Quote ID №					

Sampler(s)		
Handed over by	Matthew Kilham	
Email for Invoice	stephen@geoenvironmental.com.au	
Email for Results	AS ABOVE.	

Analyses (Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing)

AGGRESSIVITY (SALINITY SUITE.)

Containers (Change container type & size if necessary)

Required Turnaround Time (TAT) (Default will be 5 days if not ticked.)

♦Surcharge will apply
☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☒ 3 days♦
☐ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	AGGRESSIVITY (SALINITY SUITE.)	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
11	G300921RAN-01	30/9	SOIL	X									
12	G300921RAN-02	30/9	SOIL	X									
13	G300921RAN-03	30/9	SOIL	X									
14													
15													
16													
17													
18													
19													
20													
		Total Counts											

Method of Shipment	☐ Courier (#)	☒ Hand Delivered	☐ Postal	Name	Matt Kilham	Signature		Date	Time
Laboratory Use Only	Received By	Grace Turner	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	1/10	Time	3:12
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time	

Temperature: 27.27
Report №: 829161