

Stormwater Management Report

Proposed Multi-Residential Development

1-3 Folkestone Street, Bowen Hills

For: Rothschild Kingsbridge

28 July 2021

Ref: B21-110



A QUALITY ASSURED COMPANY

CERTIFIED QUALITY ASSURANCE – ISO AS/NZS 9001, 4801 & 14001

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DOCUMENT INFORMATION

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A	J. Crabb	S.Ide RPEQ 12231	28.07.2021

This report has been prepared for Rothschild Kingsbridge for the purpose of accompanying a development application to Brisbane City Council. This report must only be used by Rothschild Kingsbridge for this purpose and must not be used or relied upon by any other person for any other purpose.

The assessment, conclusions or recommendations in this report are based on conditions encountered and information received at the time of preparing the report and may not be relied upon as site conditions or operations vary over time.

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1 INTRODUCTION

Westera Partners Pty Ltd has been commissioned by Rothschild Kingsbridge to prepare a Stormwater Management Report to accompany a development application for a proposed multi-residential development.

The development involves the construction of a new multi-residential residential development, ground floor commercial tenancy and associated infrastructure. Driveway access shall be provided via a standard commercial driveway crossover from Folkestone Street.

This report documents how stormwater runoff will be managed on site in accordance with Brisbane City Council's (BCC's) requirements.

2 SITE DESCRIPTION

2.1 Location and Land Use

The proposed development site is located at 1-3 Folkestone Street, Bowen Hills; formally known as Lots 3-4 on RP10094.

The proposed development area is approximately 728m² and is currently occupied by two detached dwellings. The site currently falls north towards Folkestone Street and the adjoining property at an average grade of approximately 11%. The site is bound by residential dwellings to the south, east and west, and Folkestone Street to the north. Refer to Figure 1 for an indicative site location and Appendix C for detailed site survey information.



Figure 1 – Indicative Site Location (Nearmap, 2021)

The DRAINS software package has been used for modelling the peak flows off site. ARR2016 rainfall patterns have been adopted in drains utilising an Initial Loss – Continuing Loss (IL-CL) hydrological model with loss parameter input as specified by the ARR2016 data hub for Bowen Hills. The following losses were adopted in the DRAINS hydrological model:

- Effective impervious area initial loss 0 mm
- Effective impervious area continuing loss 0 mm/hr
- Pervious area initial loss 13 mm
- Pervious area continuing loss 2.2 mm/hr

Design ARR2016 storms for Bowen Hills have been added into DRAINS utilising a rainfall pattern file downloaded from the ARR2016 data hub along with IFD (2016) rainfall depth files downloaded from the Bureau of Meteorology (BOM) website. Design storm events have been run with durations from the 5 minute storm up to and including the 2 hour storm for this development site.

3.1 Existing Catchment

Catchment Area

The existing site consists of two detached dwellings and ground level features. The existing surface falls west towards the neighbouring properties. The existing site area is currently approximately 728m².

The total impervious area was extrapolated from the survey plan and was found to be approximately 320m² which equates to 44% fraction impervious ($f_i=0.44$).

Stormwater runoff from the existing dwellings appears to discharge to ground level where it falls north to Folkestone Street as overland flow.

Time of Concentration (t_c)

The time of concentration is determined by using a combination of overland flow time & channel flow as described in QUDM. A time of concentration of 6 has been deemed appropriate as the time of concentration for the existing site as the natural surface is very steep.

$$t_{c, \text{existing}} = 6 \text{ minutes}$$

Coefficient of Discharge (C)

This is a coefficient used within the rational method to estimate peak flows, the value of C is a statistical component of infiltration and other losses.

This coefficient was taken from Table 4.5.3 in QUDM using the measured value of impervious area from the site survey of 44%.

$$C_{10, \text{existing}} = 0.77$$

3.1.1 DRAINS results for existing site

The existing site catchment is summarised below:

- Area – 0.0728Ha
- Total time of concentration (t_c) – 6 minutes
- Percent Impervious (f_i) – 44%

Peak flow rates from the existing site were determined by modelling various storm durations for each ARI storm. The peak flows are outlined in Table 1 below.

Table 1 - Existing Site Peak Flow Rates

ARI Storm Event	Peak flow rate (L/s)
0.5EY	19
0.2EY	25
10%	31
5%	38
2%	44
1%	49

3.2 Developed Catchment

Catchment Area

The development involves the construction of a multi-residential apartment building with ground floor commercial tenancy as well as associated driveway access and ground level features. The final catchment area remains unchanged at 728m².

The total impervious area was extrapolated from the architectural plans and was found to be approximately 699m² which equates to 96% fraction impervious ($f_i=0.96$).

Stormwater runoff is proposed to be collected on site and directed to the existing gully pit in Folkestone Street.

Time of Concentration (t_c)

The time of concentration was determined by using a standard inlet time as described in QUDM.

A total time of concentration of 5 minutes has been deemed appropriate for the developed site.

$$t_{c, \text{ developed}} = 5 \text{ minutes}$$

Coefficient of Discharge (C)

This is a coefficient used within the rational method to estimate peak flows, the value of C is a statistical component of infiltration and other losses. This coefficient was taken from Table 4.5.3 in QUDM using the measured value of impervious area of 85%.

$$C_{10, \text{ developed}} = 0.89$$

3.2.1 DRAINS Results for Developed Site

The developed site catchment is summarised below:

- Area – 0.0728Ha
- Total time of concentration (t_c) – 5 minutes
- Percent Impervious (f_i) – 96%

Peak flow rates from the developed site were determined by modelling various storm durations for each ARI storm. The peak flows are outlined in Table 2 below.

Table 2 – Developed Site Peak Flow Rates.

ARI Storm Event	Peak flow rate (L/s)
0.5EY	27
0.2EY	35
10%	40
5%	46
2%	55
1%	61

3.3 Water Quantity Comparison

Table 3 compares the peak flow rates for the median design storm for each of the existing and developed cases.

Table 3 - Existing vs Developed Peak Flow Rates

AEP Storm Event	Peak flow rate (L/s)		
	Existing Case	Developed Case	Change
0.5EY	19	27	+8
0.2EY	25	35	+10
10%	31	40	+9
5%	38	46	+8
2%	44	55	+11
1%	49	61	+12

As shown in Table 3, the peak flow rate of stormwater runoff off site has increased as a result of the increase in impervious area and decrease in time of concentration for the developed case.

The development is proposed to discharge stormwater in to a major stormwater system which traverses sporting fields impacted by River Flooding. The development is also located toward the lower end of this system. There is therefore not considered to be any adverse impact from the 12L/s increase in peak flow rate for the 1% AEP event resulting from the development. Stormwater detention is therefore not considered to be required in accordance with the recommendations provided in Section 7.5.2 of the BCC Infrastructure Design Planning Scheme Policy (IDPSP).

4 WATER QUALITY MANAGEMENT

4.1 Operational Phase

According to Brisbane City Council's Stormwater Code the site is classified as a 'low risk' development. The development is not required to meet the Queensland Governments State Planning Policy (July 2017) as the site does not exceed the 2,500m² minimum site area. However stormwater quality management must still be undertaken via the application of best management practices (BMPs) to ensure no adverse impacts to the downstream environment.

Pollutants typically generated during the operational phase of the development include:

- litter/gross pollutants
- sediment (Total Suspended Solids – TSS)
- nutrients (Total Nitrogen and Total Phosphorus – TN & TP)
- hydrocarbons (oils and grease)
- heavy metals

Stormwater quality best management practices may be implemented for the development as follows:

- First flush diversion system for roof water diverting the roof water for irrigation purposes
- Gross pollutant filter baskets in field inlet pits collection runoff from ground areas.

The listed best management practices have been deemed sufficient for the site area and use. Refer to Appendix D for the preliminary services drawings.

4.2 Construction Phase

Management of stormwater runoff during construction and the implementation of an erosion & sediment control program is necessary to avoid impacts to receiving waters from pollutants typically generated during the construction phase. Typical pollutants are described in Table 6.

Table 4 – Pollutants Typically Generated During the Construction Phase

Pollutant	Sources
Litter (Gross Pollutants)	Paper, construction packaging, food packaging, cement bags.
Sediment	Unprotected exposed soils and stockpiles during earthworks and building.
Hydrocarbons	Fuel and oil spills, leaks from construction equipment.
Toxic materials	Cement slurry, asphalt prime, solvents, cleaning agents, wash waters.
pH altering substances	Acid sulphate soils, cement slurry and wash waters.

In addition to the degradation of receiving waters, impacts of inadequate erosion and sediment control downstream from the site include:

- traffic safety problems;
- blocked drains;
- local flooding problems;
- aesthetic pollution of drainage paths; and

- damage to local ecosystems.

4.2.1 Design Objectives

Management of stormwater runoff during construction should be undertaken in accordance with Appendix 2 of the SPP (July 2017). The SPP outlines the design objectives for construction phase stormwater management. These are presented in Table 5, Table 6 and Table 7.

Table 5 – SPP Appendix 2: Part 1 Construction Phase – Stormwater Management Design Objectives

Issue	Desired Outcomes
Drainage Control	1. Manage stormwater flows around or through areas of exposed soil to avoid contamination. 2. Manage sheet flows in order to avoid or minimise the generation of rill or gully erosion. 3. Provide stable concentrated flow paths to achieve the construction phase stormwater management design objectives for temporary drainage works (part 2). 4. Provide emergency spillways for sediment basins to achieve the construction phase stormwater management design objectives for emergency spillways on temporary sediment basins (part 3).
Erosion Control	1. Stage clearing and construction works to minimise the area of exposed soil at any one time. 2. Effectively cover or stabilise exposed soils prior to predicted rainfall. 3. Prior to completion of works for the development, and prior to removal of sediment controls, all site surfaces must be effectively stabilised using methods which will achieve effective short-term stabilisation.
Sediment Control	1. Direct runoff from exposed site soils to sediment controls that are appropriate to the extent of disturbance and level of erosion risk. 2. All exposed areas greater than 2500 metres must be provided with sediment controls which are designed, implemented and maintained to a standard which would achieve at least 80% of the average annual runoff volume of the contributing catchment treated (i.e. 80% hydrological effectiveness) to 50mg/L Total Suspended Solids (TSS) or less, and pH in the range (6.5–8.5).
Litter, Hydrocarbons and other contaminants	1. Remove gross pollutants and litter. 2. Avoid the release of oil or visible sheen to released waters. 3. Dispose of waste containing contaminants at authorised facilities.
Waterway Stability and flood flow management	1. Where measures are required to meet post-construction waterway stability objectives, these are either installed prior to land disturbance and are integrated with erosion and sediment controls, or equivalent alternative measures are implemented during construction. 2. Earthworks and the implementation of erosion and sediment controls are undertaken in ways which ensure flooding characteristics

Issue	Desired Outcomes
	(including stormwater quantity characteristics) external to the development site are not worsened during construction for all events up to and including the 1 in 100 year ARI (1% AEP).

