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Project Number 18670.000.001

Geotechnical Investigation

76-80 Great South Road, Newmarket, Auckland

Submitted to:
Dilworth Trust Board
2 Erin Street
Epsom
Auckland 1051

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1 Introduction

ENGEO Ltd was requested by Dilworth Trust Board to undertake a geotechnical investigation of the property at 76-80 Great South Road, Newmarket, Auckland (herein referred to as 'the site'). This work has been carried out in accordance with our proposal reference P2021.000.669_05 dated 3 December 2021, and signed agreement dated 17 March 2022.

The purpose of this assessment was to complete a site investigation and provide geotechnical recommendations to support a resource consent application for a proposed multi-storey residential and commercial building development at 76-80 Great South Road, Newmarket.

Our scope of works includes:

- A site investigation including percussion boreholes, hand auger boreholes, together with a desktop assessment of published geological and geotechnical information relevant to the site.
- Development of conceptual ground model.
- Preparation of this report presenting the findings of the investigation and analyses, to support an application for resource consent.

2 Site Description

The site at 76-80 Great South Road comprises two land parcels legally described as Lot 42 Deeds Reg 976 and Lot 1 DP 119624 and occupies an area measuring 4,173 m^2. The landform is characterised as slightly to moderately sloping to the north and northeast, with elevations ranging from 79 m RL in the southern area of 80 Great South Road to 75 m RL in both land parcels.

Two two-storey buildings occupy 80 Great South Road and are set-out in an 'L' shaped configuration together with paved areas for accessways and carparking. A 225 mm vitrified cement wastewater pipe runs perpendicular through the centre of the property in a northwest to southeast direction and along the site boundary adjoining 82 Great South Road.

A two-storey building located in 76 Great South Road is understood to have been recently demolished, hardfill appears to have been placed where the buildings foundations were removed. Concrete and brick pavements remain *in situ* around the perimeter of the site. The land parcel slopes to the northeast towards Mauranui Avenue.

3 Proposed Development

The 50% Architectural Preliminary Design Plan Set prepared by Jasmax Ltd referenced 220210 and dated 1 April 2022 (extracted drawings A1-1-002 to A1-2-099 and A4-2-011 presented in Appendix 1), presents two nine-storey buildings identified as the 'Great South Road' (southern building) and 'Mauranui' (northern building) together with paved and landscaped areas surrounding the buildings and the perimeter of the site. The proposed finished floor and ground levels indicate the Great South Road building will be raised to 78.95 m RL with surrounding landscaped areas and pavement to be formed on fill, with fill heights to range from < 0.5 m up to 2.0 m. A split-level basement structure is proposed for the Mauranui building for car stacking availability, finished floor levels (FFL) are shown as 75.8 m RL and 73 m RL indicating the building platform will be completely formed in cut. Cut depths are anticipated to range from < 0.5 m up to 6.3 m which account for an additional 0.5 m of undercut below the proposed Finished Floor Levels (FFL) for slab and under slab preparation.

The WIP Concept Structural Plan Set prepared by Enovate Ltd referenced 21-0055 and dated 22 March (Appendix 2) show the proposed basement structure for the Mauranui building will be supported with reinforced concrete pile retaining walls along the north-eastern, eastern and southern building perimeter.

No cut and fill plans have yet been developed, however based on the proposed elevations of the building platforms shown in the Jasmax Ltd Architectural Plan Set, fill will be required in the central areas of the site, specifically between both buildings and will be in the order of 1 m to 2 m. A landscaped podium with a finished ground level (FGL) of 80.2 m RL is shown along the southern extent of the Mauranui building which may require up to 4 m of fill, we understand this fill will be graded to existing ground levels to reduce the need for retention structures within the site.

4 Desktop Review

4.1 Published Geology

The site has been mapped by Kermode (1992) at a 1:50,000 scale as part of the GNS Auckland Urban Map (Map 2, Sheet R11). Geological mapping shows the site area is underlain by Auckland Volcanic Field (AVF) lithic tuff, described as 'thin graded beds of grey, mud to sand-sized fragments of comminuted country rock (mainly sandstone, mudstone, alluvium, micaceous sand) together with basalt and basanite fragments'. Basalt, basanite lava and scoria lava is mapped in surrounding areas of the site. The Mt Hobson and St John Volcanoes are mapped 500 m north and southwest of the site respectively which are inferred to be the likely sources of volcanism.

4.2 Historical Aerial Photography Review

A selection of orthorectified historical aerial photographs have been reviewed for the purpose of observing changes to the topography and land use affecting the ground conditions and profile over time. The photography was accessed from the Alexander Turnbull Library, retrieved from the Retrolens online portal (retrolens.nz) licensed by Land Information New Zealand (LINZ) and Auckland Council GeoMaps. A summary of review findings is provided in Table 1.

Table 1: Summary of Historical Aerial Photography

Year	Observed Topographic and Land Use Changes
1940	Four residential dwellings cover the site, Great South Road and Mauranui Avenue have been constructed.
1959	A tennis court has been constructed in the northern area of the site along Mauranui Avenue.
1979	The dwelling in 76 Great South Road appears to have been demolished, with two new semi-detached buildings constructed in place.
1986	One dwelling in 80 Great South Road has been demolished.
1996	All remaining residential dwellings have been demolished, the motel at 80 Great South Road has been constructed.
1996 to 2022	No observed changes.

4.3 New Zealand Geotechnical Database (NZGD)

The New Zealand Geotechnical Database (NZGD) was queried for geotechnical data available near to or within 76-80 of Great South Road. No records were found within the site, however two investigations have been completed both north and south of the site. A summary of the investigations and findings are as follows:

- ENGEO Ltd drilled one machine borehole 60 m north of the site to a target depth of 9.5 m below ground level (bgl). The borehole encountered Auckland Volcanic Field (AVF) tuff to 3.8 m bgl and then slightly weathered basalt rock to end of hole. Basalt ranged from very strong to extremely strong.

- Tonkin and Taylor Ltd drilled one machine borehole 200 m south of the site to a target depth of 80.3 m bgl. The borehole encountered AVF tuff to 3 m, basalt to 26 m overlying interbedded sequences of East Coast Bays Formation sand, sandstone and siltstone.

4.1 Previous Reporting

A Geotechnical Investigation Report was completed by Coffey Geotechnics NZ Ltd (Coffey) referenced GENZAUCK16633AA and dated 30 June 2015 to support the design and construction of a proposed commercial building at 80 Great South Road. Works completed by Coffey included a site investigation (summarised in Section 5.1), and geotechnical analysis to support the proposed development. The site investigations and assessments determined by Coffey contribute to our understanding of the ground conditions and subsequent geotechnical recommendations.

5 Site Investigations

5.1 Previously Completed Site Investigations

Coffey completed a site investigation between 2 and 3 June 2015. The investigation comprised three machine boreholes (MH01 to MH03) to a target depth of 8 m bgl and ten hand auger boreholes (HA01 to HA10) to a target depth of 4 m bgl with dynamic cone (Scala) penetrometer tests completed at the base of each hand auger borehole. Coordinates for the investigations were not supplied, however their approximate locations are presented in the Coffey Site Plan in Appendix 3 and the ENGEO Investigation Location Plan shown in Appendix 4. The Coffey 2015 investigation logs are appended to Appendix 3.

5.2 ENGEO 2022 Site Investigations

To investigate the current proposed scheme, ENGEO undertook investigations at the site between the 25 and 26 January 2022. The investigation comprised four hand auger boreholes (HA101 to 104) and 11 percussion machine boreholes (PH01 to PH09, ST01 and ST02). Two of these percussion boreholes were utilised for downhole soakage testing following drilling and are denoted ST. All test locations are shown on the Investigation Location Plan in Appendix 4. The percussion boreholes and soakage tests were drilled up to 12.5 m bgl and the hand auger boreholes extended to 1.7 m bgl.

The results of the hand auger boreholes and *in situ* material strength testing, together with detailed investigation logs are included in Appendix 5. Logs have been prepared in general accordance with the New Zealand Geotechnical Society field classification guidelines (NZGS, 2005). Percussion borehole logs and soakage tests are presented in Appendix 6.

5.3 Groundwater Conditions

Depths to groundwater were inspected in the pre-existing Coffey standpipe piezometers MH01, MH02 and MH03 on the 25 January, 15 February and 11 March 2022. All piezometers were dry, confirming the depth to groundwater is in excess of 8.00 m bgl. To confirm the screen intervals and the integrity of the piezometers a downhole endoscope inspection was completed. All piezometers presented no signs of damage, screened intervals were from 0.5 m to 5.50 m bgl with the exception of MH02 which was found to be partially screened to 5.5 m bgl with the remainder of the borehole remaining open exposed basalt (i.e. no pipe) down to 8 m bgl.

5.4 Soakage Testing

Two percussion boreholes (ST1 and ST2) were drilled in the northern areas of the site for the purposes of undertaking soakage testing in the underlying basalt rock. Soakage results were 16.8 and 19.4L per second respectively. The results are presented in Appendix 6.

6 Ground Model

A conceptual ground model is presented in Appendix 7, the investigation findings are broadly consistent with the published geology and are summarised as follows:

- The site is veneered with a surficial layer of topsoil to depths ranging from 0.10 m to 0.30 m bgl in gardened and lawn areas across the site.

- Existing fill was encountered in all investigations both beneath grassed and paved areas. Fill generally comprised a stiff to hard silt, with the exception of hardfill which was observed in 76 Great South Road where buildings were recently demolished. Cohesive fill is volcanic in origin indicating materials are likely locally sourced. Depth of fill ranged from 0.3 m to 1.2 m bgl.

- Auckland Volcanic Field (AVF) Tuff underlies the surficial fill from 0.3 m to 4.6 m bgl. Tuff is a non-welded volcanic airfall derived soil and comprises very stiff to hard silt with variable clay and sand content. Undrained shear strengths ranged from 110 kPa to 200+ kPa (average 176 kPa). Where hand auger boreholes refused at depths shallower than 5 m bgl a Scala penetrometer test was undertaken to confirm refusal, the majority of the tests reported 'bouncing' which we infer to be the top of the underlying basalt.

  Based on the investigations completed to date, the tuff was found to be relatively continuous across the entire site and typically in the order of 2 m to 3 m thick, with the exception the northern area of the Mauranui building where ash is modelled as 5 m thick (70.5 m RL base of ash layer). Tuff was not however present in the far northwest corner of the site (PH03).

- AVF Basalt was encountered across the entire site, the upper surface ranging from 2.2 m to 5.2 m bgl. Based on surrounding boreholes, (Section 4.3) the basalt is inferred to be in the order of 20 m+ thick. The basalt was observed to be typically slightly weathered to unweathered with strengths ranging from moderately strong to very strong. The top of basalt is undulating across the site which is likely representative of the landform prior to basalt flows covering the site.

  Based on the investigations completed to date the top of basalt is approximately 2.5 m deep (77 m RL) in the south-eastern area of the Mauranui building and deepens in the northern area of the 80 Great South Road to 5.2 m (70.5 m RL) which may be reflective of a paleochannel or gully. Basalt is approximately 2 m to 3.5 m deep (75 m RL to 76 m RL) in 76 Great South Road.

  Sections of broken or fractured rock and cavities were logged in the percussion boreholes (Appendix 6), with thicknesses ranging between 0.5 m to 3.5 m, however due to the drilling methodology the structure and continuity of the fractured zones could not be determined. The zones of inferred fracturing are shown to be spaced through the investigation rock mass rather than a continuous horizon based profile. It could be assumed that on excavation, sections of broken / fractured basalt may perform similar to cobbles and boulders and ravel from an exposed face or cut. The sections of inferred broken basalt are shown on the conceptual ground model.

A summary of the depth to basalt is provided in Table 2 for deep investigations.

Table 2: Depth to Basalt

Investigation ID	Depth to Top of Basalt		Investigation ID	Depth to Top of Basalt	
	m bgl	m RL		m bgl	m RL
MH01	2.9	75.2	PH05	3.9	73.1
MH02	2.7	73.3	PH06	2.6	75.9
MH03	4.7	73.8	PH07	3.8	73.7
PH01	2.2	75.8	PH08	4.6	71.4
PH02	2.2	76	PH09	3.3	74.45
PH03	0.3	75.7	ST01	1.4	74.35
PH04	4.2	72.55	ST02	5.2	70.55

6.1 Groundwater Assessment

Auckland Council require an assessment against the Auckland Unitary Plan (AUP): Operative in Part (Table E7), where excavations are proposed below the groundwater table. It is anticipated the proposed excavations for the Mauranui building will range between < 0.5 m up to 6 m in depth. Based on the piezometer observations and records as outlined in Section 5.3, the static groundwater for site is in excess of 6 m bgl in the southern areas of the site and 8 m bgl in the northern area of the site. This indicates the proposed excavation is not anticipated to intercept groundwater. Accordingly, based on these results a consent is not required as a restricted discretionary activity under Clause (A28) in the Auckland Unitary Plan (AUP): Operative in Part (Activity Table E7.7.4.1).

7 Geotechnical Considerations

7.1 Seismic Soil Classification

In accordance with the maximum categorised soil thickness in Table 3.2 of NZS 1170.5:2004 the seismic subsoil class is assessed as ‘Class C – Shallow Soils’.

7.2 Liquefaction Susceptibility

Based on the presence of cohesive tuff soils overlying basalt rock to at least 20 m bgl, the site is interpreted to have a low risk of liquefaction. Accordingly, a site-specific liquefaction assessment has not been undertaken as part of this study.

7.3 Consolidation Settlement

To account for the presence of a deeper volcanic soil profile and to mitigate risk of differential settlement we understand the preferred foundation solution for both buildings is stub piles founding on top of basalt rock. Therefore, provided the buildings are founded on stub piles on basalt rock, excessive total or differential settlements due to consolidation of soils are not considered to be of issue for the buildings.

A preliminary settlement check has however been undertaken to assess potential settlements due to the weight of the proposed fills across the site using Settle3 (V 5.010). Total settlements for a 5 m thick tuff layer (assumes ST02 investigation log) with distributed live loads up to 90 kPa are calculated to be in the order of 24 mm.

This preliminary analysis indicates total settlements fall within acceptable limits for the proposed building types, however these results are considered preliminary and should be reassessed if any large structures or buildings are founded on soils. Furthermore, the effects of settlement on building pile foundations extending through consolidating soil layers should also be taken into consideration during design.

8 Geotechnical Recommendations

Based on the geotechnical investigations completed on-site we consider that the site is geotechnically suitable for the proposed development. This opinion is predicated on the consideration that design and construction will be undertaken in accordance with the following site-specific geotechnical recommendations, Auckland Council's Code of Practice for Land Development and Subdivision, and other appropriate standards.

8.1 Building Foundations

We understand the Mauranui building will comprise a combination of shallow and stub foundations to account for the variable volcanic soil profile and the Great South Road building will utilise a stub pile foundation solution. It should be noted that the quality of rock and depth to rockhead will vary across the site away from test locations.

8.1.1 Pile Foundations

Based on the available investigation data, the top of basalt is modelled to occur to within 2 m to 5 m of the existing ground surface. Recovered core from MH01 to MH03 show the contact between the basalt and the overlying volcanic soils is relatively clean with intact rock at the contact. As such, we consider stub piles founding on the top of basalt or piles embedded within the basalt rock to be suitable for the proposed development.

However it should be noted that inferred and observed cavities, fractured rock and broken basalt layers were logged in the majority of the deep investigations undertaken on-site. This indicates that the rock mass is highly variable across the site.

A geotechnical ultimate (unfactored) bearing capacity of 6 MPa is considered suitable for stub piles founded on top of fractured basalt rock.

Where building loads necessitate greater capacity, piles socketed within the basalt rock will be required.

On the basis of *in situ* soils tests carried out to date, and with a view to limiting elastic settlements to relatively insignificant proportions, we recommend that embedded (rock socket) piles and / or ground anchors are designed with an ultimate skin friction of 1 MPa within lightly to moderately fractured basalt.

The top 1.0 m of basalt should be ignored for both compressive and uplift capacity, to allow for fractured zones near the top of the basalt. Skin friction should be disregarded in zones of voids and heavily fractured basalt.

Pile ultimate end bearing of 20 MPa may be utilised for piles with a rock socket of at least three (3) pile diameters into lightly to moderately fractured basalt.

Proof drilling (to at least 3D below the toe of piles), will be required for all foundation locations. This is to identify competent rock within and underlying rock socket zones and to confirm the competency of rock and absence of voids below the toe of stub piles. Proof drilling will allow the correct pile length to be ascertained prior to construction and will facilitate ordering the correct cage lengths - reducing construction delays due to unforeseen ground conditions.

For end bearing or rock socket (skin friction and end bearing) piles, any heavily fractured zones or voids encountered within the proof drilling boreholes should be infilled with low viscosity flowable grout (no aggregate to aid penetration), following proof drilling.

A Geotechnical Engineer familiar with the site and the contents of this report should be engaged to review the results of the proof drilling and to advise on target founding levels and the need for grouting.

8.1.2 Shallow Foundations

Basalt

Shallow slab on grade or strip and pad foundations founding on basalt are considered suitable for the southern area of the Mauranui building, where the building platform is to be cut down to found upon basalt. For design purposes, a geotechnical ultimate bearing capacity of 10 MPa is considered suitable on competent, moderately strong basalt rock.

For shallow pad foundations on rock, foundation locations should be proof drilled to 3B to prove competent basalt is present below the foundation.

Where foundation excavations encounter fractured rock or broken basalt at the subgrade level, the following remedial options may be considered:

- Remove / undercut the fractured rock or broken basalt and replace with concrete (30 MPa) or hardfill.
- Adopt a reduced geotechnical ultimate bearing capacity of 2 MPa.

It is recommended that the Geotechnical Engineer undertakes a visual inspection of the exposed subgrade to determine the quality of the basalt. An allowance should be made for cleaning and removal of basalt rubble prior to foundation pouring.

Volcanic Soils

If any ancillary structures are required for the proposed development, shallow foundations solutions founding on volcanic soils may be required. A geotechnical ultimate bearing capacity of 450 kPa should generally be available for strip and pad foundations up to 2 m wide bearing on the underlying native tuff soils and / or certified engineered fill.

We anticipate existing fill will be undercut as part of the earthworks for the site, however in the instance where foundations are proposed within where existing fill remains, the foundations will need to extend through the fill to found in the underlying native soils.

Based on the Coffey 2015 report an expansive soil class for the site is assessed as 'Class M (Moderate)' as per AS 2870:2011. Accordingly, foundations should be specifically designed for characteristic movement of 20 mm to 40 mm.

All buildings should be designed to tolerate differential settlements up to 1 in 240 (approximately 25 mm over 6 m length of a building) as required by New Zealand Building Code Handbook, Appendix B Section B1/VM4, Clause B1.0.2, under the serviceability limit state load combination of NZS 1170.0, unless the structure is specifically designed to limit damage under a greater settlement.

8.1.3 Strength Reduction Factor

As required by Section B1/VM4 of the New Zealand Code Handbook, a strength reduction factor of 0.5 must be applied to all recommended geotechnical ultimate soil capacities in conjunction with their use in factored limit state design load cases for static and earthquake conditions.

8.2 Basement Excavation

A split-level basement structure for the Mauranui building is proposed, the WIP architectural plan set shows the basement will be excavated to a finished floor level of 75.8 m RL and 73.0 m RL (assumed total excavation level 75.3 m RL and 72.5 m RL, allowing 0.5 m for the floor slab and basecourse) which will require excavations of up to 6 m from existing ground levels (refer to Figure 1).

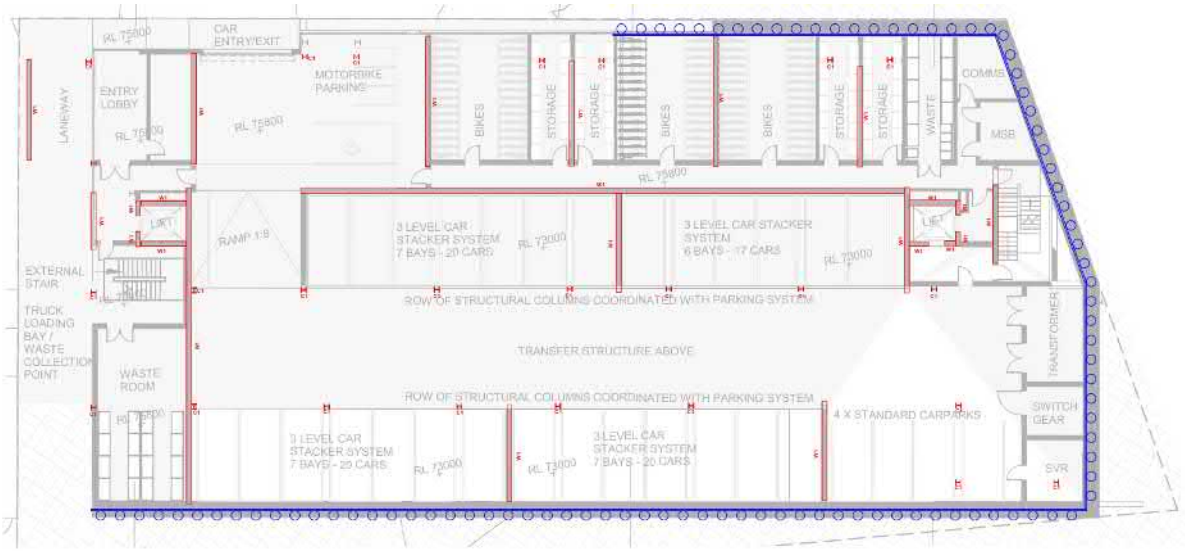

Figure 1: Mauranui building proposed basement retaining walls

8.2.1 Temporary Works

Given the majority of the basement retaining walls are proposed along the site boundary or within 5 m of the site boundary, a top-down construction methodology shall be implemented to mitigate risk of adverse effects (mechanical settlements) to adjacent buildings, structures and land. The preferred sequencing is summarised as follows:

- Drill retaining wall piles prior to bulk earthworks;
- Install reinforcing pile cages and pour concrete;

- Allow for concrete to cure; and
- Bulk excavations withing the building footprint commence.

The proposed basement retaining wall is understood to be structurally integrated into the building along the eastern and southern walls and the preferred wall type is a solider pile retaining wall. We recommend piles should be spaced no greater than 3D to promote soil arching in the overlying volcanic soils and to minimise raveling occurring in the basalt rock. Design of the basement retaining wall be undertaken during detailed design and building consent stages of the project. The walls will be designed so that they are suitably stiff to limit wall deflection and ground settlements beyond the boundary. Depending on the retained heights, this may require temporary propping to limit the short term wall deflections.

No temporary excavations are currently scheduled for the Great South Road building.

8.2.2 Groundwater

Based on groundwater inspections outlined in Section 5.3 we anticipate the static groundwater level for the site is deeper than the proposed basement excavation, however an allowance should always be made for a sump and pump to collect water from the base of the excavation to direct it to a reticulated stormwater system.

In the event groundwater levels rise i.e. during winter months an allowance for uplift pressure relief wells in the basement should be made to mitigate risk of uplift pressure occurring beneath the basement. Maintenance access points for all wells and sumps should be considered.

8.2.3 Preliminary Retaining Wall Design Parameters

The design parameters presented in Table 3 may be adopted for preliminary basement retaining wall design. Four units are considered, assuming a lower bound for basalt to account for fractured rock or broken basalt. Volcanic soils are anticipated to be present, with provision for existing non-engineered fill where present at the boundary and beneath existing pavements and buildings, and provision for engineered fill in the event any existing non-engineered fill is undercut and replaced.

Table 3: Retaining Wall Design Parameters

Material Type	Unit Weight (kN/m^3)	Friction Angle (°)	Effective Cohesion (c') (kPa)	Undrained Shear Strength (kPa)
Engineered Cohesive Fill	18.5	32	5	100
Engineered Granular Fill	20	36	-	-
Volcanic Tuff Soils (Uncemented)	18	30	1	150
Fractured Basalt	26	35	N/A	5000

The design of rigid retaining walls tied into proposed buildings (i.e. walls that are restrained from movement at the top), should be based on an 'at rest' lateral earth pressure coefficient (Ko). Flexible walls that are free to deform or rotate at least 1% of the exposed wall height (H) may be designed using an active soil coefficient (Ka).

The Retaining Wall Designer should take into account acceptable levels of wall deflection when selecting the appropriate lateral earth pressure coefficient.

For all proposed retaining walls greater than 1.5 m in vertical height, specific engineering design will be required. Due to the variability in the top of basalt and competency of the basalt across the site, we recommend that geotechnical input is sought ahead of retaining wall design to confirm appropriate parameters for their design and to undertake supplementary investigation and analysis on retaining wall alignments, if required.

8.3 Pavement Design

Based on our site investigation and the proposed development, we consider that a subgrade design CBR value of 4% can be adopted for pavement design in the volcanic soils. A supplementary programme of Scala penetrometer testing should be undertaken when subgrades are trimmed to confirm actual CBR values.

CBR values in sensitive volcanic soils can be highly affected by moisture content (i.e. exposure to the elements) and trafficking, as such, it is recommended that the subgrade is only trimmed to final level immediately prior to placing a basecourse.

8.4 Existing Services

Auckland GeoMaps show an existing 225 mm diameter vitrified clay public wastewater pipe runs perpendicular through the centre of the property in a northwest to southeast direction and along the site boundaries to the adjoining 31 Mauranui Avenue and 82 Great South Road properties.

The proposed Mauranui building footprint falls within 5 m of the wastewater pipe in the north-western area of 80 Great South Road and converges towards the southern corner of proposed basement retaining wall. Due to the pipe nearing its design life we understand the pipe will be replaced and redirected westward within 82 Great South Road, as such we consider the proposed pipeline location is outside the zone of influence of future foundations and temporary excavations and basement walls.

Once the proposed pipeline alignment is confirmed we should be given an opportunity to review potential effects to the pipeline from development to determine if further assessment is required. In addition to this, we recommend that all new service connections should be appropriately designed to accommodate potential ground movements arising from the proposed construction.

8.4.1 Private Services

We understand a transformer unit is positioned in the northern corner of 82 Great South Road and 0.5 m of the site boundary. Based the architectural plan set the transformer unit is approximately 3 m west of the proposed basement retaining wall. Cut depths for the basement excavation are anticipated to range between 3 m to 4 m, as such we consider the unit is outside the zone of influence for potential settlement related effects.

8.5 Site Works

8.5.1 Demolition

It is essential that all foundations and building debris from demolition of the existing structures are completely removed prior to construction commencing.

If any existing services are to be decommissioned outside of the building footprint, the abandoned lines should be fully removed or backfilled with grout to avoid creating preferential groundwater flow paths.

8.5.2 Earthworks

Topsoil should be stripped from all cut and fill areas prior to earthworks commencing on-site. Stockpiles of topsoil and unsuitable materials should be sited well clear of the works on suitable, approved areas of natural ground.

Trees that require removal prior to construction should have both their trunks and full root systems removed to avoid risk of differential settlement. Trunk removal will create cavities in the inorganic crust layer which should be backfilled with compacted hardfill to certifiable standards.

8.5.3 Existing Fill

We anticipate no fill will remain beneath building pile foundations, however it should be noted that all building foundations will need to penetrate both fill materials and volcanic soils to found on basalt.

Where existing fill is present at subgrade level beneath proposed driveways and / or paved areas, visual observations and further testing (including proof rolling and field strength testing) should be carried out by a ground engineering professional to confirm their suitability to remain *in situ*. Where the materials are not deemed suitable they should be undercut and backfilled with certified fill to the subgrade level.

8.5.4 Proposed Fill

We anticipate fill placement will be extensive across the landscaping areas between the Great South Road and Mauranui buildings, fill should comprise clean clay or hardfill and should be approved by the Engineer prior to use. Compaction should be carried out to certified standards (NZS 4431) with conventional plant and under engineering control.

Site-won materials from the proposed excavations will likely comprise volcanic soils. These materials are generally understood to contain allophane clay minerals. Soils with allophane clay require careful handling by an experienced Earthworks Contractor as it can lose strength when too heavily trafficked or compacted. When handling allophane soils it is recommended cut materials are transported to areas of fill and compacted as soon as possible to avoid over-drying which can lead to compaction difficulties.

All engineered or structural hardfills should be placed in ≤ 200 mm lifts and be compacted to a minimum of 95% of maximum dry density, at no less than optimum moisture content. Compaction should be achieved using standard plant and methodology suitable for the imported material. A water source should be maintained on-site for moisture control.

8.5.5 Excavations

Temporary unsupported cut slopes in volcanic soils for the basement excavation should not exceed a batter of 1v:1h (~45 degrees from horizontal). Any temporary batters greater than 2.0 m in vertical height should not exceed a batter of 1v:2h. In addition to this, cuts in volcanic soils must not be exposed to adverse weather conditions i.e. cut faces should be covered with polythene plastic to limit wetting and drying to mitigate risk of slope instability.

Whilst not currently anticipated, any cuts into competent strong columnar basalt should stand near vertical, however where fractured rock or broken basalt is encountered cut faces may be prone to raveling or toppling. An allowance for shotcrete and / or rock bolts may be required in such circumstances to ensure settlements to adjacent buildings, infrastructure and land is limited. Additionally, loosened wedges of rock should be removed or undercut from the exposed cut faces and foundation subgrade prior to shotcreting or foundation pouring. Provisions for rock breaking and ripping should also be considered for the basement excavation.

Where the allowable geometry is not sufficient to achieve the recommended temporary cut and batter a top-down construction methodology is considered suitable, specifically where the basement excavation is within 5 m of a site boundary.

All cuts and batters should be undertaken in line with WorkSafe Good Practice Guidelines for Excavation Safety (July 2016).

8.5.6 Piling

All foundation locations require proof drilling to ascertain the top of basalt and check for zones of heavily fractured basalt and / or voids. We recommend that these are drilled to a depth of at least 3 pile diameters / shallow footing widths below the foundation invert level. This should be undertaken using a combination of rotary coring and percussion drilling once the foundation layout plan is completed to enable more accurate procurement for piled foundations. Results of this proof drilling should be supplied to a geotechnical professional familiar with the contents of this report in order that the design foundation length accounts for ground conditions encountered.

Voids may be present within the basalt rock which should be allowed for in the piling construction methodology. Possible mitigation measures may include pile casing or pre-drilling pile holes and filling void zones with low viscosity flowable grout.

8.5.7 Noise and Vibration

Piling operations and bulk excavations within basalt rock will require a specialist noise and vibration assessment specific to the proposed construction methodology.

8.5.8 Erosion and Sediment Control

All erosion and sediment control should be undertaken in accordance with the current Auckland Council erosion and sediment control guidelines (GD05) and / or any specific conditions of the resource consent obtained prior to commencing site work.

9 Further Work

We recommend that foundation and retaining wall elements be designed by a Chartered Professional Engineer practising in foundation and retaining wall design. Additionally, ENGEO should be given the opportunity to review and provide comment on the geotechnical aspects of final foundation design, earthworks and retaining wall drawings and specifications, prior to building consent submission.

Additional geotechnical analysis may be required to support the design of the bored piled walls.

ENGEO should also be given the opportunity to observe the foundation excavations and proof drilling in order to verify that the recommendations presented in this report and future design reports have been interpreted as intended.

Further work may be required to inform design of temporary unsupported excavations (if proposed), including the design and specification of rock bolts and concreting (where deemed necessary).

We note that based on our assumed cuts the proposed development will likely not trigger a requirement for a detailed assessment of effects for active dewatering and groundwater drawdown under the Auckland Unitary Plan (AUP). However, we should be given an opportunity to review this assessment should proposed cuts for the site change.

10 Limitations

i. We have prepared this report in accordance with the brief as provided. This report has been prepared for the use of our client, Dilworth Trust Board, their professional advisers and the relevant Territorial Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.

ii. The recommendations in this report are based on the ground conditions indicated from published sources, site assessments and subsurface investigations described in this report based on accepted normal methods of site investigations. Only a limited amount of information has been collected to meet the specific financial and technical requirements of the client's brief and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground between test locations has been inferred using experience and judgement and it should be appreciated that actual conditions could vary from the assumed model.

iii. Subsurface conditions relevant to construction works should be assessed by contractors who can make their own interpretation of the factual data provided. They should perform any additional tests as necessary for their own purposes.

iv. This Limitation should be read in conjunction with the Engineering NZ/ACENZ Standard Terms of Engagement.

v. This report is not to be reproduced either wholly or in part without our prior written permission.

We trust that this information meets your current requirements. Please do not hesitate to contact the undersigned on (09) 972 2205 if you require any further information.

