PLANS AND DOCUMENTS
referred to in the
DEVELOPMENT APPROVAL

Issued: 17/03/2023

Other change: 3/06/2026

BCC DS
LODGED
18/11/2024
APPLICATION REF
A006656931

Shafston Estate

Site Based Stormwater Management Plan

Prepared for Verso Projects

September 2024

Project Number B23202

Document Number B23202-REP-CIV-0001

Revision B

OPPORTUNITIES THROUGH EXCELLENCE
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BG&E

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Revision	Date	Description	Prepared	Reviewed	Approved
A	09/08/24	70%	Marcellus Ng	Oliver James	
B	24/09/24	DA submission	Marcellus Ng	Oliver James	

1. Introduction

1.1 Purpose of this Report

BG&E was engaged by MSL Project Solutions on behalf of the client Verso Projects to provide a Site Based Stormwater Management Plan (SBSMP) as part of the development application to Brisbane City Council (BCC) for Shafston Estate (the Development). The Development is located in 23 Castlebar Street, Kangaroo Point.

This report documents the stormwater design for the Project and captures the following design information.

- BG&E's understanding of the project scope.
- Relevant design standards and criteria.
- Existing site conditions and constraints.

The objective of this report is to address the following principles:

- Stormwater Quantity.
- Stormwater Quality Management;
- Water Sensitive Urban Design (WSUD) compliance; and
- Lawful Point of Discharge;

This report has been prepared in consideration to the following standards and guidelines:

- Brisbane City Council (BCC) City Plan 2014;
- State Planning Policy (SPP) 2017;
- Queensland Urban Drainage Manual (QUDM);
- Plumbing and Drainage Code AS3500.3; and
- Australian Rainfall and Runoff (ARR).

1.2 Description of Project

The subjected site is situated adjacent to the Brisbane River at Kangaroo Point, and it is bounded by Castlebar Street on the northwestern boundary, Thorn Street on the southeastern boundary, and a neighbour property on the south west. The site is currently fully developed with multiple heritage listed buildings and landscaping within the site.

A locality plan is provided in Figure 1.1.

Table 1.1 – Site Details

Subject	Description
Associated Consultants	Arup KHA Urbis
Address	23 Castlebar Street, Kangaroo Point
Lot Number and Plan	Lot 10 SP339299
Site Area	10,070m2
Zoning	HDR2 High density residential (Up to 15 storeys)



Figure 1.1 – Locality Plan

The proposed development aims to develop a 26-storey tower for residential apartments with two levels of basement for parking. There are also two individual houses proposed to be located on the existing ground level adjacent to the river, they can be accessed from the ground level and basement level.

Vehicular access is proposed on Thorn Street, which provides a access to basement parking for residents.

Existing heritage buildings will be kept on site, along with the lawn area within the middle of the site.

Refer to the architectural drawings in Appendix A for details.

2. Site Characteristics

2.1 Existing Topography

From the detail site survey provided, it indicates the site generally falls from a west to eastern direction towards the Brisbane River. The contours from the survey shows the highest level at approximately RL 19m and the lowest at RL 5m, with a gradient of approximately 12.2% fall.

As the adjacent property on the western boundary is also a high-rise building, there are no upstream catchment to be considered for this development.

2.2 Soils

Based on the information obtained from BCC City Plan 2014 mapping, it indicates the site could potentially contain acid sulfate soils.

Site classification of foundation soil reactivity strictly only applies to residential buildings up to two-storeys and to other buildings of similar size, loading and flexibility as defined in accordance with AS 2870 (2011), and the proposed high-rise development would fall outside that scope, however, would apply to the proposed low-rise buildings. The following is provided for information only.

Due to the presence of fill of unknown compaction history (which must be considered as 'uncontrolled' fill) up to 1.8 m depth, the site would strictly be given a "Class P" classification, in accordance with AS 2870 (2011), requiring design by engineering principles. Where cut is undertaken and weathered rock is exposed the site classification would become Class A.

2.3 Water Corridor

According to the information obtained from BCC City Plan 2014 mapping, the lower portion of the site is located within the Brisbane River corridor.

3. Stormwater

3.1 Existing Stormwater Infrastructure

Stormwater infrastructure was not indicated within the site, based on the BCC City Plan mapping information.

However, the detail site survey (Appendix B) has located stormwater pits inside the site, but with very little information regarding to stormwater pipes. There is one 225mm PVC pipe shown within the survey, which can be interpreted as a discharge point from the site into the river.

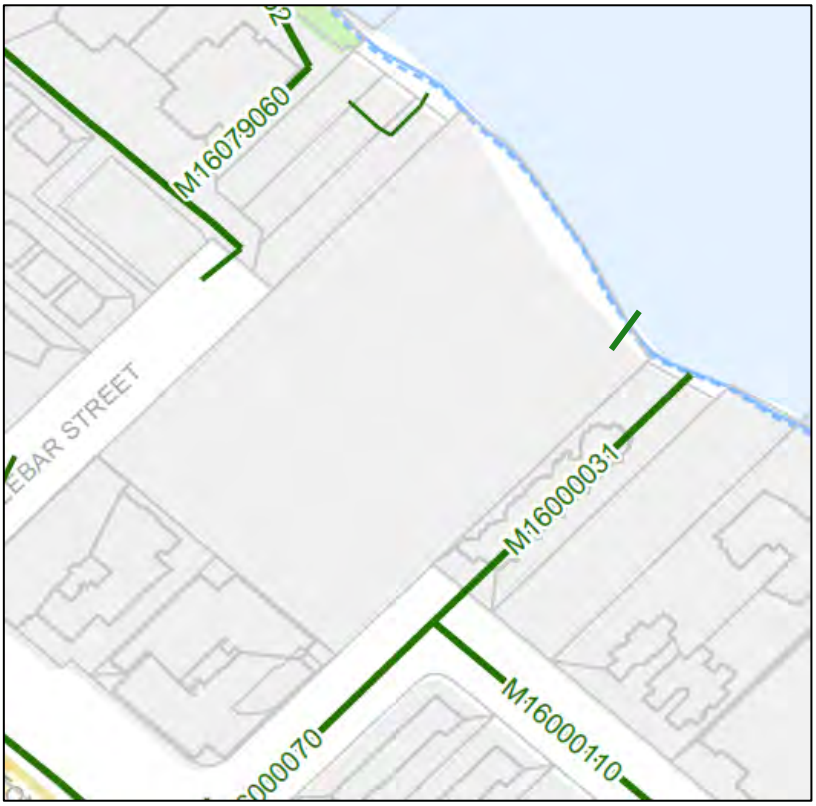


Figure 3.1 – BCC Community Maps

3.1 Flooding Objectives

The BCC's FloodWise Property Report and Flood Awareness mapping both indicates that the site currently is affected by possible river flooding and stormtide. The property report also indicates the coastal hazards overlays applies to the site. The below table is a summary of the flood levels from the Floodwise Property Report.

Table 3.1 – Estimated Flood Levels

Description	Level (mAHD)	Source
20% AEP (5 year Peak Flood Level)	1.7	River (Brisbane River)
20% AEP (5 year Peak Flood Level)	1.9	Stormtide (Moreton Bay)
5% AEP (20 year Peak Flood Level)	2.1	River (Brisbane River)
5% AEP (20 year Peak Flood Level)	2.1	Stormtide (Moreton Bay)
2% AEP (50 year Peak Flood Level)	2.9	River (Brisbane River)
2% AEP (50 year Peak Flood Level)	2.2	Stormtide (Moreton Bay)
1% AEP (100 year Peak Flood Level)	4.0	River (Brisbane River)
1% AEP (100 year Peak Flood Level)	2.5	Stormtide (Moreton Bay)

Description	Level (mAHD)	Source
0.2% AEP (500 year Peak Flood Level)	6.1	River (Brisbane River)
January 2011	3.8	River (Brisbane River)
February 2022	3.5	River (Brisbane River and Creeks/Waterways)
Defined Flood Level (DFL)	3.5	River (Brisbane River)
Residential Flood Level (RFL)	4.0	River (Brisbane River)

3.2 Lawful Point of Discharge

The lawful point of the discharge from the site is directly to the Brisbane River. The proposed development will strive to utilise the existing stormwater infrastructure where possible, while also adding new discharge points if required.

4. Stormwater Quantity

4.1 Design Standards, Requirements and Guidelines

The existing site is currently fully developed with approximately 54% impervious areas. In accordance with Brisbane City Plan 2014 – Schedule 6 PSP – Infrastructure design PSP Section 7.5.2, as the site adjacent to the Brisbane River which will not require stormwater detention where the flooding is controlled by the river or storm tide.

The proposed development contains a rainwater tank which will contribute to detention of runoff from the site. Calculation has however been completed on the pre and post development sites assuming a 100% fraction impervious catchment on the assumption that the green areas are saturated. These calculations indicate that no nett increase in flows will be generated by the development but rather a decrease.

4.2 Site drainage Management

Runoff from the majority of the site will be managed through overland flows paths on the landscaped areas, and the road runoff will be collected through pit and pipe drainage system designed for 10% AEP. Roof runoff will be captured and conveyed through hydraulic pipe system into the basement.