Table 6 – SPP Appendix 2: Part 2 Construction Phase – Stormwater Management Design Objectives for Temporary Drainage Works

Temporary Drainage Works	Anticipated Operation Design Life and Minimum Design Storm Event		
	<12 Months	12-24 Months	>24 Months
Drainage Structure	1 in 2 year ARI/39% AEP	1 in 5 year ARI/18% AEP	1 in 10 year ARI/10% AEP
Where located immediately up-slope of an occupied property that would be adversely affected by the failure or overtopping of the structure	1 in 10 year ARI/10% AEP		
Culvert Crossing	1 in 1 year ARI/63% AEP		

Table 7 – SPP Appendix 2: Part 3 Construction Phase – Stormwater Management Design Objectives for Emergency Spillways on Temporary Sediment Basins

Drainage Structure	Anticipated Operation Design Life and Minimum Design Storm Event		
	<3 Months	3-12 Months	>12 Months
Emergency spillways on temporary sediment basins	1 in 10 year ARI/10% AEP	1 in 20 year ARI/5% AEP	1 in 50 year ARI/2% AEP

Best practice erosion and sediment controls must be installed to minimise the discharge of sediment laden runoff during construction and to achieve the objectives outlined in Tables 9-11. This is discussed in the following section.

4.3 Erosion and Sediment Control

Management of stormwater runoff during construction is necessary to avoid pollution of downstream waterways from sediment and gross pollutant loading. Impacts of inadequate erosion and sediment control downstream from the site include:

- traffic safety problems;
- blocked drains;
- local flooding problems;
- aesthetic pollution of drainage paths; and

- damage to local ecosystems.

Best practice erosion and sediment controls must be installed to minimise the discharge of sediment laden runoff during construction. Erosion and sediment control plans shall be developed during detailed design phase and must be continually maintained and amended as required to minimise environmental harm.

Erosion and sediment control plans are based on three sets of control measures:

- drainage control;
- erosion control; and
- sediment control.

These control measures must be maintained in an effective operational condition. Sediment disposal from site is to occur to the satisfaction of BCC. Defects in erosion and sediment control devices, such as sediment fences, are to be inspected and documented. Upon Inspection, the Contractor is to determine whether the device should be replaced or repaired. Documentation is to include how the damage was caused and what measures can be implemented to reduce the possibility of repeat occurrences. Any damage to either permanent or temporary water quality control structures or devices is to be immediately rectified at the contractor's expense.

The effectiveness of the erosion and sediment control devices can be monitored by visual audits. All ESC measures are to be inspected:

- at least daily (when work is occurring on site) or weekly (when work is not occurring on site);
- within 24 hours of expected rain; and
- within 18 hours of a rainfall event (i.e. an event of sufficient intensity and duration to mobilise sediment on site).

Drainage paths are to be inspected to ensure the sediment fences are not being bypassed as a result of soil erosion.

Sediment laden runoff shall be prevented from entering neighbouring properties. This shall be achieved by landscaping disturbed areas immediately and prior to a rainfall event.

The proposed development is classed as a 'medium' risk site by the BCC erosion hazard assessment. Council will require further ESC related information from the applicant during the detailed design stage. Refer Appendix A for details.

4.3.1 Maintenance and Monitoring Requirements

Periodic maintenance and monitoring of stormwater devices proposed in this report is crucial to ensure effective operation and design life.

Inspect field inlet grates, pits and underground pipes for blockage or damage at least 6 monthly or after significant rainfall event. The filter baskets shall be inspected and maintained preferably by the manufacturer to avoid damage to units and to ensure adequate cleaning and record keeping. For the first 12 months routine inspections of filter baskets shall be carried out monthly with routine clean out at alternate months. Results of the initial 12 months maintenance program shall be used to determine future maintenance intervals. Refer manufactures maintenance and monitoring methodology for specific details.

Maintenance of ESC measures must occur in accordance with Table 10.

Table 8 - ESC maintenance requirements.

ESC Measure	Maintenance Trigger	Timeframe for Completion of Maintenance
Sediment basins	When settled sediment exceeds the volume of the sediment storage zone	Within 7 days of the inspection.
Other ESC measures	The capacity of ESC measures falls below 75%.	By the end of the day.

Sediment accumulation on ESC devices is to be removed and disposed of to the satisfaction of BCC.

5 CONCLUSION

This SWMP outlines how stormwater runoff from the site will be managed in order to not adversely impact the receiving environment.

The proposed lawful point of discharge for the development shall be the existing gully pit in Folkestone Street. Stormwater shall be collected on site and directed here via on site drainage. Stormwater detention is not considered to be required.

Stormwater treatment could be managed on site by first flush diverters directing runoff for irrigation of landscaped areas and/or the installation of field inlet pit inserts. Based on the scale of the proposed development, and typical pollutants produced, these measures are considered adequate.

By implementing the proposed stormwater management system, and providing adequate maintenance, the downstream environment and neighbouring properties will not experience any adverse deterioration of water quality as a result of the proposed development.

6 APPENDICES**Appendix A – Erosion Hazard Assessment**



Erosion Hazard Assessment - June 2014

Brisbane City Council (BCC), *Erosion Hazard Assessment* form must be read in conjunction with the *Erosion Hazard Assessment- Supporting Technical Notes* (June 2014 or later version) for explanatory terms and Certification information.

What is an Erosion Hazard Assessment?

Soil erosion and sediment from urban development, particularly during construction activities, is a significant source of sediment pollution in Brisbane's waterways. The Erosion Hazard Assessment determines whether the risk of soil erosion and sediment pollution to the environment is 'low', 'medium' or 'high'.

When is the EHA required?

An *Erosion Hazard Assessment* form must be completed and lodged with BCC for any Development Application (ie MCU or ROL) that will result in soil disturbance OR Operational Works or Compliance Assessment Application for 'Filling' or Excavation.

Failure to submit this form during lodgement of an application may result in assessment delays or refusal of the application.

Privacy Statement

The personal information collected on this form will be used by Brisbane City Council for the purposes of fulfilling your request and undertaking associated Council functions and services. Your personal information will not be disclosed to any third party without your consent, unless this is required or permitted by law.

Assessment Details

1 Please turn over and complete the erosion hazard assessment.

2 Based on the erosion hazard assessment overleaf, is the site:

☐ A 'low' risk site

Best practice erosion and sediment control (ESC) must be implemented but no erosion and sediment control plans need to be submitted with the development application. Factsheets outlining best practice ESC can be found at <http://www.waterbydesign.com.au/factsheets>

☒ A 'medium' risk site

If the development is approved, the applicant will need to engage a Registered Professional Engineer (RPEQ) or Certified Professional in Erosion and Sediment Control (CPESC) to prepare an ESC Program and Plan and supporting documentation — in accordance with the requirements of the Infrastructure Design Planning Scheme Policy.

☐ A 'high' risk site

If the development is approved, the applicant will need to engage a RPEQ and CPESC to prepare an ESC Program and Plan and supporting documentation — in accordance with the requirements of the Infrastructure Design Planning Scheme Policy. The plans and program will need to be certified by a CPESC.

3 Site Information and Certification

Application number (if known)

Site address

1-3 Folkestone Road
Bower Hills
QLD Postcode 4006

I certify that:

- ☒ I have made all relevant enquiries and am satisfied no matters of significance have been withheld from the assessment manager.
- ☒ I am a person with suitable qualifications and/or experience in erosion and sediment control.
- ☒ The Erosion Hazard Assessment was completed in accordance with the Erosion Hazard Assessment Supporting Technical Notes and the BCC Infrastructure Design Planning Scheme Policy.
- ☒ The Erosion Hazard Assessment accurately reflects the site's overall risk of soil erosion and sediment pollution to the environment.
- ☒ I acknowledge and accept that the BCC, as assessment manager, relies, in good faith, on this certification as part of its development assessment process and the provision of false or misleading information to the BCC constitutes an offence for which BCC may take punitive steps/ action against me/ enforcement action against me.

Certified by Print name

JAMES CRABB

Certifier's signature

Date

01/07/2021

Table 1: Low Risk Test

		Yes	No
1.1	is the area of land disturbance > 1000 m ²	☐	☒
1.2	does any land disturbance occur in a BCC mapped waterway corridor	☐	☒
1.3	is there any slope on site (longer than three metres in length) before, during or after construction that is steeper than 5%	☐	☒
1.4	does any land disturbance occur below 5 m AHD	☒	☐
1.5	does development involve endorsement of a staging plan	☐	☒
1.6	is there an upstream catchment passing through the site > 1 hectare	☐	☒

Have you answered 'yes' to any of the questions in Table 1?

Yes	No
☒	☐

If 'Yes' then proceed to Table 2

If 'No' then site is **low risk** with respect to erosion and sediment control

Table 2: Medium Risk Test

		Yes	No
2.1	is the area of land disturbance > 1 hectare	☐	☒

If 'Yes' then proceed to Table 3

If 'No' then site is **medium risk** with respect to erosion and sediment control

Table 3: High Risk Test

3.1	is there an upstream catchment passing through the site > 1 hectare	☐	☐
3.2	does any land disturbance occurs in a BCC mapped waterway corridor	☐	☐
3.3	is there any slope on site (longer than three metres in length) before, during or after construction that is steeper than 15%	☐	☐

Have you answered 'yes' to any of the questions in Table 3?