Report prepared by

Samantha MacKay

Engineering Geologist

Report reviewed by

Paul Fletcher, CMEngNZ (CPEng)

Associate Geotechnical Engineer

APPENDIX 1:

Jasmax Ltd 50% Architectural Preliminary Design Plan Set

Issued Drawing Sheet List

Sheet Number	Sheet Name	Revision
A1 - General Arrangement		
A1-1-000	COVERSHEET	A
A1-1-002	DRAWING CONVENTIONS	A
A1-1-010	LOCATION PLAN	A
A1-1-011	EXISTING SITE PLAN	A
A1-1-012	PROPOSED SITE PLAN	A
A1-1-099	SITEWIDE - PLAN LEVEL B1	A
A1-1-100	SITEWIDE - PLAN LEVEL 00	A
A1-1-101	SITEWIDE - PLAN LEVEL 01-07 TYPICAL	A
A1-1-108	SITEWIDE - PLAN LEVEL 08	A
A1-1-109	SITEWIDE - PLAN ROOF	A
A1-1-301	SITEWIDE - ELEVATIONS 1	A
A1-1-302	SITEWIDE - ELEVATIONS 2	A
A1-1-401	SITEWIDE - SECTIONS 1	A
A1-1-402	SITEWIDE - SECTIONS 2	A
A1-1-403	SITEWIDE - SECTIONS 3	A
A1-2-099	MAURANUI - PLAN LEVEL B1	A
A1-2-100	MAURANUI - PLAN LEVEL 00	A
A1-2-101	MAURANUI - PLAN LEVEL 01-07 TYPICAL	A
A1-2-108	MAURANUI - PLAN LEVEL 08	A
A1-2-109	MAURANUI - PLAN ROOF	A
A1-3-100	GREAT SOUTH RD - PLAN LEVEL 00	A
A1-3-101	GREAT SOUTH RD - PLAN LEVEL 01-07 TYPICAL	A
A1-3-108	GREAT SOUTH RD - PLAN LEVEL 08	A
A1-3-109	GREAT SOUTH RD - PLAN ROOF	A
A4 - External Enclosure		
A4-2-011	MAURANUI - FACADE SECTIONS 1	A
A4-2-012	MAURANUI - FACADE SECTIONS 2	A
A4-2-015	MAURANUI - TYPICAL BALCONY	A
A4-3-011	GREAT SOUTH ROAD - FACADE SECTIONS 1	A
A5 - Internal Enclosure		
A5-2-511	MAURANUI - STAIR 1	A
A5-2-512	MAURANUI - STAIR 1	A
A5-2-513	MAURANUI - STAIR 2	A
A5-2-514	MAURANUI - STAIR 2	A
A5-2-515	MAURANUI - STAIR 3	A
A5-3-511	GREAT SOUTH RD - STAIR 1	A
A5-3-512	GREAT SOUTH RD - STAIR 1	A
A5-3-513	GREAT SOUTH RD - STAIR 2	A
A5-3-514	GREAT SOUTH RD - STAIR 2	A
A5-4-001	COMMON - INTERIOR WALL TYPE DETAILS 1	A
A5-4-002	COMMON - INTERIOR WALL TYPE DETAILS 2	A
A5-4-901	COMMON - APARTMENT TYPOLOGY PLANS	A
A5-4-902	COMMON - APARTMENT TYPOLOGY PLANS	A
A9 - Schedules		
A9-2-100	MAURANUI - AREA PLANS	A
A9-3-100	GREAT SOUTH ROAD - AREA PLANS	A

Project Stellar

COVERSHEET A1-1-000 REV A

220210

50% PRELIMINARY DESIGN

JASMAX

A1-0002 General Notes

1 The Architectural drawings shall be read in conjunction with the associated specifications and conditions of contract. The drawings shall also be read in conjunction with any structural, services, civil and all other project drawings. Any discrepancies shall be referred to the Architect for resolution.

2 Verify all dimensions with structural, services, civil and all other project drawings prior to construction commencing. Refer all discrepancies to the Architect for resolution.

3 Substitution for or amendment of specified details or material shall not be carried out without approval of the Architect.

A1-0002 Abbreviations

(Generally in accordance with NZS/AS 1100)

*	Clear Width
A/C	Air Conditioning
AD	Above Datum
AFL	Above Floor Level
AGL	Above Ground Level
AHU	Air Handling Unit
AL	Aluminium
ALUM	Aluminium
AP	Access Panel
APPR	Approved
APPROX	Approximately
ASSY	Assembly
BDY	Boundary
BET	Between
BLDG	Building
BM	Bench Mark
BTM	Bottom
C/C	Centre to Centre
CAB	Cabinet
CAV	Cavity
CB	Coach Bolt
CCTV	Closed Circuit Television
CFL	Counterflashing
CHS	Circular Hollow Section
CJ	Control Joint
CL	Centre Line
CLG	Ceiling
CLR	Clearance
CNJ	Construction Joint
CODE	Building Code
COL	Column
COMMS	Communications
CONC	Concrete
CONT	Continuous
CORR	Corrugated
COS	Check on Site
COV	Cover
CP	Cesspit
CRS	Centres
CS	Countersunk
DB	Distribution Board
DEG	Degree
DHS	Dimond Hi-Span (Metal Purlin)
DIA	Diameter
DIAG	Diagonal
DIM	Dimension
DP	Downpipe
DPC	Damp Proof Course
DPM	Damp Proof Membrane
DR	Drain Rain
DRG	Drawing
DS	Drain Sewer
EA	Equal Angle
EJ	Expansion Joint
EQ	Equal
ETG	Existing
EW	Each Way
FB	From Below
FG	Fixed Glass
FGL	Finished Ground Level
FHR	Fire Hose Reel
FL	Floor Level
FTG	Footing
GALV	Galvanised
GRND	Ground
GT	Gully Trap
HD	Head
HDG	Hot Dipped Galvanised
HGR	Hanger
HOR	Horizontal
HVAC	Heating Ventilation and Air Conditioning
IB	Inspection Board
ID	Inside Diameter
IJ	Inspection Junction
IL	Invert Level
INFO	Information
kW	Kilowatt
L	Litre
LH	Left Hand
LN	Length
LNDG	Landing
LTG	Lighting

A1-0002 Abbreviations

M	Metre
MAS	Masonry
MAX.	Maximum
MECH	Mechanical
MEMB	Membrane
MH	Manhole
MIN.	Minimum
MJ	Movement Joint
mm	Millimetre
MS	Mild Steel
MSEA	Mild Steel Equal Angle
MSFL	Mild Steel Flat
MSPL	Mild Steel Plate
MSUA	Mild Steel Unequal Angle
NB	Nominal Bore
No.	Number
NOM	Nominal
NS	Near Side
NTS	Not To Scale
NZS	New Zealand Standard
O/A	Overall
O/F	Overflow
O/H	Overhead
OD	Outside Diameter
OPP HD	Opposite Hand
OPT	Optional
PC	Precast Concrete
PCD	Pitch Circle Diameter
PFC	Parallel Flange Channel
PL	Plate
QTY	Quantity
RAD	Radiata
RC	Reinforced Concrete
REF	Reference
REINF	Reinforcement
REQD	Required
REV	Revision
RH	Right Hand
RHS	Rectangular Hollow Section
RL	Reduced Level
RO	Rough Opening
ROW	Right of Way
SAN	Sanitary
SC	Sawcut Joint
SCHED	Schedule
SED	Small End Diameter
SF	Strip Footing
SHS	Square Hollow Section
SHT	Sheet
SIM	Similar
SK	Sketch
SL	Structural Level
SP	Soil Pipe
SPEC	Specification
SQ	Square
SQ/M	Square Metre
SS	Stainless Steel
SSL	Structural Slab Level
STC	Sound Transmission Class
T.O	Top Of
TA	To Above
TB	Tie Beam
TBA	To Be Advised
TBC	To Be Confirmed
TFC	Tapered Flange Channel
TGV	Tongue, Groove and Vee Joint
THK	Thick
THR	Threshold
TV	Terminal Vent
TYP	Typical
U/S	Underside
UA	Unequal Angle
UB	Universal Beam
UC	Universal Column
UNO	Unless Noted Otherwise
VERT	Vertical
W	Watt
WB	Welded Beam
WC	Welded Column
WPR	Waterproofing
WT	Wall Thickness

Drawing Number

A = Producer Discipline (e.g.. A is Architectural)

1 = Drawing Category CBI Code (e.g.. 1 is General)

X = Drawing Package where:
1 = Sitewide Drawings
2 = Maurauui Building
3 = Great South Road Building
4 = Common Details
5 = Exterior Works
6 = Landscape

101 = Sheet Number (Refer Drawing List)

ARCHITECTURAL
Drawing Number: A1-X-101 Revision: A

Plan, Section, Elevation or Detail view titles

Number
for plan, section, elevation or detail

2 West Elevation
A1-1001 1:100 Elevation

Back Reference
to the drawing sheet that the detail is referenced from

Plan, Section, Elevation or Detail Reference symbols

2 / A1-1001 — **PLAN DETAILS**

2 / A1-1001 — **SECTION DETAILS**

2 / A1-1001 — **LONG & CROSS SECTIONS**

2 / A1-1001 — **EXTERNAL ELEVATIONS**

1 / 2 / 3 / 4 / A1-1001 — **INTERNAL ELEVATIONS**

Drawing Annotation

Openings

Refer to the floor plans & the door & window schedules for the rough opening sizes, finishes, hardware & furniture.

OPENING NUMBERS

D4.16-1 (UL)
D Opening Type (Door)
4.16 Space Number
1 Consecutive identifier

EXTERNAL WINDOW NUMBERS

WN4.1
WN Opening Type (Window North)
4 Level 4
1 Consecutive identifier

Wall Type Symbol

WTxx — Unique Wall Type number relating to the Partition wall section details

The Wall Type Coding references a Wall Type detail sheet plus schedule of wall type build ups.

Performance Rating Key

Fire Rating (Red)
Acoustic Rating (Green)
Fire and Acoustic Rating (Blue)

Floor Finishes Symbol

CO2

Read in conjunction with the specific legends which are located on either the floor plans or on a separate legends sheet

Ceiling Type Symbol

C1

Read in conjunction with the specific legends which are located on either the reflected ceiling plans or on a separate legends sheet

Wall Finishes Symbol

Read in conjunction with the specific legends which are located on either the floor plans or on a separate legends sheet

Space Numbering

1.02 OFFICE
1 Level Number
02 Space Number
OFFICE Space Name

Expression of Levels

Levels shown are in terms of city datum
(Mean Sea Level = 0)
Levels as per as 1100.301-1985

+ SPOT LEVEL

FFL — Finished floor level. For areas with carpet, tiles, vinyl, stone etc. To be shown on floor plans

FCL — Finished ceiling level

SL — Structural surface level.
For concrete work SL includes all concrete topping slabs and leveling screeds

FFL — Finished floor levels shown on sections and elevations

RL — Relative level shown on sections and details

Grid References

1 / A — **Project Grid References**

Letters in the vertical direction and Numbers in the horizontal direction with dimensions to show the distance between the grid lines

CBI Code & Categories

General
10 General

Site
21 Demolition
22 Preparation and Groundwork
23 Foundations
24 Minor Demolition and Alterations

Structure
31 Concrete
32 Earth
33 Masonry
34 Steel
35 Stainless Steel
36 Aluminium
37 Other Metals
38 Timber
39 Plastics

Enclosure
41 Tanking and Damp-proofing
42 Cladding
43 Roofing and Decking
44 Membrane Roofing
45 Windows, Doors and Roof Lights
46 Glazing
47 Insulation
48 Sealants

Interior
51 Linings
52 Partitions
53 Ceilings
54 Access Floors
55 Joinery Fixtures
56 Specialist Equipment and Assemblies
57 Furniture and Appliances
58 Signs and Features
59 Stairs and Ramps

Finishes
61 Applied Coatings
62 Tiling
63 Sheet, Slab and Panel Wall Surfacing
64 Resilient Surfacing
65 Carpeting
66 Flooring Ancillaries
67 Painting and Paper Hanging

Services (in walls and underground)
71 Liquid (Sanitary, Tapware, Fixtures, etc.)
72 Gas
73 Fire Suppression
74 Plumbing and Drainage (incl. downpipes)
75 Heating and Cooling
76 Ventilation and Air Conditioning
77 Electrical and Lighting
78 Communications and Controls
79 Transport

External
81 Retaining Walls
82 Roads and Paving
83 Landscaping and Planting
84 Site Fittings
85 Engineering Works
86 Specialist Structures

KEYNOTES

Number
Specification Section & Clause Number

Title (in capitals)
Specification Clause Heading - Material Description

4311-4.6
DIMOND BB900 UNPAINTED ZINCALUME ROOFING

Revisions
A 50% PRELIMINARY DESIGN 01/04/2022

Notes

If there are any discrepancies in the documents please seek clarification before proceeding with any work.

No building work shall proceed until Building Consent has been granted for the work described.

JASMAX

Client
Dilworth Property Trust

Consultant Team
Enovate
Structural Engineer
Cosgroves
Services (MEP) Engineers
Earcon
Acoustic Engineer
Blue Barn
Civil Engineer

Project Number: 220210
Project Stellar
76 & 80 Great South Road, Epsom, Auckland 1051

Sheet
DRAWING CONVENTIONS

SCALE @ A1= 1 : 1

ARCHITECTURAL
Drawing Number: A1-1-002 Revision: A

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Sheet

LOCATION PLAN

SCALE @A1= 1 : 500

ARCHITECTURAL

Drawing Number Revision

A1-1-010 A

DO NOT SCALE OFF THIS DRAWING.
CONTRACTOR MUST VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING ANY WORK.

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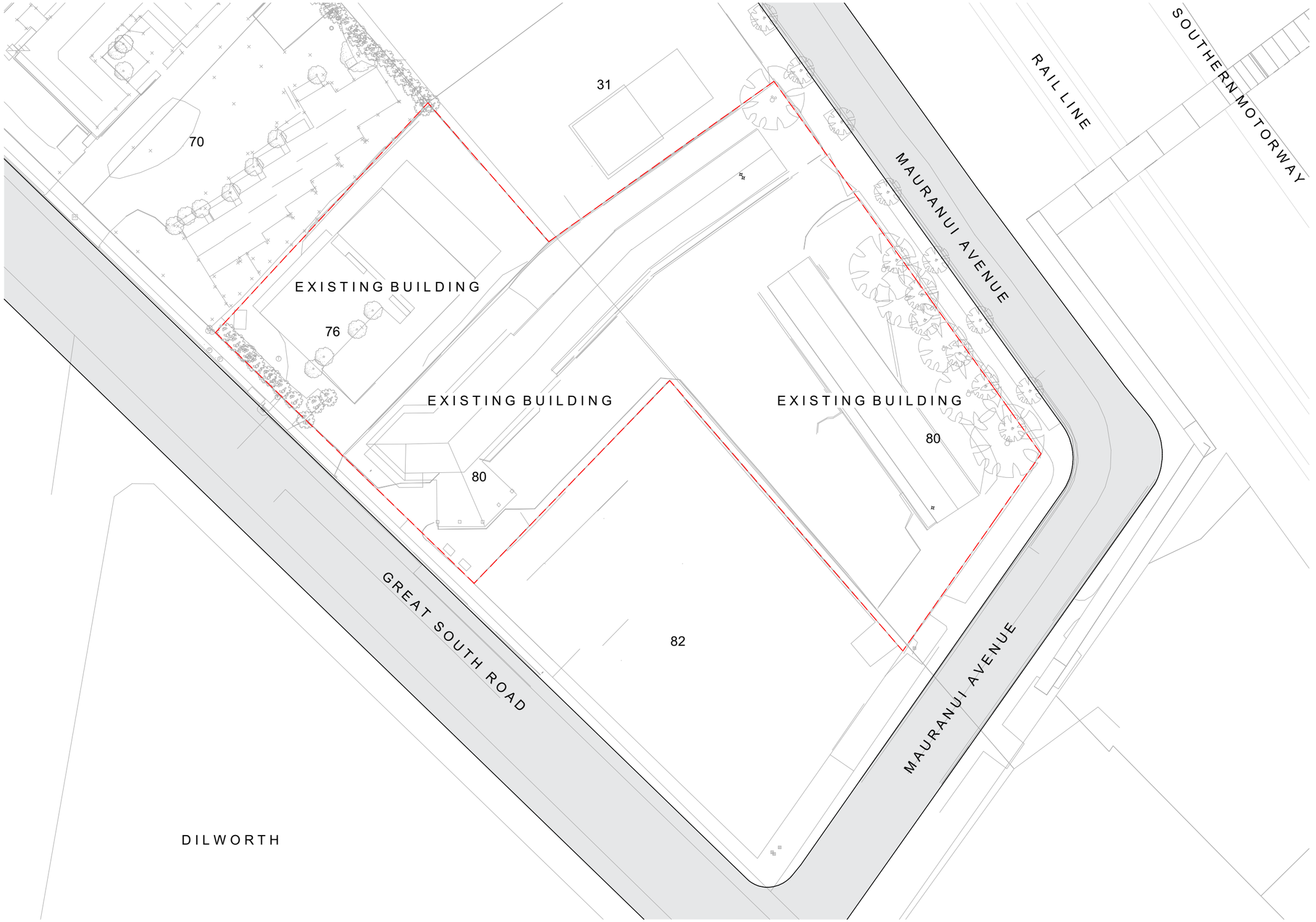

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Sheet

EXISTING SITE PLAN

SCALE @ A1=1 : 250

ARCHITECTURAL

Drawing Number Revision

A1-1-011 A

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Sheet

PROPOSED SITE PLAN

SCALE @ A1=1 : 250

ARCHITECTURAL

Drawing Number Revision

A1-1-012 A

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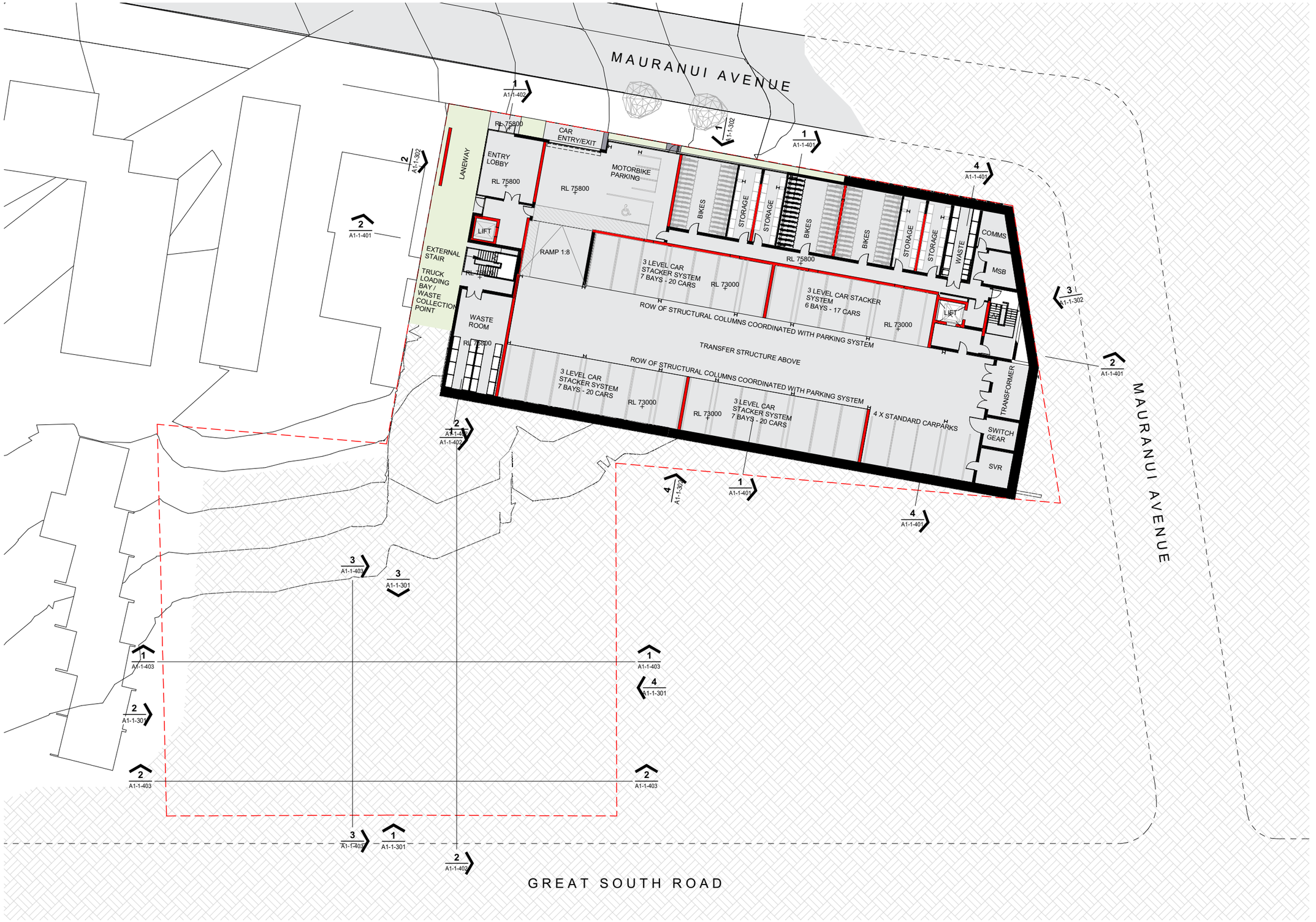

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76 & 80 Great South Road, Epsom, Auckland 1051

Sheet

SITEWIDE - PLAN LEVEL B1

SCALE @ A1= 1 : 200

ARCHITECTURAL

Drawing Number: A1-1-099

Revision: A

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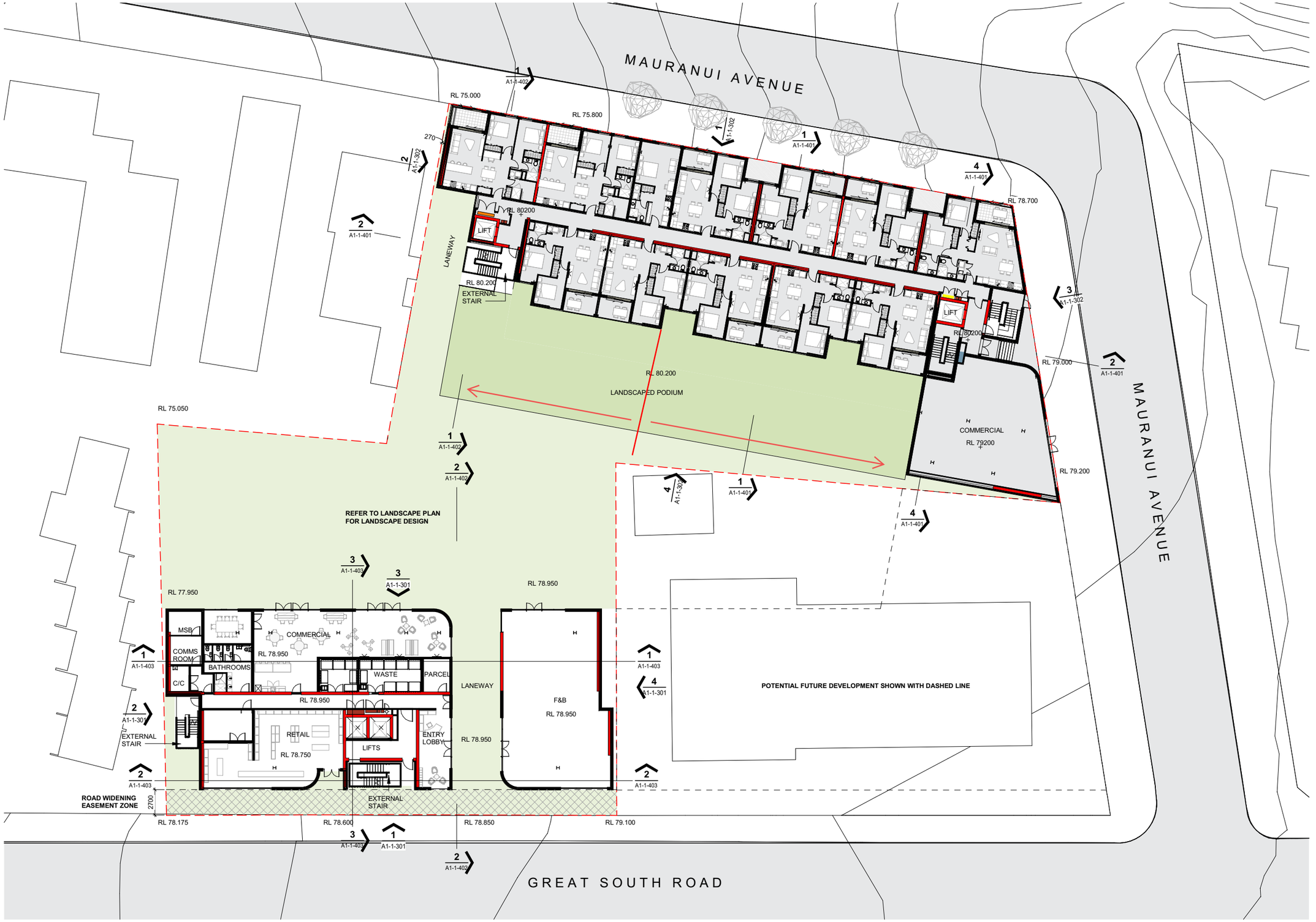

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Sheet

SITEWIDE - PLAN LEVEL 00

SCALE @ A1= 1 : 200

ARCHITECTURAL

Drawing Number: A1-1-100 Revision: A

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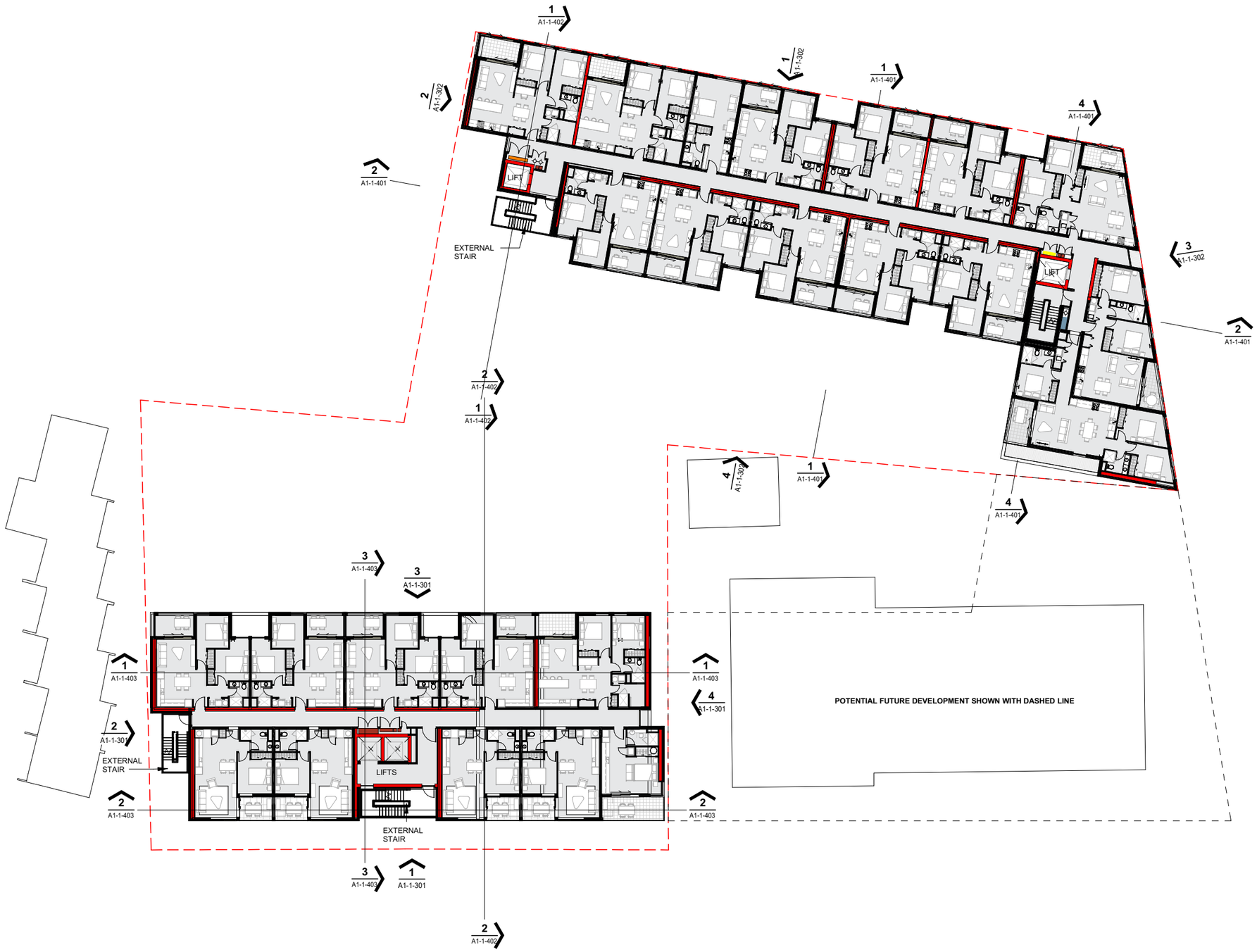

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Sheet

SITEWIDE - PLAN
LEVEL 01-07 TYPICAL

SCALE @ A1= 1 : 200

ARCHITECTURAL

Drawing Number: A1-1-101 Revision: A

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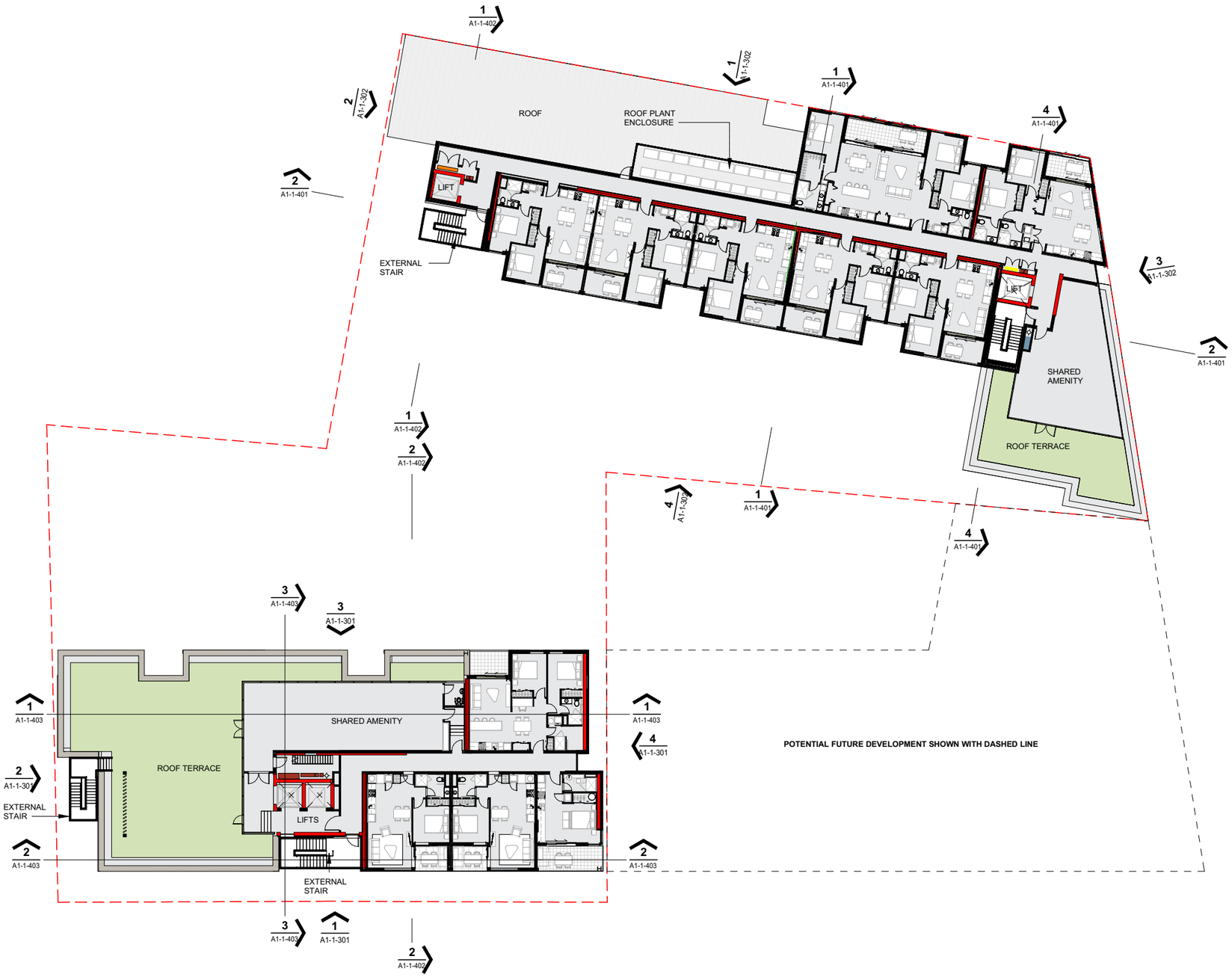