To ensure adherence to the SPP 2017, there will be a rainwater tank capturing the runoff as noted in the stormwater quality section, but these tanks are not purposed for stormwater detention. However, they will provide the effect of stormwater detention during the treatment process.

4.3 Stormwater Quantity Analysis

A rational method stormwater analysis was completed in accordance with the Brisbane City Council (BCC) City Plan 2014, Queensland Urban Drainage Manual Fourth Edition (IPWEA, 2016) and Australian Rainfall & Runoff. It has been demonstrated in the table below.

The post-developed coefficient of runoff (C10) was determined by interpolating Tables 4.5.3 and 4.5.4 of the Queensland Urban Drainage Manual (QUDM) with the derived fraction impervious (Fi) and rainfall intensity (I_{10}). The corresponding Cy values were equation calculated by applying 4.4 of QUDM with frequency factors obtained from Table 4.5.2.

Table 4.1 – Pre and Post Development Catchment Conditions

Catchment	Area (m^2)	Fraction Impervious	63.2% AEP (m^3/s)	10% AEP (m^3/s)	1% AEP (m^3/s)
Existing	10,070	0.765	0.240	0.439	0.657
Proposed	10,070	0.75	0.235	0.430	0.644

Review of the results presented in Table 4.1 demonstrate a no increase in stormwater flow from the proposal. The consistency of impervious areas between the pre and post-developed scenario generate little change to the flow rate of stormwater discharging from the site.

5. Stormwater Quality Assessment and Management

The sites current usage was constructed prior to the implementation of the State Planning Policy 2017 (SPP). Therefore, there are no current Water Sensitive Urban Design measures in place.

5.1 Stormwater Treatment Objectives

In order to determine the water quality objectives for the site, the SPP was considered. The SPP applies to the proposed development since it is a material change of use greater than 2,500m² which will result in an impervious area greater than 25% of the net developable area. Per the Guidelines the site must meet the minimum reductions in mean annual loads shown in Table 5.1 below for the operational phase for Southeast Queensland:

Table 5.1 – Mean Annual Loads Reduction Target

Pollutant	Reduction Target	Reduction
Total Suspended Solids (TSS)	80%	90%
Total Phosphors (TP)	60%	70.4%
Total Nitrogen (TN)	45%	45.6%
Gross Pollutants (GP)	90%	100%

To achieve the pollutant reduction targets the site would need to implement a treatment train within the stormwater network consisting of primary (e.g. litter baskets) and secondary (e.g. cartridge filtration, bio-retention basins) treatment devices. Irrigation products are also uses throughout the site to allow for rainwater reuse.

Due to the site drainage constraints related to existing/proposed lawful point of discharge, it is proposed to implement proprietary products by a third party supplier prior to stormwater discharging from the site.

5.2 MUSIC Modelling

The sites stormwater runoff was measured using Model for Urban Stormwater Improvement Conceptualisation (MUSIC) to achieve the water quality objectives for the South East Queensland (SEQ) region. The employment of Ocean Protect proprietary products is proposed to satisfy the load reduction targets as stipulated in the SPP. BG&E recommend the following products to comply with the SPP:

- 2 x Ocean Protect Oceanguard
- 7 x Ocean Protect StormFilter
- WaterUps Sub irrigation channel

The treatment train is detailed in figures below.

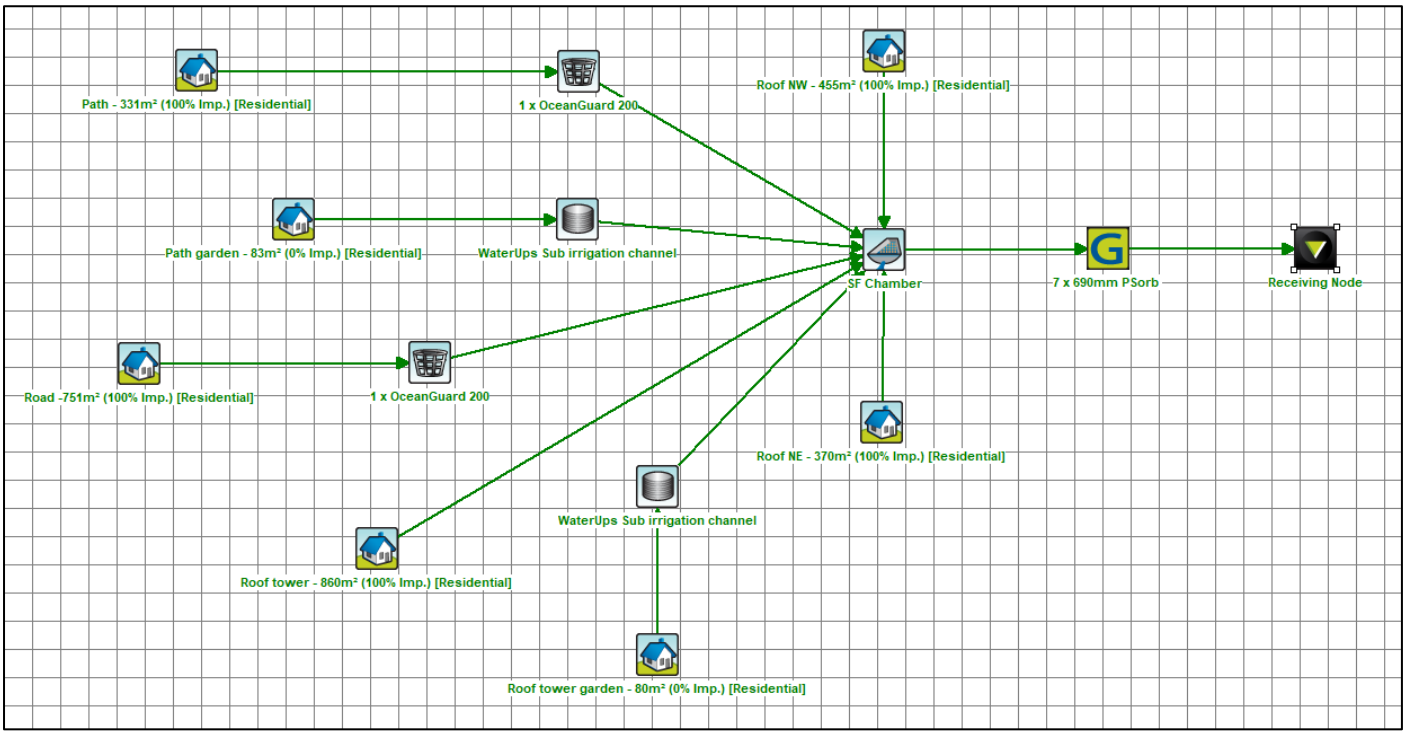


Figure 5.1 – MUSIC Model Layout

Treatment Train Effectiveness - Receiving Node

	Sources	Residual Load	% Reduction
Flow (ML/yr)	3.02	2.99	1
Total Suspended Solids (kg/yr)	454	45.3	90
Total Phosphorus (kg/yr)	0.989	0.292	70.4
Total Nitrogen (kg/yr)	6.36	3.46	45.6
Gross Pollutants (kg/yr)	69.2	0	100

Figure 5.2 – MUSIC Model Results

5.3 Construction Phase Objectives

Stormwater run-off from land development and infrastructure development sites have a high potential to cause water contamination and/or environmental harm. This is regulated under the EP Act 1994.

Under S440ZG it is an offence to unlawfully deposit a prescribed water contaminant to waters. Prescribed contaminants are listed in Schedule 9 of the Environmental Protection Regulation 2008 (EP Reg), and include: ashes, clay, gravel, sediment, stones and similar organic or inorganic matter, as well as building and construction materials and waste.

Under S 319 persons in Queensland carrying out activities which may cause environmental harm must comply with the 'general environmental duty' (GED). This requires that all reasonable and practicable measures must be adopted to prevent and minimise environmental harm. Although not being able to demonstrate compliance against GED is not an offence, demonstrating that all reasonable and practicable measures have been adopted is a defence for offences such as water contamination. For instance, under chapter 10, s493A of the EP Act, where a person deposits a prescribed water contaminant to waters or causes unlawful environmental harm, it is a defence to demonstrate compliance with the GED. Demonstrating that all reasonable and practicable measures have been conceived and

implemented should include:

- Thorough and ongoing site assessments;
- Consideration of, and adaptation for site specific erosion risk factors including topography, soil type, climate and season; and
- Design, installation, operation, management, maintenance and monitoring of control measures as identified in the erosion and sediment control plan.

5.4 Erosion Hazard Assessment

Based on Brisbane City Council's Erosion Hazard Assessment – June 2014, the site is a medium risk site. Refer to the Erosion Hazard Assessment form included as Appendix C to this report.

5.5 Erosion and Sediment Control Strategy

A detailed erosion and sediment control strategy will be submitted with the operational works application.