Yes	No
☐	☐

If 'Yes' then site is **high risk** with respect to erosion and sediment control

If 'No' then site is **medium risk** with respect to erosion and sediment control

Appendix B – Engineering Drawings

EARTHWORKS SUMMARY

AREA OF CUT - 710m²
VOLUME OF CUT - 3118m³
AREA OF FILL - 0m²
VOLUME OF FILL - 0m³

THE EARTHWORKS VOLUMES SHOWN ARE INDICATIVE NETT FIGURES ONLY BETWEEN EXISTING SURFACE LEVEL AND FINISHED EARTHWORKS LEVEL AND DO NOT ALLOW FOR DEMOLITION WORKS, STRIPPING OF TOPSOIL, UNSUITABLE MATERIAL AND VEGETATION OR COMPACTION LOSSES.

PAVEMENT LEVELS SHOWN ARE 200mm BELOW F.S.L. BUILDING PAD LEVELS SHOWN ARE 200mm BELOW F.S.L. LANDSCAPING LEVELS SHOWN ARE 100mm BELOW F.S.L.

EARTHWORKS LEVELS MAY BE ADJUSTED TO SUIT FFL'S. CONSTRUCTION METHODS BASED ON STRUCTURAL DESIGN AS APPROVED BY SUPERINTENDENT.

AREA OF FILL - AREA OF CUT -

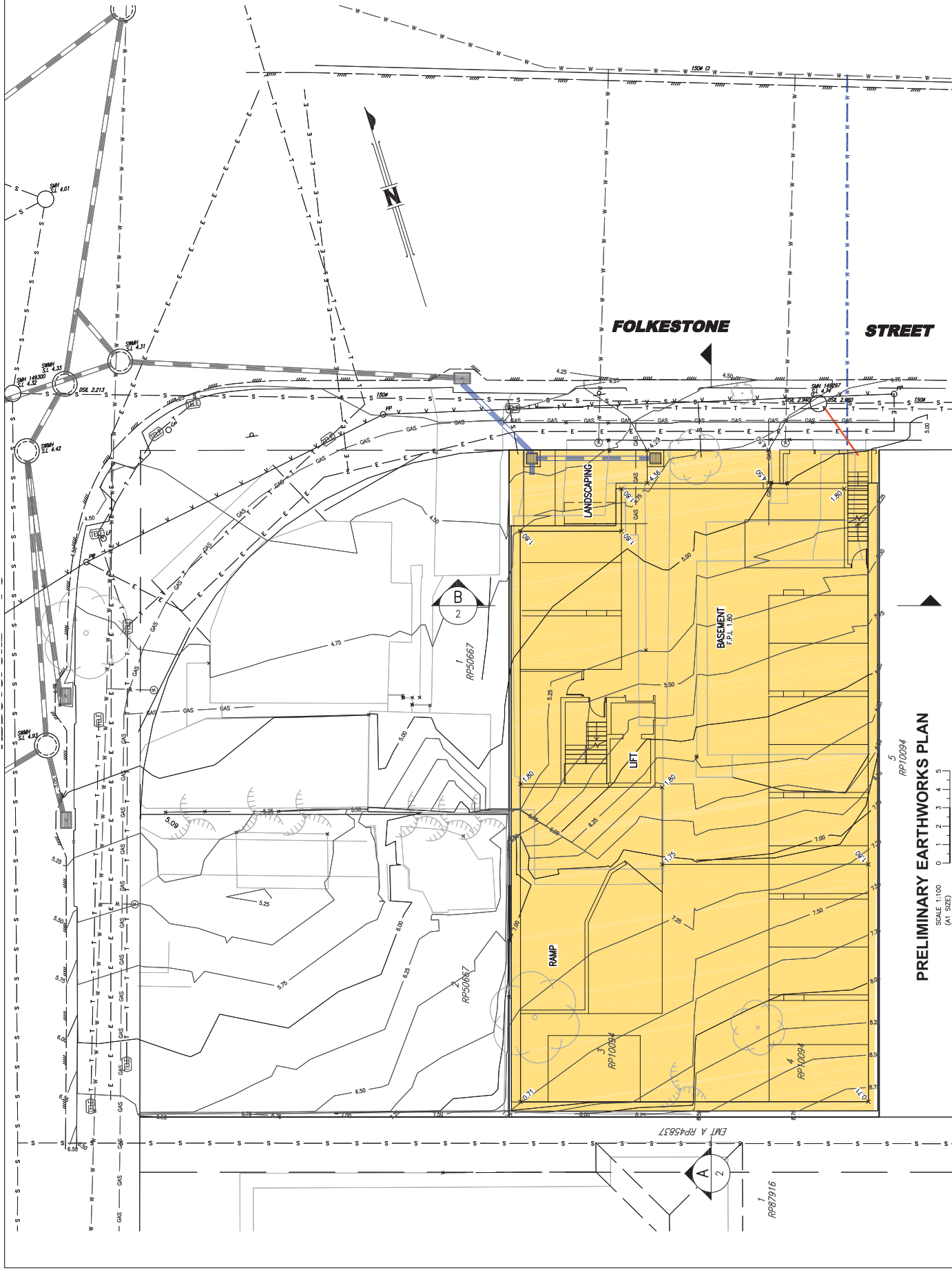
GENERAL NOTES

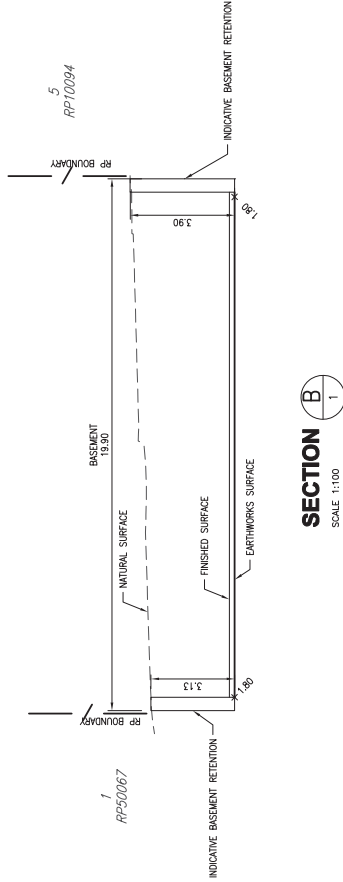
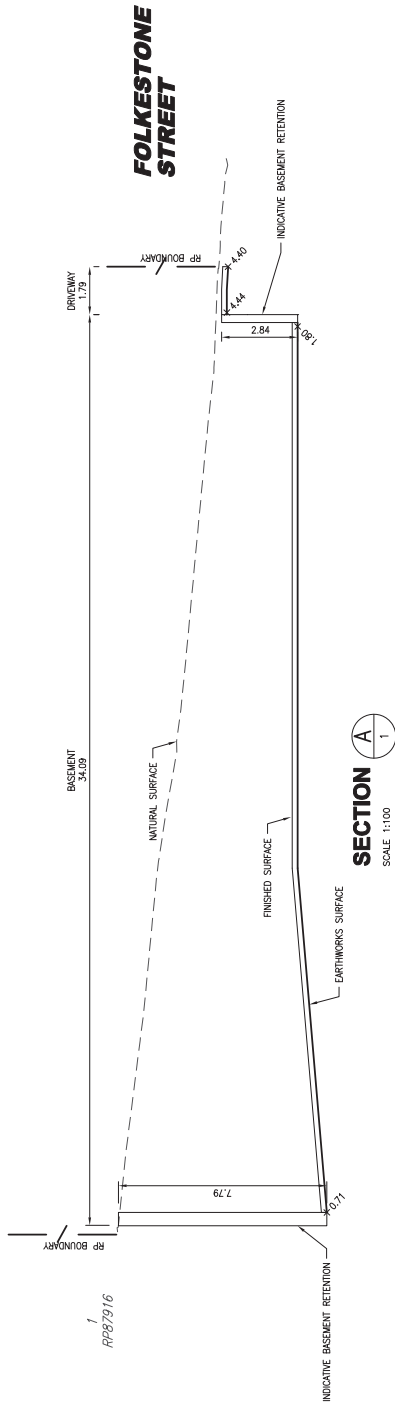
1. IN CASE OF DOUBT - AS4
2. ALL LEVELS TO AHD, DIMENSIONS IN METERS UNLESS OTHERWISE STATED
3. THE CONTRACTOR'S RESPONSIBILITY
4. THE LOCATION OF EXISTING SERVICES IS FOR CONTRACTOR'S INFORMATION ONLY, THE LOCATION OF SERVICES WILL BE CONFIRMED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORKS.
5. ANY DAMAGE CAUSED TO THE EXISTING SERVICE WILL BE REPAIRED BY THE CONTRACTOR AT HIS OWN COST.
6. EARTHWORKS PROCEDURES ARE TO BE CARRIED OUT IN ACCORDANCE WITH AS 3798 - 2007 "GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS".
7. EARTHWORKS OPERATIONS ARE TO BE CARRIED OUT IN GENERAL ACCORDANCE WITH THE GEOLOGICAL REPORT.
8. WORKS ARE TO BE CARRIED OUT IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS OF THE LOCAL AUTHORITY.
9. THE CONTRACTOR IS TO ALLOW FOR ALL FEES AND HAULAGE COSTS ASSOCIATED WITH DISPOSAL OF MATERIAL FROM THE SITE.
10. ALL COSTS ASSOCIATED WITH NOISE AND DUST MONITORING ARE TO BE DEEMED THE CONTRACTOR'S RESPONSIBILITY.
11. COMPACTION STANDARDS
 - MODIFIED TO AS 1289 TEST 5.2.1
 - STANDARD TO AS 1289 TEST 5.1.1
12. PRIOR TO COMMENCEMENT OF WORKS THE CONTRACTOR WILL PROVIDE SCOUR AND EROSION PROTECTION INCLUDING PROVISION OF SUE TRAPS AND FENCES TO MINIMISE DAMAGE TO EXISTING INFRASTRUCTURE OF THE PROPERTY.
13. NO BASTING WILL BE PERMITTED.
14. THE LOCATION OF THE SITE SHEDS, SITE OFFICE AND AMENITIES BUILDING WILL BE LOCATED TO SUIT TEMPORARY UTILITY SERVICES OR AS AGREED WITH THE MANAGER.
15. TESTING FREQUENCY AS 3798 - 2007 SECTION 8.0 OR AS AGREED WITH THE MANAGER.
16. AT COMPLETION OF CONSTRUCTION THE CONTRACTOR SHALL ARRANGE FOR AN INDEPENDENT LICENSED SURVEYOR TO CARRY OUT A "WORKS AS CONSTRUCTED" SURVEY AND SUBMIT THE DETAIL PLAN TO THE MANAGER.
17. THE LOCATION OF TEMPORARY STOCKPILES DURING CONSTRUCTION IS TO BE AGREED WITH THE MANAGER.