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Project Stellar

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Sheet

SITEWIDE - PLAN LEVEL 08

SCALE @ A1= 1 : 200

ARCHITECTURAL

Drawing Number: **A1-1-108** Revision: **A**

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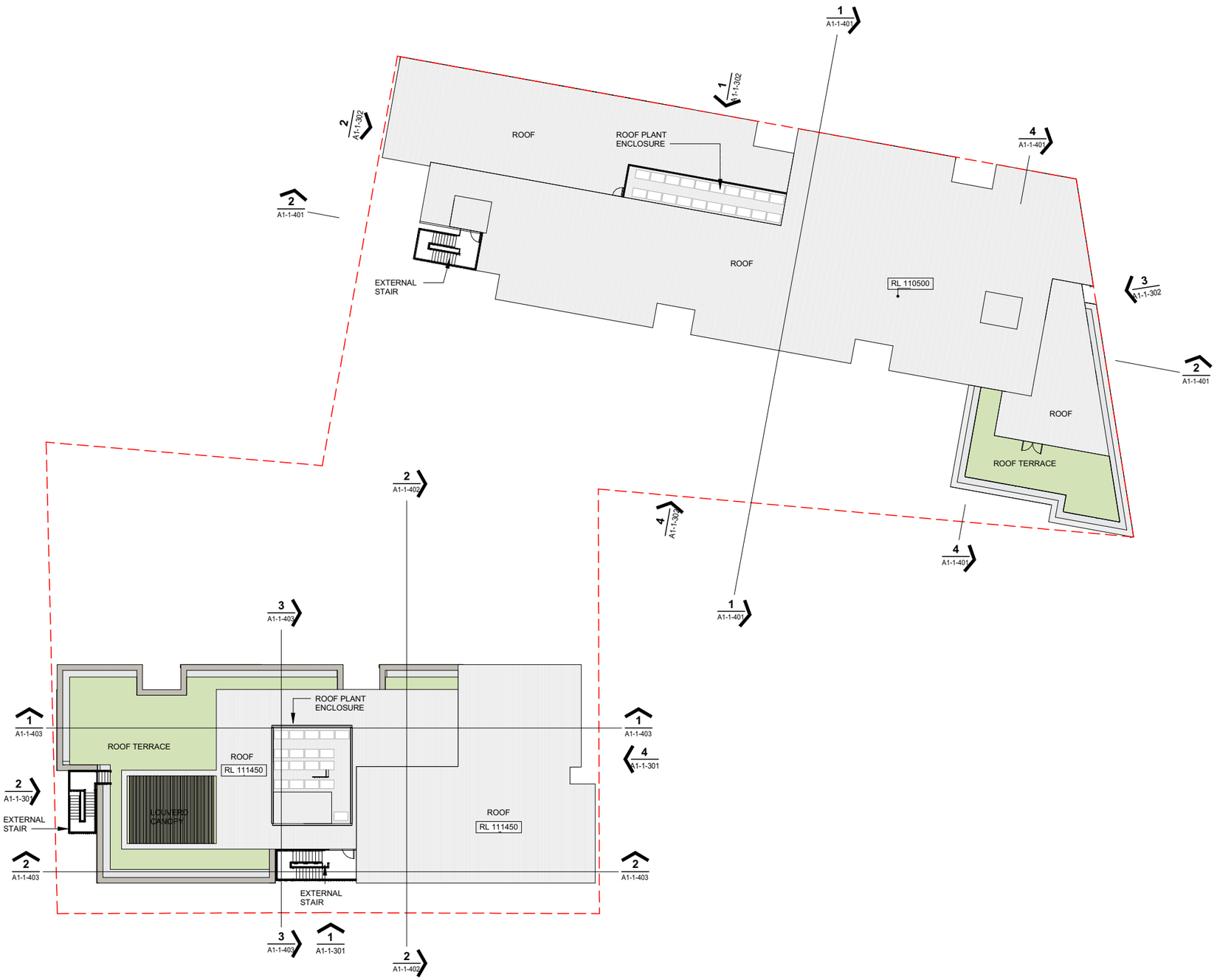

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Sheet

SITEWIDE - PLAN ROOF

SCALE @ A1= 1 : 200

ARCHITECTURAL

Drawing Number: A1-1-109

Revision: A

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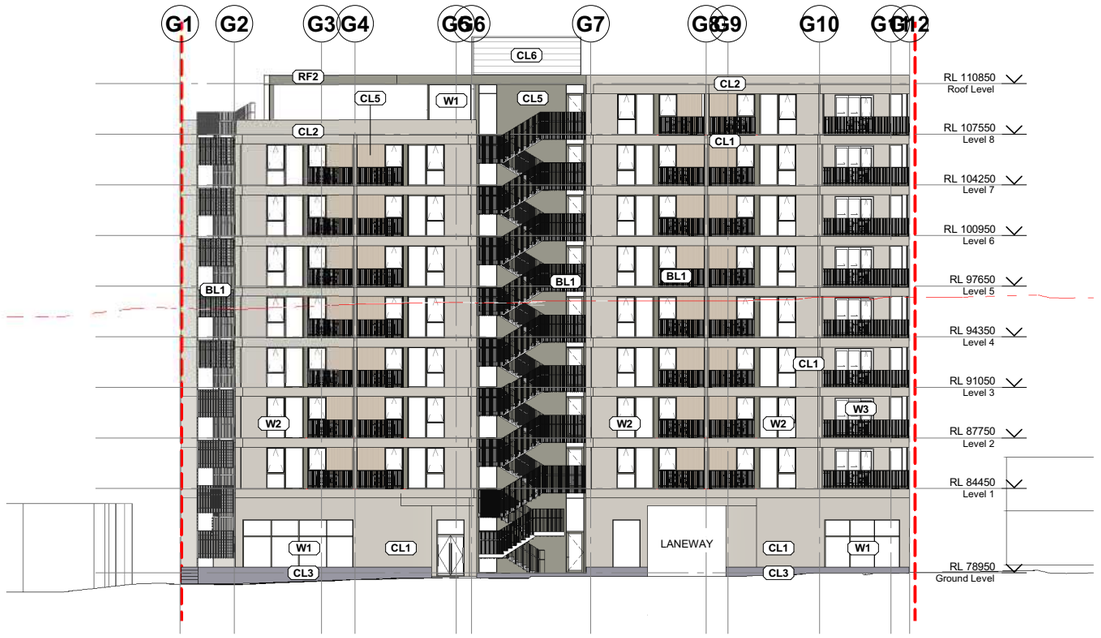
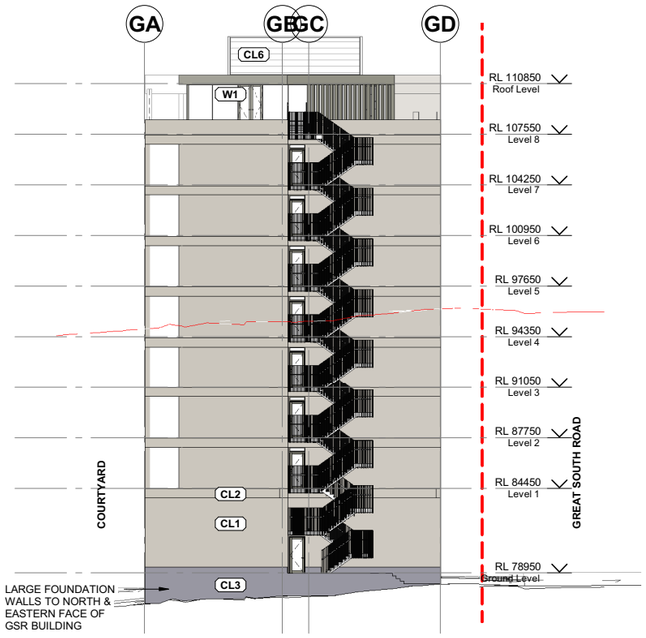
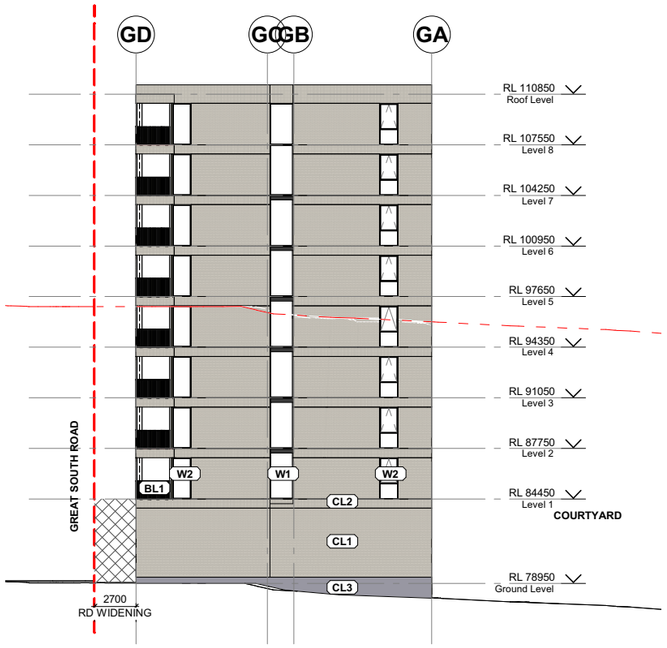


1 | 1 : 200 Elevation
A1-1-099 | GRT STH RD BLDG - EAST ELEVATION



2 | 1 : 200 Elevation
A1-1-099 | GRT STH RD



4 | 1 : 200 Elevation
A1-1-099 | GT STH RD - SOUTH ELEVATION

3 | 1 : 200 Elevation
A1-1-099 | GRT STH RD - EAST ELEVATION

MATERIALS FINISHES LEGEND

- CL1 BRICK VENEER ON TIMBER FRAME - RUNNING BOND
- CL2 BRICK VENEER ON TIMBER FRAME - SOLDIER COURSE
- CL3 CONCRETE WALL WITH DARK HONED FINISH
- CL4 ALUMINIUM PANEL ON TIMBER FRAME
- CL5 HPL WOOD LOOK CLADDING PANEL
- CL6 ALUMINIUM LOUVRE
- W1 COMMERCIAL GLAZING SYSTEM
- W2 RESIDENTIAL GLAZING
- W3 SLIDING GLAZED DOORS
- RF1 PROFILED METAL 'WARM ROOF' SYSTEM
- RF2 LOUVERED CANOPY
- BL1 ALUMINIUM FIN BALUSTRADE

50% PRELIMINARY DESIGN

Revisions

A 50% PRELIMINARY DESIGN 01/04/2022

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Project Number: 220210

Project Stellar

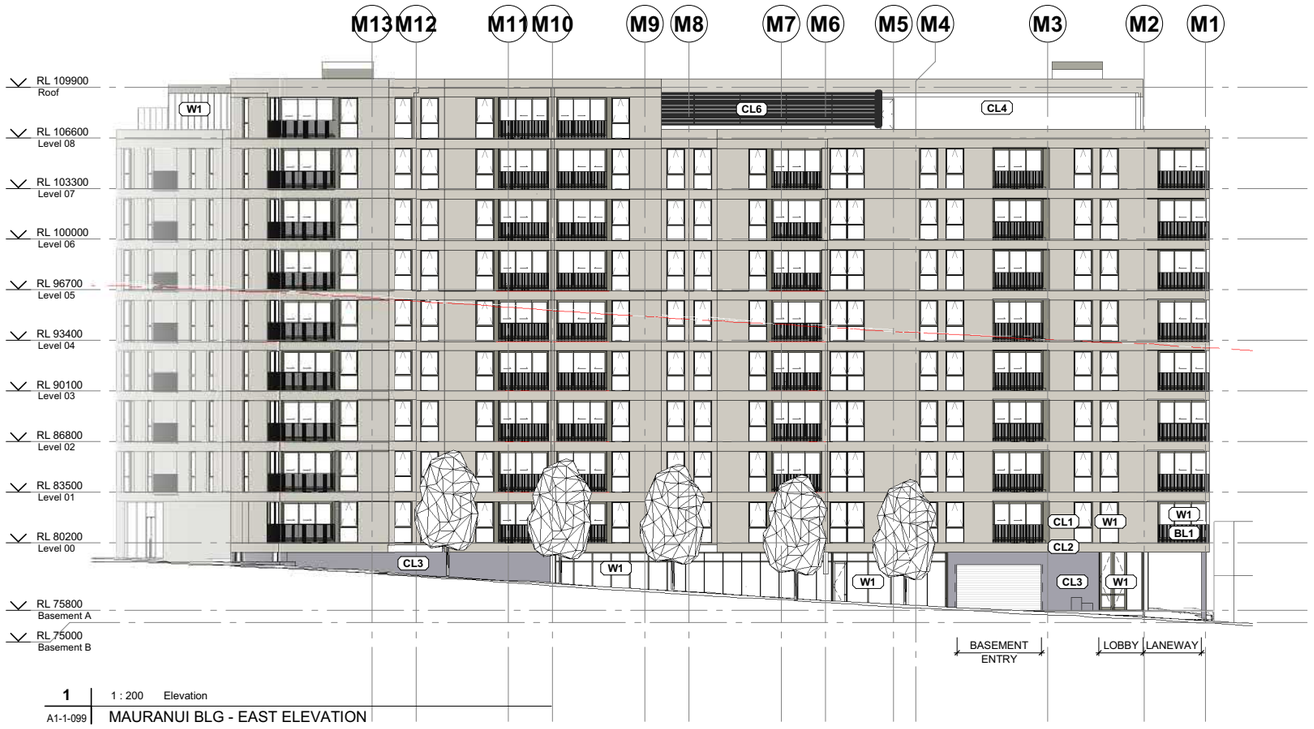
76 & 80 Great South Road, Epsom, Auckland 1051

Sheet
SITEWIDE - ELEVATIONS 1

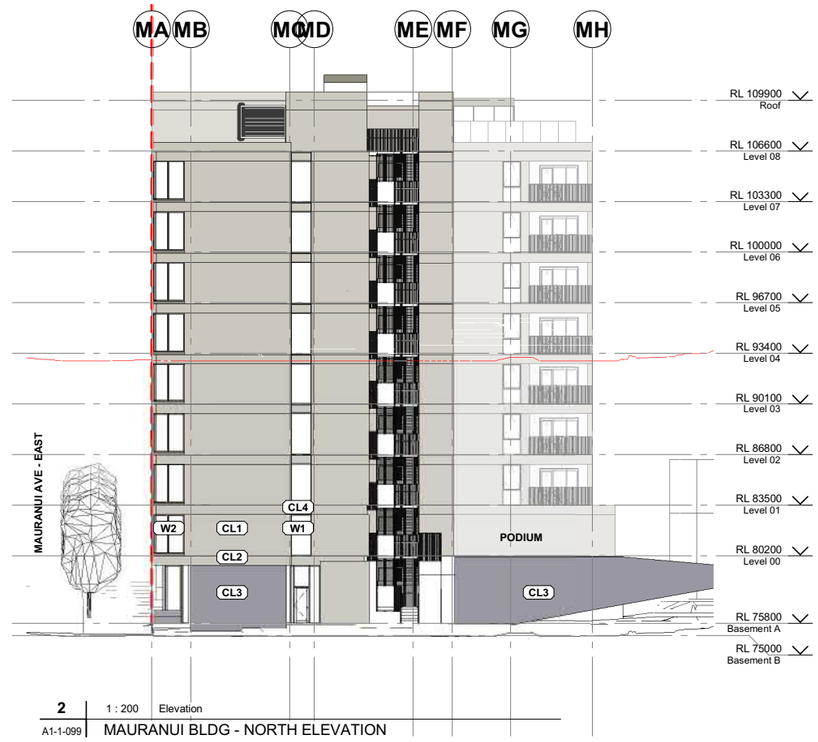
SCALE @ A1= 1 : 200

ARCHITECTURAL

Drawing Number: A1-1-301
Revision: A



1 | 1 : 200 Elevation
A1-1-099 | MAURANUI BLG - EAST ELEVATION



2 | 1 : 200 Elevation
A1-1-099 | MAURANUI BLDG - NORTH ELEVATION

3 | 1 : 200 Elevation
A1-1-099 | MAURANUI BLG - SOUTH ELEVATION

4 | 1 : 200 Elevation
A1-1-099 | MAURANUI BLD - WEST ELEVATION

MATERIALS FINISHES LEGEND

- CL1 BRICK VENEER ON TIMBER FRAME - RUNNING BOND
- CL2 BRICK VENEER ON TIMBER FRAME - SOLDIER COURSE
- CL3 CONCRETE WALL WITH DARK HONED FINISH
- CL4 ALUMINIUM PANEL ON TIMBER FRAME
- CL5 HPL WOOD LOOK CLADDING PANEL
- CL6 ALUMINIUM LOUVRE
- W1 COMMERCIAL GLAZING SYSTEM
- W2 RESIDENTIAL GLAZING
- W3 SLIDING GLAZED DOORS
- RF1 PROFILED METAL 'WARM ROOF' SYSTEM
- RF2 LOUVERED CANOPY
- BL1 ALUMINIUM FIN BALUSTRADE

50% PRELIMINARY DESIGN

Revisions

A 50% PRELIMINARY DESIGN 01/04/2022

Notes

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JASMAX

Client
Dilworth Property Trust

Consultant Team
Enovate
Structural Engineer
Cosgroves
Services (MEP) Engineers
Earcon
Acoustic Engineer
Blue Barn
Civil Engineer

Project Number: 220210

Project Stellar

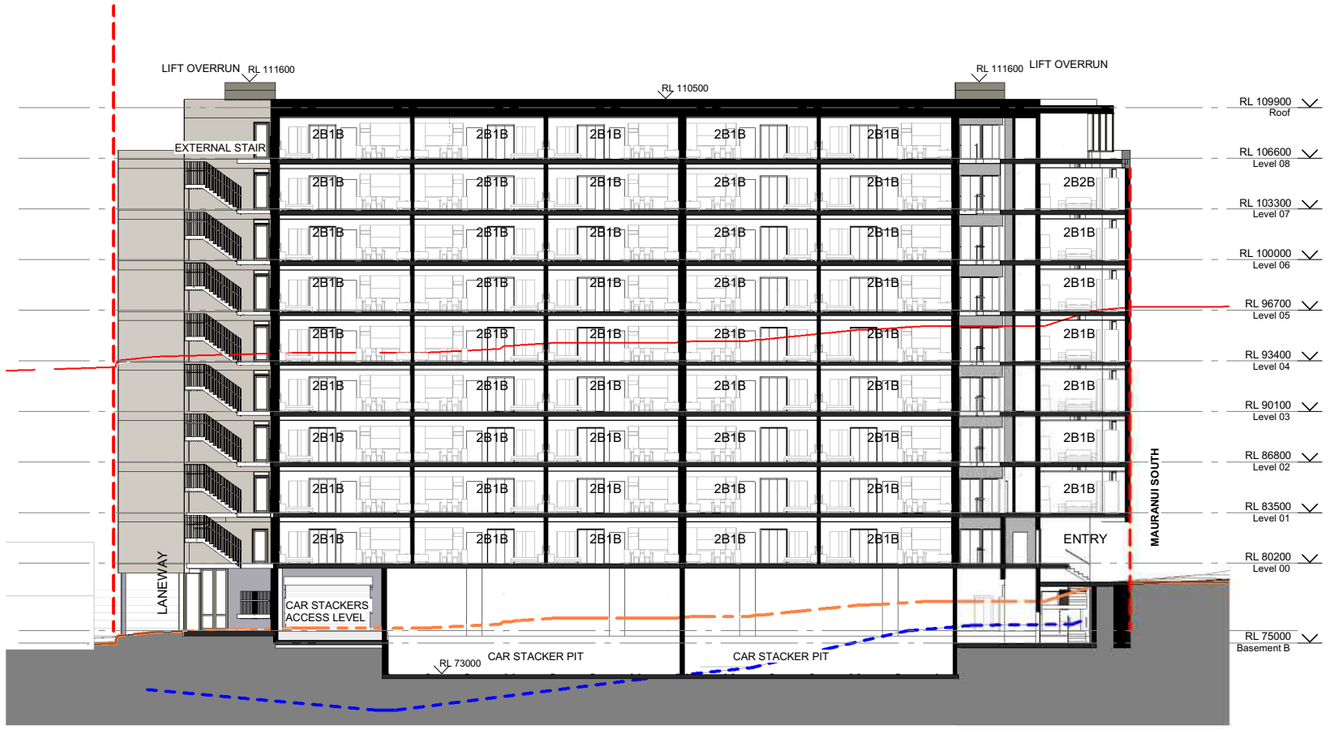
76 & 80 Great South Road, Epsom, Auckland 1051

Sheet
SITEWIDE - ELEVATIONS 2

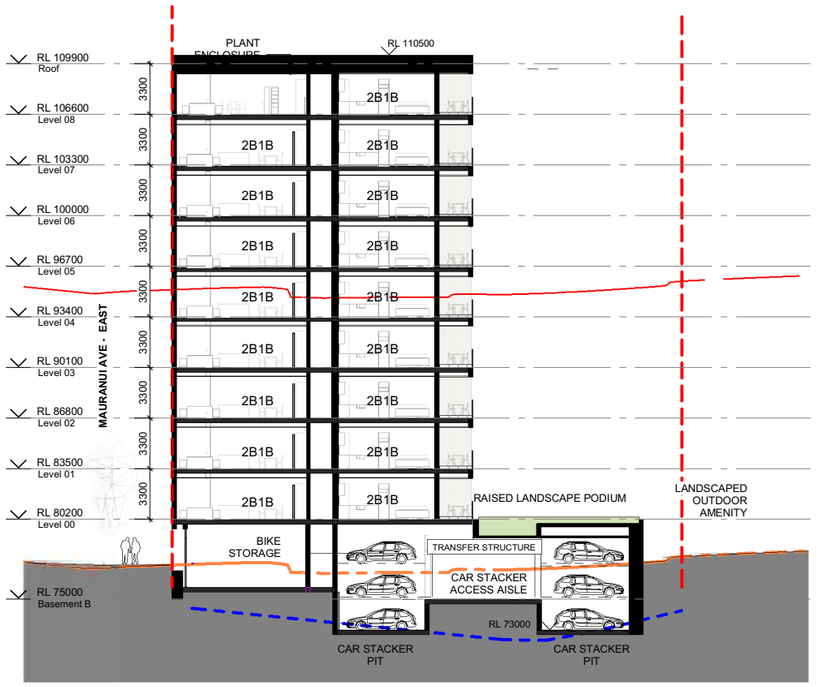
SCALE @ A1= 1 : 200

ARCHITECTURAL

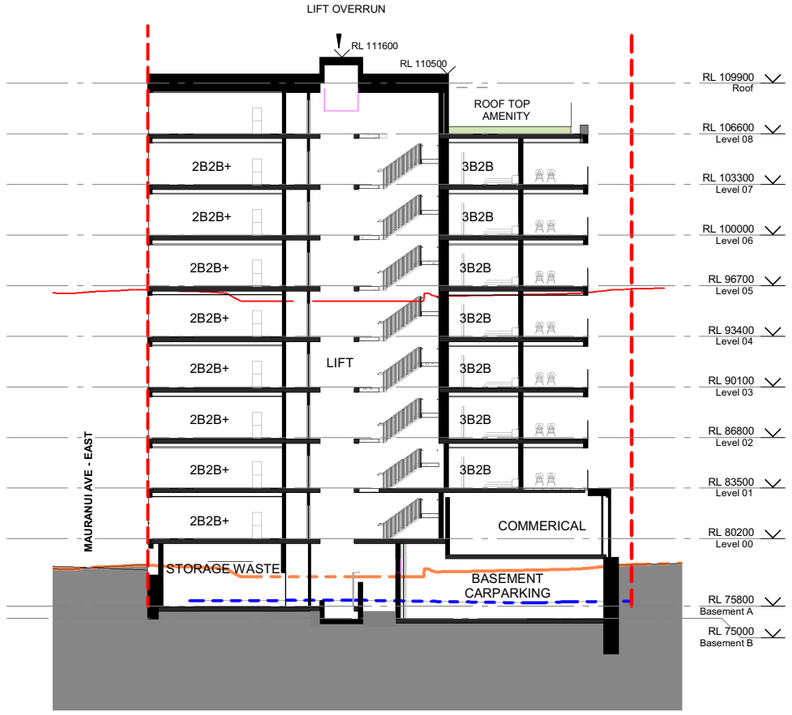
Drawing Number: A1-1-302
Revision: A



2 | 1 : 200 Section
A1-1-099 | MAURANUI - SECTION 1



1 | 1 : 200 Section
A1-1-099 | MAURANUI - SECTION 2



4 | 1 : 200 Section
A1-1-099 | MAURANUI - SECTION 3

SECTION KEY

- 18M ROLLING HEIGHT PLANE
- EXISTING TOPOGRAPHY
- APPROXIMATE BASALT LAYER

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Civil Engineer

Project Number: 220210

Project Stellar

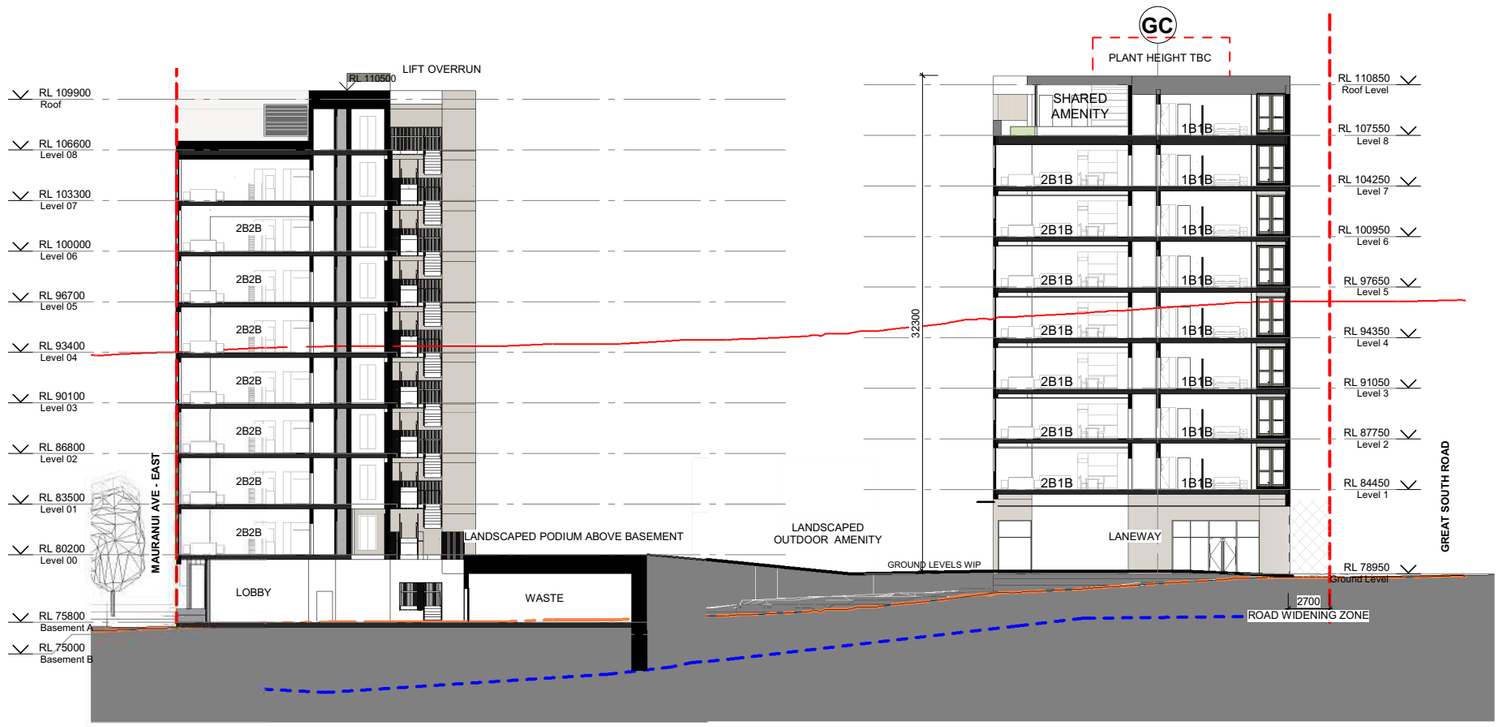
76 & 80 Great South Road, Epsom, Auckland 1051

Sheet
SITEWIDE - SECTIONS 1

SCALE @ A1= 1 : 200

ARCHITECTURAL

Drawing Number: A1-1-401
Revision: A



1 | 1 : 200 Section
A1-1-099 | SITE WIDE - SECTION 1

2 | 1 : 200 Section
A1-1-099 | SITE WIDE - SECTION 2

SECTION KEY

- 18M ROLLING HEIGHT PLANE
- EXISTING TOPOGRAPHY
- APPROXIMATE BASALT LAYER

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Project Number: 220210

Project Stellar

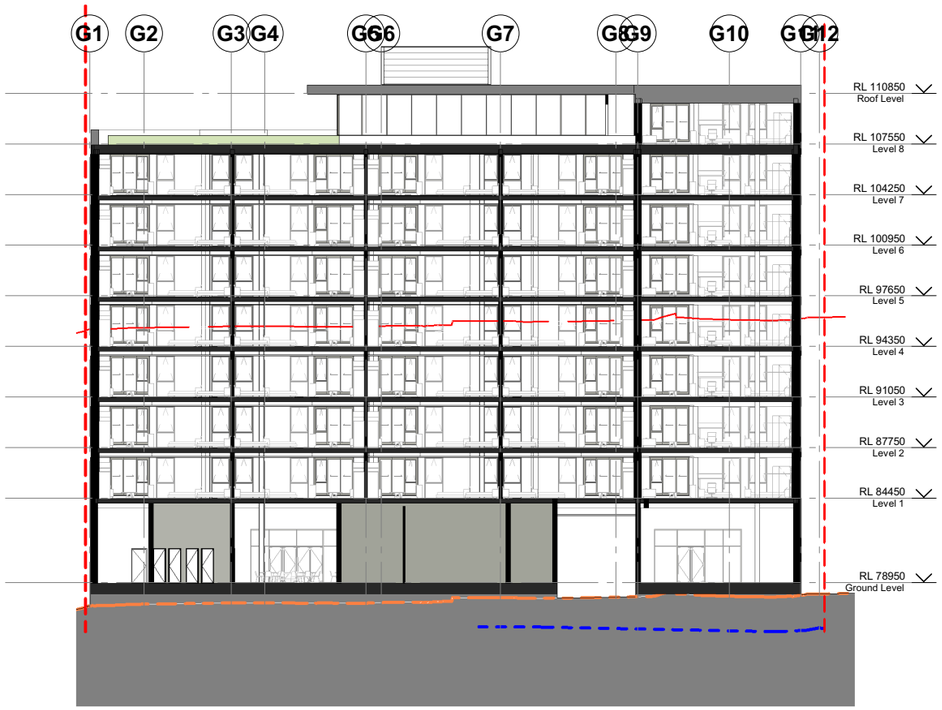
76 & 80 Great South Road, Epsom, Auckland 1051

Sheet
SITEWIDE - SECTIONS 2

SCALE @ A1= 1 : 200

ARCHITECTURAL

Drawing Number A1-1-402 Revision A



1 | 1 : 200 Long Section
A1-1-099 | GSRB LONG SECTION 1

2 | 1 : 200 Long Section
A1-1-099 | GSRB LONG SECTION 2

3 | 1 : 200 Cross Section
A1-1-099 | GRT STH RD - CROSS SECTION 1

SECTION KEY

- 18M ROLLING HEIGHT PLANE
- EXISTING TOPOGRAPHY
- APPROXIMATE BASALT LAYER

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Project Number: 220210

Project Stellar

76 & 80 Great South Road, Epsom, Auckland 1051

Sheet
SITEWIDE - SECTIONS 3

SCALE @ A1= 1 : 200

ARCHITECTURAL

Drawing Number Revision
A1-1-403 A

M1 M2 M3 M4 M5 M6 M7 M8 M9 M10 M11 M12 M13 M14

MA MB MC MD ME MF MG MH

5500
HEIGHT TBC
CAR ENTRY/EXIT

LANEWAY

ENTRY
LOBBY
RL 75500

RL 75500

MOTORBIKE
PARKING

BIKES | STORAGE | STORAGE | BIKES | BIKES | STORAGE | STORAGE | WASTE | COMMS

3 A4-2-011

3 A4-2-011

RL 75500

3100

7700

MSB
RL 75500

RL 75500

LIFT
RL 75500

RAMP 1:8

3 LEVEL CAR
STACKER SYSTEM
7 BAYS - 20 CARS

3 LEVEL CAR STACKER
SYSTEM
6 BAYS - 17 CARS

LIFT
RL 75500

STAIR UNDER
REVIEW

RL 74700

EXTERNAL
STAIR

2 A4-2-011

ROW OF STRUCTURAL COLUMNS COORDINATED WITH PARKING SYSTEM

TRUCK
LOADING BAY /
WASTE
COLLECTION
POINT

TRANSFORMER

TRANSFER STRUCTURE ABOVE
RL 74700

WASTE ROOM
RL 75500

ROW OF STRUCTURAL COLUMNS COORDINATED WITH PARKING SYSTEM

SWITCHGEAR

10630

3 LEVEL CAR
STACKER SYSTEM
7 BAYS - 20 CARS

2 A4-2-011

3 LEVEL CAR
STACKER SYSTEM
7 BAYS - 20 CARS

4 X STANDARD CARPARKS

SVR

1 A4-2-011

5490

LANDSCAPE RETAINING WALL

1 A4-2-011

BOUNDARY

ZONE THAT COULD HAVE ALLOWANCE
FOR VENTILATION (LOUVRES ABOVE
PILE CAP) EXTENT TBC

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Revisions

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Civil Engineer

Project Number: 220210

Project Stellar

76 & 80 Great South Road, Epsom, Auckland 1051

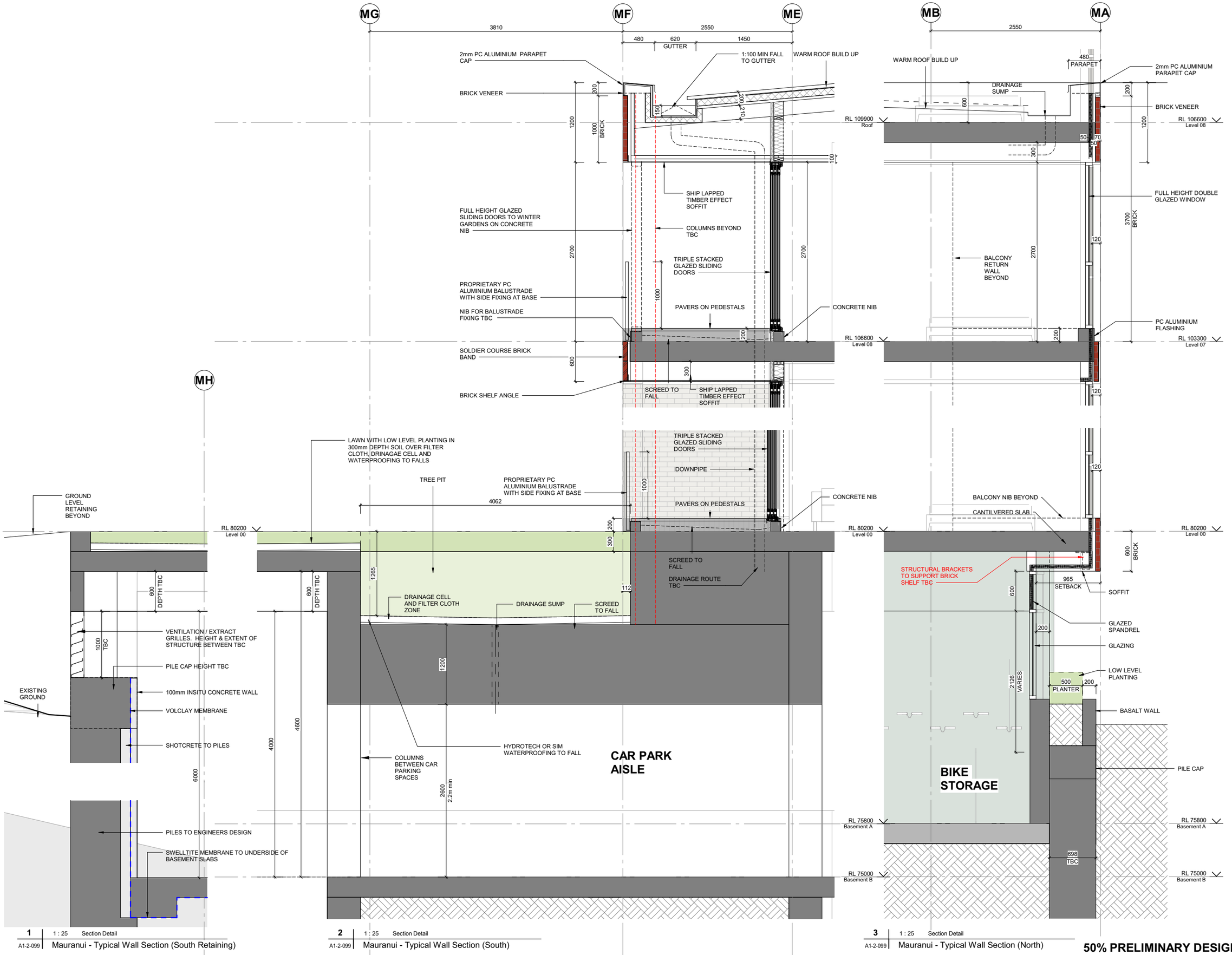
Sheet
MAURANUI - PLAN LEVEL B1

SCALE @ A1= 1 : 100

ARCHITECTURAL

Drawing Number: A1-2-099
Revision: A

DO NOT SCALE OFF THIS DRAWING
CONTRACTOR MUST VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING ANY WORK



1 | 1 : 25 | Section Detail
A1-2-099 | Mauranui - Typical Wall Section (South Retaining)