The site should be able to be effectively managed through conventional erosion and sediment control practices, including:

- Timing of ground works to avoid wet weather;
- Capture of runoff with filter fences (not silt fences);
- Avoiding stockpiling of material within the overland flow path;
- Rapid stabilization of bare soil using mulch or turf, or geo-fabric as a temporary measure;
- Appropriate vehicle wash-down at entry/exit points; and
- Temporary Sediment Basin.

6. Existing Services

As the site is fully developed, the surroundings contain in ground services which facilitate the existing development and its neighbouring properties. A request to Before You Dig (BYDA) was submitted to obtain services locations from the relevant authorities.

6.1 APA Group Gas

BYDA mapping of the APA Gas indicates there are high pressure mains on both streets surrounding the site, but no existing connection to the site are shown.

Refer to the BYDA application 37109743. Further investigation should be carried out by the relevant service consultants.

6.2 Energex

Energex cables can be seen on the southwestern boundary of the site, while also containing additional connections on both Castlebar Street and Thorn Street.

Refer to the BYDA application 37109743. Further investigation should be carried out by the relevant service consultants.

6.3 NBN Co

There are four NBN connections shown on the BYDA mapping, two on Thron Street towards the south and the other two are via Castlebar Street.

Refer to the BYDA application 37109743. Further investigation should be carried out by the relevant service consultants.

6.4 Nextgen

No indication of Nextgen cables is noted on the BYDA mapping.

6.5 Optus and Uecomm

No indication of Optus or Uecomm cables are noted on the BYDA mapping.

6.6 Urban Utilities

Both Urban Utilities mapping and BCC community mapping indicates there are existing water and sewer connection to the property.

The water connections are shown on Castlebar Street and Thorn Street.

An existing sewer connection is located on the south corner of the site, which is adjacent to the neighbouring property. There is also a sewer main traversing across the site near the riverbank, but no easement allocation has been shown for this main.

Refer to the BYDA application 37109743. Further investigation should be carried out by the relevant service consultants.

6.7 Telstra

Telstra connections are noted on the Thorn Street entrance, and the other is located on the western corner of the site.

Refer to the BYDA application 37109743. Further investigation should be carried out by the relevant service consultants.

6.8 TPG Telecom

A PIPE Network cable is shown on the southern corner of the site, adjacent to Thorn Street.

Refer to the BYDA application 37109743. Further investigation should be carried out by the relevant service consultants.

7. Conclusion

The site was previously developed which was adequately serviced by public utilities. All information discussed in this report are inferred from Brisbane City Council information, Before You Dig Australia records and as constructed plans.

A rational method analysis was completed for the stormwater quantity section of this report. The consistency between the site characteristics such as the impervious area will not generate a significant increase in runoff, and will not be impacting any downstream properties the post-developed scenario. The proposed treatment train will consist of litter baskets within the inlet ‘Ocean Guard’ which will capture suspended solids prior to discharging to the underground treatment system.

The main tower will capture the runoff from the roof and conveyed to basement stormwater treatment device complete with proprietary products, which will achieve the treatment load reduction factors as stipulated in the SPP 2017. This will provide an improvement in water quality conditions from the existing scenario. The site will also contain some irrigation channels in the garden areas which will provide rainwater reuse.

Existing water and sewer reticulation mains are located immediately adjacent to the site with existing connections.

The services for electrical, telecommunication and gas are located adjacent to the site. If any of these services require an upgrade, this will be confirmed and addressed by the relevant service consultants at the detail design stage of the project

Appendices

Appendix A
Architectural Drawings

SHAFSTON ESTATE
FINAL DRAFT DEVELOPMENT APPLICATION

TO BE UPDATED



DRAWING LIST	DWG NO.	ISSUE
0000 - GENERAL		
OVERVIEW PAGE	A0000	3
DEVELOPMENT SCHEDULE	A0001	3
0010 - SITE PLANS		
EXISTING SITE PLAN	A0010	3
DEMOLITION SITE PLAN	A0020	3
ROOF SITE PLAN	A0030	3
BASEMENT 2 SITE PLAN	A0040	3
BASEMENT 1 SITE PLAN	A0050	3
LOWER GROUND SITE PLAN	A0060	3
GROUND SITE PLAN	A0070	3
LEVEL 1 SITE PLAN	A0080	3
1000 - GENERAL ARRANGEMENT PLANS		
TOWER - LOWER GROUND PLAN	A0990	3
TOWER - GROUND FLOOR PLAN	A1000	3
TOWER - LEVEL 1 PLAN	A1001	3
TOWER - LEVEL 2,4,6,8,10,12,14,16,18,20,22,24	A1002	3
TOWER - LEVEL 3,5,7,9,11,13,15,17,19,21,23,25	A1002	3
TOWER - LEVEL 13 PLAN	A1013	3
TOWER - LEVEL 26 PLAN	A1026	3
TOWER - LEVEL 27 PLAN	A1027	3
TOWER - ROOF PLAN	A1028	3
WARDS BUILDING - LOWER GROUND PLAN	A1201	3
SOUTHERN RIVER HOME - GROUND FLOOR PLAN (SITE BASEMENT 2)	A1400	3
SOUTHERN RIVER HOME - UPPER GROUND FLOOR PLAN (SITE BASEMENT 1)	A1401	3
SOUTHERN RIVER HOME - LEVEL 1 PLAN (SITE LOWER GROUND)	A1402	3
SOUTHERN RIVER HOME - ROOF PLAN (SITE GROUND)	A1403	3
NORTHERN RIVER HOME - GROUND FLOOR PLAN (SITE BASEMENT 2)	A1500	3
NORTHERN RIVER HOME - LEVEL 1 PLAN (SITE BASEMENT 1)	A1501	3
NORTHERN RIVER HOME - ROOF PLAN (SITE LOWER GROUND)	A1502	3
2000 - SECTIONS		
SITE SECTION A-A - TOWER, WARDS, SOUTHERN RIVER HOME	A2001	3
SITE SECTION B-B - SHAFSTON, POOL, BASEMENT	A2002	3
SITE SECTION C-C - ORDERLIES, NORTHERN RIVER HOME	A2003	3
3000 - ELEVATIONS		
TOWER ELEVATION NORTH AND WEST	A3001	3
TOWER ELEVATION SOUTH AND EAST	A3002	3
SOUTHERN RIVERHOME SOUTH ELEVATION	A3401	3
SOUTHERN RIVERHOME EAST ELEVATION	A3402	3
NORTHERN RIVERHOME SOUTH ELEVATION	A3501	3
NORTHERN RIVERHOME EAST ELEVATION	A3502	3
4000 - FACADE		
TYPICAL FACADE TYPE 1	A4201	3
TYPICAL FACADE TYPE 2	A4202	3
TYPICAL FACADE TYPE 3	A4203	3
TYPICAL FACADE TYPE 4	A4204	3
4700 - PERSPECTIVE VIEWS		
PERSPECTIVE VIEW 1	A4700	3
PERSPECTIVE VIEW 2	A4701	3
PERSPECTIVE VIEW 3	A4702	3
PERSPECTIVE VIEW 4	A4703	3
PERSPECTIVE VIEW 5	A4704	3
9100 - GFA PLANS		
GFA SCHEDULE	A9100	-
GFA PLANS 1	A9101	-
GFA PLANS 2	A9102	-
GFA PLANS 3	A9103	-

NOTES / LEGEND / MATERIAL

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1. REFER TO HERITAGE CONSULTANT (URBIS) DRAWINGS FOR:
   - SHAFSTON HOUSE - GROUND FLOOR PLAN
   - SHAFSTON HOUSE - LEVEL 1 PLAN
   - WARDS BUILDING - GROUND FLOOR PLAN
   - ORDERLIES BUILDING - GROUND FLOOR PLAN
   - GUEST HOUSE (OLD POSTAL DEPOT) - GROUND FLOOR PLAN

   - FINAL LEVELS WILL BE DOCUMENTED AS PART OF DETAILED DESIGN

LEGEND

- SITE BOUNDARY
- RIPARIAN SETBACK
- DA APPROVED ENVELOPE

ISSUE	DATE	AMENDMENT	CHECKED
1	09.08.24	70% DEVELOPMENT APPLICATION	KHA
2	02.09.24	WORK IN PROGRESS	KHA
3	18.09.24	FINAL DRAFT DA	KHA

STATUS

FINAL DRAFT
DEVELOPMENT APPLICATION

CLIENT

BURGUNDY GROUP

ARCHITECT

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PROJECT	REF
SHAFTSTON ESTATE	638

ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA	NORTH
SCALE (@ A1)	-	
DATE	18.09.2024	