NOTE:
TEMPORARY EXCAVATIONS ARE TO BE SUPERVISED BY A SUITABLY QUALIFIED GEO-TECHNICAL ENGINEER.

ALL EXCAVATION WALLS TO BE WITHIN THE SET TO STAKES. EXCAVATION TO BE WITHIN THE PROPERTY BOUNDARY INCLUDING ALL ASSOCIATED FOOTINGS AND SUB-SOIL DRAINAGE.

CONTRACTOR TO USE EXCAVATION TECHNIQUE THAT WILL MINIMISE VIBRATION TO ADJACENT PROPERTIES IN ACCORDANCE WITH GEO-TECHNICAL ENGINEERS REPORT AND ADVICE ON SITE.





NOTE:
TEMPORARY EXCAVATIONS ARE TO BE SUPERVISED
BY A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER.

ALL RETAINING WALLS LOCATED WITHIN THE SITE
TO BE STRENGTHENED TO ACCORDANCE WITH THE
PROPERTY BOUNDARY INCLUDING ALL ASSOCIATED
FOOTINGS AND SUB-SOIL DRAINAGE.

CONTRACTOR TO USE EXCAVATION TECHNIQUE THAT
MINIMISES VIBRATION AND SETTLEMENT OF ADJACENT
PROPERTIES IN ACCORDANCE WITH GEOTECHNICAL
ENGINEERS REPORT AND ADVICE ON SITE.

No.	Date	Revisions	File Name	PRE_2024_07_201	Date	Checked	Drawn	Designed	Document Control	Approved	SIL	S. ISE RP02 12201	WESTER PARTNERS PTY. LTD.	www.westerpartners.com.au ABN 52 097 417 975	STRUCTURAL-CIVIL-ENVIRONMENTAL ENGINEERS	WESTER PARTNERS	SUNSHINE COAST 34/40-36/40, 38/40, 40/40, 42/40, 44/40, 46/40, 48/40, 50/40, 52/40, 54/40, 56/40, 58/40, 60/40, 62/40, 64/40, 66/40, 68/40, 70/40, 72/40, 74/40, 76/40, 78/40, 80/40, 82/40, 84/40, 86/40, 88/40, 90/40, 92/40, 94/40, 96/40, 98/40, 100/40, 102/40, 104/40, 106/40, 108/40, 110/40, 112/40, 114/40, 116/40, 118/40, 120/40, 122/40, 124/40, 126/40, 128/40, 130/40, 132/40, 134/40, 136/40, 138/40, 140/40, 142/40, 144/40, 146/40, 148/40, 150/40, 152/40, 154/40, 156/40, 158/40, 160/40, 162/40, 164/40, 166/40, 168/40, 170/40, 172/40, 174/40, 176/40, 178/40, 180/40, 182/40, 184/40, 186/40, 188/40, 190/40, 192/40, 194/40, 196/40, 198/40, 200/40, 202/40, 204/40, 206/40, 208/40, 210/40, 212/40, 214/40, 216/40, 218/40, 220/40, 222/40, 224/40, 226/40, 228/40, 230/40, 232/40, 234/40, 236/40, 238/40, 240/40, 242/40, 244/40, 246/40, 248/40, 250/40, 252/40, 254/40, 256/40, 258/40, 260/40, 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Appendix C – Site Survey & Architectural Drawings

DEVELOPMENT APPROVAL

24 x MULTIPLE DWELLINGS

1 & 3 FOLKESTONE ST, BOWEN HILLS

MAYHILL

URBAN PLANNING • ARCHITECTURE



BOWEN HILLS PDA - ZONE PLAN

- MEDIUM DENSITY RESIDENTIAL
- HIGH DENSITY RESIDENTIAL
- MIXED USE
- SPORT AND RECREATION





EXISTING SURROUNDING BUILDINGS

EXISTING MULTIPLE DWELLINGS



EXISTING DWELLING HOUSE



EXISTING SHOPS





LEVEL 7 (STOREY 8) 2 UNITS	2 x 3 BED
LEVEL 6 (STOREY 7) 4 UNITS	3 x 2 BED 1 x 1 BED
LEVEL 5 (STOREY 6) 4 UNITS	3 x 2 BED 1 x 1 BED
LEVEL 4 (STOREY 5) 4 UNITS	3 x 2 BED 1 x 1 BED
LEVEL 3 (STOREY 4) 4 UNITS	3 x 2 BED 1 x 1 BED
LEVEL 2 (STOREY 3) 4 UNITS	3 x 2 BED 1 x 1 BED
LEVEL 1 (STOREY 2) 2 UNITS	1 x 2 BED 1 x 3 BED COS
GROUND (STOREY 1)	9 CARPARKS CAFE
BASEMENT (NOT A STOREY) 14 CARPARKS	

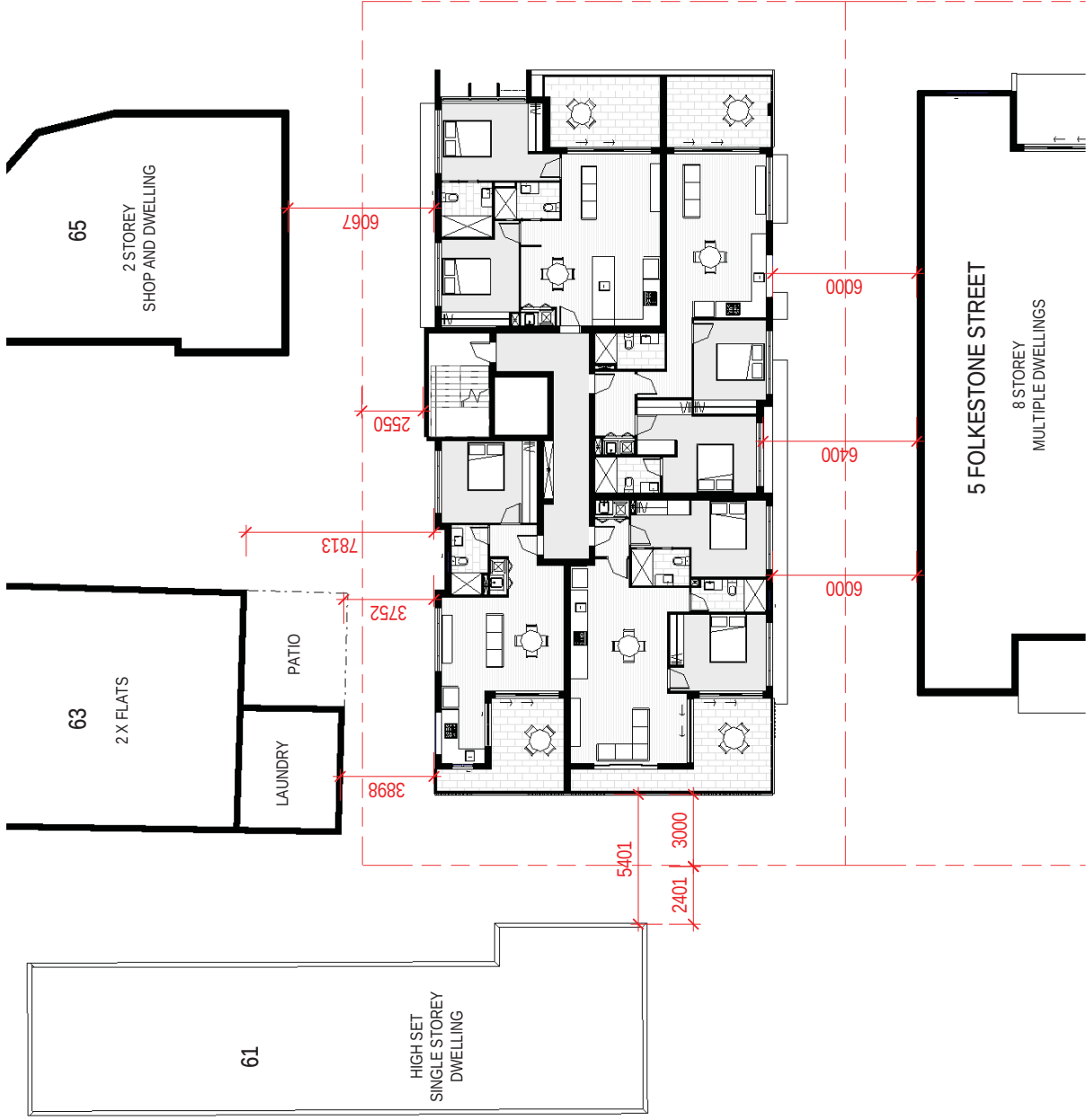
UNDER 25m EFFECTIVE BUILDING HEIGHT
22.6m

SITE DETAILS	
AREA	728m ²
WIDTH	20.1m
DEPTH	36m
LOT AND PLAN	LOTS 3 & 4 ON RP10094
ZONING	HIGH DENSITY RES

DEVELOPMENT DETAILS	
NUMBER OF UNITS	24
NUMBER OF CARS	23
NUMBER OF STOREY	8 STOREY
COS	187m ²
SITE COVER	59%
PLOT RATIO	3.5:1
LANDSCAPE	35m ²

PROPOSED CAR PARKING	
BASEMENT	14 SPACES
GROUND	9 SPACES
TOTAL	23 SPACES (INCL. 2 x PWD)