2 | 1 : 25 | Section Detail
A1-2-099 | Mauranui - Typical Wall Section (South)

3 | 1 : 25 | Section Detail
A1-2-099 | Mauranui - Typical Wall Section (North)

50% PRELIMINARY DESIGN

Revisions

A 50% PRELIMINARY DESIGN 01/04/2022

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Civil Engineer

Project Number: 220210

Project Stellar

76 & 80 Great South Road, Epsom, Auckland 1051

Sheet
MAURANUI - FACADE SECTIONS 1

SCALE @ A1= 1 : 25

ARCHITECTURAL

Drawing Number: A4-2-011
Revision: A

APPENDIX 2:

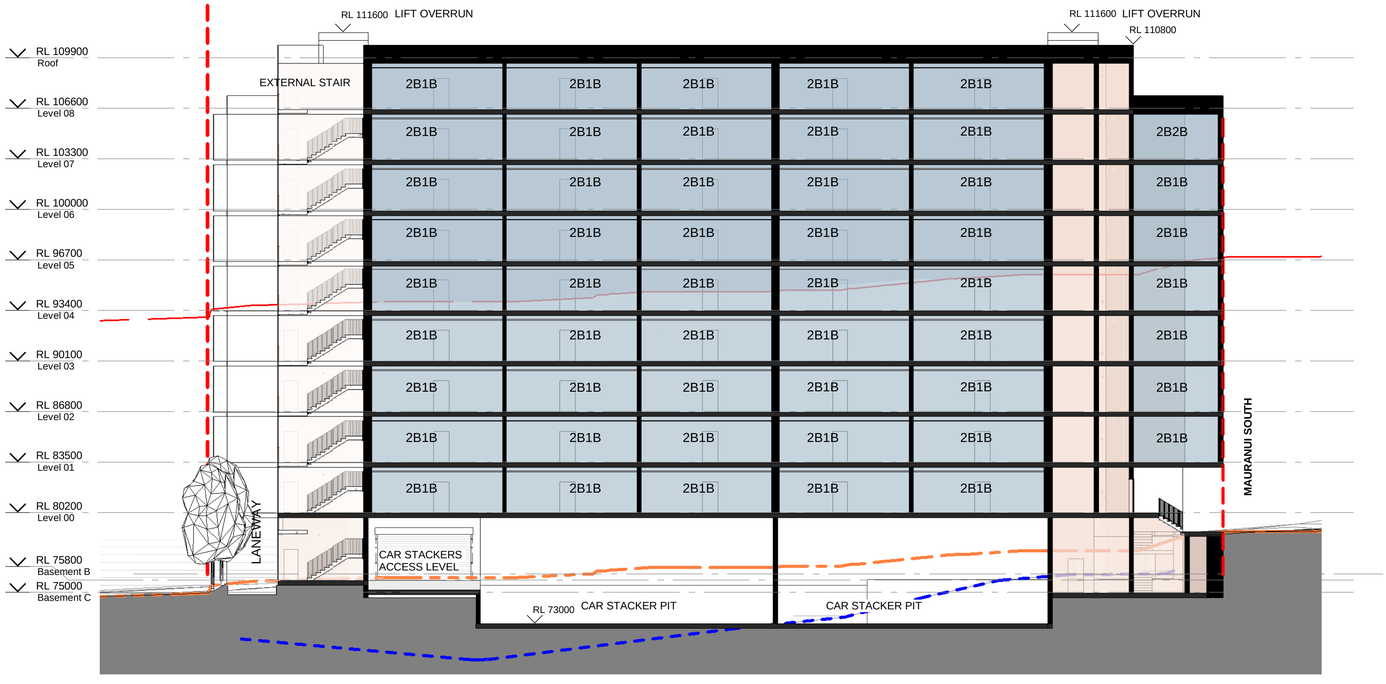
Enovate Ltd WIP Structural Plan Set

STELLAR PROJECT NORTH BUILDING

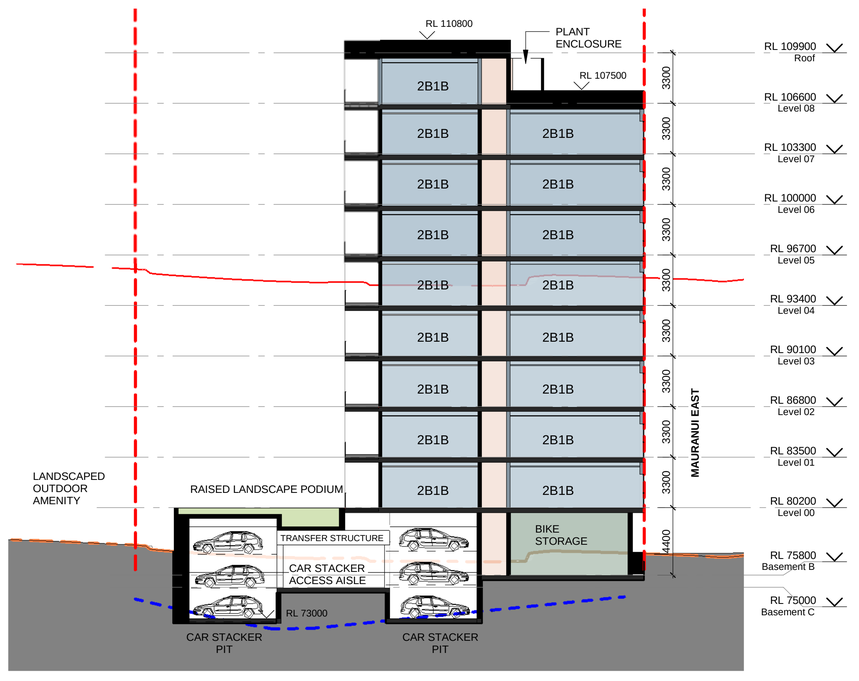
21-0055

ISSUED --.--.--

STRUCTURAL DRAWING LIST				
DRG No.	REV	TITLE	DATE	DESIGN STATUS
S000	-	COVER SHEET	--.--.--	FOR INFORMATION
S100	-	MAURANUI BUILDING FOUNDATION PLAN	--.--.--	FOR INFORMATION
S115	-	MAURANUI BUILDING BASEMENT PLAN	--.--.--	FOR INFORMATION
S120	-	MAURANUI BUILDING LEVEL 00 PLAN	--.--.--	FOR INFORMATION
S125	-	MAURANUI BUILDING LEVEL 02 TO LEVEL 03 PLAN	--.--.--	FOR INFORMATION
S130	-	MAURANUI BUILDING LEVEL 04 PLAN	--.--.--	FOR INFORMATION
S135	-	MAURANUI BUILDING LEVEL 05 TO LEVEL 07 PLAN	--.--.--	FOR INFORMATION
S140	-	MAURANUI BUILDING LEVEL 08 PLAN	--.--.--	FOR INFORMATION
S145	-	MAURANUI BUILDING ROOF PLAN	--.--.--	FOR INFORMATION
S340	-	MAURANUI BUILDING BALCONY DETAIL	--.--.--	FOR INFORMATION



1 | 1 : 200 Section
SK-251 | MAURANUI - SECTION 1



2 | 1 : 200 Section
SK-251 | MAURANUI - SECTION 2

DRAWING STATUS:
FOR INFORMATION
PRECAST CONC. OPTION

ENOVATE CONSULTANTS

AMP CENTRE, LEVEL 12,
29 CUSTOMS STREET WEST,
AUCKLAND CITY, 1010
NEW ZEALAND

TEL: +64 9 320 3060

EMAIL: contact@enovate.co.nz

WEBSITE: www.enovate.co.nz

CLIENT:

Dilworth

SCALE
1 : 100

UNDER REVISION

DATE	REV	DATE	REVISION DESCRIPTION	DRAWN	ENG	DRG CHK	ENG CHK	APPROVER
MAR 2022	A	09.03.22	PRELIMINARY DESIGN	MX	MX	PM	PM	PM

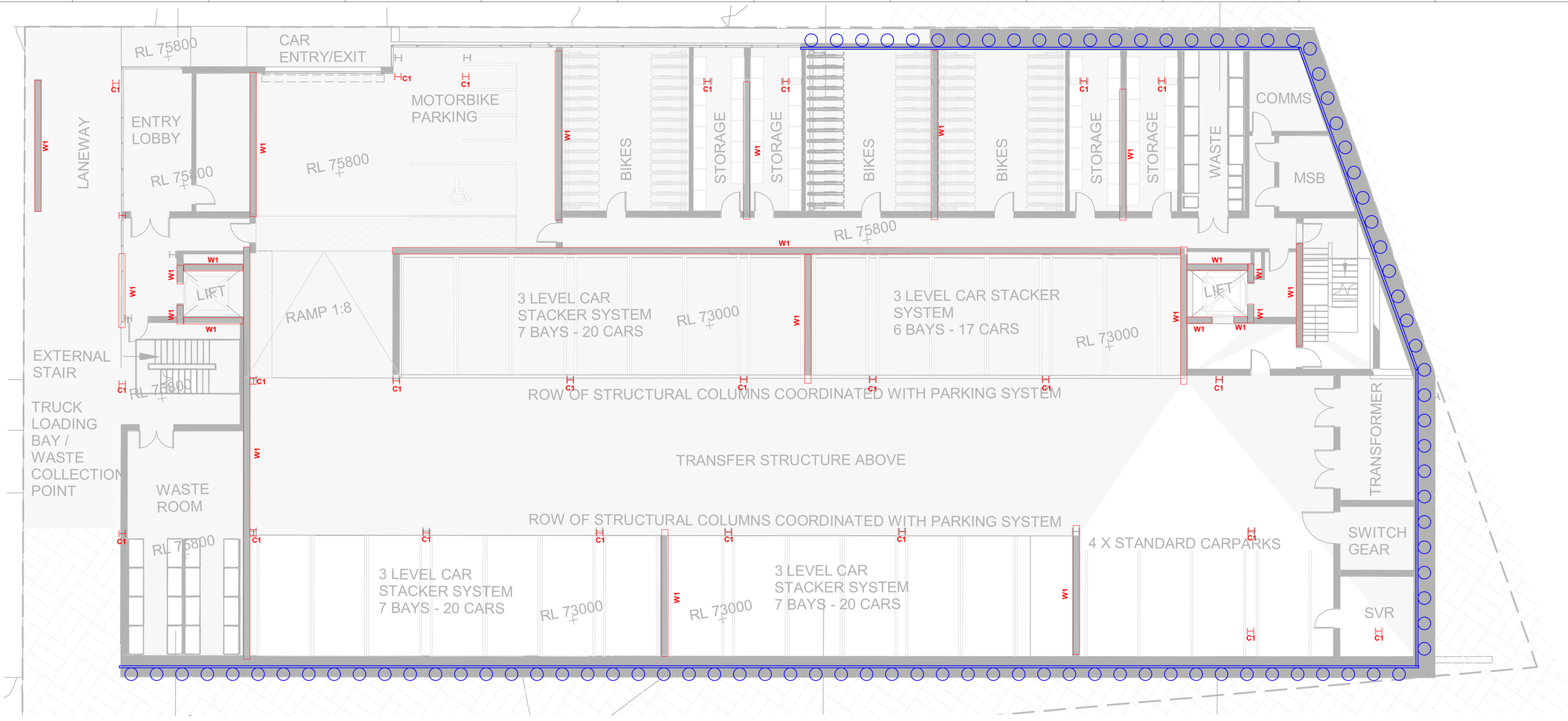
PROJECT:
STELLAR
PROJECT

DRAWING TITLE:
MAURANUI BUILDING
FOUNDATION PLAN

DRAWING STATUS:
FOR INFORMATION
PRECAST CONC. OPTION

PROJECT No.	SHEET No.	REV
21-0055	S100	A

ORIGINAL SHEET SIZE
A1 (841x594)



STRUCTURAL WALL SCHEDULE		
MARK	SIZE	REMARKS
W1	300 THK	PRECAST CONCRETE WALL
W2	230 THK	PRECAST CONCRETE WALL

COLUMN SCHEDULE		
MARK	SIZE	REMARKS
C1	310 UC 158	STEEL COLUMN
C2	250 UC 90	STEEL COLUMN

BEAM SCHEDULE		
MARK	SIZE	REMARKS
B1	460 UB 82	STEEL BEAM
B2	250 UB 37	STEEL BEAM
B3	530 UB 92	STEEL BEAM
B4	610 UB 101	STEEL BEAM
B5	1000 WB 215	TRANSFER BEAM
B6	1000 WB 296	TRANSFER BEAM
B7	1200 WB 455	TRANSFER BEAM
B8	1200 WB 455	TRANSFER BEAM
B9	410 UB 54	STEEL BEAM

FLOOR SCHEDULE		
MARK	SIZE	REMARKS
SFA	75 FLATSLAB + 100THK CONC TOPPING	PROPPED DURING CONSTRUCTION TO MANUFACTURER'S SPECIFICATION
SFB	75 FLATSLAB + 125THK CONC TOPPING	PROPPED DURING CONSTRUCTION TO MANUFACTURER'S SPECIFICATION
125 SOG	125THICK CONC ON GROUND	PROPPED DURING CONSTRUCTION TO MANUFACTURER'S SPECIFICATION

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NEW ZEALAND
TEL: +64 9 320 3060
EMAIL: contact@enovate.co.nz
WEBSITE: www.enovate.co.nz

CLIENT: Dilworth

SCALE 1 : 100

DATE MAR 2022

REV	DATE	REVISION DESCRIPTION	DRAWN	ENG	DRG CHK	ENG CHK	APPROVER
A	09.03.22	PRELIMINARY DESIGN	MX	MX	PM	PM	PM

UNDER REVISION

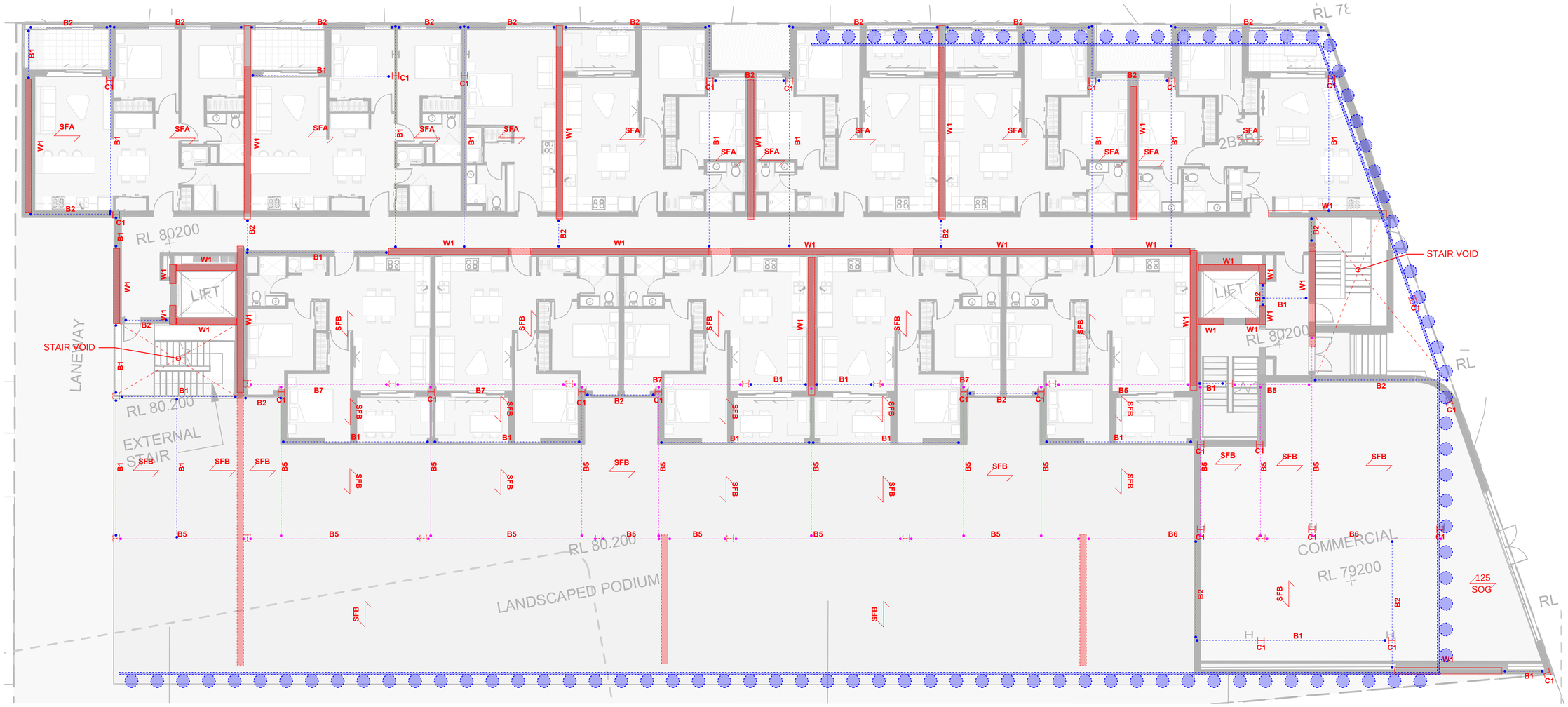
PROJECT: STELLAR PROJECT

DRAWING TITLE: MAURANUI BUILDING BASEMENT PLAN

DRAWING STATUS: FOR INFORMATION
PRECAST CONC. OPTION

PROJECT No.	SHEET No.	REV
21-0055	S115	A

ORIGINAL SHEET SIZE A1 (841x594)



STRUCTURAL WALL SCHEDULE		
MARK	SIZE	REMARKS
W1	300 THK	PRECAST CONCRETE WALL
W2	230 THK	PRECAST CONCRETE WALL

COLUMN SCHEDULE		
MARK	SIZE	REMARKS
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C2	250 UC 90	STEEL COLUMN

BEAM SCHEDULE		
MARK	SIZE	REMARKS
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B2	250 UB 37	STEEL BEAM
B3	530 UB 92	STEEL BEAM
B4	610 UB 101	STEEL BEAM
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B6	1000 WB 296	TRANSFER BEAM
B7	1200 WB 455	TRANSFER BEAM
B8	1200 WB 455	TRANSFER BEAM
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FLOOR SCHEDULE		
MARK	SIZE	REMARKS
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SCALE 1 : 100

DATE MAR 2022

UNDER REVISION

REV	DATE	REVISION DESCRIPTION	DRAWN	ENG	DRG CHK	ENG CHK	APPROVER
A	09.03.22	PRELIMINARY DESIGN	MX	MX	PM	PM	PM

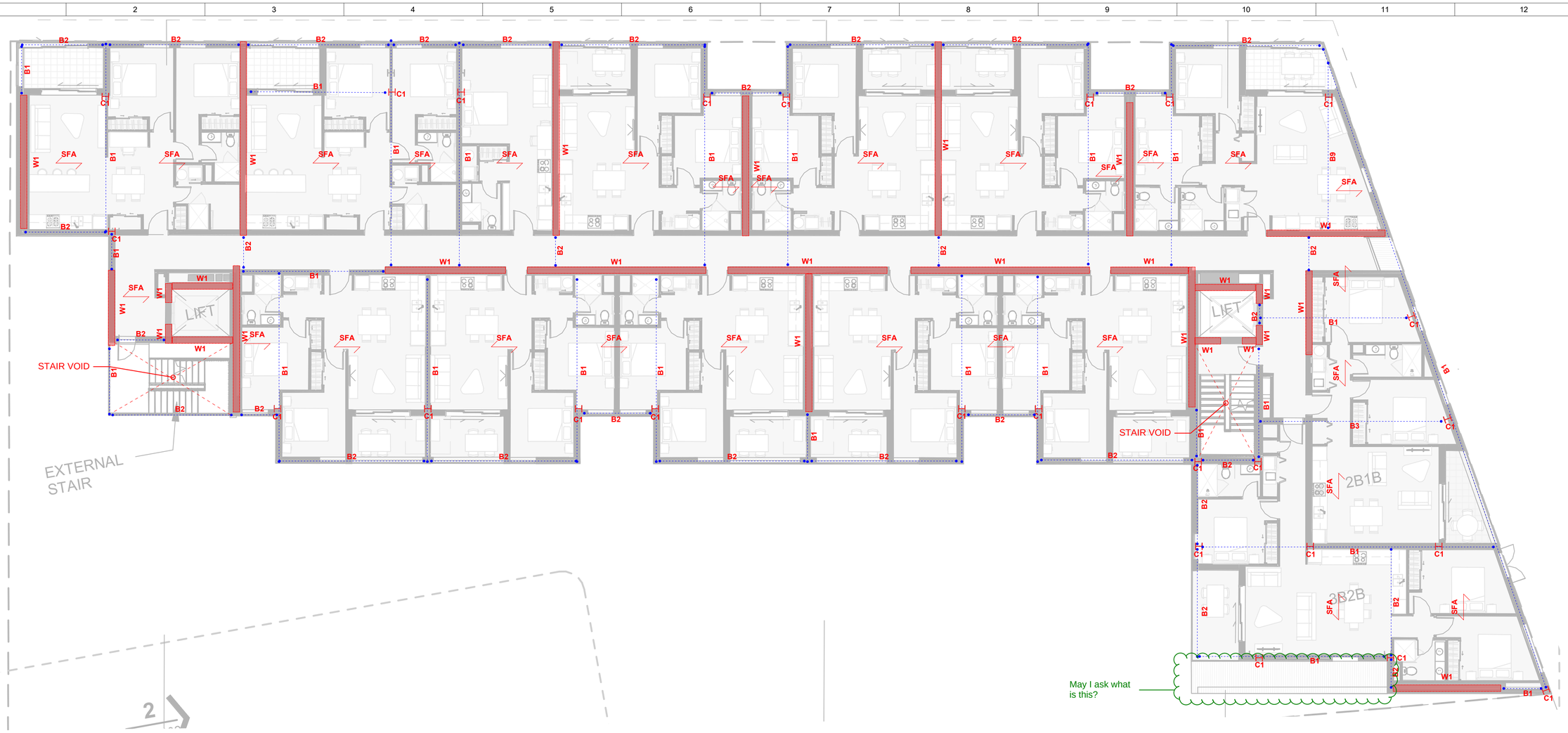
PROJECT: STELLAR PROJECT

DRAWING TITLE: MAURANUI BUILDING LEVEL 00 PLAN

DRAWING STATUS: FOR INFORMATION PRECAST CONC. OPTION

PROJECT No.	SHEET No.	REV
21-0055	S120	A

ORIGINAL SHEET SIZE A1 (841x594)



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MARK	SIZE	REMARKS
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SCALE 1 : 100

DATE MAR 2022

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REV	DATE	REVISION DESCRIPTION	DRAWN	ENG	DRG CHK	ENG CHK	APPROVER
A	09.03.22	PRELIMINARY DESIGN	MX	MX	PM	PM	PM

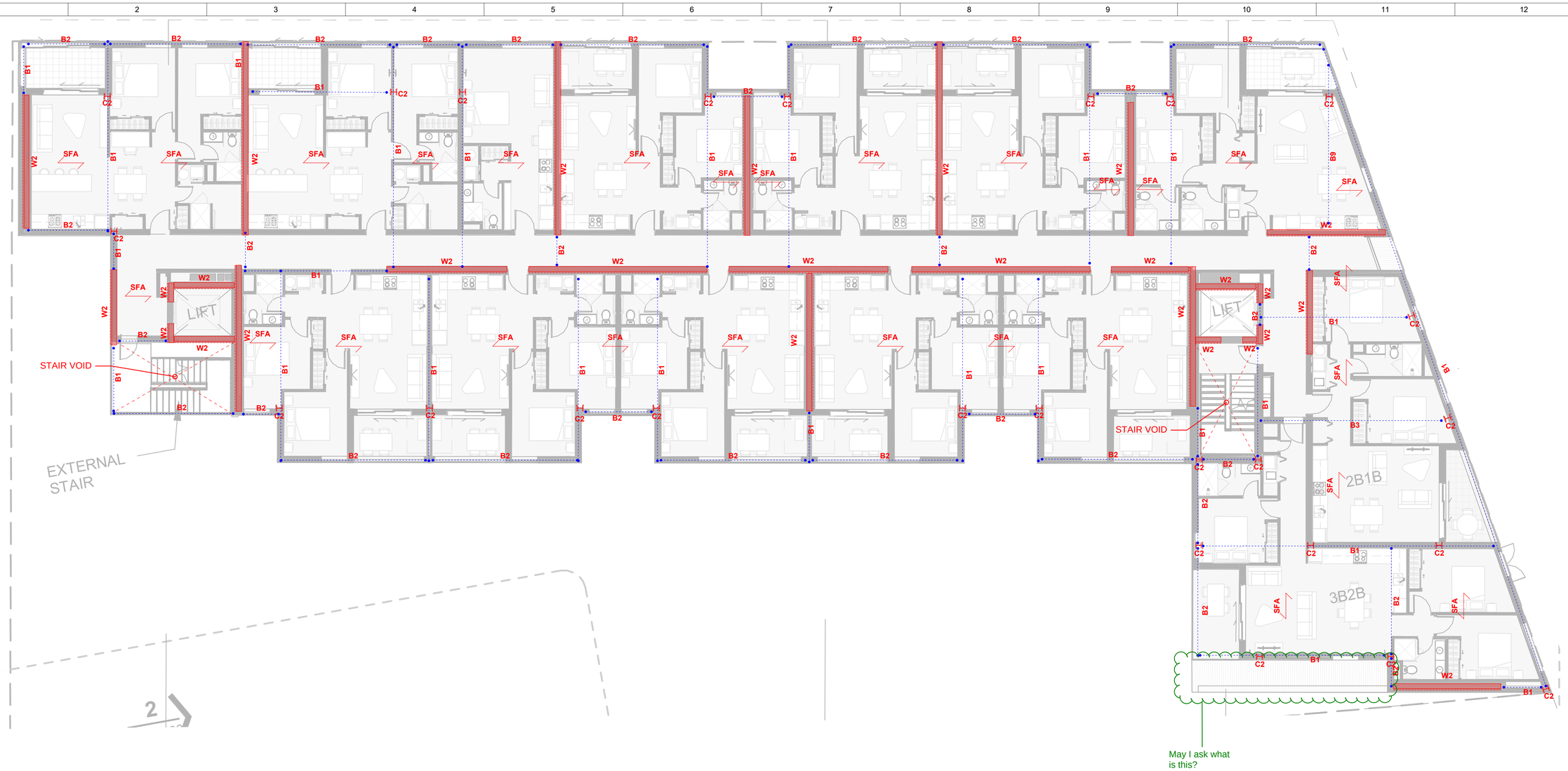
PROJECT: STELLAR PROJECT

DRAWING TITLE: MAURANUI BUILDING LEVEL 02 TO LEVEL 03 PLAN

DRAWING STATUS: FOR INFORMATION PRECAST CONC. OPTION

PROJECT No.	SHEET No.	REV
21-0055	S125	A

ORIGINAL SHEET SIZE A1 (841x594)



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MARK	SIZE	REMARKS
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May I ask what is this?