DRAWING TITLE
OVERVIEW PAGE

DRAWING NUMBER	ISSUE
A0000	3

TOWER						
LEVEL	**USE / TYPE**	**RL (m)**	**FL to FL (mm)**	**3 BED**	**4 BED**	**BALCONY SIZE (sqm)**
Level 27	**Roof Terrace**	114,150	3400			
	Roof Plant	112,550	5000			
Level 26	**4 Bed+Study Apt - Type C2**	108,920	3630		1	128
Level 25	**Floor Plate Type B**	105,590	3330			
	3 Bed Apt W - Type B1			1		56
	3 Bed Apt E - Type B2			1		52
Level 24	**Floor Plate Type A**	102,260	3330			
	3 Bed Apt W - Type A1			1		65
	3 Bed Apt E - Type B1			1		46
Level 23	**Floor Plate Type B**	98,930	3330			
	3 Bed Apt W - Type B1			1		56
	3 Bed Apt E - Type B2			1		52
Level 22	**Floor Plate Type A**	95,600	3330			
	3 Bed Apt W - Type A1			1		65
	3 Bed Apt E - Type B1			1		46
Level 21	**Floor Plate Type B**	92,270	3330			
	3 Bed Apt W - Type B1			1		56
	3 Bed Apt E - Type B2			1		52
Level 20	**Floor Plate Type A**	88,940	3330			
	3 Bed Apt W - Type A1			1		65
	3 Bed Apt E - Type B1			1		46
Level 19	**Floor Plate Type B**	85,610	3330			
	3 Bed Apt W - Type B1			1		56
	3 Bed Apt E - Type B2			1		52
Level 18	**Floor Plate Type A**	82,280	3330			
	3 Bed Apt W - Type A1			1		65
	3 Bed Apt E - Type B1			1		46
Level 17	**Floor Plate Type B**	78,950	3330			
	3 Bed Apt W - Type B1			1		56
	3 Bed Apt E - Type B2			1		52
Level 16	**Floor Plate Type A**	75,620	3330			
	3 Bed Apt W - Type A1			1		65
	3 Bed Apt E - Type B1			1		46
Level 15	**Floor Plate Type B**	72,290	3330			
	3 Bed Apt W - Type B1			1		56
	3 Bed Apt E - Type B2			1		52
Level 14	**Floor Plate Type A**	68,960	3330			
	3 Bed Apt W - Type A1			1		65
	3 Bed Apt E - Type B1			1		46
Level 13	**4 Bed+Study Apt - Type C2**	65,630	3330		1	118
Level 12	**Floor Plate Type A**	62,300	3330			
	3 Bed Apt W - Type A1			1		65
	3 Bed Apt E - Type B1			1		46
Level 11	**Floor Plate Type B**	58,970	3330			
	3 Bed Apt W - Type B1			1		56
	3 Bed Apt E - Type B2			1		52
Level 10	**Floor Plate Type A**	55,640	3330			
	3 Bed Apt W - Type A1			1		65
	3 Bed Apt E - Type B1			1		46
Level 9	**Floor Plate Type B**	52,310	3330			
	3 Bed Apt W - Type B1			1		56
	3 Bed Apt E - Type B2			1		52
Level 8	**Floor Plate Type A**	48,980	3330			
	3 Bed Apt W - Type A1			1		65
	3 Bed Apt E - Type B1			1		46
Level 7	**Floor Plate Type B**	45,650	3330			
	3 Bed Apt W - Type B1			1		56
	3 Bed Apt E - Type B2			1		52
Level 6	**Floor Plate Type A**	42,320	3330			
	3 Bed Apt W - Type A1			1		65
	3 Bed Apt E - Type B1			1		46
Level 5	**Floor Plate Type B**	38,990	3330			
	3 Bed Apt W - Type B1			1		56
	3 Bed Apt E - Type B2			1		52
Level 4	**Floor Plate Type A**	35,660	3330			
	3 Bed Apt W - Type A1			1		65
	3 Bed Apt E - Type B1			1		46
Level 3	**Floor Plate Type B**	32,330	3330			
	3 Bed Apt W - Type B1			1		56
	3 Bed Apt E - Type B2			1		52
Level 2	**Floor Plate Type A**	29,000	3330			
	3 Bed Apt W - Type A1			1		65
	3 Bed Apt E - Type B1			1		46
Level 1	**Plant**	24,500	4500			
Ground	**Apartment Lobby**	19,000	10000			
Lower Ground	**Service Area**	14,500	4500			
Basement 1	**Resident's Parking**	11,500	3000			
Basement 2	**Resident's Parking**	8,500	3000			
				46	2	
TOTAL				**48**		**2752**

MULTI DWELLING MIX		
3 BED	**4 BED**	**TOTAL**
95.8%	4.2%	100.0%

SOUTHERN RIVER HOME					
LEVEL	**USE / TYPE**	**RL (m)**	**FL to FL (mm)**	**5 BED**	**BALCONY SIZE (sqm)**
Level 1	Main Building	13,300	3800		62.71
Void	Staff Quarter	11,500	3200		0
Ground Floor	Main Building	8,500	4800		71
TOTAL				**1**	**133**

NORTHERN RIVER HOME					
LEVEL	**USE / TYPE**	**RL (m)**	**FL to FL (mm)**	**5 BED**	**BALCONY SIZE (sqm)**
Level 1	Main Building	12,540	3800		62.71
Ground Floor	Main Building	7,740	4800		60
TOTAL				**1**	**122**

POSTAL DEPOT - GUEST HOUSE					
LEVEL	**USE / TYPE**	**RL (m)**	**FL to FL (mm)**	**1 BED**	**BALCONY SIZE (sqm)**
Ground Floor	Main Building	16,010	-		0
TOTAL				**1**	**0**

BCC PARKING RATES			
TYPE	**RATE**	**APARTMENT TOTAL**	**MIN. REQUIREMENT**
3 BED	1.3	46	60
4 BED	1.3	2	3
5 BED (RH)	1.3	2	3
GUEST HOUSE	1	1	1
VISITORS	0.15	51	8
TOTAL		51	**74**

BIKE PARKING RATES			
TYPE	**RATE**	**APARTMENT TOTAL**	**MIN. REQUIREMENT**
RESIDENTS	1	51	51
VISITORS	0.25	51	13
TOTAL			**64**

CAR PARKING SCHEDULE				
LEVEL	**RESIDENTIAL**	**VISITOR**	**RIVER HOMES**	**TOTAL**
BASEMENT 2	49	0	8	57
BASEMENT 1	48	0	0	48
LOWER GROUND	0	0	0	0
GROUND FLOOR	0	8	0	8
TOTAL	97	8	8	**113**

BICYCLE PARKING				
LEVEL	**RESIDENTIAL**	**VISITOR**	**RIVER HOMES**	**TOTAL**
BASEMENT 2	24	0	4	28
BASEMENT 1	28	0	0	28
LOWER GROUND	0	6	0	6
GROUND FLOOR	0	8	0	8
TOTAL	52	14	4	**70**

SITE COVER		
	SITE COVER (sqm)	**SITE COVER (%)**
PROPOSED DEVELOPMENT - TOWER & RIVER HOMES	1993.3	19.8
TOTAL SITE COVER INCLUDING HERITAGE BUILDINGS	3264.2	32.43

NOTES / LEGEND / MATERIAL

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LEGEND

- SITE BOUNDARY
- RIPARIAN SETBACK
- DA APPROVED ENVELOPE

ISSUE	DATE	AMENDMENT	CHECKED
1	09.08.24	70% DEVELOPMENT APPLICATION	KHA
2	02.09.24	WORK IN PROGRESS	KHA
3	18.09.24	FINAL DRAFT DA	KHA