PROPOSED BICYCLE PARKING	
RESIDENTS	24 SPACES
VISITORS	6 SPACES
TOTAL	30 SPACES



1

BUILDING SEPARATION PLAN - TYPICAL TOWER

1 : 200 @ A3

ROTHSCHILD KINGSBRIDGE PTY LTD

client

1 & 3 FOLKESTONE ST, BOWEN HILLS

address

BUILDING SEPARATION PLAN

drawing title

2020-108

job number

LP

drawn

1 : 200

scale at A3

DA 1.02

dwg number

J

issue

27.07.21

date

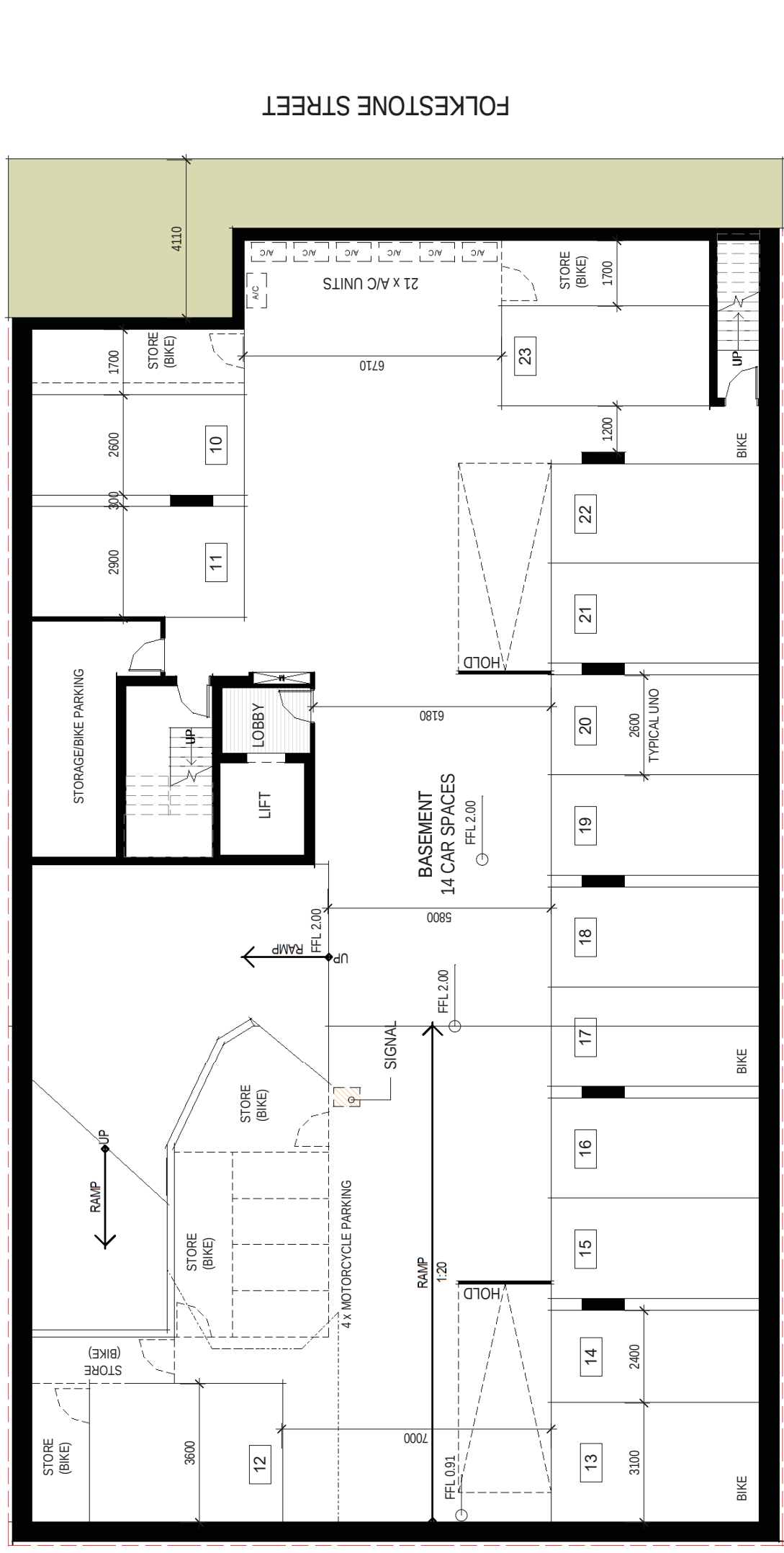
DA

description



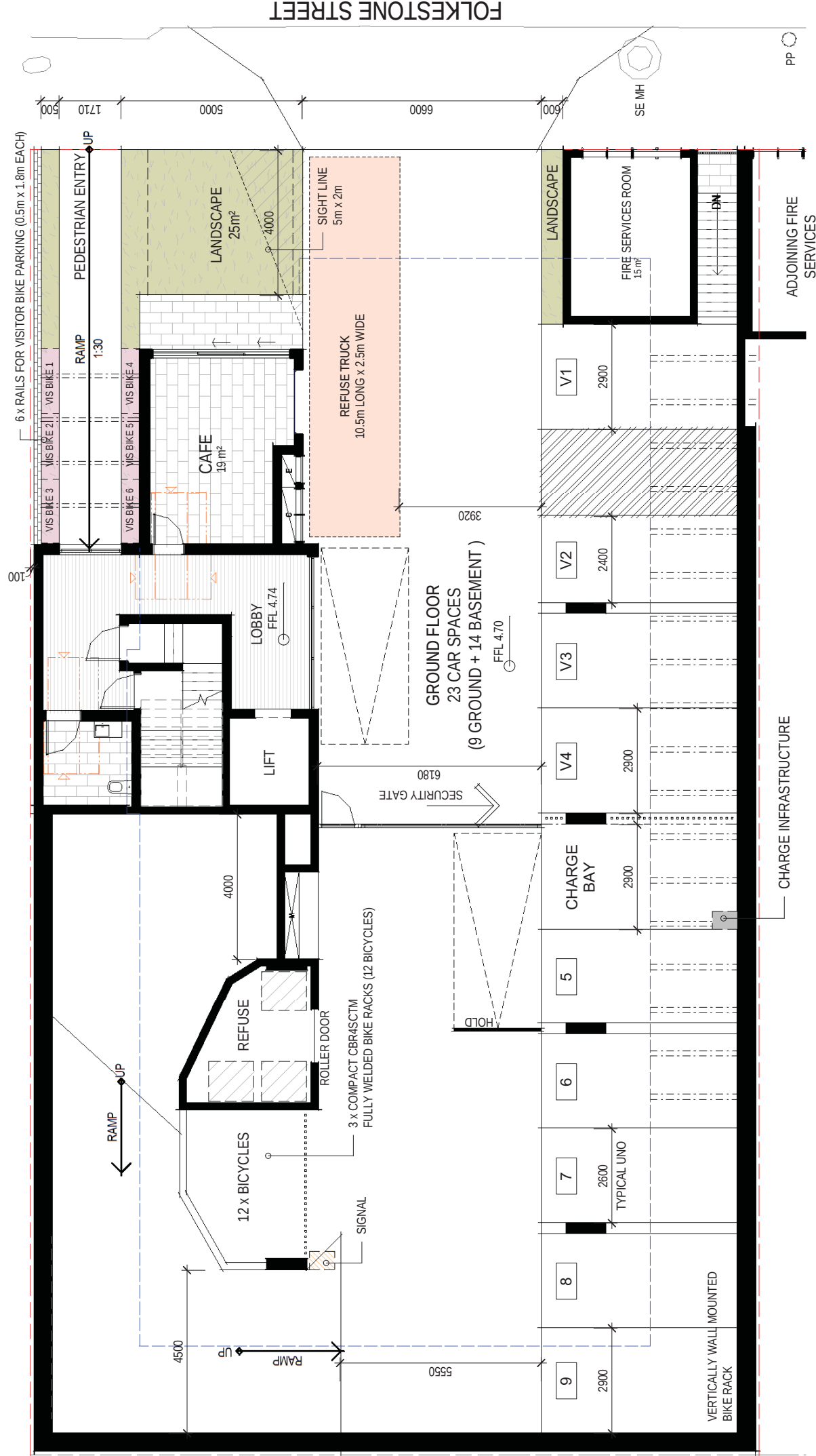
MAYHILL

URBAN PLANNING • ARCHITECTURE



25010
BUILT TO BOUNDARY WALL

25010



1 FLOOR PLAN - GROUND
1:100 @ A3

ROTHSCHILD KINGSBRIDGE PTY LTD