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NEW ZEALAND
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SCALE 1 : 100

DATE MAR 2022

UNDER REVISION

REV	DATE	REVISION DESCRIPTION	DRAWN	ENG	DRG CHK	ENG CHK	APPROVER
A	09.03.22	PRELIMINARY DESIGN	MX	MX	PM	PM	PM

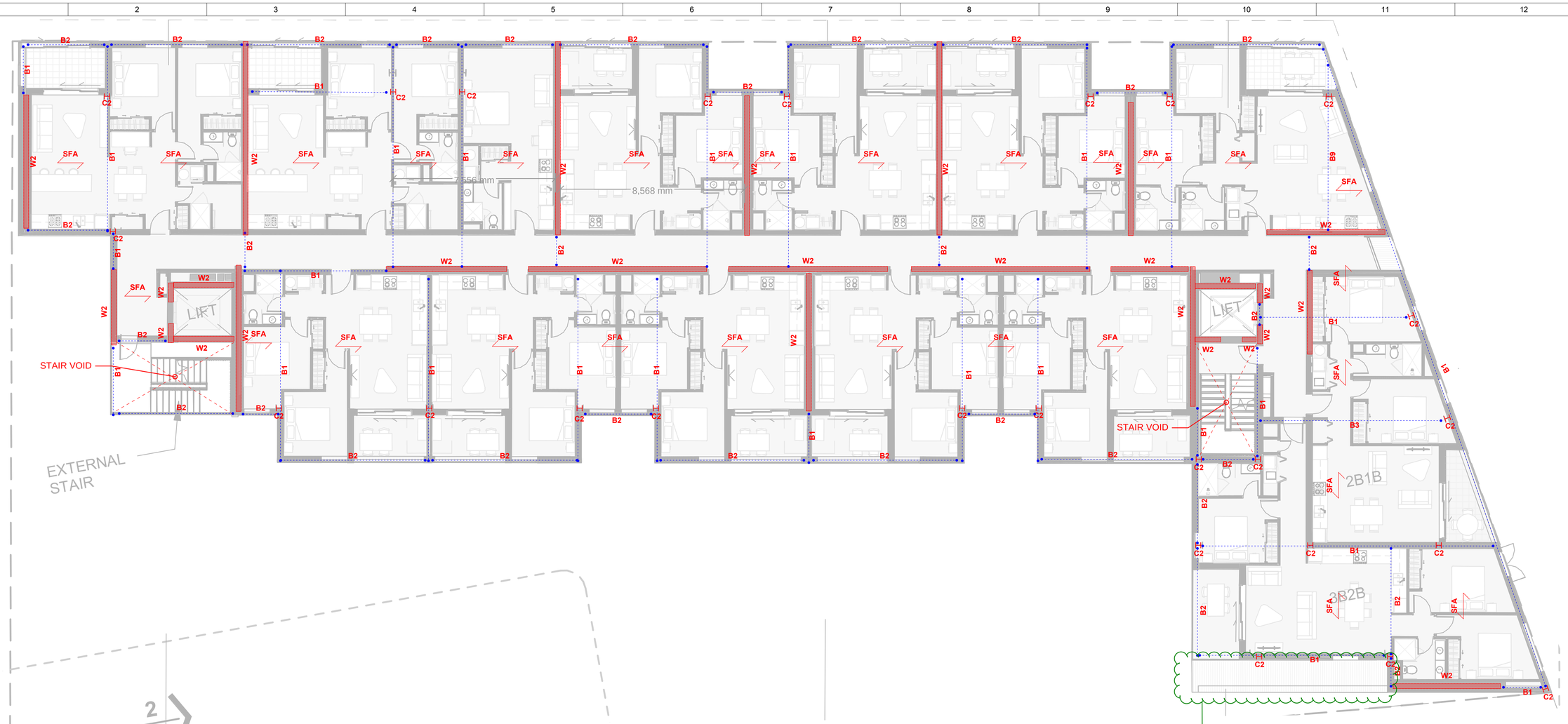
PROJECT: STELLAR PROJECT

DRAWING TITLE: MAURANUI BUILDING LEVEL 04 PLAN

DRAWING STATUS: FOR INFORMATION PRECAST CONC. OPTION

PROJECT No.	SHEET No.	REV
21-0055	S130	A

ORIGINAL SHEET SIZE A1 (841x594)



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SCALE 1 : 100

DATE MAR 2022

UNDER REVISION

REV	DATE	REVISION DESCRIPTION	DRAWN	ENG	DRG CHK	ENG CHK	APPROVER
A	09.03.22	PRELIMINARY DESIGN	MX	MX	PM	PM	PM

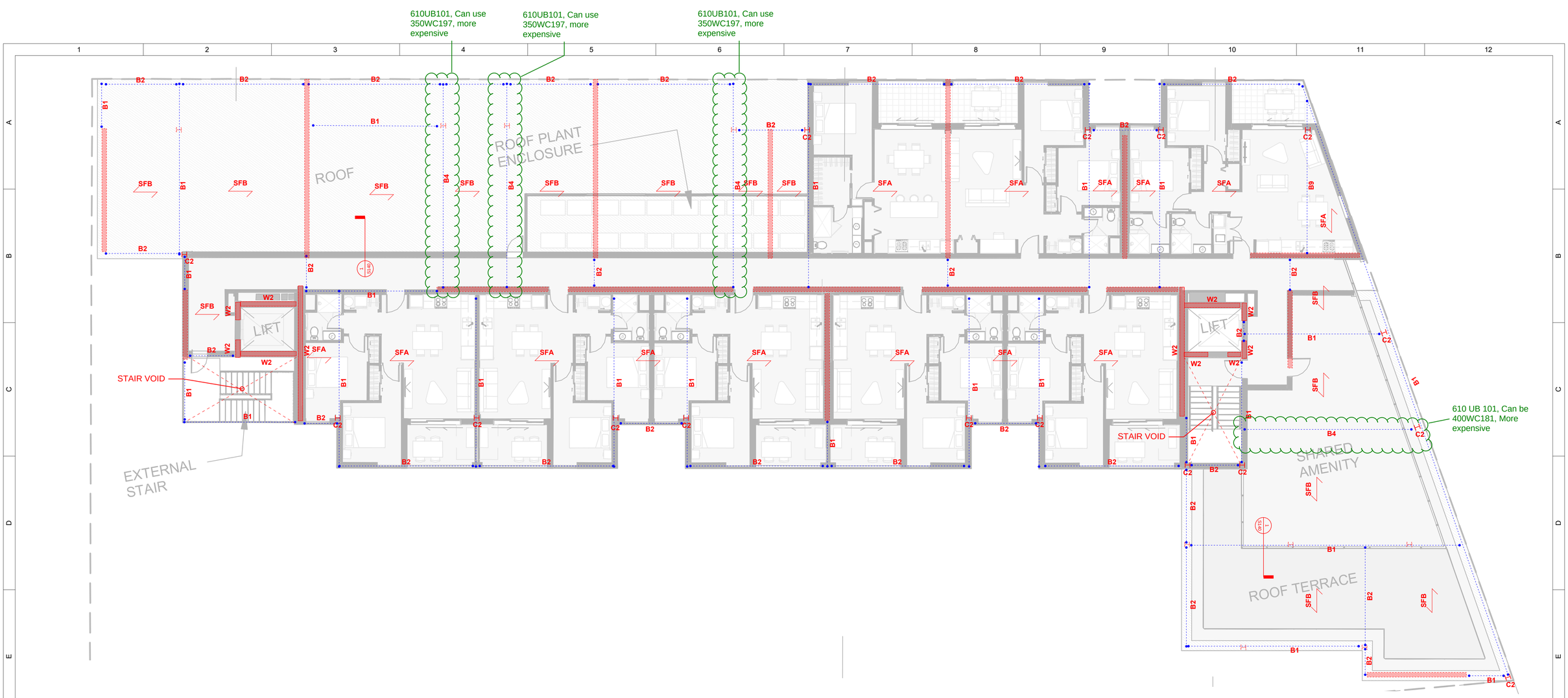
PROJECT: STELLAR PROJECT

DRAWING TITLE: MAURANUI BUILDING LEVEL 05 TO LEVEL 07 PLAN

DRAWING STATUS: FOR INFORMATION PRECAST CONC. OPTION

PROJECT No.	SHEET No.	REV
21-0055	S135	A

ORIGINAL SHEET SIZE A1 (841x594)



STRUCTURAL WALL SCHEDULE		
MARK	SIZE	REMARKS
W1	300 THK	PRECAST CONCRETE WALL
W2	230 THK	PRECAST CONCRETE WALL

COLUMN SCHEDULE		
MARK	SIZE	REMARKS
C1	310 UC 158	STEEL COLUMN
C2	250 UC 90	STEEL COLUMN

BEAM SCHEDULE		
MARK	SIZE	REMARKS
B1	460 UB 82	STEEL BEAM
B2	250 UB 37	STEEL BEAM
B3	530 UB 92	STEEL BEAM
B4	610 UB 101	STEEL BEAM
B5	1000 WB 215	TRANSFER BEAM
B6	1000 WB 296	TRANSFER BEAM
B7	1200 WB 455	TRANSFER BEAM
B8	1200 WB 455	TRANSFER BEAM
B9	410 UB 54	STEEL BEAM

FLOOR SCHEDULE		
MARK	SIZE	REMARKS
SFA	75 FLATSLAB + 100THK CONC TOPPING	PROPPED DURING CONSTRUCTION TO MANUFACTURER'S SPECIFICATION
SFB	75 FLATSLAB + 125THK CONC TOPPING	PROPPED DURING CONSTRUCTION TO MANUFACTURER'S SPECIFICATION
125 SOG	125THICK CONC ON GROUND	PROPPED DURING CONSTRUCTION TO MANUFACTURER'S SPECIFICATION

ENOVATE CONSULTANTS
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WEBSITE: www.enovate.co.nz

CLIENT: Dilworth

SCALE 1 : 100

DATE MAR 2022

UNDER REVISION

REV	DATE	REVISION DESCRIPTION	DRAWN	ENG	DRG CHK	ENG CHK	APPROVER
A	09.03.22	PRELIMINARY DESIGN	MX	MX	PM	PM	PM

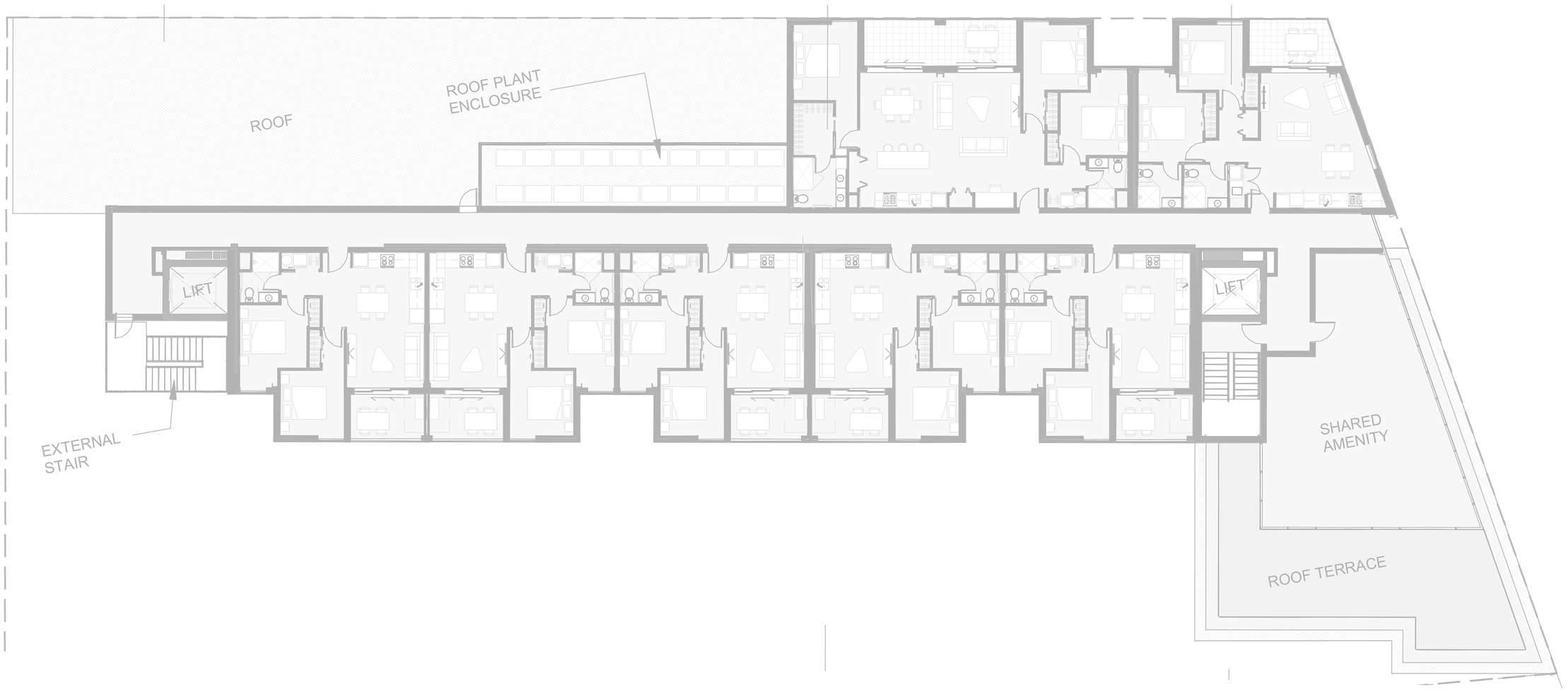
PROJECT: STELLAR PROJECT

DRAWING TITLE: MAURANUI BUILDING LEVEL 08 PLAN

DRAWING STATUS: FOR INFORMATION
PRECAST CONC. OPTION

PROJECT No.	SHEET No.	REV
21-0055	S140	A

ORIGINAL SHEET SIZE A1 (841x594)



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MAR 2022	A	09.03.22	PRELIMINARY DESIGN	MX	MX	PM	PM	PM

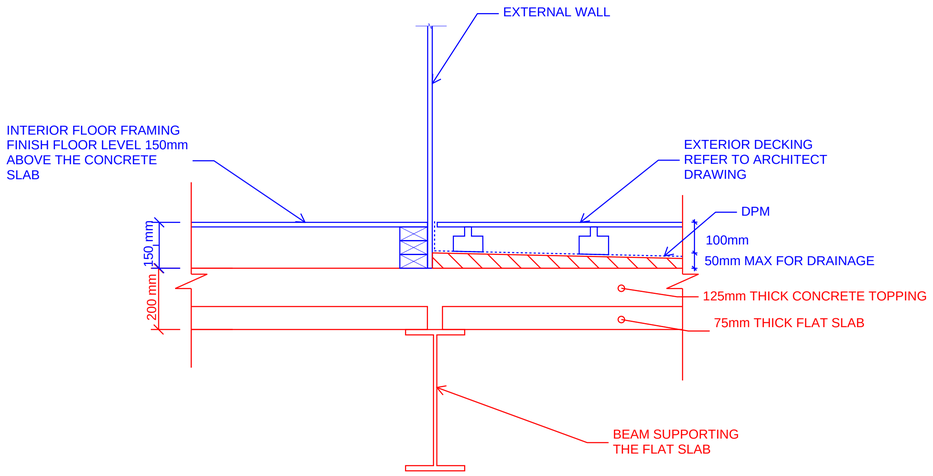
PROJECT: STELLAR PROJECT

DRAWING TITLE: MAURANUI BUILDING ROOF PLAN

DRAWING STATUS: FOR INFORMATION
PRECAST CONC. OPTION

PROJECT No.	SHEET No.	REV
21-0055	S145	A

ORIGINAL SHEET SIZE A1 (841x594)



EXTERNAL FLOOR JUNCTION

1 / S140 SCALE 1:10

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SCALE 1 : 10

UNDER REVISION

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MAR 2022	A	09.03.22	PRELIMINARY DESIGN	MX	MX	PM	PM	PM

PROJECT: STELLAR PROJECT

DRAWING TITLE: MAURANUI BUILDING EXTERNAL FLOOR JUNCTION

DRAWING STATUS: FOR INFORMATION
PRECAST CONC. OPTION

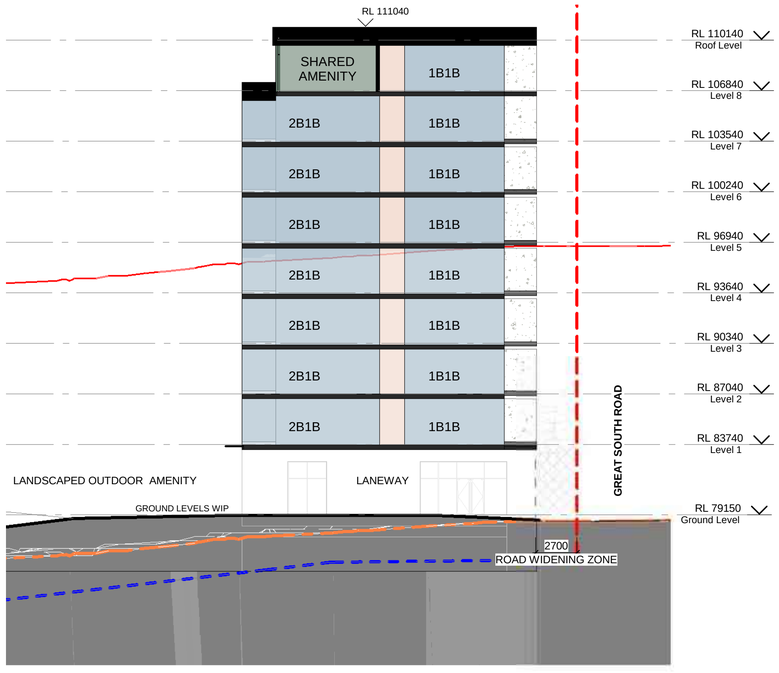
PROJECT No.	SHEET No.	REV
21-0055	S340	A

ORIGINAL SHEET SIZE A1 (841x594)

STELLAR
PROJECT
SOUTH BUILDING
21-0055

ISSUED --.--.--

STRUCTURAL DRAWING LIST				
DRG No.	REV	TITLE	DATE	DESIGN STATUS
S000	-	COVER SHEET	--.--.--	FOR INFORMATION
S100	-	GSR BUILDING FOUNDATION PLAN	--.--.--	FOR INFORMATION
S115	-	GSR BUILDING GROUND LEVEL PLAN	--.--.--	FOR INFORMATION
S120	-	GSR BUILDING LEVEL 1 PLAN	--.--.--	FOR INFORMATION
S125	-	GSR BUILDING LEVEL 2 TO LEVEL 3 PLAN	--.--.--	FOR INFORMATION
S130	-	GSR BUILDING LEVEL 4 PLAN	--.--.--	FOR INFORMATION
S135	-	GSR BUILDING LEVEL 5 TO LEVEL 7 PLAN	--.--.--	FOR INFORMATION
S140	-	GSR BUILDING LEVEL 8 PLAN	--.--.--	FOR INFORMATION
S145	-	GSR BUILDING ROOF PLAN	--.--.--	FOR INFORMATION
S340	-	GSR BUILDING EXTERNAL FLOOR JUNCTION	--.--.--	FOR INFORMATION



2 1 : 200 Section
SK-A-001 SITE WIDE - SECTION 2

DRAWING STATUS:
FOR INFORMATION
PRECAST CONC. OPTION

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Dilworth

SCALE
1 : 100

UNDER REVISION

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MAR 2022	A	09.03.22	PRELIMINARY DESIGN	MX	MX	PM	PM	PM

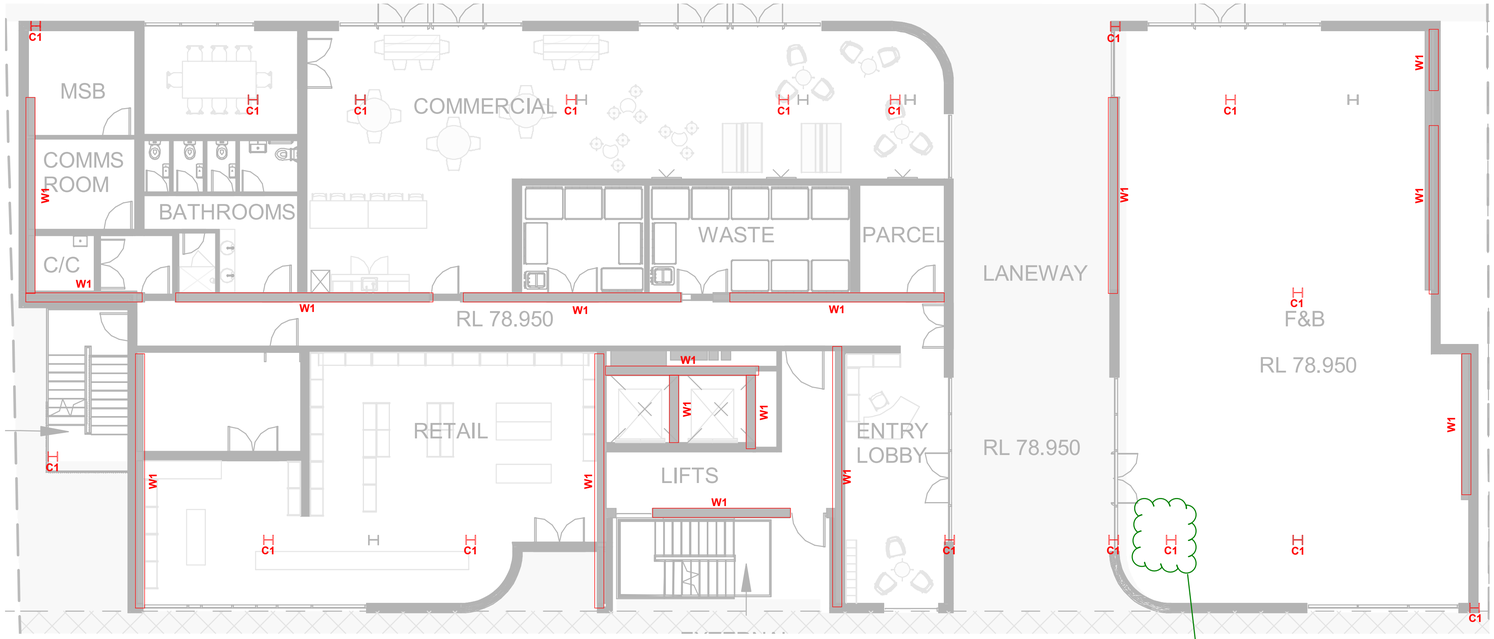
PROJECT:
STELLAR
PROJECT

DRAWING TITLE:
GSR BUILDING
FOUNDATION PLAN

DRAWING STATUS:
FOR INFORMATION
PRECAST CONC. OPTION

PROJECT No.	SHEET No.	REV
21-0055	S100	A

ORIGINAL SHEET SIZE
A1 (841x594)



STRUCTURAL WALL SCHEDULE		
MARK	SIZE	REMARKS
W1	300 THK	PRECAST CONCRETE WALL
W2	230 THK	PRECAST CONCRETE WALL

COLUMN SCHEDULE		
MARK	SIZE	REMARKS
C1	310 UC 158	STEEL COLUMN
C2	250 UC 90	STEEL COLUMN

BEAM SCHEDULE		
MARK	SIZE	REMARKS
B1	460 UB 82	STEEL BEAM
B2	250 UB 37	STEEL BEAM
B3	800 WB 192	TRANSFER BEAM
B4	610 UB 101	STEEL BEAM

FLOOR SCHEDULE		
MARK	SIZE	REMARKS
SFA	75 FLATSLAB + 100THK CONC TOPPING	PROPPED DURING CONSTRUCTION TO MANUFACTURER'S SPECIFICATION
SFB	75 FLATSLAB + 125THK CONC TOPPING	PROPPED DURING CONSTRUCTION TO MANUFACTURER'S SPECIFICATION

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SCALE 1 : 100

UNDER REVISION

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MAR 2022	A	09.03.22	PRELIMINARY DESIGN	MX	MX	PM	PM	PM

PROJECT: STELLAR PROJECT

DRAWING TITLE: GSR BUILDING GROUND LEVEL PLAN

DRAWING STATUS: FOR INFORMATION
PRECAST CONC. OPTION

PROJECT No.	SHEET No.	REV
21-0055	S115	A

ORIGINAL SHEET SIZE A1 (841x594)

STRUCTURAL WALL SCHEDULE		
MARK	SIZE	REMARKS
W1	300 THK	PRECAST CONCRETE WALL
W2	230 THK	PRECAST CONCRETE WALL

COLUMN SCHEDULE		
MARK	SIZE	REMARKS
C1	310 UC 158	STEEL COLUMN
C2	250 UC 90	STEEL COLUMN

BEAM SCHEDULE		
MARK	SIZE	REMARKS
B1	460 UB 82	STEEL BEAM
B2	250 UB 37	STEEL BEAM
B3	800 WB 192	TRANSFER BEAM
B4	610 UB 101	STEEL BEAM

FLOOR SCHEDULE		
MARK	SIZE	REMARKS
SFA	75 FLATSLAB + 100THK CONC TOPPING	PROPPED DURING CONSTRUCTION TO MANUFACTURER'S SPECIFICATION
SFB	75 FLATSLAB + 125THK CONC TOPPING	PROPPED DURING CONSTRUCTION TO MANUFACTURER'S SPECIFICATION

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SCALE 1 : 100

DATE MAR 2022

UNDER REVISION

REV	DATE	REVISION DESCRIPTION	DRAWN	ENG	DRG CHK	ENG CHK	APPROVER
A	09.03.22	PRELIMINARY DESIGN	MX	MX	PM	PM	PM

PROJECT: STELLAR PROJECT

DRAWING TITLE: GSR BUILDING LEVEL 1 PLAN

DRAWING STATUS: FOR INFORMATION PRECAST CONC. OPTION

PROJECT No.	SHEET No.	REV
21-0055	S120	A

ORIGINAL SHEET SIZE A1 (841x594)

STRUCTURAL WALL SCHEDULE		
MARK	SIZE	REMARKS
W1	300 THK	PRECAST CONCRETE WALL
W2	230 THK	PRECAST CONCRETE WALL

COLUMN SCHEDULE		
MARK	SIZE	REMARKS
C1	310 UC 158	STEEL COLUMN
C2	250 UC 90	STEEL COLUMN

BEAM SCHEDULE		
MARK	SIZE	REMARKS
B1	460 UB 82	STEEL BEAM
B2	250 UB 37	STEEL BEAM
B3	800 WB 192	TRANSFER BEAM
B4	610 UB 101	STEEL BEAM

FLOOR SCHEDULE		
MARK	SIZE	REMARKS
SFA	75 FLATSLAB + 100THK CONC TOPPING	PROPPED DURING CONSTRUCTION TO MANUFACTURER'S SPECIFICATION
SFB	75 FLATSLAB + 125THK CONC TOPPING	PROPPED DURING CONSTRUCTION TO MANUFACTURER'S SPECIFICATION

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SCALE 1 : 100

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MAR 2022	A	09.03.22	PRELIMINARY DESIGN	MX	MX	PM	PM	PM

PROJECT: STELLAR PROJECT

DRAWING TITLE: GSR BUILDING LEVEL 2 TO LEVEL 3 PLAN

DRAWING STATUS: FOR INFORMATION
PRECAST CONC. OPTION

PROJECT No.	SHEET No.	REV
21-0055	S125	A

ORIGINAL SHEET SIZE A1 (841x594)

STRUCTURAL WALL SCHEDULE		
MARK	SIZE	REMARKS
W1	300 THK	PRECAST CONCRETE WALL
W2	230 THK	PRECAST CONCRETE WALL

COLUMN SCHEDULE		
MARK	SIZE	REMARKS
C1	310 UC 158	STEEL COLUMN
C2	250 UC 90	STEEL COLUMN

BEAM SCHEDULE		
MARK	SIZE	REMARKS
B1	460 UB 82	STEEL BEAM
B2	250 UB 37	STEEL BEAM
B3	800 WB 192	TRANSFER BEAM
B4	610 UB 101	STEEL BEAM

FLOOR SCHEDULE		
MARK	SIZE	REMARKS
SFA	75 FLATSLAB + 100THK CONC TOPPING	PROPPED DURING CONSTRUCTION TO MANUFACTURER'S SPECIFICATION
SFB	75 FLATSLAB + 125THK CONC TOPPING	PROPPED DURING CONSTRUCTION TO MANUFACTURER'S SPECIFICATION

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SCALE 1 : 100

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MAR 2022	A	09.03.22	PRELIMINARY DESIGN	MX	MX	PM	PM	PM

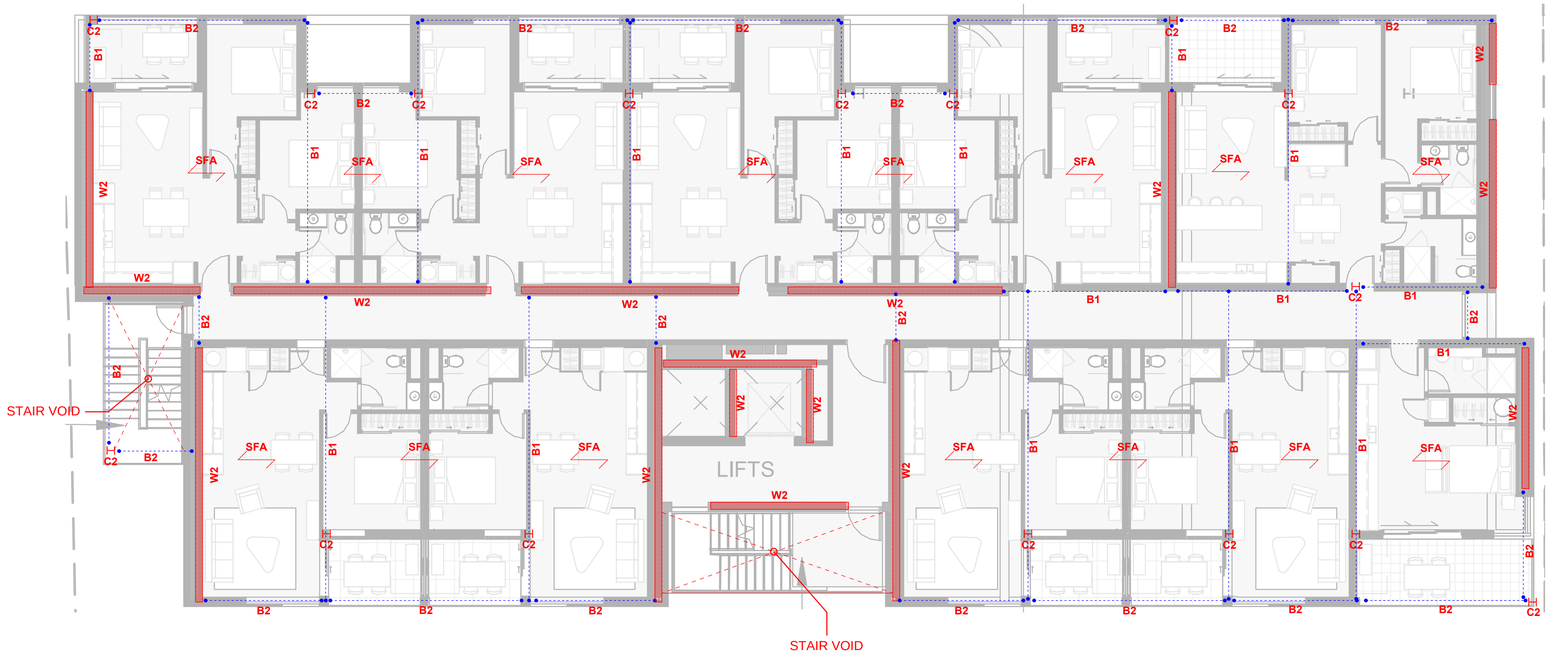
PROJECT: STELLAR PROJECT

DRAWING TITLE: GSR BUILDING LEVEL 4 PLAN

DRAWING STATUS: FOR INFORMATION
PRECAST CONC. OPTION

PROJECT No.	SHEET No.	REV
21-0055	S130	A

ORIGINAL SHEET SIZE A1 (841x594)



STRUCTURAL WALL SCHEDULE		
MARK	SIZE	REMARKS
W1	300 THK	PRECAST CONCRETE WALL
W2	230 THK	PRECAST CONCRETE WALL

COLUMN SCHEDULE		
MARK	SIZE	REMARKS
C1	310 UC 158	STEEL COLUMN
C2	250 UC 90	STEEL COLUMN

BEAM SCHEDULE		
MARK	SIZE	REMARKS
B1	460 UB 82	STEEL BEAM
B2	250 UB 37	STEEL BEAM
B3	800 WB 192	TRANSFER BEAM
B4	610 UB 101	STEEL BEAM

FLOOR SCHEDULE		
MARK	SIZE	REMARKS
SFA	75 FLATSLAB + 100THK CONC TOPPING	PROPPED DURING CONSTRUCTION TO MANUFACTURER'S SPECIFICATION
SFB	75 FLATSLAB + 125THK CONC TOPPING	PROPPED DURING CONSTRUCTION TO MANUFACTURER'S SPECIFICATION

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SCALE 1 : 100

UNDER REVISION

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MAR 2022	A	09.03.22	PRELIMINARY DESIGN	MX	MX	PM	PM	PM

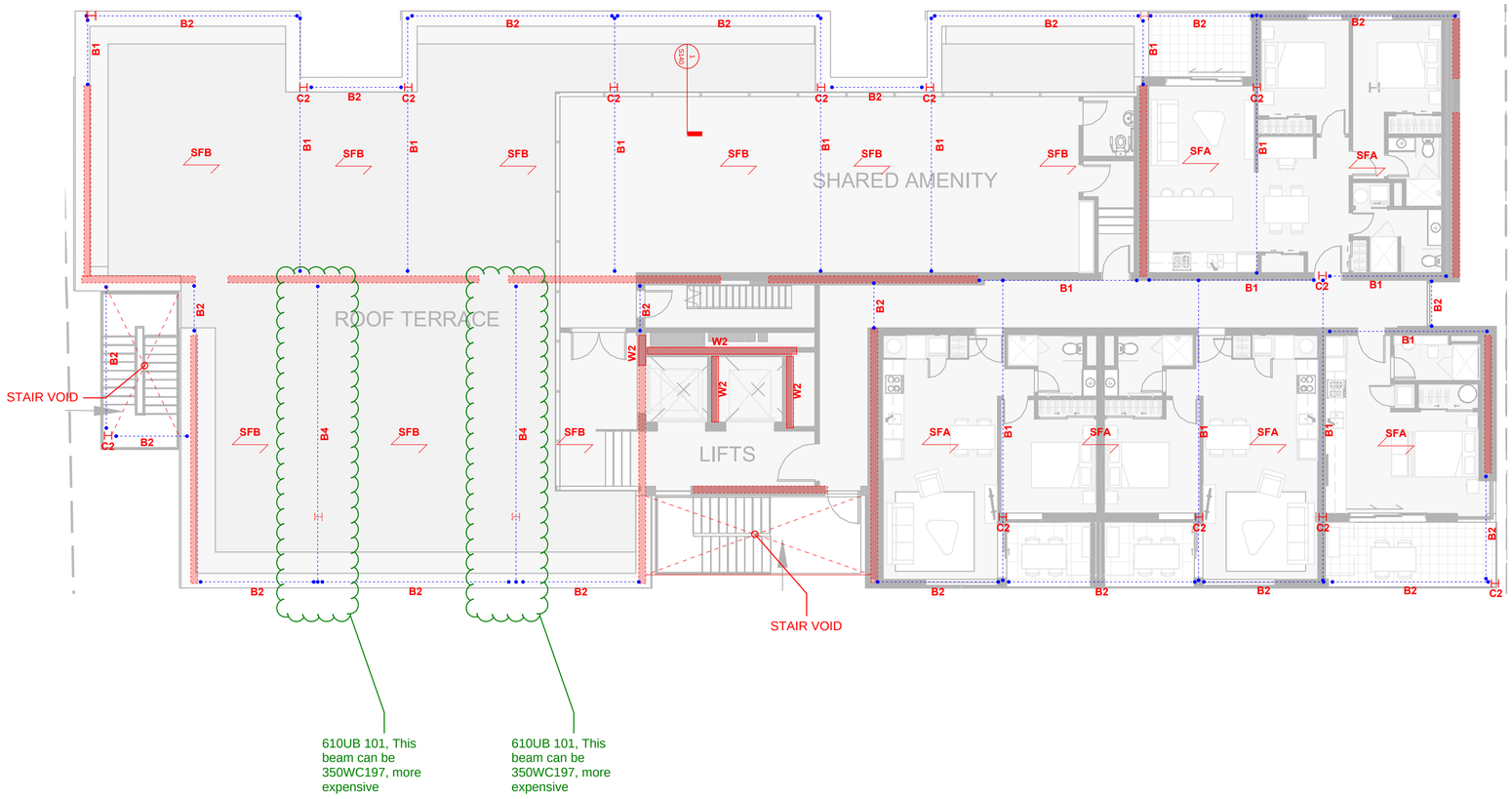
PROJECT: STELLAR PROJECT

DRAWING TITLE: GSR BUILDING LEVEL 5 TO LEVEL 7 PLAN

DRAWING STATUS: FOR INFORMATION
PRECAST CONC. OPTION

PROJECT No.	SHEET No.	REV
21-0055	S135	A

ORIGINAL SHEET SIZE A1 (841x594)



STRUCTURAL WALL SCHEDULE		
MARK	SIZE	REMARKS
W1	300 THK	PRECAST CONCRETE WALL
W2	230 THK	PRECAST CONCRETE WALL

COLUMN SCHEDULE		
MARK	SIZE	REMARKS
C1	310 UC 158	STEEL COLUMN
C2	250 UC 90	STEEL COLUMN

BEAM SCHEDULE		
MARK	SIZE	REMARKS
B1	460 UB 82	STEEL BEAM
B2	250 UB 37	STEEL BEAM
B3	800 WB 192	TRANSFER BEAM
B4	610 UB 101	STEEL BEAM

FLOOR SCHEDULE		
MARK	SIZE	REMARKS
SFA	75 FLATSLAB + 100THK CONC TOPPING	PROPPED DURING CONSTRUCTION TO MANUFACTURER'S SPECIFICATION
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PROJECT: STELLAR PROJECT

DRAWING TITLE: GSR BUILDING LEVEL 8 PLAN

DRAWING STATUS: FOR INFORMATION
PRECAST CONC. OPTION

PROJECT No.	SHEET No.	REV
21-0055	S140	A

ORIGINAL SHEET SIZE A1 (841x594)