STATUS

FINAL DRAFT
DEVELOPMENT APPLICATION

CLIENT

BURGUNDY GROUP

ARCHITECT

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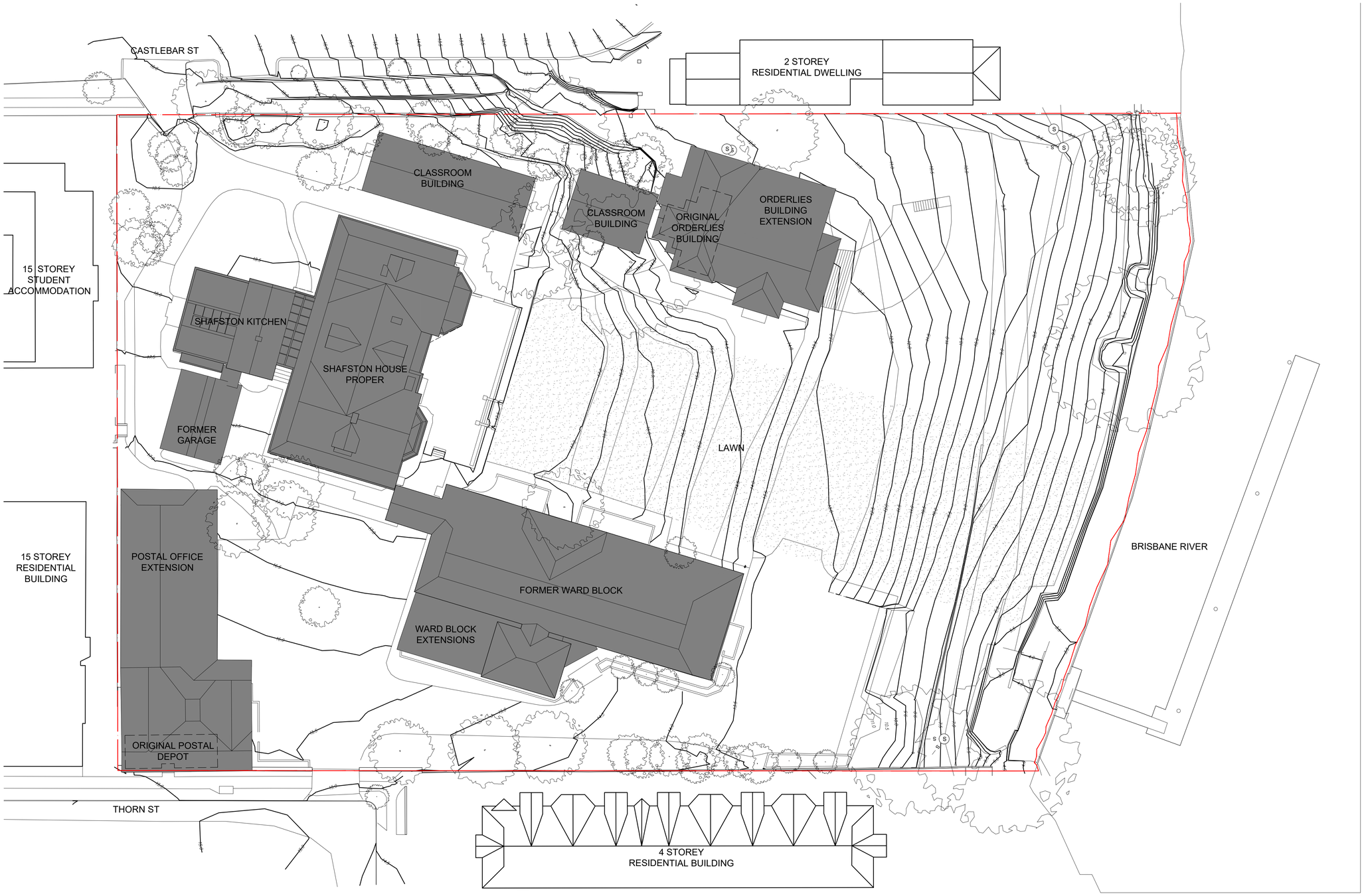
PROJECT	REF
SHAFSTON ESTATE	638

ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA	NORTH
SCALE (@ A1)	-	
DATE	18.09.2024	

DRAWING TITLE
DEVELOPMENT SCHEDULE

DRAWING NUMBER	ISSUE
A0001	3



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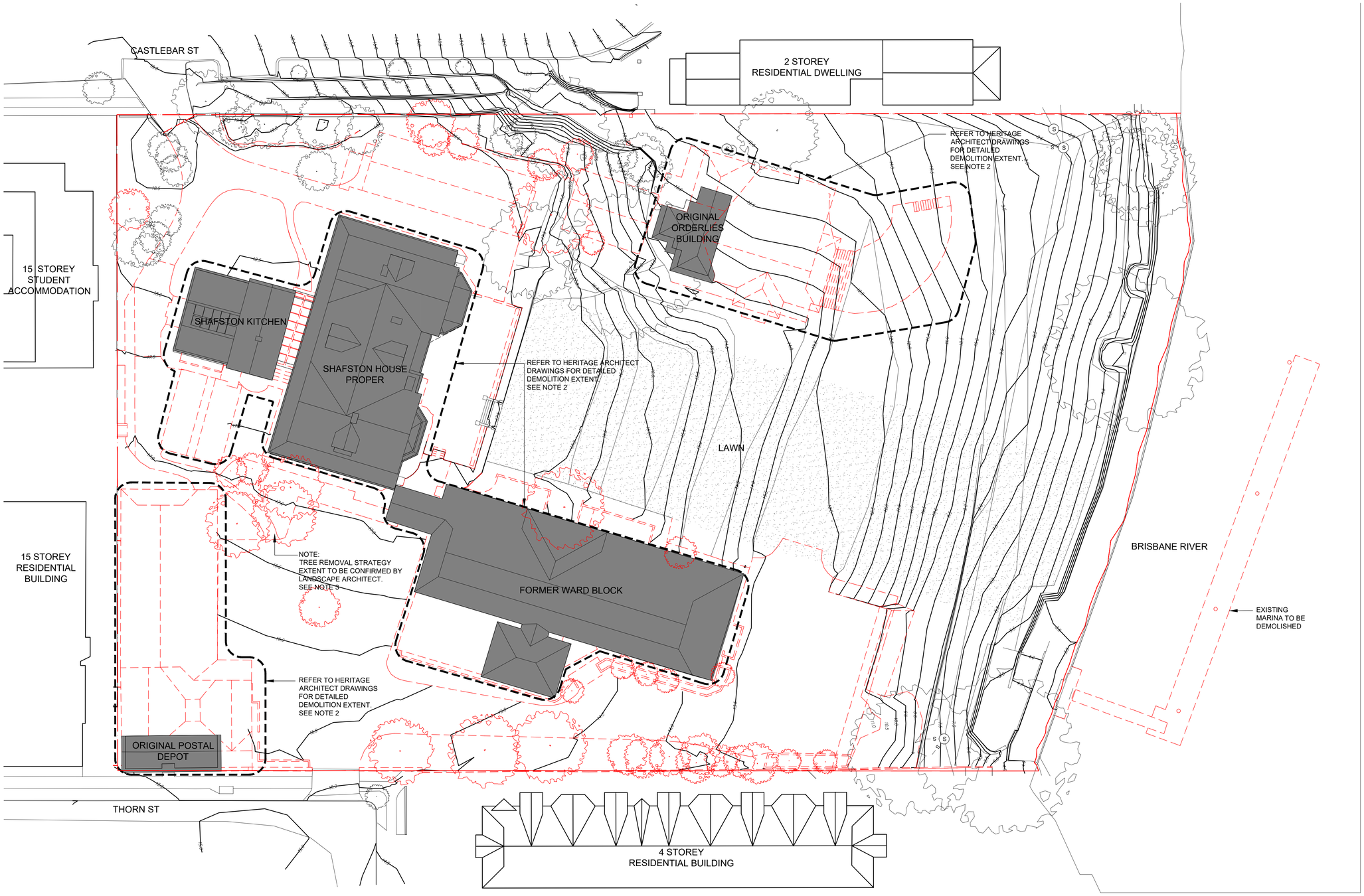
ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA
SCALE (@ A1)	1:250
DATE	18.09.2024

NORTH

DRAWING TITLE
EXISTING SITE PLAN

DRAWING NUMBER	ISSUE
A0010	3



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2. REFER TO HERITAGE CONSULTANT (URBIS) DRAWINGS FOR DETAILED DEMOLITION EXTENT TO EXISTING BUILDINGS

3. REFER TO LANDSCAPE REPORT FOR TREE REMOVAL & RETENTION sSTRATEGY

LEGEND

- SITE BOUNDARY
- RIPARIAN SETBACK
- DA APPROVED ENVELOPE

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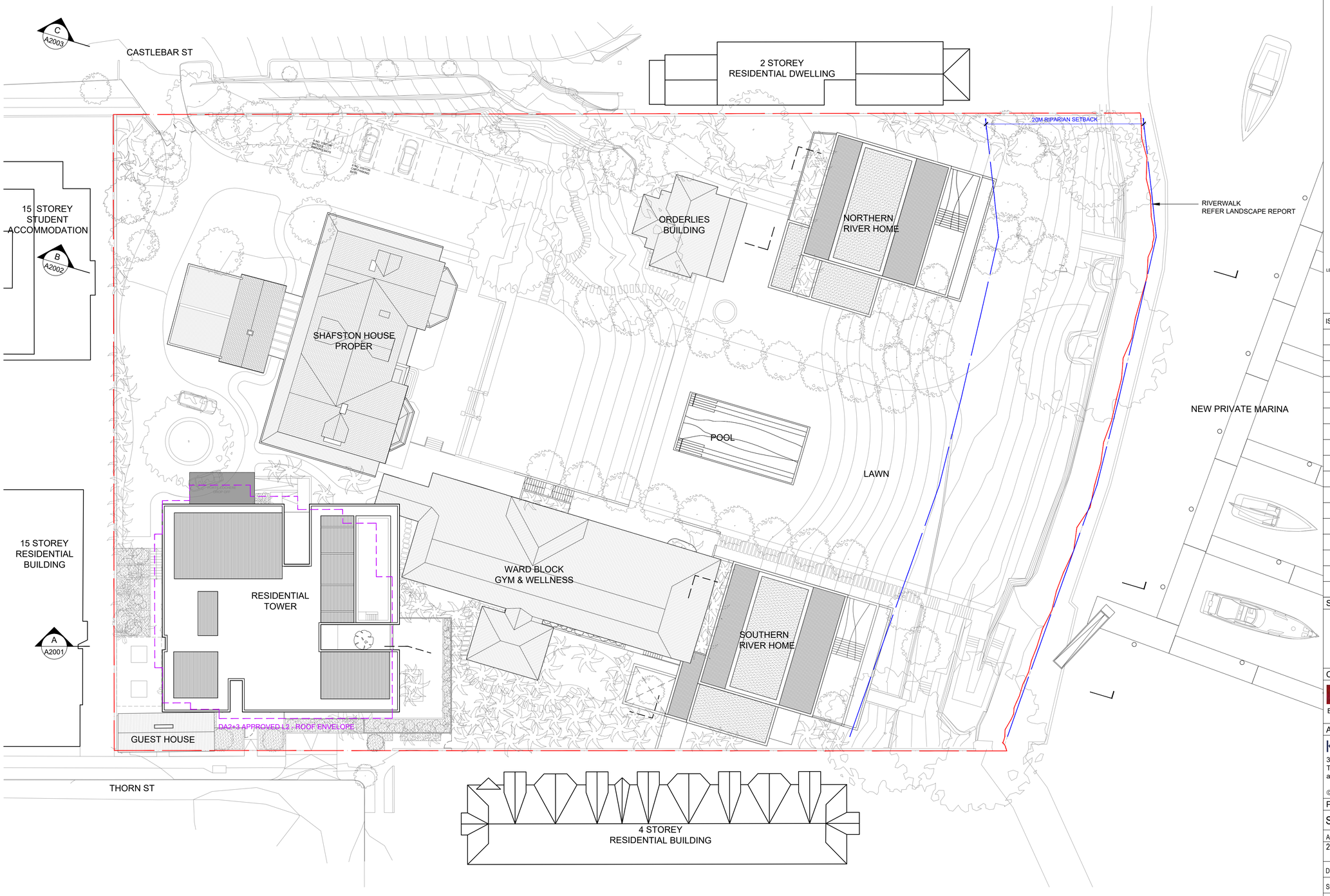
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23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA
SCALE (@ A1)	1:250
DATE	18.09.2024