address
1 & 3 FOLKESTONE ST, BOWEN HILLS

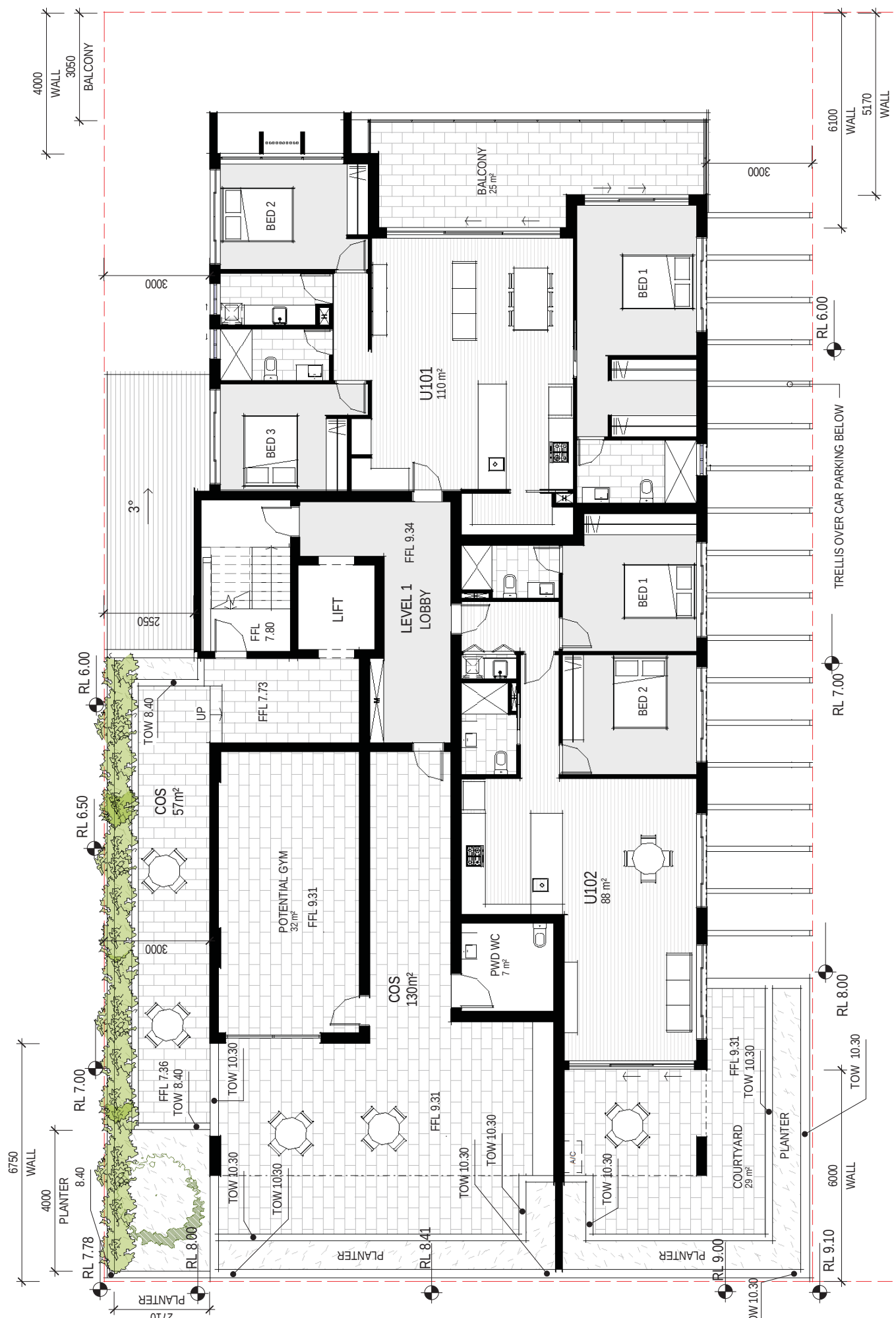
FLOOR PLAN - GROUND
drawing title

2020-108
job number

LP 1 : 100 DA 2.02
drawn scale at A3 dwg number

J	27.07.21	DA
issue	date	description

MAYHILL
URBAN PLANNING • ARCHITECTURE



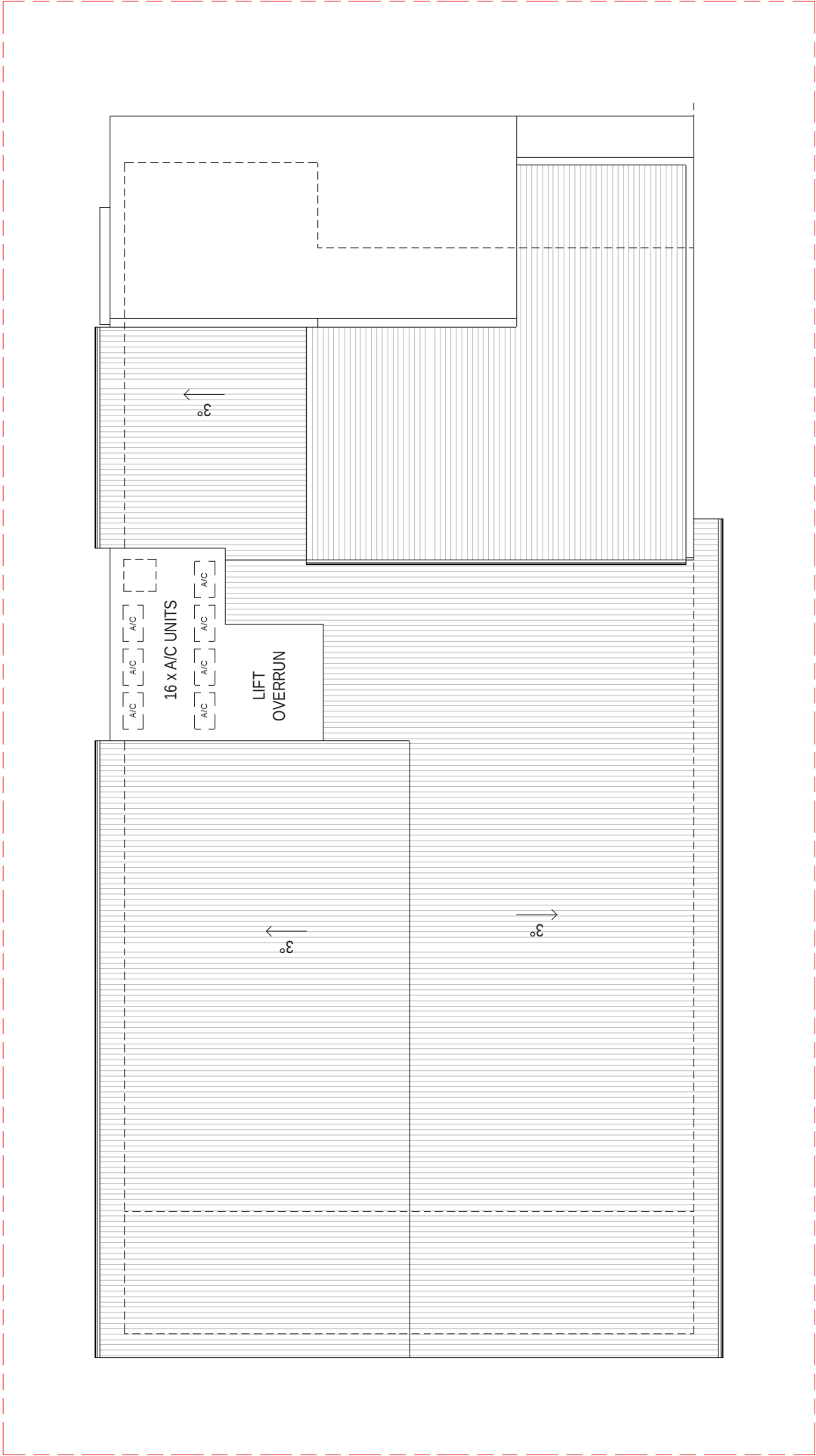
1 FLOOR PLAN - LEVEL 1
1:100 @ A3

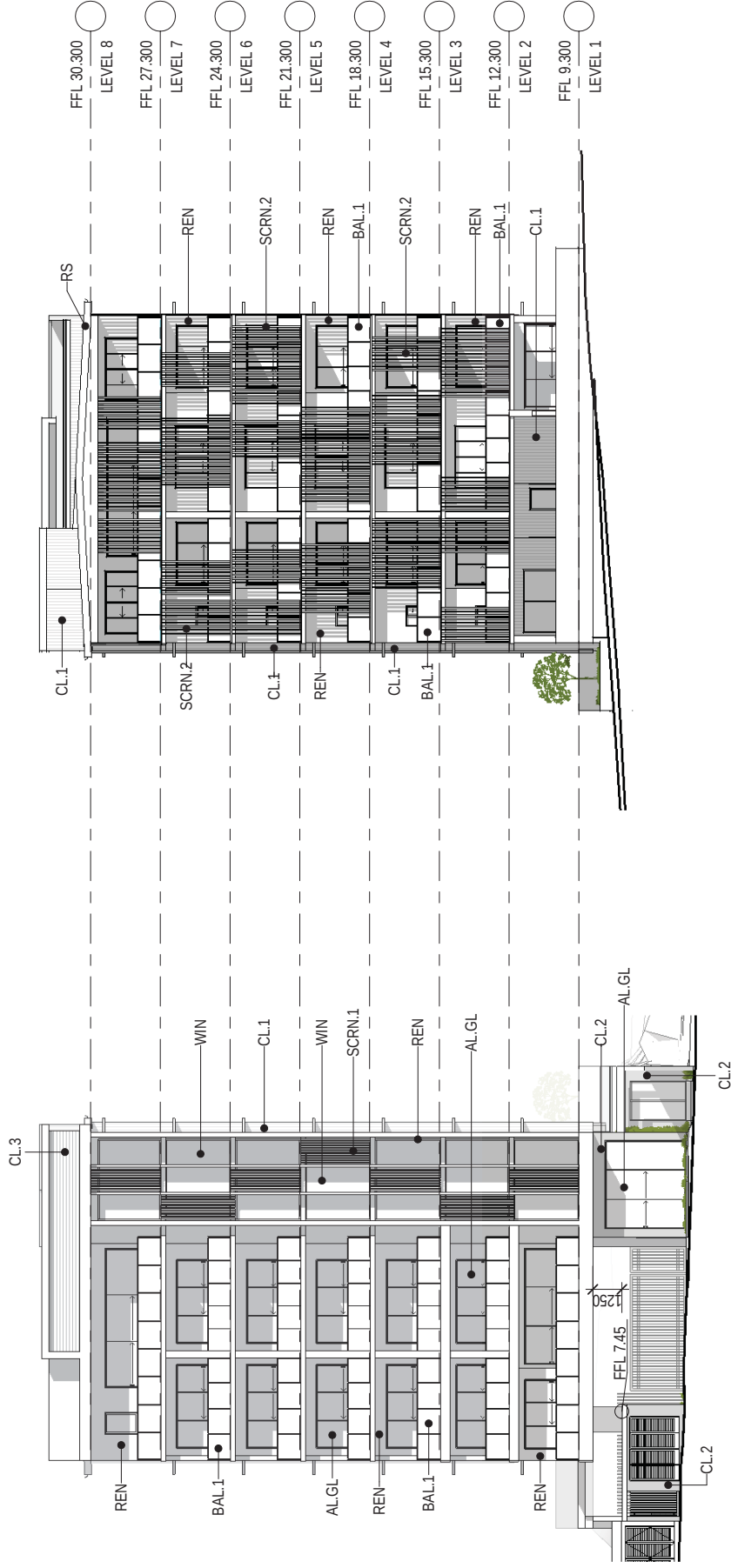




FOLKESTONE STREET







1 NORTH ELEVATION (FOLKESTONE STREET)
1 : 200 @ A3

2 SOUTH ELEVATION
1 : 200 @ A3



FACE BRICK CLADDING
PGH DRY PRESSED BRICK FACINGS
'FLINDERS RED' WITH 'MACQUARIE
BLEND' MIX.