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SCALE
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UNDER REVISION

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MAR 2022	A	09.03.22	PRELIMINARY DESIGN	MX	MX	PM	PM	PM

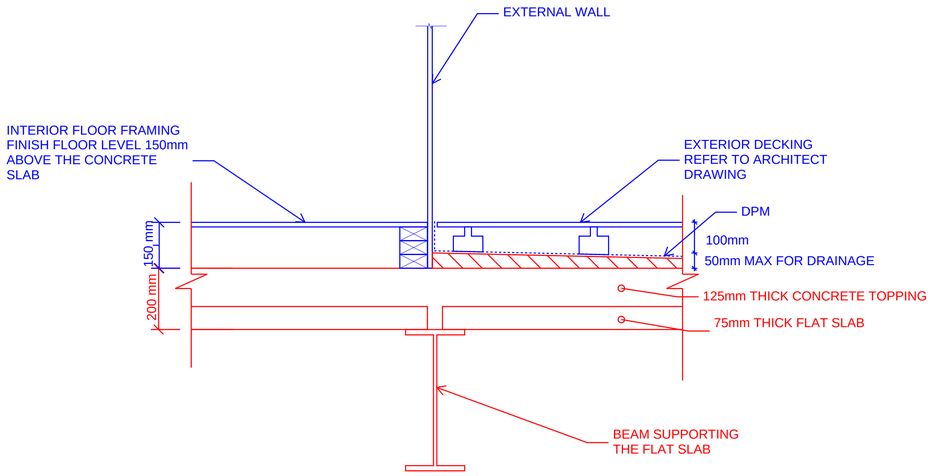
PROJECT:
STELLAR
PROJECT

DRAWING TITLE:
GSR BUILDING
ROOF PLAN

DRAWING STATUS:
FOR INFORMATION
PRECAST CONC. OPTION

PROJECT No.	SHEET No.	REV
21-0055	S145	A

ORIGINAL SHEET SIZE
A1 (841x594)



EXTERNAL FLOOR JUNCTION

1 / S140 SCALE 1:10

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CLIENT: Dilworth

SCALE 1 : 10

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PROJECT: STELLAR PROJECT

DRAWING TITLE: GSR BUILDING EXTERNAL FLOOR JUNCTION

DRAWING STATUS: FOR INFORMATION
PRECAST CONC. OPTION

PROJECT No.	SHEET No.	REV
21-0055	S340	A

ORIGINAL SHEET SIZE A1 (841x594)

APPENDIX 3:

Coffey Geotechnics NZ Ltd 2015 Site Investigation Plan and Logs

LEGEND

- HAND AUGER BOREHOLE LOCATION
- MACHINE BOREHOLE LOCATION
- SECTION LINE
- PROPERTY BOUNDARY

AERIAL IMAGE SOURCE: GOOGLE EARTH PRO 7.1.2
AERIAL IMAGE ©: SINCLAIR KNIGHT MERZ 2014

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE			

0 10.0 20.0 30.0
Horizontal Scale (metres)
0 10.0 20.0 30.0
Vertical Scale (metres)

drawn	ZL
approved	PB
date	08/06/2015
scale	1:500
original size	A3

coffey

client: DILWORTH TRUST ROAD
project: 80 GREAT SOUTH ROAD NEWMARKET
title: SITE PLAN
project no: GENZAUCK16633AA
figure no: FIGURE 1
rev: A

PLOT DATE: 8/06/2015 2:00:44 p.m. DWG FILE: P:\GENZ\PROJECTS\16000-16999\16633.B\ GREAT SOUTH ROAD NEWMARKET\4 ANALYSIS, DESIGN & DRAWINGS\4.1 DRAWINGS\03 OUTGOING\01 DWG\PLANS_280315.DWG

Engineering Log - Borehole

Borehole ID.	***MH01***
sheet:	1 of 2
project no.	***GENZAUCK16633AA***
client:	***Dilworth Trust Board***
date started:	***02 Jun 2015***
principal:	
date completed:	***02 Jun 2015***
project:	***80 Great South Road***
logged by:	***PP***
location:	***Refer to Site Plan***
checked by:	***JRF***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

drill model: , Bob Cat mounted | casing diameter : HW | vane id.: 288

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear (kPa) ⊕ remoulded ⊙ peak (50 100 150 200)	structure and additional observations
HA					0.0			**ASPHALT**.	M	D - VD		**TUFF**
								Sandy GRAVEL: fine to coarse grained, sub-angular to angular, dark brown/grey, sand is fine to coarse grained.				Core Run (0.0-1.5 m): 0% recovery
							ML	**Clayey SILT**: low plasticity, dark brown mottled pale brown/black, some fine to medium grained sand, trace carbonaceous inclusion.		VSt - H		
					0.5							
					1.0		ML	**Sandy SILT**: non plastic, dark brown speckled pale brown/black, trace clay, sand is fine to medium grained, with trace carbonaceous inclusion.				
HW casing			SPT 4, 6, 5 N*=11		1.5							Core Run (1.5-2.0 m): 0% recovery
					2.0		MH	**Clayey SILT**: medium plasticity, pale brown speckled orange-brown, minor fine grained sand, trace carbonaceous inclusion.				Core Run (2.0-2.9 m): 100% recovery
OB					2.5			2.5 m: with minor fine to medium grained sub-angular to angular basalt gravel, with trace basalt cobblestone, sub-angular, low vesicular 2.6 m: becoming dark brown speckled pale brown Borehole MH01 continued as cored hole			⊕⊙	
					3.0							
					3.5							

CDF_0_9_06_LIBRARY.GLB rev:AI Log COF BOREHOLE: NON CORED MH LOGS.GPJ <<DrawingFile>> 22/06/2015 14:33

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger
- OB open barrel

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description
based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

Engineering Log - Cored Borehole

Borehole ID.	**MH01**
sheet:	2 of 2
project no.	**GENZAUCK16633AA**
client:	**Dilworth Trust Board**
date started:	**02 Jun 2015**
principal:	
date completed:	**02 Jun 2015**
project:	**80 Great South Road**
logged by:	**PP**
location:	**Refer to Site Plan**
checked by:	**JRF**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

drill model: , Bob Cat mounted | drilling fluid: | casing diameter : HW | vane id.: 288

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VW W MS S VS ES	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run details	defect spacing (mm) 20 60 200 600 2000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
PQ			3.0		start coring at 2.90m **BASALT**: fine to medium grained, dark grey speckled brown, massive, highly vesiclular, vesicles have orange-brown staining with silty sand infill, vesicles are interconnected.	SW			TCR= 100% SCR= 53% RQD= 47%		**AUCKLAND BASALTS** Drilling Break, 0 - 5°, IR, RO, SN, Drilling induced fracture
											Drilling Break, 0 - 5°, IR, RO, SN, Drilling induced fracture
			3.5								Drilling Break, 0 - 10°, IR, RO, SN, Drilling induced fracture
											Drilling Break, 20 - 30°, UN - IR, RO, SN, Drilling induced fracture
			4.0			SW to UW					CS, silty sand, fine to coarse grained, pale brown, sub-angular to angular, with trace fine to coarse grained sub-rounded basalt filled
									TCR= 100% SCR= 93% RQD= 93%		Drilling Break, 5 - 10°, UN - IR, RO, CN
			4.5								
					4.70 m: becoming lightly vesicular, vesicles appear not interconnected						
			5.0								
			5.5								CS, sandy gravel, fine to coarse grained, dark brown, sub-angular to angular SN - filled JT, 60 - 70°, UN - PL, RO, sandy silt, orange-brown, sand is to medium grained SN
									TCR= 100% SCR= 45% RQD= 35%		
			6.0								JT, 40 - 50°, UN, RO, SN JT, 30 - 40°, UN, RO, SN JT, 80 - 90°, UN, RO, SN JT, 0 - 5°, UN, RO, SN
											JT, 60 - 70°, UN - IR, RO, SN Drilling Break, recovered as sandy gravel, fine to coarse grained, sub-angular to angular SN, Drilling induced fracture
			6.5		Borehole MH01 terminated at 6.50 m Target stratum						

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method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
SPT standard penetration test
HA hand auger
OB open barrel

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run details
barrel withdrawn

TCR = Total Core Recovery (%)
SCR = Solid Core Recovery (%)
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
CW completely weathered
HW highly weathered
MW moderately weathered
SW slightly weathered
UW unweathered
*W replaced with A for alteration

strength
VW very weak
W weak
MS moderately strong
S strong
VS very strong
ES extremely strong

defect type
BS bedding shear
PT parting
JT joint
SZ shear zone
SS shear surface
CO contact
CS crushed seam
SM seam

roughness
SL slickensided
POL polished
SO smooth
RO rough
VR very rough

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

coating
CN clean
SN stain
VN veneer
CO coating

Client:	**Dilworth Trust Boarrd**	Project no:	**GENZAUCK16633AA**		
Project: coffey	**80 Great South Road**	Borehole Number:	**MH01**		
		Compiled:	**PP**	Date:	**02/06/2015**
Title:	**MH01 CORE BOX PHOTOGRAPHS**				

Depth: 0.0 m to 5.0 m

Depth: 5.0 m to 6.5 m

Engineering Log - Borehole

Borehole ID.	**MH02**
sheet:	1 of 2
project no.	**GENZAUCK16633AA**
client:	**Dilworth Trust Board**
date started:	**02 Jun 2015**
principal:	
date completed:	**03 Jun 2015**
project:	**80 Great South Road**
logged by:	**PP**
location:	**Refer to Site Plan**
checked by:	**JRF**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

drill model: , Bob Cat mounted | casing diameter : HW | vane id.:

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear ⊕ remoulded ⊙ peak (kPa) 50 100 150 200	structure and additional observations
HA, HW casing					0.0			**TOPSOIL.**	M	VSt - H		**TUFF** Core Run (0.0-1.5 m): 0% recovery
					0.5		ML	**Clayey SILT**: low plasticity, brown speckled black/pale brown, minor fine to medium grained sand, trace carbonaceous inclusion.				
					1.0		ML	**Sandy SILT**: non plastic, dark brown speckled orange-brown/black, sand is fine to medium grained, trace carbonaceous inclusion.				
OB			SPT 1, 1, 2 N=3		1.5							Core Run (1.5-2.0 m): 100% recovery
					2.0		MH	**Clayey SILT**: medium plasticity, orange-brown speckled pale brown, minor fine grained sand, trace fine to medium grained sub-angular to angular basalt gravel, trace carbonaceous inclusion.				Core Run (2.0-2.7 m): 100% recovery
					2.5			2.6 m: with some fine to medium grained sub-angular to angular basalt gravel Borehole MH02 continued as cored hole				
					3.0							
					3.5							

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger
- OB open barrel

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Engineering Log - Cored Borehole

Borehole ID.	**MH02**
sheet:	2 of 2
project no.	**GENZAUCK16633AA**
client:	**Dilworth Trust Board**
date started:	**02 Jun 2015**
principal:	
date completed:	**03 Jun 2015**
project:	**80 Great South Road**
logged by:	**PP**
location:	**Refer to Site Plan**
checked by:	**JRF**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

drill model: , Bob Cat mounted | drilling fluid: | casing diameter : HW | vane id.:

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description: ROCK TYPE: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VW W MS S VS ES	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run details	defect spacing (mm) 20 60 200 600 2000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
PQ					start coring at 2.70m						
					BASALT: fine to medium grained, dark grey, massive, highly vesiclular, vesicles are interconnected, sandy silt infill, orange-brown.	SW					**AUCKLAND BASALTS**
			3.0		3.00 to 3.40 m: basalt is moderately vesicular, vesicles are spread out with greater diameter and interconnected				TCR= 100% SCR= 75% RQD= 70%		Drilling Break, UN - IR, RO, SN, Drilling induced fracture
											JT, 30 - 40°, UN - CU, RO, SN
			3.5		3.50 m: vesicles diameter reduced and appear not interconnected						Drilling Break, 0 - 5°, UN - IR, RO, CN, Drilling induced fracture
			4.0								CS, clasts (100%), 10-40mm, sub-angular to angular, highly vesicular, vesicles interconnected SN
									TCR= 100% SCR= 17% RQD= 8%		JT, 80 - 90°, UN - CU, RO, silt, pale brown-orange SN - VN
											Drilling Break, 0 - 2°, UN - IR, RO, CN, Drilling induced fracture
											JT, 80 - 90°, UN - CU, RO, silt, pale brown-orange SN - VN
			4.5								JT, 40 - 50°, UN - ST, RO, silt, pale brown-orange SN - VN
											JT, 80 - 90°, UN, RO, silt, pale brown-orange SN - VN
			5.0								Drilling Break, 0 - 5°, UN - IR, RO, CN
			5.5		5.50 to 6.50 m: basalt is highly vesicular, vesicles are interconnected				TCR= 100% SCR= 45% RQD= 45%		Drilling Break, recovered as clasts (100%), 20-50mm, sub-angular to angular, highly vesiculated, vesicles interconnected, Drilling induced fracture
											Drilling Break, recovered as clasts (100%), 10-30mm, sub-angular to angular, highly vesiculated, vesicles interconnected, Drilling induced fracture
			6.0								
			6.5		Borehole MH02 terminated at 6.50 m Target stratum						Drilling Break, recovered as clasts (100%), 30-50mm, sub-angular to angular, highly vesiculated, vesicles interconnected

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method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
SPT standard penetration test
HA hand auger
OB open barrel

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run details
barrel withdrawn

TCR = Total Core Recovery (%)
SCR = Solid Core Recovery (%)
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
CW completely weathered
HW highly weathered
MW moderately weathered
SW slightly weathered
UW unweathered
*W replaced with A for alteration

strength
VW very weak
W weak
MS moderately strong
S strong
VS very strong
ES extremely strong

defect type
BS bedding shear
PT parting
JT joint
SZ shear zone
SS shear surface
CO contact
CS crushed seam
SM seam

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

roughness
SL slickensided
POL polished
SO smooth
RO rough
VR very rough

coating
CN clean
SN stain
VN veneer
CO coating

Client:	Dilworth Trust Boarrd	Project no:	GENZAUCK16633AA		
Project: coffey	80 Great South Road	Borehole Number:	MH02		
		Compiled:	PP	Date:	02/06/2015
Title:	MH02 CORE BOX PHOTOGRAPHS				

Depth: 0.0 m to 5.0 m

Depth: 5.0 m to 6.5 m

Engineering Log - Borehole

Borehole ID.	***MH03***
sheet:	1 of 3
project no.	***GENZAUCK16633AA***
client:	***Dilworth Trust Board***
date started:	***03 Jun 2015***
principal:	
date completed:	***03 Jun 2015***
project:	***80 Great South Road***
logged by:	***PP***
location:	***Refer to Site Plan***
checked by:	***JRF***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

drill model: , Bob Cat mounted | casing diameter : HW | vane id.: 288

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear (remoulded ⊕, peak ⊙) (kPa) 50 100 150 200	structure and additional observations
HA, HW casing, OB					0			**TOPSOIL.**	M	VSt - H		**TUFF** Core Run (0.0-1.5 m): 0% recovery
					0.5		ML	**Clayey SILT**: low plasticity, brown speckled dark brown/black, minor fine to medium grained sand, trace carbonaceous inclusion.				
					1.0		ML	**Sandy SILT**: non plastic to low plasticity, brown speckled orange/dark brown/black, trace clay, sand is fine to medium grained, trace carbonaceous inclusion.				
			SPT 4, 3, 5 N*=8		1.5							Core Run (1.5-2.0 m): 100% recovery
					2.0							Core Run (2.0-3.0 m): 100% recovery
					2.5							
			SPT 1, 1, 1 N*=2		3.0		ML-MH	**Clayey SILT**: low to medium plasticity, dark brown speckled black, minor fine grained sand, trace carbonaceous inclusion.			⊕ ⊙	Core Run (3.0-3.5 m): 100% recovery VS 70/ 22 kPa
					3.5			3.9 m: with trace fine to medium grained				Core Run (3.5-4.0 m): 100% recovery

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger
- OB open barrel

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description
based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Engineering Log - Borehole

Borehole ID.	***MH03***
sheet:	2 of 3
project no.	***GENZAUCK16633AA***
client:	***Dilworth Trust Board***
date started:	***03 Jun 2015***
principal:	
date completed:	***03 Jun 2015***
project:	***80 Great South Road***
logged by:	***PP***
location:	***Refer to Site Plan***
checked by:	***JRF***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

drill model: , Bob Cat mounted | casing diameter : HW | vane id.: 288

drilling information						material substance						
method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description **SOIL TYPE**: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	vane shear ⊕ remoulded ⊙ peak (kPa) 50 100 150 200	structure and additional observations
OB					4.5		ML-MH	sub-angular to angular basalt gravel **Clayey SILT**: low to medium plasticity, dark brown speckled black, minor fine grained sand, trace carbonaceous inclusion. *(continued)* 4.0 m: with trace basalt boulders, 40-60mm, highly vesicular, vesicles are interconnected Borehole MH03 continued as cored hole	M	VSt - H		**TUFF** Core Run (4.0-5.0 m): 100% recovery VS 104/ 24 kPa
					5.0			Borehole MH03 continued as cored hole				
					5.5							
					6.0							
					6.5							
					7.0							
					7.5							

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method

AD	auger drilling*
AS	auger screwing*
HA	hand auger
W	washbore
HA	hand auger
OB	open barrel
*	bit shown by suffix
e.g.	AD/T
B	blank bit
T	TC bit
V	V bit

support

M	mud
C	casing
N	nil

penetration

1 2 3 — no resistance ranging to refusal

water

10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests

B	bulk disturbed sample
D	disturbed sample
E	environmental sample
SS	split spoon sample
U##	undisturbed sample ##mm diameter
HP	hand penetrometer (kPa)
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
VS	vane shear; peak/remouded (kPa)
R	refusal
HB	hammer bouncing

classification symbol & soil description
based on Unified Classification System

moisture

D	dry
M	moist
W	wet
S	saturated
Wp	plastic limit
Wl	liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Engineering Log - Cored Borehole

Borehole ID.	***MH03***
sheet:	3 of 3
project no.	***GENZAUCK16633AA***
client:	***Dilworth Trust Board***
date started:	***03 Jun 2015***
principal:	
date completed:	***03 Jun 2015***
project:	***80 Great South Road***
logged by:	***PP***
location:	***Refer to Site Plan***
checked by:	***JRF***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

drill model: , Bob Cat mounted | drilling fluid: | casing diameter : HW | vane id.: 288

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VW W MS S VS ES	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run details	defect spacing (mm) 20 60 200 600 2000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
HQ			5.0		start coring at 4.70m **BASALT**: fine to medium grained, dark grey, massive, highly vesiclular, vesicles are interconnected.	SW					**AUCKLAND BASALTS** Drilling Break, 0 - 5°, CN, Drilling induced fracture
			5.5		5.15 to 5.30 m: recovered as high plasticity clayey silt, dark brown, with trace basalt cobbles, highly vesicular, vesicles are interconnected 5.30 to 6.10 m: vesicles are increased in diameter and largely spread out						JT, 70 - 80°, SN - VN JT, 10 - 20°, UN, RO, clayey silt, dark brown SN - filled
			6.0						TCR= 100% SCR= 63% RQD= 57%		JT, 20 - 30°, UN, RO, clayey silt, dark brown SN - VN
			6.5		6.10 to 8.00 m: vesicles diameter is reduced to smaller diameter and close to each other						JT, 40 - 50°, UN, RO, SN - VN
			7.0		6.50 to 6.70 m: recovered as clast (90%) 10-40mm, clast is basalt, sub-angular to angular, basalt s highly vesicular, vesicles are interconnected, fines (10%) clayey silt, high plasticity, dark brown				TCR= 53% SCR= 33% RQD= 27%		JT, 10 - 20°, UN - IR, RO, clayey silt, dark brown SN - filled Drilling Break, IR, clast (100%) basalt, 20-50mm, sub-angular to angular, highly vesicular SN, Drilling induced fracture
			7.5								
			8.0		Borehole MH03 terminated at 8.00 m Target stratum						
			8.5								

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method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger
- OB open barrel

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run details
- barrel withdrawn

TCR = Total Core Recovery (%)
SCR = Solid Core Recovery (%)
RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- CW completely weathered
- HW highly weathered
- MW moderately weathered
- SW slightly weathered
- UW unweathered

*W replaced with A for alteration

strength
- VW very weak
- W weak
- MS moderately strong
- S strong
- VS very strong
- ES extremely strong

defect type
- BS bedding shear
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CO contact
- CS crushed seam
- SM seam

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

Client:	**Dilworth Trust Boarrd**	Project no:	**GENZAUCK16633AA**		
Project: coffey	**80 Great South Road**	Borehole Number:	**MH03**		
		Compiled:	**PP**	Date:	**02/06/2015**
Title:	**MH03 CORE BOX PHOTOGRAPHS**				

Depth: 0.0 m to 5.3 m

Depth: 5.3 m to 8.0 m

Engineering Log - Hand Auger

Borehole ID.	**HA01**
sheet:	1 of 1
project no.	**GENZAUCK16633AA**
client:	**Dilworth Trust Board**
date started:	**02 Jun 2015**
principal:	
date completed:	**02 Jun 2015**
project:	**80 Great South Road, New Market**
logged by:	**RT**
location:	**Refer to Site Plan**
checked by:	**JRF**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.:

drill model: Hand Auger | hole diameter : 50 mm | vane id.: 1356

drilling information | **material substance**

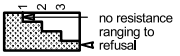
method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear (remoulded / peak) (kPa) 50 100 150 200	DCP (blows/ 100 mm) 4 8 12 16	structure and additional observations
HA N		Not Encountered			0.0			**TOPSOIL.**					**TUFF**
					0.5		CL	**Silty CLAY**: medium plasticity, orange brown, with minor fine grained sand.	M	VSt			VS 181/ 75 kPa
								0.6 m: with some fine grained sand					
					1.0			0.8 m: becoming brown orange streaked dark orange					VS 175/ 60 kPa
								1.1 m: becoming pale brown streaked orange brown					VS 181 kPa
					1.5		SC	**Clayey SAND**: fine to medium grained, dark red brown, with some silt.		MD			
							CL	**Sandy CLAY**: medium plasticity, pale brown mottled dark red brown, with some silt.		VSt			VS 181 kPa
							CH	**Silty CLAY**: high plasticity, orange brown, with trace fine grained sand.					
					2.0			Hand Auger HA01 terminated at 1.9 m Refusal					Scala Bouncing
					2.5								
					3.0								
					3.5								
					4.0								

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

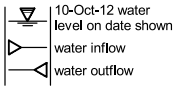
support
- M mud
- C casing
- N nil

penetration



no resistance ranging to refusal

water



10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description
based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

coffey

Engineering Log - Hand Auger

Borehole ID.	**HA02**
sheet:	1 of 1
project no.	**GENZAUCK16633AA**
client:	**Dilworth Trust Board**
date started:	**02 Jun 2015**
principal:	
date completed:	**02 Jun 2015**
project:	**80 Great South Road, New Market**
logged by:	**RT**
location:	**Refer to Site Plan**
checked by:	**JRF**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.:

drill model: Hand Auger | hole diameter : 50 mm | vane id.: 1356

drilling information | **material substance**

method & support	penetration (1 2 3)	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear (remoulded / peak) (kPa) 50 100 150 200	DCP (blows/ 100 mm) 4 8 12 16	structure and additional observations
HA, N		Not Encountered			0.0			**TOPSOIL.**					**FILL**
					0.5			**Clayey SILT**: medium plasticity, brown mottled dark red brown, with trace fine to coarse sand and minor fine to medium gravel.	M	VSt			VS 181 kPa
								0.8 m: with no gravel and trace fine grained sand					VS 181/ 78 kPa
					1.0		CL	**Silty CLAY**: medium plasticity, dark orange brown, with trace fine grained sand.					**TUFF**
													VS 165/ 82 kPa
					1.5			1.7 m: becoming pale orange brown with minor fine to medium grained sand					VS 171/ 110 kPa
					2.0			2.0 m: becoming pale brown mottled dark red brown, with some fine to medium grained sand					VS 156/ 39 kPa
					2.5								VS 110/ 53 kPa
					3.0								VS 110/ 53 kPa
								Hand Auger HA02 terminated at 3.1 m Refusal					Scala Bouncing
					3.5								
					4.0								

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description
based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Engineering Log - Hand Auger

Borehole ID.	**HA03**
sheet:	1 of 1
project no.	**GENZAUCK16633AA**
client:	**Dilworth Trust Board**
date started:	**02 Jun 2015**
principal:	
date completed:	**02 Jun 2015**
project:	**80 Great South Road, New Market**
logged by:	**RT**
location:	**Refer to Site Plan**
checked by:	**JRF**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.:

drill model: Hand Auger | hole diameter : 50 mm | vane id.: 1356

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear (remoulded / peak) (kPa) 50 100 150 200	DCP (blows/ 100 mm) 4 8 12 16	structure and additional observations
HA N		Not Encountered			0.0			**TOPSOIL.**					**FILL**
					0.5			**Clayey SILT**: medium plasticity, brown, with trace fine to medium grained sand and some fine to medium gravel.	M	H			VS UTP
								0.8 m: with no gravel		VSt	⊕ ⊙		VS 181/ 60 kPa
					1.0		CL	**Silty CLAY**: medium plasticity, orange brown.					**TUFF**
											⊕ ⊙		VS 156/ 63 kPa
					1.5						⊕ ⊙		VS 175/ 83 kPa
					2.0			2.0 m: becoming pale brown			⊙		VS 181 kPa
								2.2 m: becoming pale brown mottled dark red brown with some fine to medium grained sand			⊕ ⊙		VS 159/ 60 kPa
					2.5						⊙		VS 181 kPa
					3.0			3.2 m: becoming pale grey brown mottled orange with trace fine grained sand			⊕ ⊙		VS 115/ 53 kPa
					3.5			3.5 m: becoming orange brown			⊕ ⊙		VS 132/ 46 kPa
					4.0			Hand Auger HA03 terminated at 4.0 m			⊕ ⊙		VS 181/ 46 kPa

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description
based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Engineering Log - Hand Auger

Borehole ID.	**HA04**
sheet:	1 of 1
project no.	**GENZAUCK16633AA**
client:	**Dilworth Trust Board**
date started:	**02 Jun 2015**
principal:	
date completed:	**02 Jun 2015**
project:	**80 Great South Road, New Market**
logged by:	**RT**
location:	**Refer to Site Plan**
checked by:	**JRF**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.:

drill model: Hand Auger | hole diameter : 50 mm | vane id.: 1356

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear (remoulded / peak) (kPa) 50 100 150 200	DCP (blows/ 100 mm) 4 8 12 16	structure and additional observations
HA N		Not Encountered			0.0			**TOPSOIL.**					**FILL**
					0.5			**Clayey SILT**: medium plasticity, dark grey brown, with some fine grained sand and trace fine to medium grained gravel.	M	VSt			VS 181 kPa
							MH	**Clayey SILT**: medium plasticity, dark brown orange, with trace fine grained sand.					**TUFF**
					1.0								VS 149/ 50 kPa
								1.2 m: becoming pale grey brown					VS UTP
					1.5			1.5 m: becoming pale grey brown mottled dark brown red with some fien to medium grained sand					VS 181 kPa
					2.0			2.0 m: with no sand		H			VS UTP
					2.5					VSt			VS 181 kPa
								2.7 m: with some fine to medium grained sand					VS 181 kPa
					3.0								
							CH	**Silty CLAY**: high plasticity, brown, with trace fine grained sand.					VS 140/ 89 kPa
					3.5								
								Hand Auger HA04 terminated at 3.6 m Refusal					VS UTP Scala Bouncing
					4.0								

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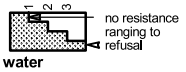
method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

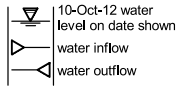
support
- M mud
- C casing
- N nil

penetration



no resistance ranging to refusal

water



10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description
based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Engineering Log - Hand Auger

Borehole ID.	**HA05**
sheet:	1 of 1
project no.	**GENZAUCK16633AA**
client:	**Dilworth Trust Board**
date started:	**02 Jun 2015**
principal:	
date completed:	**02 Jun 2015**
project:	**80 Great South Road, New Market**
logged by:	**RT**
location:	**Refer to Site Plan**
checked by:	**JRF**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.:

drill model: Hand Auger | hole diameter : 50 mm | vane id.: 1356

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear (remoulded / peak) (kPa) 50 100 150 200	DCP (blows/ 100 mm) 4 8 12 16	structure and additional observations
HA, N		Not Encountered			0.0			**TOPSOIL**.					**FILL**
					0.5			**Clayey SILT**: medium plasticity, dark grey brown. 0.5 m: with minor fine grained gravel	M	VSt			VS 123/ 39 kPa
													VS 175/ 104 kPa
					1.0			**Silty SAND**: fine to coarse grained, grey brown, with some fine gravel.		MD			
							SM	**Silty CLAY**: medium plasticity, brown orange, with trace fine grained sand.		VSt			**TUFF** VS 181 kPa
					1.5		MH	**Clayey SILT**: medium plasticity, pale brown grey mottled pale brown orange, with some fine grained sand.					VS 181 kPa
					2.0					H			VS UTP
					2.5		CL	**Silty CLAY**: medium plasticity, brown, with trace fine grained sand.		VSt			VS 156/ 49 kPa
								Hand Auger HA05 terminated at 2.7 m Refusal					Scala Bouncing
					3.0								
					3.5								
					4.0								

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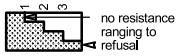
method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

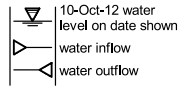
* bit shown by suffix, e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration



water



samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description
based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

Engineering Log - Hand Auger

Borehole ID.	**HA06**
sheet:	1 of 1
project no.	**GENZAUCK16633AA**
client:	**Dilworth Trust Board**
date started:	**02 Jun 2015**
principal:	
date completed:	**02 Jun 2015**
project:	**80 Great South Road, New Market**
logged by:	**RT**
location:	**Refer to Site Plan**
checked by:	**JRF**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.:

drill model: Hand Auger | hole diameter : 50 mm | vane id.: 1356

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear (remoulded / peak) (kPa) 50 100 150 200	DCP (blows/ 100 mm) 4 8 12 16	structure and additional observations
HA N		Not Encountered			0.0			**Clayey SILT**.	M	VSt			**FILL**
								0.3 m: with trace fine grained gravel					VS 181 kPa
					0.5		MH	**Clayey SILT**: medium plasticity, dark brown, with minor fine grained gravel.					**TUFF**
													VS 181 kPa
					1.0		CL	**Silty CLAY**: medium plasticity, pale orange brown, with trace fine grained sand.					VS 165/ 86 kPa
					1.5			1.5 m: with some fine to medium grained sand					VS 181 kPa
							MH	**Clayey SILT**: medium plasticity, pale grey brown mottled brown orange, with minor fine grained sand.					VS 181 kPa
					2.0			Hand Auger HA06 terminated at 2.1 m Refusal					Scala Bouncing
					2.5								
					3.0								
					3.5								
					4.0								

CDF_0_9_06_LIBRARY.GLB rev:AI Log COF BOREHOLE: NON CORED + DCP HA LOGS.GPJ <<DrawingFile>> 08/06/2015 08:57

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description
based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Engineering Log - Hand Auger

Borehole ID.	**HA07**
sheet:	1 of 1
project no.	**GENZAUCK16633AA**
client:	**Dilworth Trust Board**
date started:	**02 Jun 2015**
principal:	
date completed:	**02 Jun 2015**
project:	**80 Great South Road, New Market**
logged by:	**RT**
location:	**Refer to Site Plan**
checked by:	**JRF**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.:

drill model: Hand Auger | hole diameter : 50 mm | vane id.: 1356

drilling information | **material substance**

method & support	penetration (1 2 3)	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear (remoulded / peak) (kPa)	DCP (blows/ 100 mm)	structure and additional observations
HA, N		Not Encountered			0.0			**TOPSOIL**.					**FILL**
								Clayey SILT: medium plasticity, brown, with trace fine to medium grained sand and minor fine to medium grained gravel.	M	H			VS UTP
					0.5		CL	**Silty CLAY**: medium plasticity, orange brown.					**TUFF**
										VSt			VS 181 kPa
					1.0			1.1 m: with some fine to medium grained sand					VS 181 kPa
								1.3 m: becoming pale brown mottled dark red orange					VS 181 kPa
					2.0			2.0 m: with no sand, high plasticity					VS 123/ 53 kPa
										H			VS UTP
					2.5			Hand Auger HA07 terminated at 2.5 m Refusal					Scala Bouncing
					3.0								
					3.5								
					4.0								

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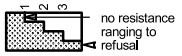
method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

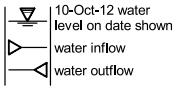
support
- M mud
- C casing
- N nil

penetration



no resistance ranging to refusal

water



10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description
based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Engineering Log - Hand Auger

Borehole ID.	**HA08**
sheet:	1 of 1
project no.	**GENZAUCK16633AA**
client:	**Dilworth Trust Board**
date started:	**02 Jun 2015**
principal:	
date completed:	**02 Jun 2015**
project:	**80 Great South Road, New Market**
logged by:	**RT**
location:	**Refer to Site Plan**
checked by:	**JRF**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.:

drill model: Hand Auger | hole diameter : 50 mm | vane id.: 1356

drilling information | **material substance**

method & support	penetration (1 2 3)	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear (remoulded / peak) (kPa)	DCP (blows/ 100 mm)	structure and additional observations
HA N		Not Encountered			0.0								
								Gravelly SILT: fine to coarse grained, grey, with some fine to coarse grained sand.	D				**FILL** Predrilled through asphalt and hardfill
					0.5								
							CL	**Silty CLAY**: medium plasticity, brown orange, with trace fine grained sand.	M				**TUFF**
					1.0								
										VSt			VS 181 kPa
					1.5								VS 181 kPa
					2.0								VS 175/ 46 kPa
					2.5								VS 181 kPa
					3.0								VS 117/ 49 kPa
													VS 159/ 86 kPa
					3.5			Hand Auger HA08 terminated at 3.5 m Refusal					Scala Bouncing
					4.0								