NORTH

DRAWING TITLE
DEMOLITION SITE PLAN

DRAWING NUMBER	ISSUE
A0020	3



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LEGEND
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SCALE (@ A1)	1:250
DATE	18.09.2024

NORTH

DRAWING TITLE
ROOF SITE PLAN

DRAWING NUMBER	ISSUE
A0030	3

C A2003

B A2002

A A2001

POTENTIAL FOR ANCHORS WITHOUT PILES

DA2+3 APPROVED B1/LG ENVELOPE
TOWER B1 RL 10.300 - 11.120

POTENTIAL TO EXTEND BASEMENT OR IT CAN BE BATTERED EXCAVATED

600DIA PILES -1800 CTS SHORING SYSTEM WITH ATLEAST ONE ROW OF ANCHORS

600DIA PILES -1800 CTS SHORING SYSTEM WITH ATLEAST ONE ROW OF ANCHORS

DA2+3 APPROVED B2 - B3 ENVELOPE
B2 RL 8.000
B3 RL 4.840-3.855

NORTHERN RIVER HOME - GF
REFER TO A1500

SOUTHERN RIVER HOME - GF
REFER TO A1400

20M RIPARIAN SETBACK

DA2+3 APPROVED B1/LG ENVELOPE
8.470 - 10.070

RIVERWALK
REFER LANDSCAPE REPORT

LANDSCAPE PATH
REFER LANDSCAPE REPORT

POOL ABOVE

BIKE PARKING
28 NO. BICYCLE PARKING BAYS

57 NO. CAR PARKING BAYS

PLANT

B2 LOBBY

RL7.740

RL8.500

RL6.220

RL4.100

1:20

1:14

1:16

1:30

20783

21922

18810

9175

TPZ R11400

7915

6500

11400

5400

2600

4905

5675

3475

2050

6700

6600

890

1325

1960

3405

SHORING SYSTEM SCHEME

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LEGEND
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PROJECT	REF
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ADDRESS
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DRAWN	KHA
SCALE (@ A1)	1:250
DATE	18.09.2024

NORTH

DRAWING TITLE
BASEMENT 2 SITE PLAN

DRAWING NUMBER	ISSUE
A0040	3



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LEGEND

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SHAFTSTON ESTATE	638

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DRAWN	KHA
SCALE (@ A1)	1:250
DATE	18.09.2024

NORTH

DRAWING TITLE
BASEMENT 1 SITE PLAN

DRAWING NUMBER	ISSUE
A0050	3

C A2003

B A2002

A A2001

ORDERLIES BUILDING - SEE NOTE 1

E.RL14.14

NORTHERN RIVER HOME - ROOF REFER TO A1502

20M RIPARIAN SETBACK

2342

2404

6687

3586

13360

10503

5612

20878

21917

32840

RIVERWALK
REFER LANDSCAPE REPORT

RL13.740

RL13.740

WARDS BUILDING - LG
REFER TO A1201

DA2+3 APPROVED GF ENVELOPE
TOWER GF RL 15.050

RL14.700

TOWER - LG
REFER TO A0990

6500

6 NO. BICYCLE PARKING BAYS

6500

RL16.100

RL15.100

GUEST HOUSE
SEE NOTE 1

RL14.500

SOUTHERN
RIVER HOME - L1
REFER TO A1402

DA2+3 APPROVED GF ENVELOPE
10.070 - 17.170

PMT

18810

2457

9174

LANDSCAPE PATH
REFER LANDSCAPE
REPORT

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LEGEND

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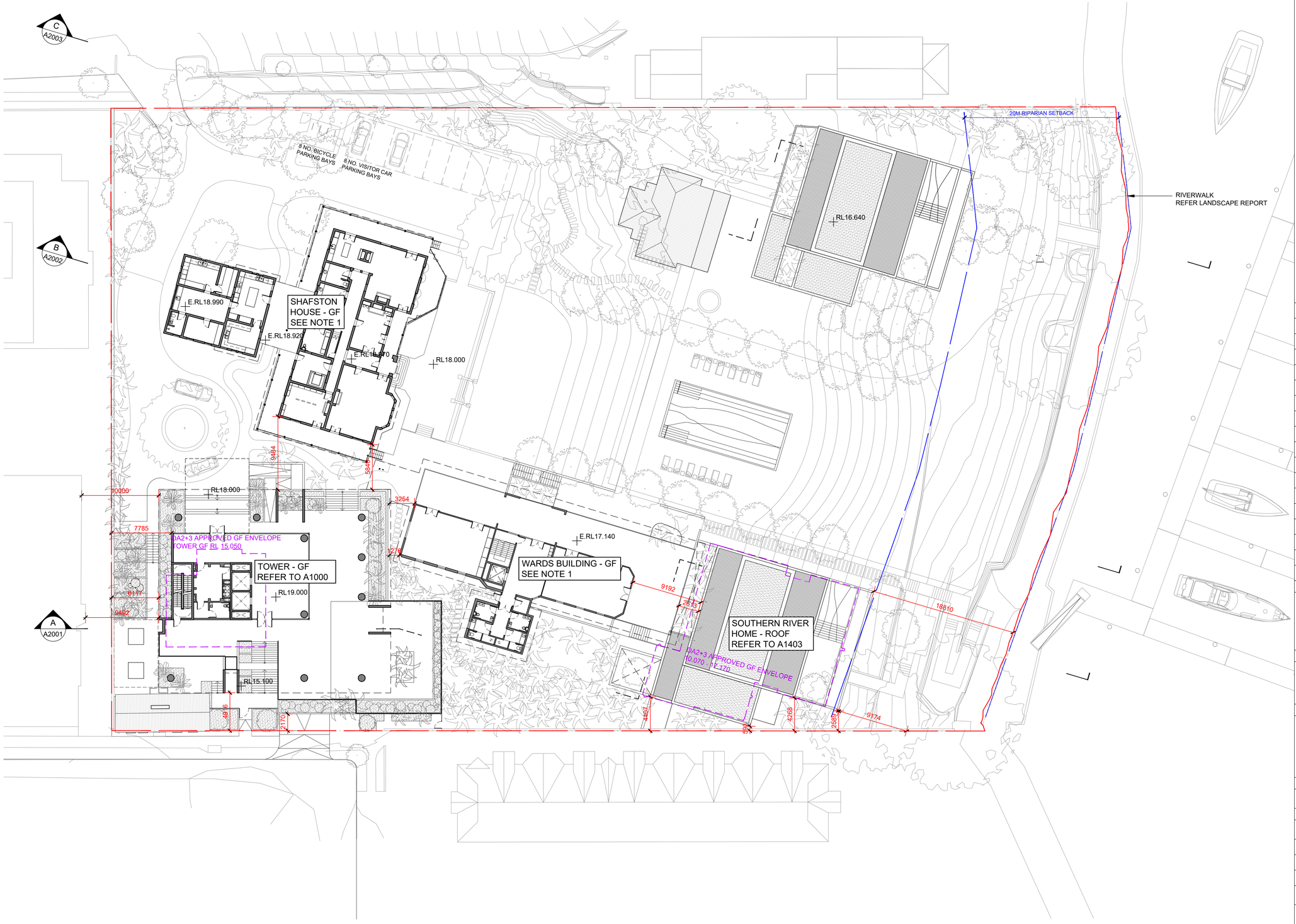
PROJECT	REF
SHAFTSTON ESTATE	638

ADDRESS
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DRAWN	KHA	NORTH
SCALE (@ A1)	1:250	
DATE	18.09.2024	

DRAWING TITLE
LOWER GROUND SITE PLAN

DRAWING NUMBER	ISSUE
A0060	3



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PROJECT	REF
SHAFTSTON ESTATE	638