COLORBOND COLOUR
MONUMENT



BRISTOL COLOUR
'COTTON BALL'

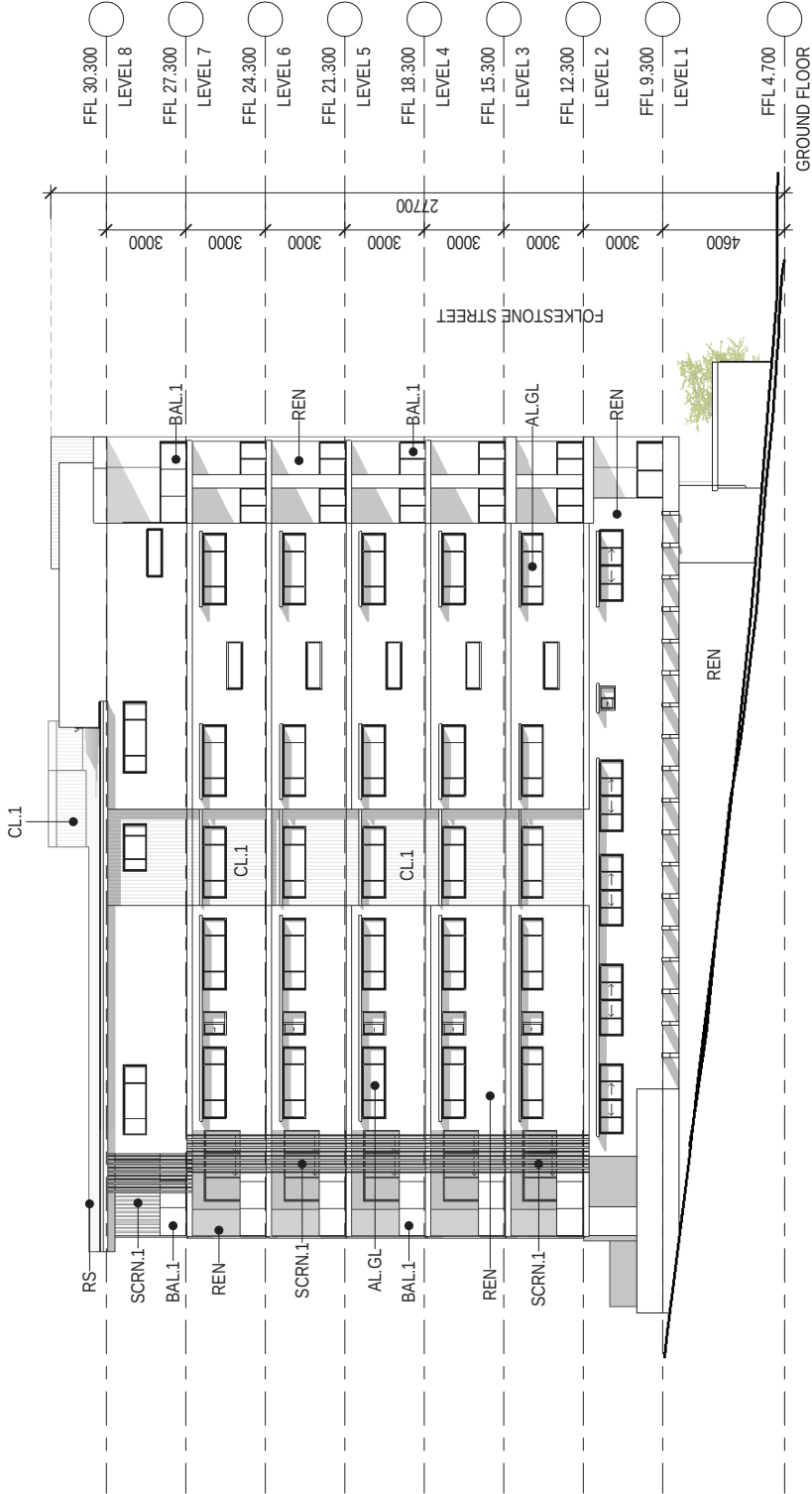
MATERIALS LEGEND

DESCRIPTION

- POWDER COATED ALUMINIUM FRAMED GLAZING.
- ALUMINIUM FRAMED CLEAR GLASS SOLID BALUSTRADE WITH NO GAPS.
- CLADDING TYPE 1. VERTICAL CLADDING. PAINT FINISH.
- CLADDING TYPE 2. FACE BRICK CLADDING.
- CLADDING TYPE 3. HORIZONTAL CLADDING. PAINT FINISH.
- RENDERED BLOCK WALL. PAINT FINISH.
- ROOF SHEETING. REFER TO FINISHES SCHEDULE.
- SCREEN TYPE 1. POWDER COATED ALUMINIUM FIXED FEATURE BATTENS.
- SCREEN TYPE 2. POWDER COATED ALUMINIUM MOVEABLE SCREENS.
- DOUBLE HUNG WINDOW. TOP OPEN, BOTTOM FIXED.

ABBRV.

- AL.GL
- BAL.1
- CL.1
- CL.2
- CL.3
- REN
- RS
- SCRN.1
- SCRN.2
- WIN



1 EAST ELEVATION
1:200 @ A3

FACE BRICK CLADDING
PGH DRY PRESSED BRICK FACINGS
'FLINDERS RED' WITH 'MACQUARIE
BLEND' MIX.



BRISTOL COLOUR
'COTTON BALL'



MATERIALS LEGEND

ABBRV.	DESCRIPTION
AL.GL	POWDER COATED ALUMINIUM FRAMED GLAZING.
BAL.1	ALUMINIUM FRAMED CLEAR GLASS SOLID BALUSTRADE WITH NO GAPS.
CL.1	CLADDING TYPE 1. VERTICAL CLADDING. PAINT FINISH.
REN	RENDERED BLOCK WALL. PAINT FINISH.
RS	ROOF SHEETING. REFER TO FINISHES SCHEDULE.
SCRN.1	SCREEN TYPE 1. POWDER COATED ALUMINIUM FIXED FEATURE BATTENS.



1 WEST ELEVATION
1 : 200 @ A3

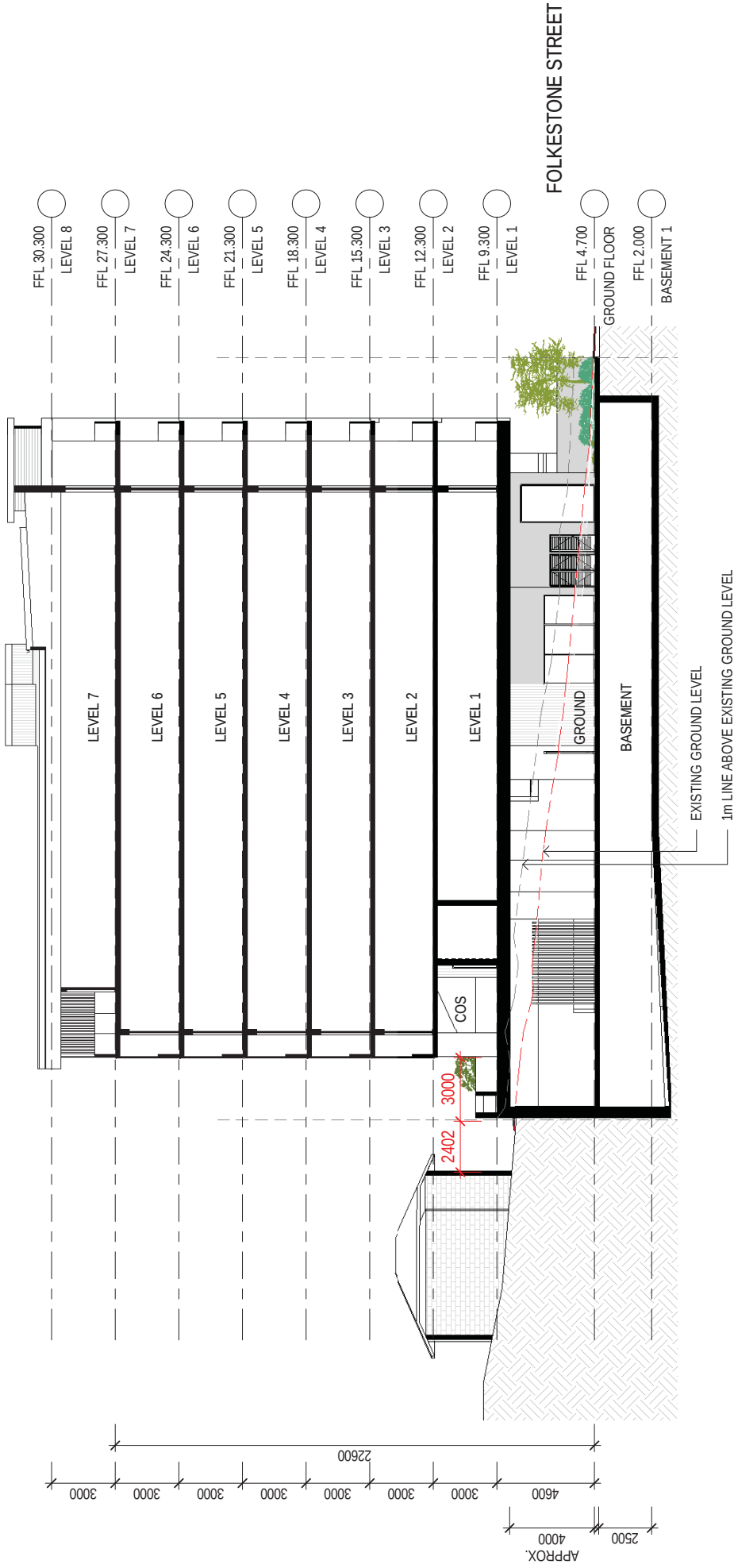


BRISTOL COLOUR
"COTTON BALL"