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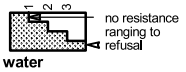
method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

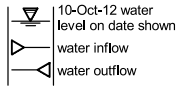
* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration



water



samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description
based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

Engineering Log - Hand Auger

Borehole ID.	**HA09**
sheet:	1 of 1
project no.	**GENZAUCK16633AA**
client:	**Dilworth Trust Board**
date started:	**03 Jun 2015**
principal:	
date completed:	**03 Jun 2015**
project:	**80 Great South Road, New Market**
logged by:	**PP**
location:	**Refer to Site Plan**
checked by:	**JRF**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.:

drill model: Hand Auger | hole diameter : 50 mm | vane id.: 1349

drilling information | **material substance**

method & support	penetration (1 2 3)	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear (kPa) ⊕ remoulded ⊙ peak (50 100 150 200)	DCP (blows/ 100 mm) (4 8 12 16)	structure and additional observations
HA / N		Not Encountered			0.0			**ASPHALT**.					**FILL**
					0.5			**Sandy GRAVEL**: fine to coarse grained, dark brown, with some silt.	M	MD to D			VS UTP
					1.0		ML	**Clayey SILT**: low plasticity, dark brown speckled black, with minor fine grained sand and trace carbonaceous inclusions.		H	⊙		**TUFF** VS 208 kPa
					1.5			1.6 m: becoming speckled orange, dark brown and black			⊙		VS 208 kPa
					2.0			1.9 m: with some fine to medium grained sand		VSt	⊕ ⊙		VS 194/ 54 kPa
					2.5		ML	**Sandy SILT**: fine to medium grained, non plastic, dark brown speckled black, with trace carbonaceous inclusions.		H	⊕ ⊙		VS 208/ 42 kPa
					3.0		MH	**Clayey SILT**: medium plasticity, brown speckled orange, dark brown and pale brown, with trace fine grained sand and trace carbonaceous inclusions.		VSt	⊕ ⊙		VS 160/ 48 kPa
					3.5			3.2 m: becoming dark brown speckled black			⊕ ⊙		VS 144/ 51 kPa
								3.6 m: with trace fine to medium grained subangular to angular basalt gravel			⊕ ⊙		VS 194/ 36 kPa
					4.0			Hand Auger HA09 terminated at 3.7 m Refusal					Scala Bouncing

CDF_0_9_06_LIBRARY.GLB rev:AI Log COF BOREHOLE: NON CORED + DCP HA LOGS.GPJ <<DrawingFile>> 08/06/2015 08:57

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

* bit shown by suffix, e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration (1 2 3) — no resistance ranging to refusal

water — 10-Oct-12 water level on date shown; water inflow; water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Engineering Log - Hand Auger

Borehole ID.	**HA10**
sheet:	1 of 1
project no.	**GENZAUCK16633AA**
client:	**Dilworth Trust Board**
date started:	**02 Jun 2015**
principal:	
date completed:	**02 Jun 2015**
project:	**80 Great South Road, New Market**
logged by:	**PP**
location:	**Refer to Site Plan**
checked by:	**JRF**

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.:

drill model: Hand Auger | hole diameter : 50 mm | vane id.: 1349

drilling information | **material substance**

method & support	penetration (1 2 3)	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear (kPa) ⊕ remoulded ⊙ peak (50 100 150 200)	DCP (blows/ 100 mm) (4 8 12 16)	structure and additional observations
HA / N					0.0			**TOPSOIL.**					**TUFF**
					0.5		ML	**Clayey SILT**: low plasticity, dark brown mottled black and pale brown, with minor fine to medium grained sand.	M	H			VS UTP
					1.0		ML	**Sandy SILT**: non plastic, dark brown speckled black and pale brown, with trace fine to medium grained subangular to angular gravel and trace carbonaceous inclusions.					VS UTP
					1.5		MH	**Clayey SILT**: medium plasticity, brown speckled pale brown, with minor fine grained sand and trace carbonaceous inclusions.			⊙		VS 208 kPa
					2.0			1.6 m: becoming brown speckled black			⊙		VS 208 kPa
											⊙		VS 208 kPa
							SM	**Silty SAND**: fine to medium grained, dark brown speckled black and pale brown, with trace carbonaceous inclusions.		MD			
					2.5		MH	**Clayey SILT**: medium plasticity, brown speckled pale orange brown, with trace fine grained sand.		VSt	⊕ ⊙		VS 197/ 39 kPa
										H			VS UTP
					3.0								
		02/06/15							W		⊙		VS 205 kPa
					3.5								
								Hand Auger HA10 terminated at 3.6 m Refusal					VS UTP Scala Bouncing
					4.0								

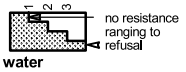
CDF_0_9_06_LIBRARY.GLB rev:AI Log COF BOREHOLE: NON CORED + DCP HA LOGS.GPJ <<DrawingFile>> 08/06/2015 08:57

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

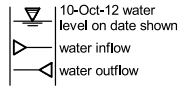
support
- M mud
- C casing
- N nil

penetration



no resistance ranging to refusal

water


10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

APPENDIX 4:

Investigation Location Plan

Legend

- ENGEO 2022 Soakage Tests
- ENGEO 2022 Percussion Boreholes
- ENGEO 2022 Hand Auger Boreholes
- ENGEO 2022 Scala Penetrometer Tests
- Coffey 2015 Investigations
- Site Boundary

Contours

- Contours 050m

0 5 m 10 m

ENGEO

Produced by Datanest.earth

Title: Investigation Location Plan		
Client: Dilworth Trust Board		
Project: 76-80 Great South Road, Remuera	Drawn: SM	Figure No: 1 Size: A4
Date: 07-03-2022	Checked: PF	
Proj No: 18670.000.001	Scale: 1:500	Version: 1

APPENDIX 5:

ENGEO 2022 Hand Auger Borehole Logs

LOG OF AUGER HA101

Geotechnical Investigation
76-80 Great South Road
Remuera, Auckland

Client : Dilworth Trust Board
Client Ref. : 18670.000.001
Date : 25/01/2022
Hole Depth : 1.7 m
Hole Diameter : 50 mm

Shear Vane No : 3144
Logged By : ML
Reviewed By : SOM
Latitude : -36.877999
Longitude : 174.780732

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer Blows per 100mm (2 4 6 8 10 12)
	FILL	GW	[HARD FILL] Fine to coarse GRAVEL with minor fine to coarse cobbles. Well graded.		78		D	N/A		
			[TUFF] Clayey SILT with trace fine to coarse sand; brown with light brown and reddish orange streaks with occasional black speckles. Low plasticity.						UTP	
0.5	AUCKLAND VOLCANIC FIELD	ML							180/0	
1.0							M	VSt-H	167/49	
					77				152/32	
1.5									UTP	
			End of Hole Depth: 1.7 m Termination Condition: Practical refusal							>>
2.0										

Hand auger met practical refusal at 1.7 m depth on hard material.
Scala Penetrometer met practical refusal at 1.7 m depth.
Standing groundwater was not encountered.
N/A = Not Assessed; UTP = Unable to Penetrate.

Elevation data was obtained from Auckland Council Geomaps.
Coordinates were obtained using Google Earth Pro.

GEOTECH HAND AUGER GINT.GPJ NZ DATA TEMPLATE 2.GDT 22/2/22

LOG OF AUGER HA102

Geotechnical Investigation
76-80 Great South Road
Remuera, Auckland

Client : Dilworth Trust Board
Client Ref. : 18670.000.001
Date : 25/01/2022
Hole Depth : 1.2 m
Hole Diameter : 50 mm

Shear Vane No : 3144
Logged By : ML
Reviewed By : SOM
Latitude : -36.877871
Longitude : 174.780983

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer Blows per 100mm (2 4 6 8 10 12)
	FILL	GP	HARDFILL] Fine to coarse GRAVEL with some fine to coarse sand. Gravel is angular to subangular, basalt. Poorly graded.				D	VSt	180+	
0.5	AUCKLAND VOLCANIC FIELD	ML	[TUFF] Clayey SILT with some fine gravel; orange brown with dark red streaks and black speckles. Low plasticity.				M	VSt-H	167/51	
									129/37	
1.0					75					
			End of Hole Depth: 1.2 m Termination Condition: Practical refusal						UTP	>>
1.5										

Hand auger met practical refusal at 1.2 m depth on hard material.
Scala Penetrometer met practical refusal at 1.3 m depth.
Standing groundwater was not encountered.
UTP = Unable to Penetrate.

Elevation data was obtained from Auckland Council Geomaps.
Coordinates were obtained using Google Earth Pro.

GEOTECH HAND AUGER GINT.GPJ NZ DATA TEMPLATE 2.GDT 22/2/22

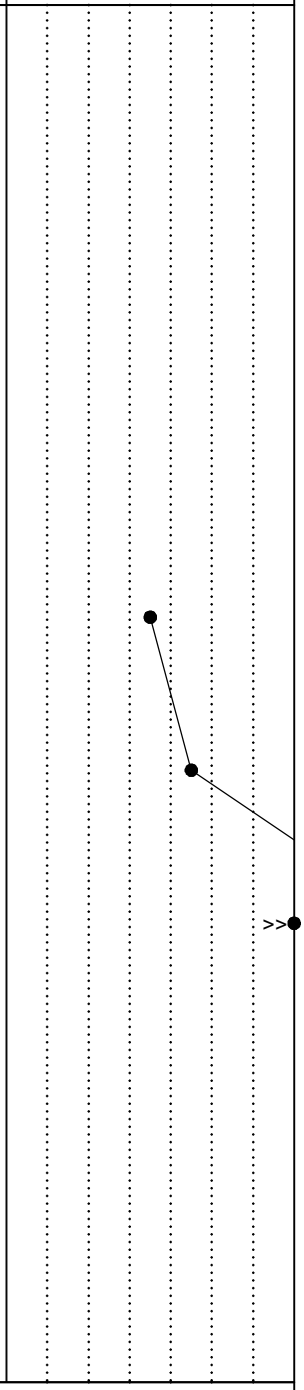
LOG OF AUGER HA103

Geotechnical Investigation
76-80 Great South Road
Remuera, Auckland

Client : Dilworth Trust Board
Client Ref. : 18670.000.001
Date : 25/01/2022
Hole Depth : 0.6 m
Hole Diameter : 50 mm

Shear Vane No : 3144
Logged By : ML
Reviewed By : SOM
Latitude : -36.877864
Longitude : 174.780737

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded
0.5	FILL	ML	[FILL] Clayey SILT with minor fine to coarse gravel and minor rootlets; brown with dark brown streaks. Low plasticity.				M	H	UTP
			End of Hole Depth: 0.6 m Termination Condition: Practical refusal						



Hand auger met practical refusal at 0.6 m depth on hard material.
Standing groundwater was not encountered.
UTP = Unable to Penetrate.
Elevation data was obtained from Auckland Council Geomaps.

Coordinates were obtained using Google Earth Pro.

GEOTECH HAND AUGER GINT.GPJ NZ DATA TEMPLATE 2.GDT 22/2/22

LOG OF AUGER HA104

Geotechnical Investigation
76-80 Great South Road
Remuera, Auckland

Client : Dilworth Trust Board
Client Ref. : 18670.000.001
Date : 25/01/2022
Hole Depth : 1.2 m
Hole Diameter : 50 mm

Shear Vane No : 3144
Logged By : ML
Reviewed By : SOM
Latitude : -36.87813
Longitude : 174.781132

Depth (m BGL)	Material	USCS Symbol	DESCRIPTION	Graphic Symbol	Elevation (mRL)	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength (kPa) Peak/Remolded	Scala Penetrometer Blows per 100mm (2 4 6 8 10 12)
	FILL	ML	[FILL] Clayey SILT with minor fine to coarse sand and trace fine to coarse gravel; brown. Low plasticity.					H	UTP	
0.5	FILL	SW	[FILL] Silty SAND; brownish grey. Well graded.				M	S-VSt	64/5	
	AVF	ML	[TUFF] Clayey SILT with some fine to coarse sand; dark brown. Low plasticity.		77			H	180+	
1.0			End of Hole Depth: 1.2 m Termination Condition: Practical refusal						UTP	
1.5										

Hand auger met practical refusal at 1.2 m depth on hard material.
Scala Penetrometer met practical refusal at m depth.
Standing groundwater was not encountered.
UTP = Unable to Penetrate; AVF = Auckland Volcanic Field.

Elevation data was obtained from Auckland Council Geomaps.
Coordinates were obtained using Google Earth Pro.

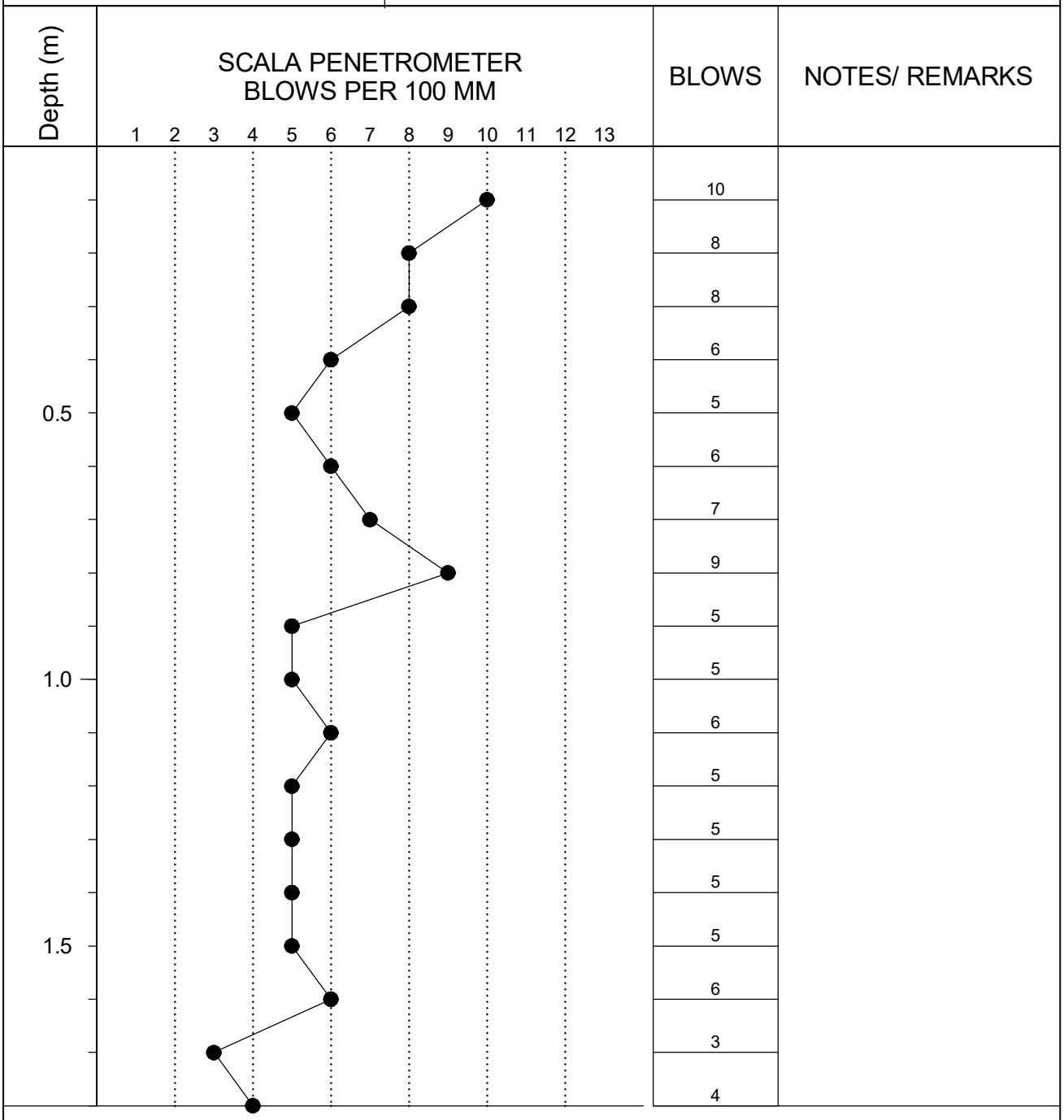
GEOTECH HAND AUGER GINT.GPJ NZ DATA TEMPLATE 2.GDT 22/2/22

LOG OF SCALA SP01

Geotechnical Investigation
76-80 Great South Road
Remuera, Auckland

Client : Dilworth Trust Board
Client Ref. : 18670.000.001
Date : 25/01/2022
Scala Depth : 1.8 m

Logged By : ML
Reviewed By : SOM
Latitude : -36.878226
Longitude :174.781032



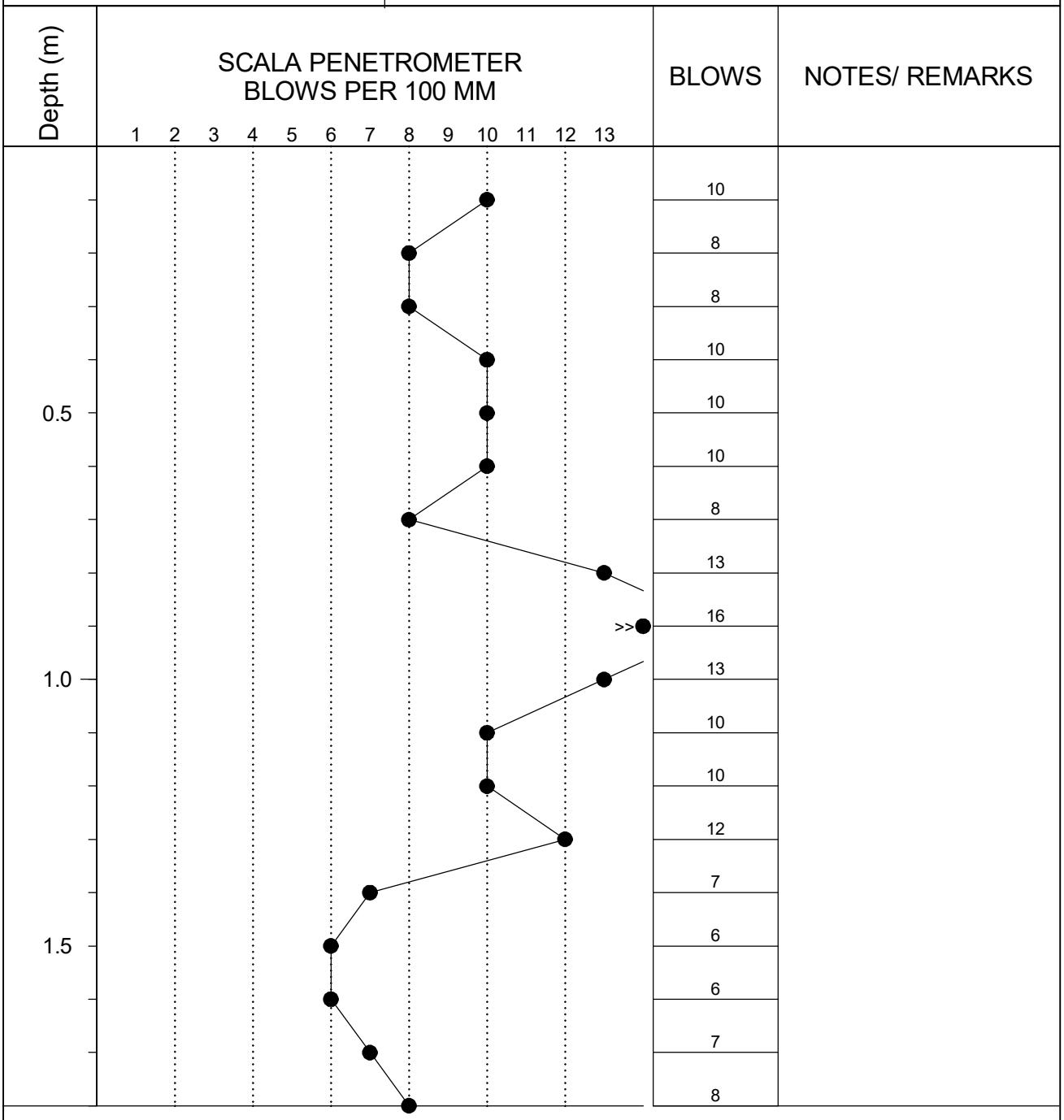
BLOWS	NOTES/ REMARKS
10	
8	
8	
6	
5	
6	
7	
9	
5	
5	
6	
5	
5	
5	
5	
6	
3	
4	

LOG OF SCALA SP02

Geotechnical Investigation
76-80 Great South Road
Remuera, Auckland

Client : Dilworth Trust Board
Client Ref. : 18670.000.001
Date : 25/01/2022
Scala Depth : 1.8 m

Logged By : ML
Reviewed By : SOM
Latitude : -36.87813
Longitude :174.781132



BLOWS	NOTES/ REMARKS
10	
8	
8	
10	
10	
10	
8	
13	
16	
13	
10	
10	
12	
7	
6	
6	
7	
8	

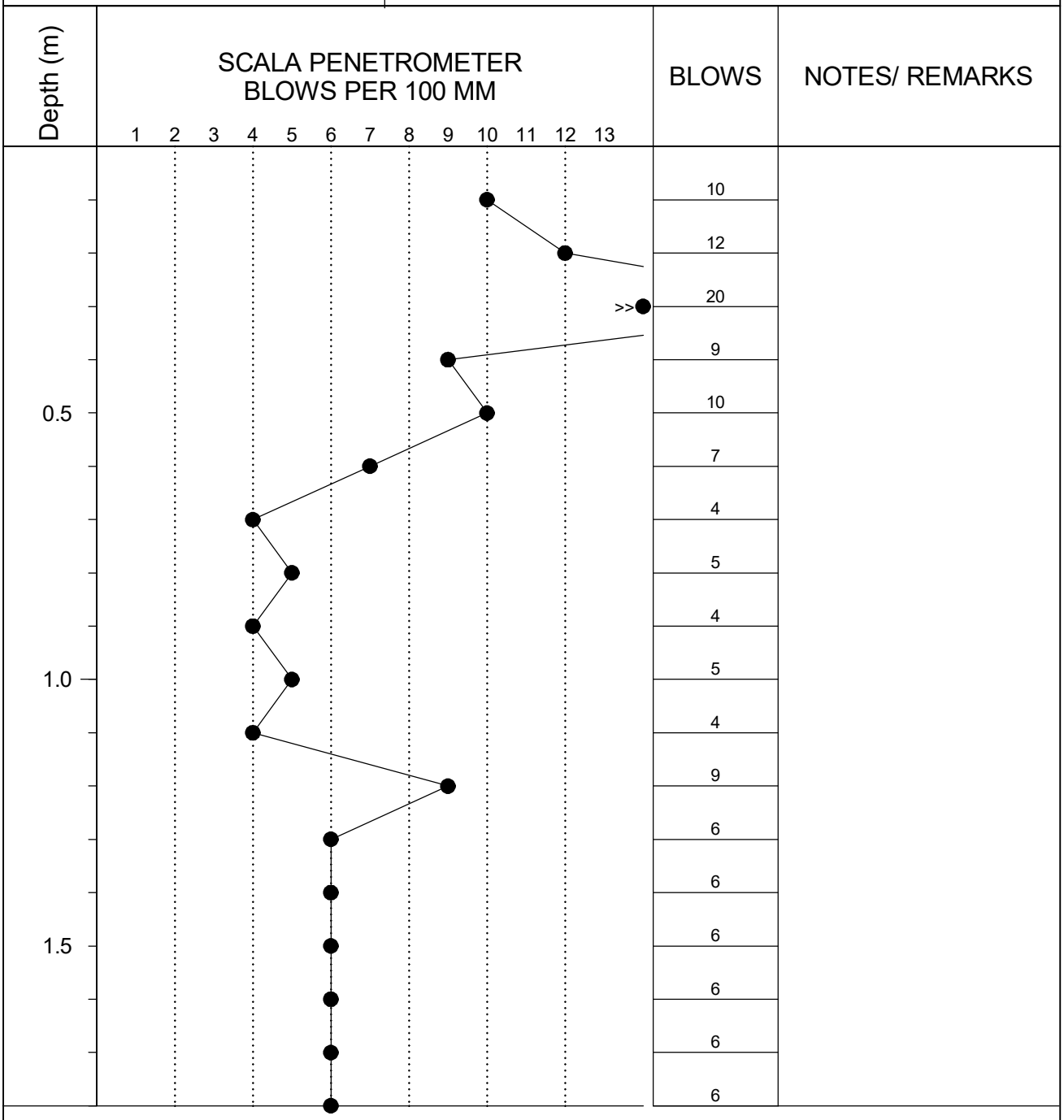
GEOTECH SCALA GINT.GPJ NZ DATA TEMPLATE 2.GDT 22/2/22

LOG OF SCALA SP03

Geotechnical Investigation
76-80 Great South Road
Remuera, Auckland

Client : Dilworth Trust Board
Client Ref. : 18670.000.001
Date : 25/01/2022
Scala Depth : 1.8 m

Logged By : ML
Reviewed By : SOM
Latitude : -36.877864
Longitude :174.781536



BLOWS	NOTES/ REMARKS
10	
12	
20	
9	
10	
7	
4	
5	
4	
5	
4	
9	
6	
6	
6	
6	
6	
6	

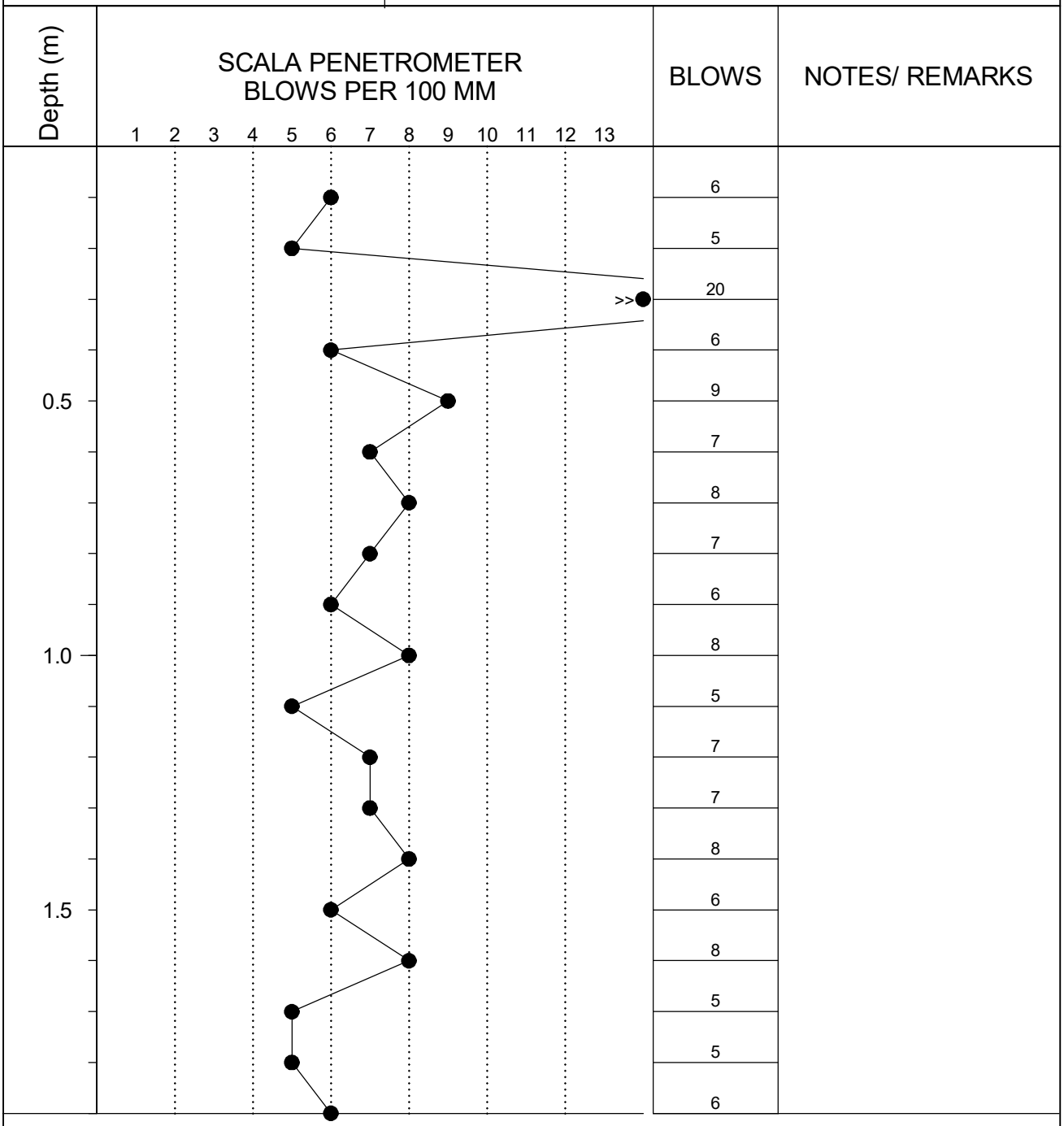
GEOTECH SCALA GINT.GPJ NZ DATA TEMPLATE 2.GDT 22/2/22

LOG OF SCALA SP04

Geotechnical Investigation
76-80 Great South Road
Remuera, Auckland

Client : Dilworth Trust Board
Client Ref. : 18670.000.001
Date : 25/01/2022
Scala Depth : 1.9 m

Logged By : ML
Reviewed By : SOM
Latitude : -36.878269
Longitude :174.781718



BLOWS	NOTES/ REMARKS
6	
5	
20	
6	
9	
7	
8	
7	
6	
8	
5	
7	
7	
8	
6	
8	
5	
5	
6	

GEOTECH SCALA GINT.GPJ NZ DATA TEMPLATE 2.GDT 22/2/22

APPENDIX 6:

2022 Percussion Borehole Logs and Soakage Tests

Investigation Drilling

Intorock Drilling Ltd
PO Box 79, Drury 2247
Ph: 09 294 6181
info@intorock.co.nz

Date: 25/01/2022

Client: ENGEO

Address: 76-80 Great South Rd, Remuera

Borehole location: As per plan

Description of work: Drill investigation bores

Method of boring: Percussion DTH

PH01

0.0m - 0.3m	Fill Gravel & Sand
0.3m - 2.2m	Ash
2.2m - 7.0m	Basalt Rock
7.0m - 7.9m	Broken Rock
7.9m - 8.8m	Basalt Rock
8.8m - 10.6m	Broken Rock & Cavities
10.6m - 11.3m	Basalt Rock
11.3m - 12.0m	Scoria

E.O.B

PH02

0.0m - 0.1m	Concrete
0.1m - 2.2m	Ash
2.2m - 7.0m	Basalt Rock
7.0m - 7.4m	Broken Rock
7.4m - 7.9m	Basalt Rock
7.9m - 11.5m	Highly Fractured/Broken Rock
11.5m - 12.5m	Broken Rock & Cavities

E.O.B

PH03

0.0m - 0.3m	Fill, Ash & Gravel
0.3m - 0.7m	Basalt Rock
0.7m - 2.8m	Fractured Rock & Ash
2.8m - 5.0m	Basalt Rock
5.0m - 6.1m	Broken Rock & Cavities
6.1m - 6.7m	Basalt Rock
6.7m - 8.7m	Broken Rock & Cavities
8.7m - 10.0m	Basalt Rock

E.O.B

PH04

0.0m - 0.1m	Seal
0.1m - 0.7m	Fill Gravel
0.7m - 3.1m	Ash
3.1m - 4.2m	Highly Fractured/Broken Rock
4.2m - 5.3m	Basalt Rock
5.3m - 8.3m	Broken Rock & Voids
8.3m - 9.0m	Basalt Rock
9.0m - 10.0m	Broken Rock

E.O.B

PH05

0.0m - 1.2m	Fill Gravel
1.2m - 3.9m	Ash
3.9m - 5.7m	Basalt Rock
5.7m - 6.2m	Fractured Rock
6.2m - 7.0m	Basalt Rock
7.0m - 7.4m	Broken Rock
7.4m - 8.5m	Basalt Rock
8.5m - 8.8m	Broken Rock
8.8m - 9.5m	Basalt Rock
9.5m - 11.2m	Broken Rock & Cavities
11.2m - 12.1m	Basalt Rock
12.1m - 12.5m	Highly Fractured/Broken Rock

E.O.B

Investigation Drilling

Intorock Drilling Ltd
PO Box 79, Drury 2247
Ph: 09 294 6181
info@intorock.co.nz

PH06

0.0m - 2.6m	Fill (clay)
2.6m - 5.9m	Basalt Rock
5.9m - 6.8m	Broken Rock & Scoria
6.8m - 9.3m	Basalt Rock
9.3m - 10.0m	Broken Rock & Cavities

E.O.B

PH07

0.0m - 0.1m	Seal
0.1m - 1.0m	Fill Gravel & Ash
1.0m - 3.4m	Ash
3.4m - 3.8m	Broken Rock & Ash
3.8m - 5.1m	Basalt Rock
5.1m - 5.6m	Fractured Rock
5.6m - 6.4m	Broken Rock & Cavities
6.4m - 7.5m	Basalt Rock
7.5m - 8.8m	Broken Rock & Cavities
8.8m - 10.0m	Basalt Rock

E.O.B

PH08

0.0m - 0.1m	Seal
0.1m - 0.4m	Fill Gravel
0.4m - 4.3m	Ash
4.3m - 4.6m	Fractured Rock
4.6m - 6.4m	Basalt Rock
6.4m - 7.0m	Broken Rock & Cavities
7.0m - 7.6m	Basalt Rock
7.6m - 8.3m	Broken Rock & Cavities
8.3m - 8.8m	Fractured Rock
8.8m - 10.0m	Basalt Rock

E.O.B

PH09

0.0m 0.1m	Seal
0.1m - 0.5m	Fill Gravel
0.5m - 2.6m	Ash
2.6m - 3.3m	Ash & Boulders
3.3m - 4.6m	Basalt Rock
4.6m - 6.8m	Broken Rock & Cavities
6.8m - 8.7m	Basalt Rock
8.7m - 9.2m	Broken Rock & Cavities
9.2m - 10.0m	Basalt Rock

E.O.B

Bore Log Sheet

CLIENT: ENGEO **DATE:** 25/01/2022

DESCRIPTION OF WORK: Drill bore for soakage & test

LOCATION: 76-80 Great South Rd, Remuera

METHOD OF BORING: Percussion DTH

BOREHOLE NO: ST1 **BOREHOLE DIA:** 100mm

BOREHOLE ID:

BOREHOLE LOCATION: 6.7m from rear boundary x 7.8m from right boundary

STRATA		FLOW TEST			
Depth	Description	Meter Start	Meter Finish	Duration	L/sec
1m	Fill, Ash & Gravel				
	1.0m Ash & Boulders				
2m	1.4m				
3m	Basalt Rock				
4m					
5m	4.8m				
6m	Broken Rock & Cavities				
7m	6.6m Scoria				
	7.2m Broken Rock				
8m	7.5m **E.O.B**				
9m					
10m					
11m					
12m					
13m					
14m					
15m		Pre	Soak	10 mins	
16m		10,262.64	10,272.72	10 mins	
17m		=	10080 L	/ 600 secs	**16.8 L/sec**
18m					
19m			Full	Delivery	Flow
20m					

90mm PVC pipe 50mm slotted PVC pipe

Notes: Tested with water truck

Flow test result is only relevant to the actual time of testing.