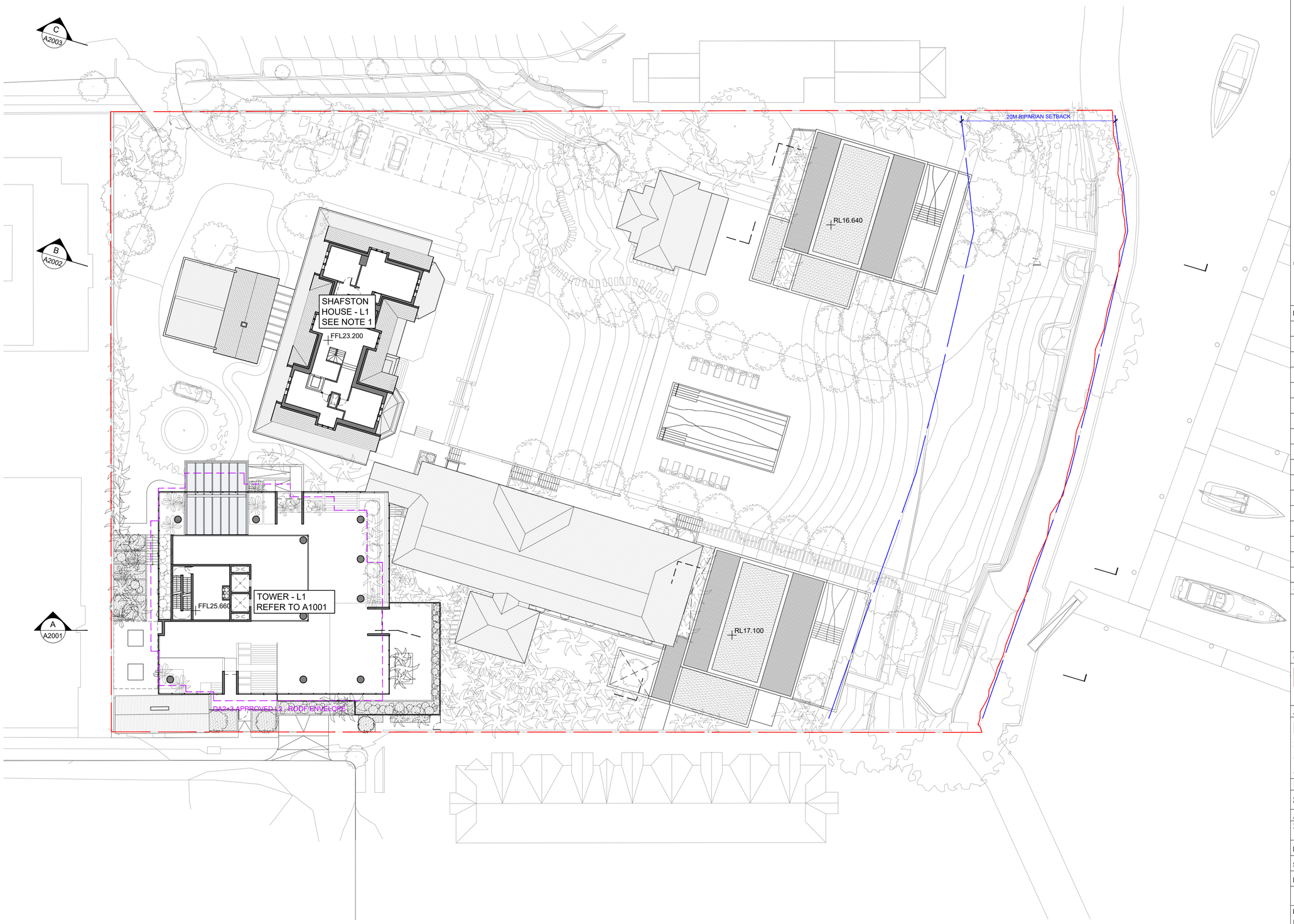
ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA
SCALE (@ A1)	1:250
DATE	18.09.2024

NORTH

DRAWING TITLE
GROUND SITE PLAN

DRAWING NUMBER	ISSUE
A0070	3



NOTES / LEGEND / MATERIAL

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   - GUEST HOUSE (OLD POSTAL DEPOT) - GROUND FLOOR PLAN

   - FINAL LEVELS WILL BE DOCUMENTED AS PART OF DETAILED DESIGN

LEGEND

- SITE BOUNDARY
- RIPARIAN SETBACK
- DA APPROVED ENVELOPE

ISSUE	DATE	AMENDMENT	CHECKED
1	09.08.24	70% DEVELOPMENT APPLICATION	KHA
2	02.09.24	WORK IN PROGRESS	KHA
3	18.09.24	FINAL DRAFT DA	KHA

STATUS

FINAL DRAFT
DEVELOPMENT APPLICATION

CLIENT

BURGUNDY GROUP

ARCHITECT

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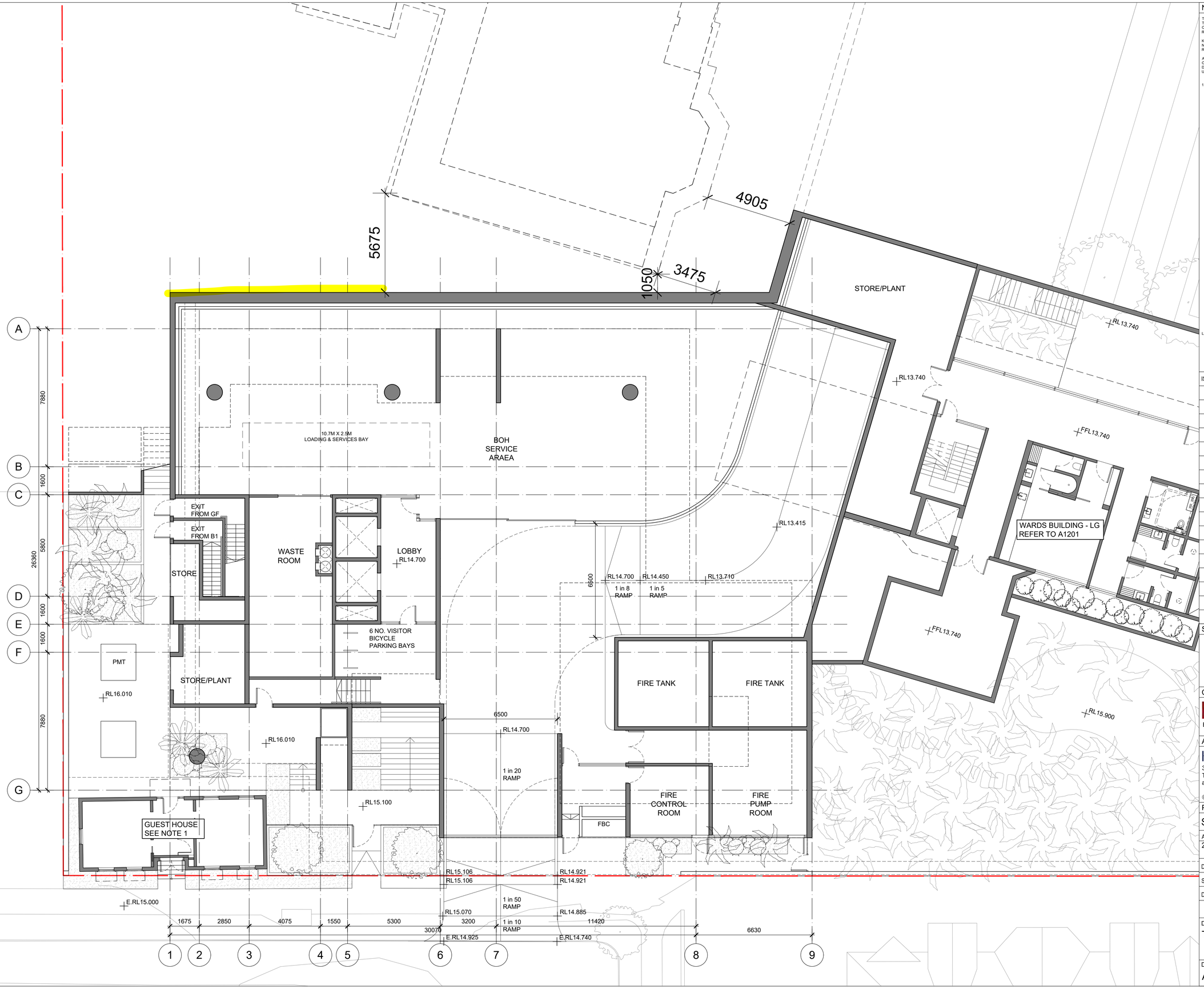
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23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA
SCALE (@ A1)	1:250
DATE	18.09.2024