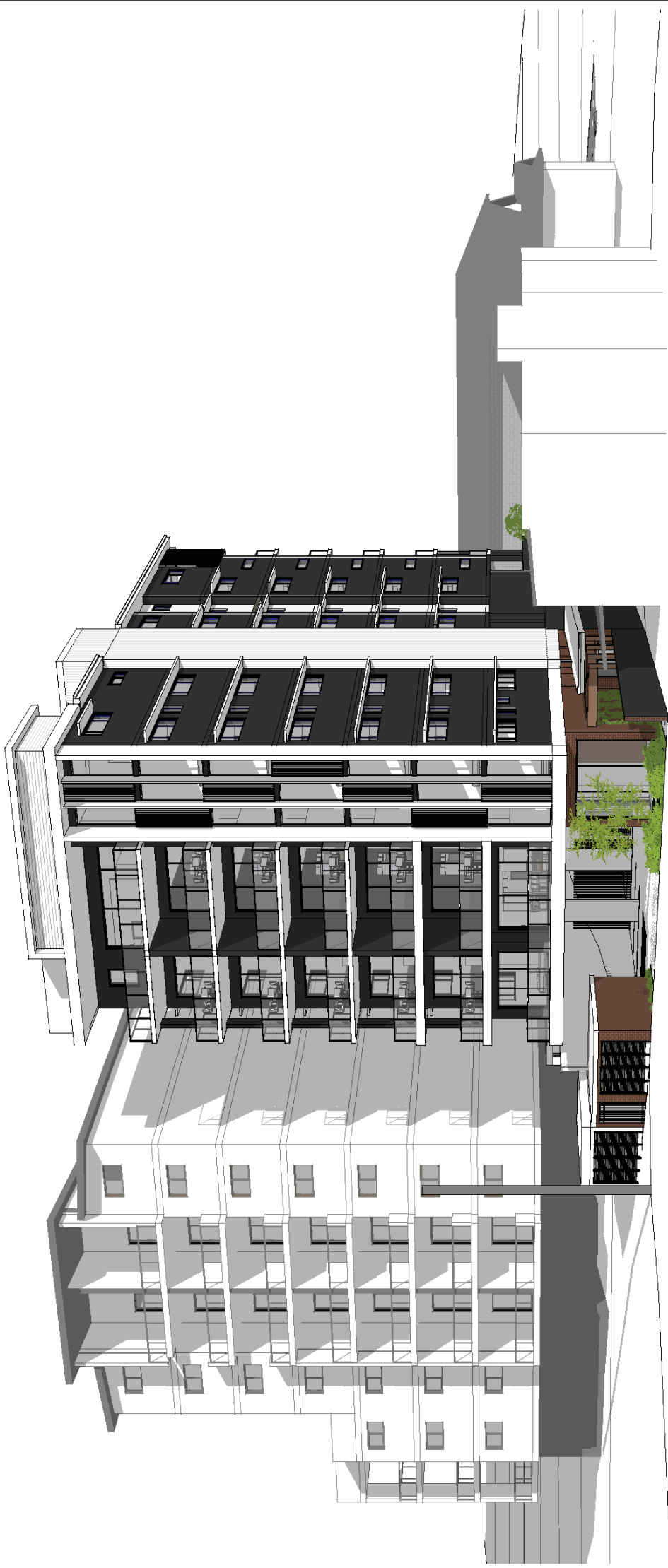
ABBREV.
AL.GL
BAL.1
CL.1
CL.2
CL.3
REN
RS
SCRN.1

MATERIALS LEGEND

DESCRIPTION
POWDER COATED ALUMINIUM FRAMED GLAZING.
ALUMINIUM FRAMED CLEAR GLASS SOLID BALUSTRADE WITH NO GAPS.
CLADDING TYPE 1. VERTICAL CLADDING. PAINT FINISH.
CLADDING TYPE 2. FACE BRICK CLADDING.
CLADDING TYPE 3. HORIZONTAL CLADDING. PAINT FINISH.
RENDERED BLOCK WALL. PAINT FINISH.
ROOF SHEETING. REFER TO FINISHES SCHEDULE.
SCREEN TYPE 1. POWDER COATED ALUMINIUM FIXED FEATURE BATTENS.



A SCHEMATIC SECTION A
1 : 200 @ A3



client

ROTHSCHILD KINGSBRIDGE PTY LTD

address

1 & 3 FOLKESTONE ST, BOWEN HILLS

drawing title

PERSPECTIVE

job number

2020-108

drawn

LP

scale at A3

DA 5.01

dwg number

J

issue

27.07.21

date

description

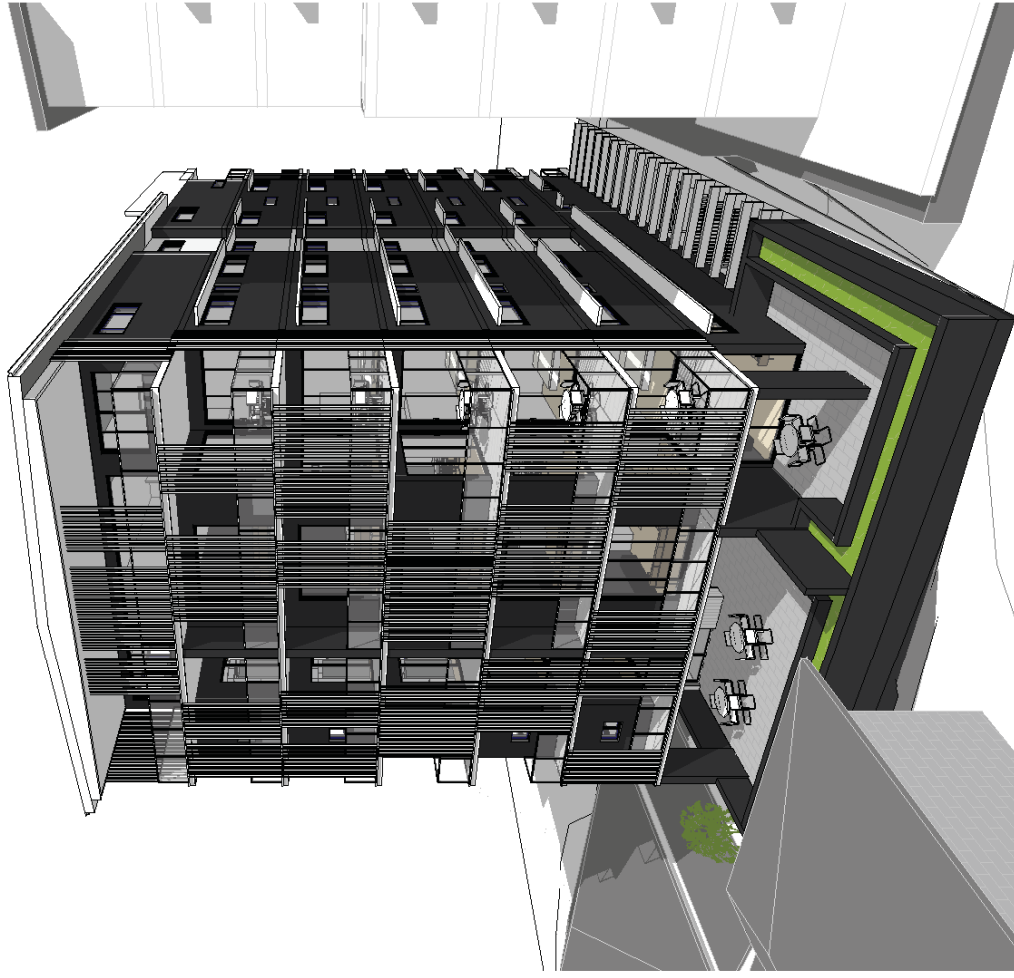
DA

description

MAY HILL

URBAN PLANNING • ARCHITECTURE





client

ROTHSCHILD KINGSBRIDGE PTY LTD

address

1 & 3 FOLKESTONE ST, BOWEN HILLS

drawing title

PERSPECTIVE

job number

drawn

LP

scale at A3

dwg number

DA 5.03

issue

J

date

27.07.21

description

DA

MAY HILL
URBAN PLANNING • ARCHITECTURE



client

ROTHSCHILD KINGSBRIDGE PTY LTD

address

1 & 3 FOLKESTONE ST, BOWEN HILLS

drawing title

PERSPECTIVE

job number

2020-108

drawn

LP

scale at A3

dwg number

DA 5.04

issue

J

date

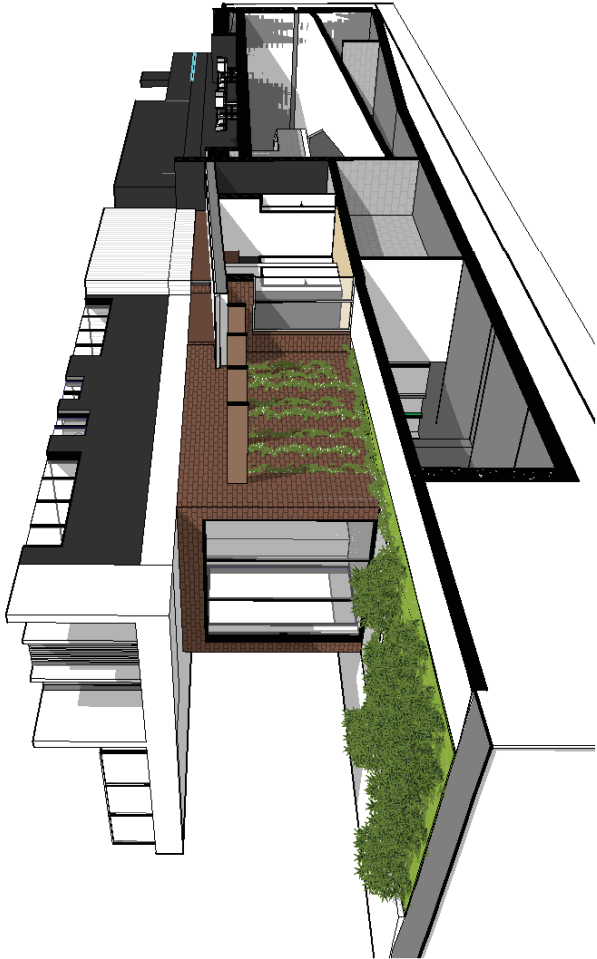
27.07.21

description

DA

MAY HILL
URBAN PLANNING • ARCHITECTURE





1 3D SECTION - PEDESTRIAN ENTRY
@ A3



ROTHSCHILD KINGSBRIDGE PTY LTD
client

1 & 3 FOLKESTONE ST, BOWEN HILLS
address

PERSPECTIVES
drawing title

2020-108
job number

LP
drawn

DA 5.06
dwg number

J
issue

27.07.21
date

DA
description

MAY HILL
URBAN PLANNING • ARCHITECTURE