Ph: 09 294 6181 email: info@intorock.co.nz
www.intorockdrilling.co.nz PO Box 79 Drury 2247

Constant Head Percolation Test

Intorock Drilling Ltd

CLIENT: ENGEO **DATE:** 25/01/22

DESCRIPTION OF WORK: Drill bore for soakage & test

LOCATION: 76-80 Great South Rd, Remuera

METHOD OF BORING: Percussion DTH

BOREHOLE NO: ST1 **BOREHOLE DIA:** 100mm

BOREHOLE ID:

BOREHOLE LOCATION: 6.7m from rear boundary x 7.8m from right boundary

FLOW TEST

Presoak duration: 10 minutes **Weather conditions:** Dry

Presoak volume: 3,000L **Tested via:** Water truck

Interval start time (min:sec)	Interval length (seconds) x	Flow meter reading at start of interval	Volume infiltrated during interval (Vi) (litres)	Flow rate during interval =Vi / x (L/sec)
00:00	60	10,262.64	1008	16.8
01:00	60	10263.65	1008	16.8
02:00	60	10264.66	1008	16.8
03:00	60	10265.66	1008	16.8
04:00	60	10266.67	1008	16.8
05:00	60	10267.68	1008	16.8
06:00	60	10268.69	1008	16.8
07:00	60	10269.70	1008	16.8
08:00	60	10270.70	1008	16.8
09:00	60	10271.71	1008	16.8
Meter finish reading		10,272.72	Full Delivery Flow	

Intorock Drilling Ltd Technician on site Callum

Flow test result is only relevant to the actual time of testing.

Ph: 09 294 6181 email: info@intorock.co.nz
www.intorockdrilling.co.nz PO Box 79 Drury 2247

Bore Log Sheet

Intorock Drilling Ltd

CLIENT: ENGEO **DATE:** 25/01/2022

DESCRIPTION OF WORK: Drill bore for soakage & test

LOCATION: 76-80 Great South Rd, Remuera

METHOD OF BORING: Percussion DTH

BOREHOLE NO: ST2 **BOREHOLE DIA:** 100mm

BOREHOLE ID:

BOREHOLE LOCATION: As per plan

STRATA		FLOW TEST			
Depth	Description	Meter Start	Meter Finish	Duration	L/sec
1m	0.1m Seal				
2m	Ash				
3m					
4m	3.7m				
5m	Ash (damp)				
6m	5.2m Basalt Rock				
7m	6.4m				
8m	Broken Rock & Cavities				
9m	8.6m				
10m	Basalt Rock				
11m	9.7m Broken Rock & Cavities 10.0m **E.O.B**				
12m					
13m					
14m					
15m		Pre	Soak	10 mins	
16m		10,248.05	10,259.67	10 mins	
17m		=	11620 L	/ 600 secs	**19.4 L/sec**
18m					
19m			Full	Delivery	Flow
20m					

90mm PVC pipe 50mm slotted PVC pipe

Notes: Tested with water truck

Flow test result is only relevant to the actual time of testing.

Ph: 09 294 6181 email: info@intorock.co.nz
www.intorockdrilling.co.nz PO Box 79 Drury 2247

Constant Head Percolation Test

Intorock Drilling Ltd

CLIENT: ENGEO **DATE:** 25/01/22

DESCRIPTION OF WORK: Drill bore for soakage & test

LOCATION: 76-80 Great South Rd, Remuera

METHOD OF BORING: Percussion DTH

BOREHOLE NO: ST2 **BOREHOLE DIA:** 100mm

BOREHOLE ID:

BOREHOLE LOCATION: As per plan

FLOW TEST

Presoak duration: 10 minutes **Weather conditions:** Dry

Presoak volume: 3,000L **Tested via:** Water truck

Interval start time (min:sec)	Interval length (seconds) x	Flow meter reading at start of interval	Volume infiltrated during interval (Vi) (litres)	Flow rate during interval =Vi / x (L/sec)
00:00	60	10,248.05	1162	19.4
01:00	60	10249.21	1162	19.4
02:00	60	10250.37	1162	19.4
03:00	60	10251.54	1162	19.4
04:00	60	10252.70	1162	19.4
05:00	60	10253.86	1162	19.4
06:00	60	10255.02	1162	19.4
07:00	60	10256.18	1162	19.4
08:00	60	10257.35	1162	19.4
09:00	60	10258.51	1162	19.4
Meter finish reading		10,259.67	Full Delivery Flow	

Intorock Drilling Ltd Technician on site Callum

Flow test result is only relevant to the actual time of testing.

Ph: 09 294 6181 email: info@intorock.co.nz
www.intorockdrilling.co.nz PO Box 79 Drury 2247

Legend

- Proposed Soakage Tests
- Proposed Percussion Boreholes
- Proposed Hand Auger Boreholes
- Proposed Scala Penetrometer Tests
- Site Boundary

Contours

- Contours 050m

0 5 m 10 m

© Nearmaps

ENGEO

Produced by Datanest.earth

Title: Proposed Investigation Location Plan		
Client: Dilworth Trust Board		
Project: 76-80 Great South Road, Newmarket	Drawn: SM	Figure No: 1 Size: A4
Date: 22-12-2021	Checked: DB	
Proj No: 18670.000.002	Scale: 1:500	Version: DRAFT

APPENDIX 7:

Ground Model

DATE PLOTTED: 5 April 2022 6:48 PM BY: CAROLINE DJERDJERIAN

LEGEND:

- ENGEO 2022 Soakage Tests
- ENGEO 2022 Percussion Boreholes
- ENGEO 2022 Hand Auger Boreholes
- ENGEO 2022 Scala Penetrometer Tests
- Coffey 2015 Hand Auger Boreholes
- Coffey 2015 Machine Boreholes
- 2.2 (75.8) Depth to Basalt m bgl (m RL)

LOT 1 DP 546300
974

LOT 43B DEEDS REG 9
918

LOT 42 DEEDS REG 976

LOT 1 D
1179

LOT 1 DP 59345
1762

LOT 6 DP 3
9673

LOT 2 D
1379

HA03
4.0 (71.5)

PH03
0.3 (75.7)

ST2
5.2 (70.55)

MH03
4.7 (73.8)

HA103
0.6 (76.65)

ST1
1.4 (74.35)

HA102
1.2 (75.05)

HA02
3.1 (72.9)

HA04
3.6(72.5)

S03

PH01
2.2 (75.8)

PH08
4.6 (71.4)

HA101
1.7 (76.5)

HA01
1.9 (75.85)

PH04
4.2 (72.55)

HA09
3.9 (73.1)

HA05
2.7 (4.55)

PH02
2.2 (76.0)

PH07
3.8 (73.7)

HA104
1.2 (76.55)

PH05
3.9 (73.1)

S02

HA08
3.5 (74.0)

HA06
2.1 (76.4)

MH01
2.9 (75.2)

PH09
3.3 (74.45)

PH06
2.6 (75.9)

S01

HA10

MH02
2.7 (73.3)

HA07
2.5 (76.0)

S04

A
A'
B
B'
C
C'
D
D'
E
E'
F
F'

Rev	Date	Description	Drwn	Chkd
A	5.4.22	Issue	CD	BOL

ENGEO

Auckland Office
8 Greydene Place
Takapuna 0622,
Auckland
Tel: 09 972 2205
www.engeo.co.nz

Title: SITE PLAN

Client: Dilworth Trust Board

Project: 76-80 Great South Road Auckland

Designed: SM
Drawn: CD
Checked: BOL
Date: 5.4.22

Proj No: 18670.000.001

Scale: 1:400

Drawing: 1

Size: A3

Rev: A

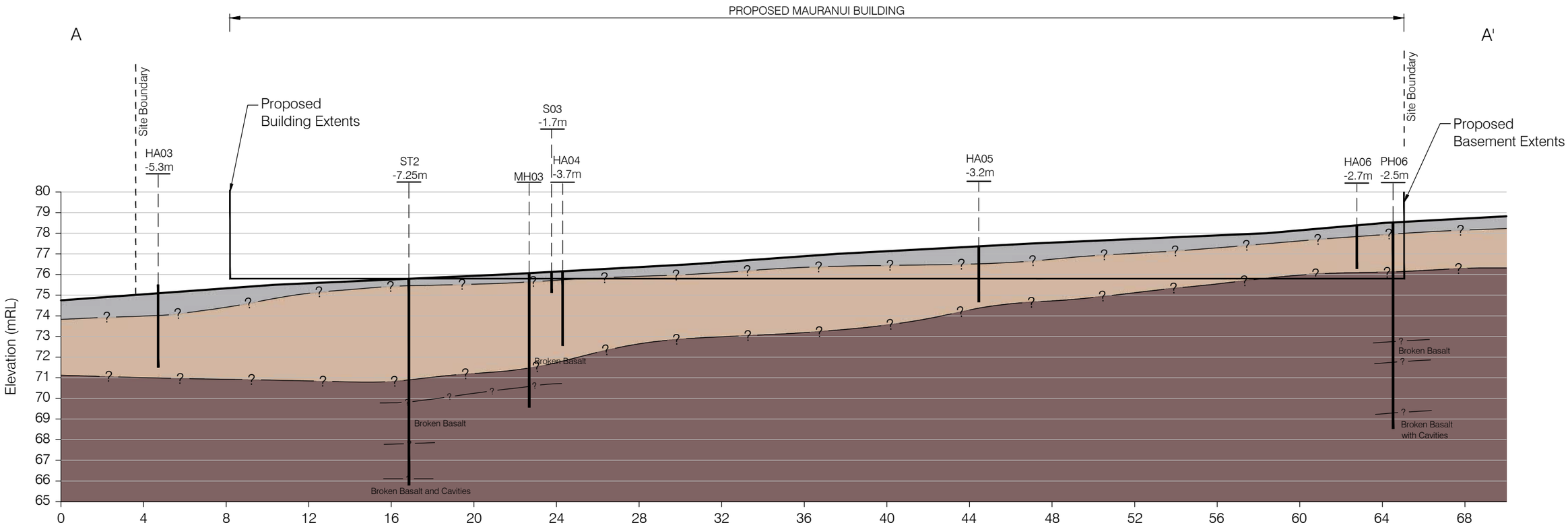
CAD File: Z:\Drafting\18001 to 19000\18670 - 76-80 Great South Road\18670 - 76-80 Great South Road-XSec-222.dwg
XREF's:

ORIGINAL FIGURE PRINTED IN COLOUR

DATE PLOTTED: 5 April 2022 6:51 PM BY: CAROLINE DJERDJERIAN

Legend:

- FILL
- AUCKLAND VOLCANIC FIELD - TUFF (VERY STIFF TO HARD)
- AUCKLAND VOLCANIC FIELD - BASALT (MODERATELY STRONG +)



Distance (m)

CROSS SECTION A-A'

SCALES 1:200

Rev	Date	Description	Drwn	Chkd
A	5.4.22	Issue	CD	BOL

ENGEO

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Auckland
Tel: 09 972 2205
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Title: Cross Section A-A'

Client: Dilworth Trust Board

Project: 76-80 Great South Road Auckland

Designed: SM
Drawn: CD
Checked: BOL
Date: 5.4.22

Proj No: 18670.000.001

Scale: 1:200

Drawing: 2

Size: A3

Rev: A

CAD File: Z:\Drafting\18001 to 19000\18670 - 76-80 Great South Road\18670 - 76-80 Great South Road-XSec-222.dwg

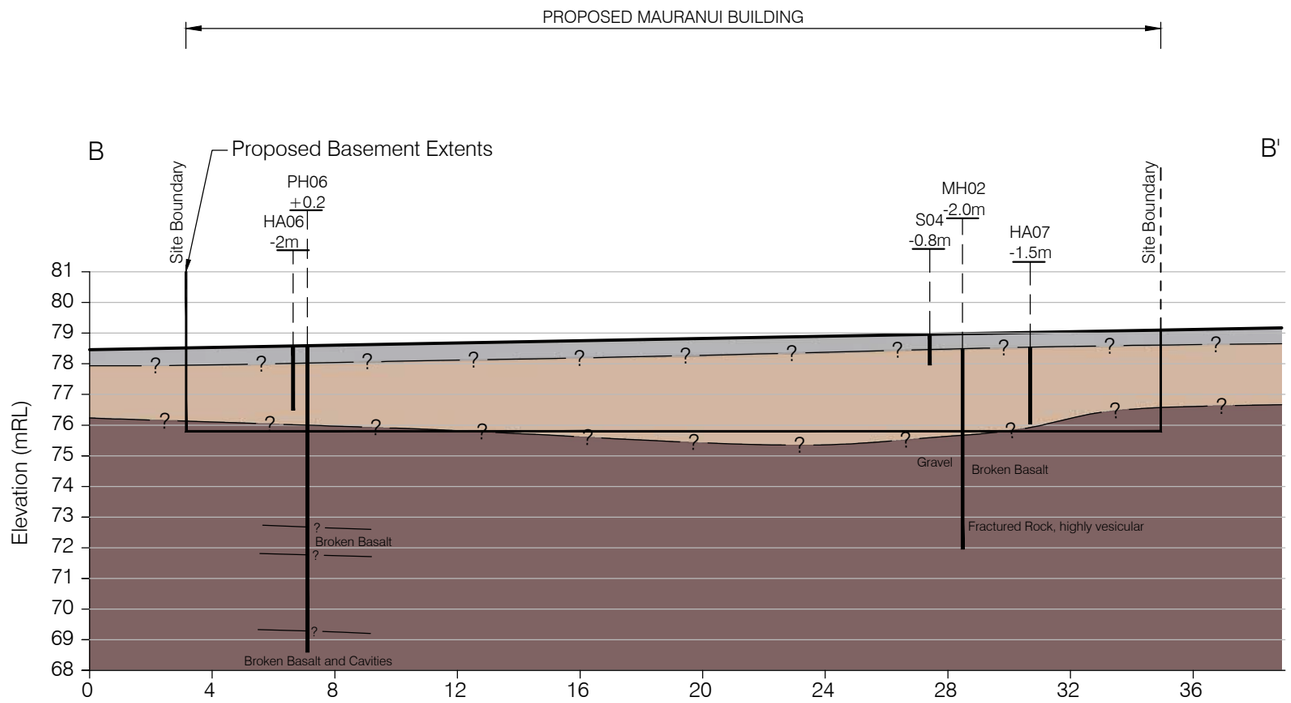
XREF's:

ORIGINAL FIGURE PRINTED IN COLOUR

DATE PLOTTED: 5 April 2022 6:53 PM BY : CAROLINE DJERDJERIAN

Legend:

- FILL
- AUCKLAND VOLCANIC FIELD - TUFF (VERY STIFF TO HARD)
- AUCKLAND VOLCANIC FIELD - BASALT (MODERATELY STRONG +)



CROSS SECTION B-B'

SCALES 1:200

Rev	Date	Description	Drwn	Chkd
A	5.4.22	Issue	CD	BOL

ENGEO
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Title: Cross Section B-B'

Client: Dilworth Trust Board

Project: 76-80 Great South Road Auckland

Designed: SM
Drawn: CD
Checked: BOL
Date: 5.4.22

Proj No: 18670.000.001
Scale: 1:200

Drawing: 3
Size: A3
Rev: A

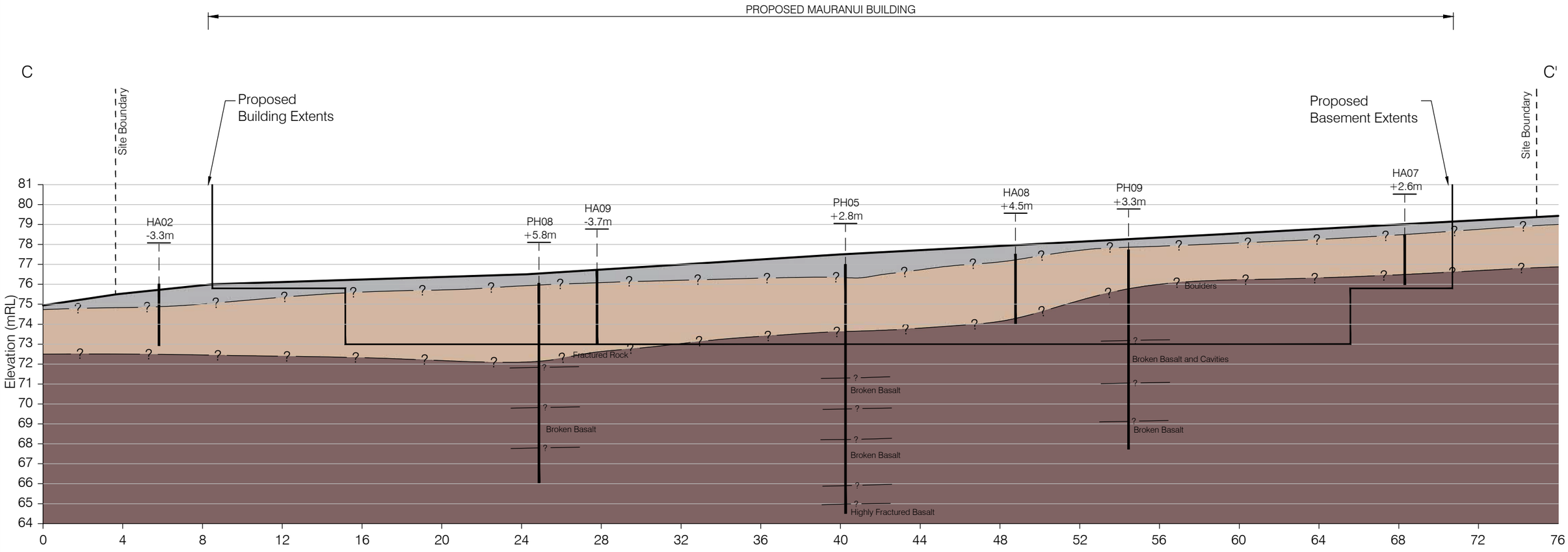
CAD File: Z:\Drafting\18001 to 19000\18670 - 76-80 Great South Road\18670 - 76-80 Great South Road-XSec-222.dwg
XREF's:

ORIGINAL FIGURE PRINTED IN COLOUR

DATE PLOTTED: 5 April 2022 6:56 PM BY: CAROLINE DJERDJERIAN

Legend:

- FILL
- AUCKLAND VOLCANIC FIELD - TUFF (VERY STIFF TO HARD)
- AUCKLAND VOLCANIC FIELD - BASALT (MODERATELY STRONG +)



CROSS SECTION C-C'

SCALES 1:200

Rev	Date	Description	Drwn	Chkd
A	5.4.22	Issue	CD	BOL

ENGEO

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Title: Cross Section C-C'

Client: Dilworth Trust Board

Project: 76-80 Great South Road Auckland

Designed: SM
Drawn: CD
Checked: BOL
Date: 5.4.22

Proj No: 18670.000.001
Scale: 1:200

Drawing: 4
Size: A3
Rev: A

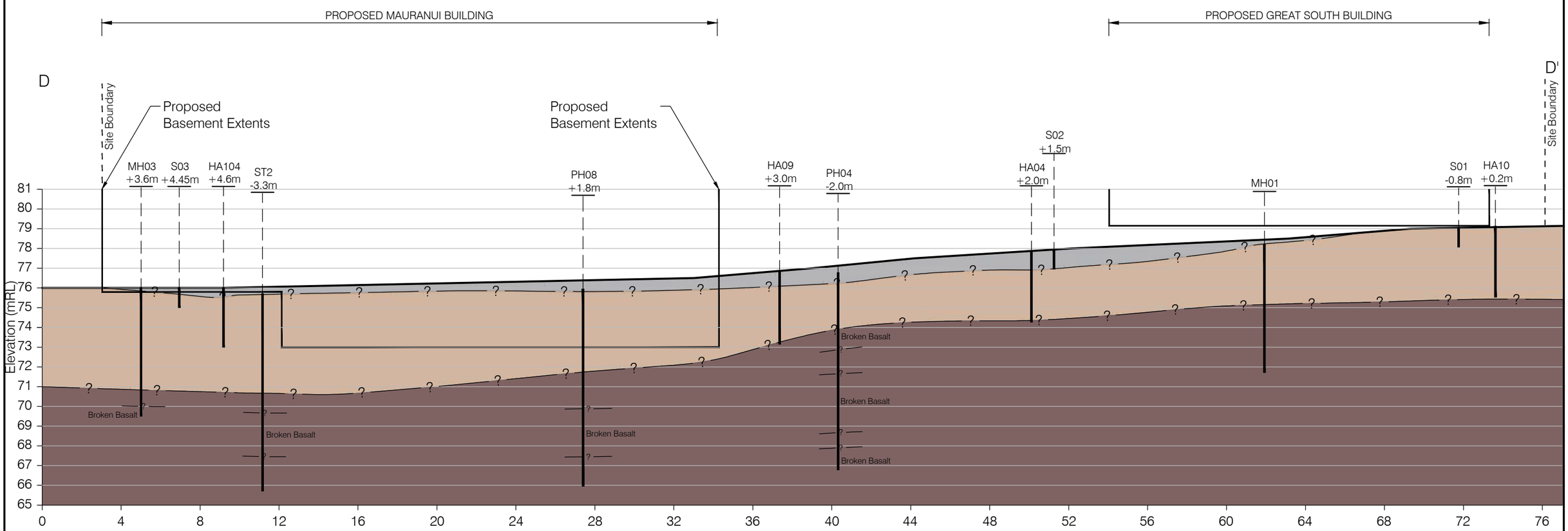
CAD File: Z:\Drafting\18001 to 19000\18670 - 76-80 Great South Road\18670 - 76-80 Great South Road-XSec-222.dwg
XREF's:

ORIGINAL FIGURE PRINTED IN COLOUR

DATE PLOTTED: 5 April 2022 6:58 PM BY: CAROLINE DJERDJERIAN

Legend:

- FILL
- AUCKLAND VOLCANIC FIELD - TUFF (VERY STIFF TO HARD)
- AUCKLAND VOLCANIC FIELD - BASALT (MODERATELY STRONG +)



Distance (m)

CROSS SECTION D-D'
SCALES 1:200

Rev	Date	Description	Drwn	Chkd
A	5.4.22	Issue	CD	BOL

ENGEO
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Tel: 09 972 2205
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Title: Cross Section D-D'

Client: Dilworth Trust Board

Project: 76-80 Great South Road Auckland

Designed: SM
Drawn: CD
Checked: BOL
Date: 5.4.22

Proj No: 18670.000.001
Scale: 1:200

Drawing: 5
Size: A3
Rev: A

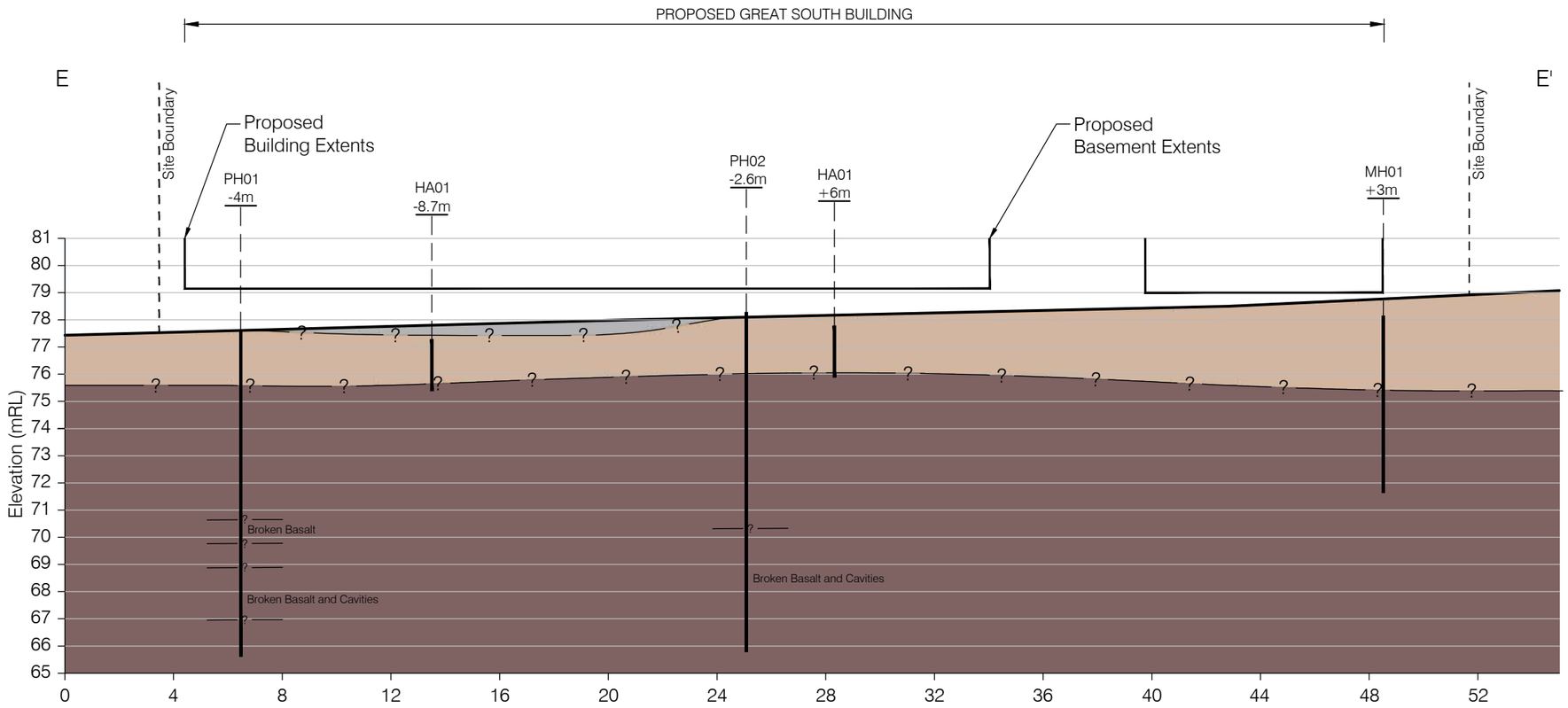
CAD File: Z:\Drafting\18001 to 19000\18670 - 76-80 Great South Road\18670 - 76-80 Great South Road-XSec-222.dwg
XREF's:

ORIGINAL FIGURE PRINTED IN COLOUR

DATE PLOTTED: 5 April 2022 7:06 PM BY: CAROLINE DJERDJERIAN

Legend:

- FILL
- AUCKLAND VOLCANIC FIELD - TUFF (VERY STIFF TO HARD)
- AUCKLAND VOLCANIC FIELD - BASALT (MODERATELY STRONG +)



Distance (m)

CROSS SECTION E-E'

SCALES 1:200

Rev	Date	Description	Drwn	Chkd
A	5.4.22	Issue	CD	BOL

ENGEO

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Title: Cross Section E-E'

Client: Dilworth Trust Board

Project: 76-80 Great South Road
Auckland

Designed: SM
Drawn: CD
Checked: BOL
Date: 5.4.22

Proj No: 18670.000.001

Scale: 1:200

Drawing: 6

Size: A3

Rev: A

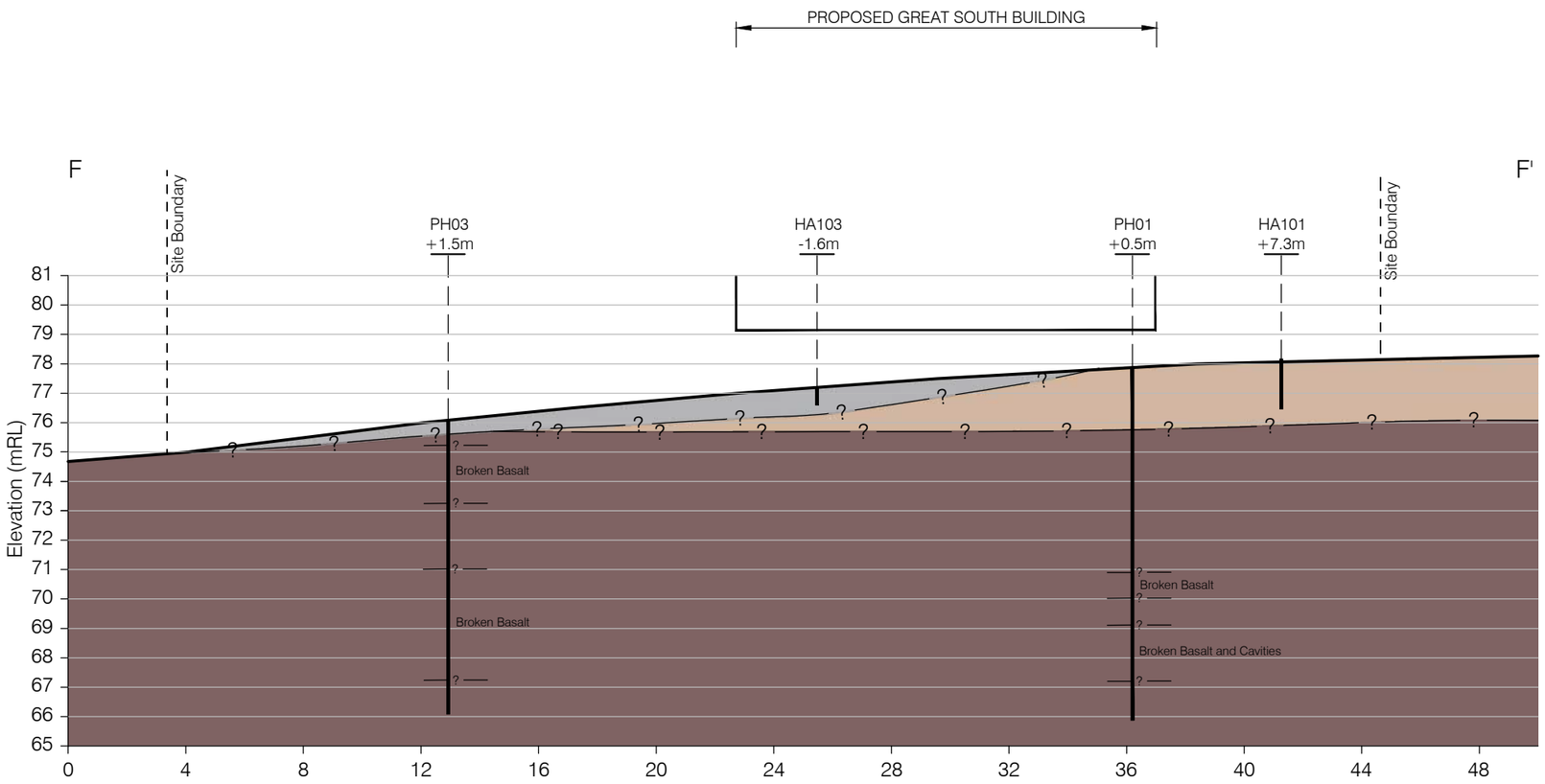
CAD File: Z:\Drafting\18001 to 19000\18670 - 76-80 Great South Road\18670 - 76-80 Great South Road-XSec-222.dwg
XREF's:

ORIGINAL FIGURE PRINTED IN COLOUR

DATE PLOTTED: 5 April 2022 7:10 PM BY: CAROLINE DJERDJERIAN

Legend:

- FILL
- AUCKLAND VOLCANIC FIELD - TUFF (VERY STIFF TO HARD)
- AUCKLAND VOLCANIC FIELD - BASALT (MODERATELY STRONG +)



CROSS SECTION F-F'
SCALES 1:200

Rev	Date	Description	Drwn	Chkd
A	5.4.22	Issue	CD	BOL

ENGEO
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Auckland
Tel: 09 972 2205
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Title: Cross Section F-F'

Client: Dilworth Trust Board
Project: 76-80 Great South Road Auckland
Designed: SM
Drawn: CD
Checked: BOL
Date: 5.4.22
Proj No: 18670.000.001
Scale: 1:200
Drawing: 7
Size: A3
Rev: A

CAD File: Z:\Drafting\18001 to 19000\18670 - 76-80 Great South Road\18670 - 76-80 Great South Road-XSec-222.dwg
XREF's:

ORIGINAL FIGURE PRINTED IN COLOUR