NORTH

DRAWING TITLE
LEVEL 1 SITE PLAN

DRAWING NUMBER	ISSUE
A0080	3



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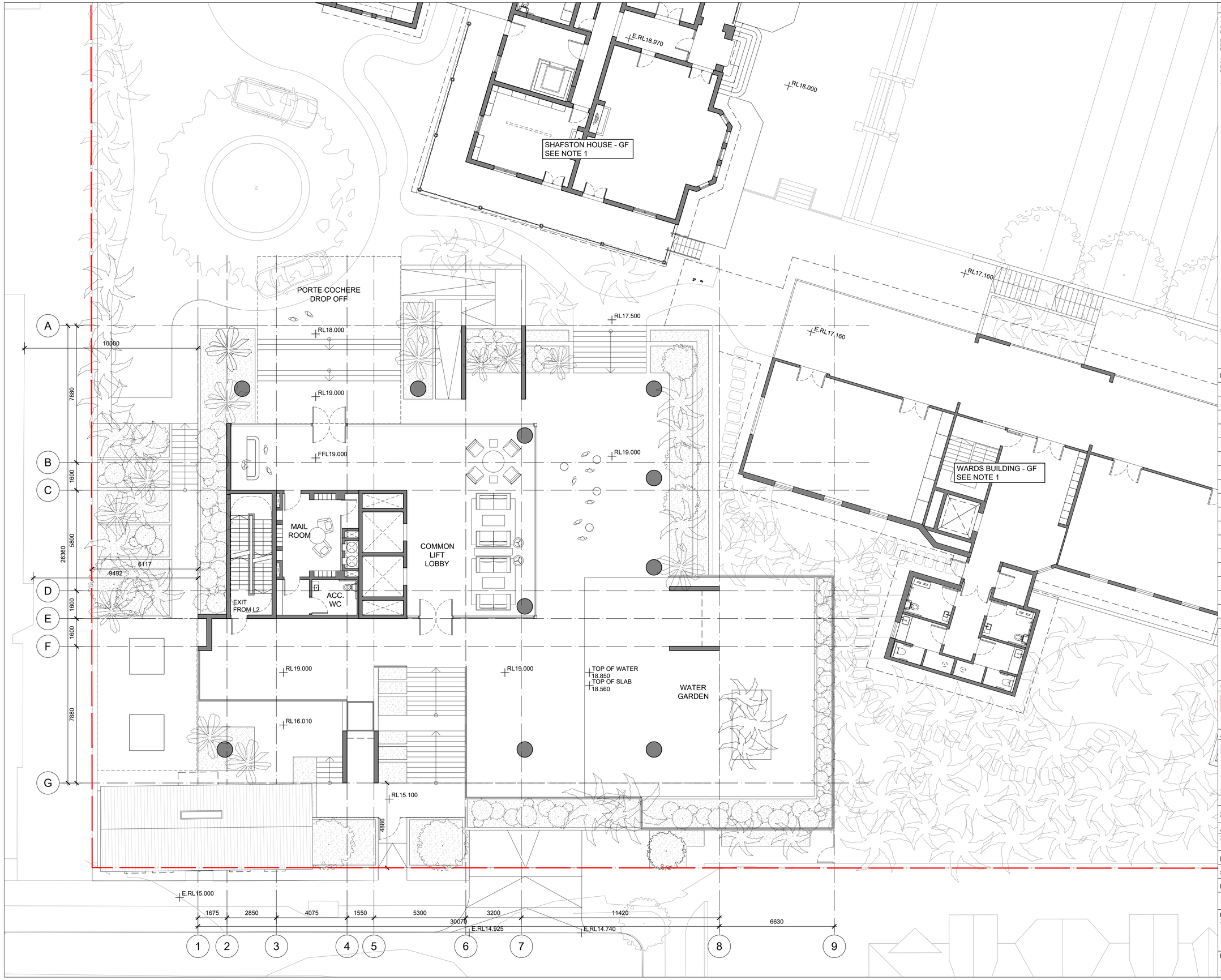
PROJECT	REF
SHAFSTON ESTATE	638

ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA	NORTH
SCALE (@ A1)	1:100	
DATE	18.09.2024	

DRAWING TITLE
TOWER - LOWER GROUND PLAN

DRAWING NUMBER	ISSUE
A0990	3



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DATE	18.09.2024

NORTH

DRAWING TITLE
TOWER - GROUND FLOOR PLAN

DRAWING NUMBER	ISSUE
A1000	3

SHAFSTON HOUSE - L1
SEE NOTE 1

RL23.500

VOID

VOID

PLANT
FFL25.660

VOID

WATER
GARDEN

VOID

10000

7880

1600

1600

1600

7880

26360

5800

6117

9492

4886

1675 2850 4075 1550 5300 3200 11420 6630

30070

A B C D E F G

1 2 3 4 5 6 7 8 9

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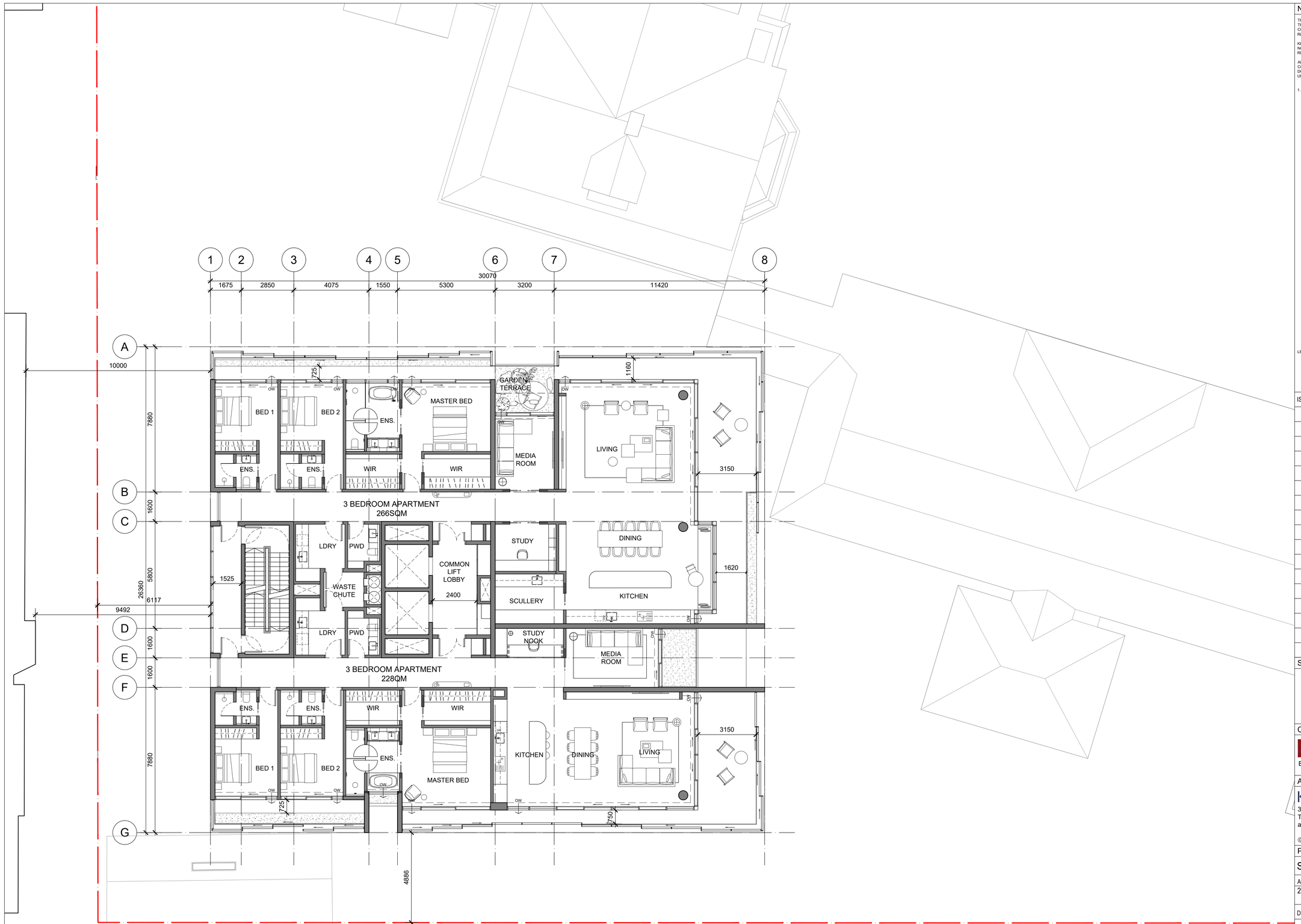
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SHAFSTON ESTATE	638

ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA	NORTH
SCALE (@ A1)	1:100	
DATE	18.09.2024	

DRAWING TITLE
TOWER - LEVEL 1 PLAN

DRAWING NUMBER	ISSUE
A1001	3



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SHAFSTON ESTATE	638

ADDRESS
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DRAWN	KHA
SCALE (@ A1)	1:100
DATE	18.09.2024

NORTH

DRAWING TITLE
TOWER - LEVELS 2,4,6,8,10,12,14,16, 18,20,22,24 PLAN

DRAWING NUMBER	ISSUE
A1002	3



NOTES / LEGEND / MATERIAL

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LEGEND

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STATUS

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PROJECT	REF
SHAFSTON ESTATE	638

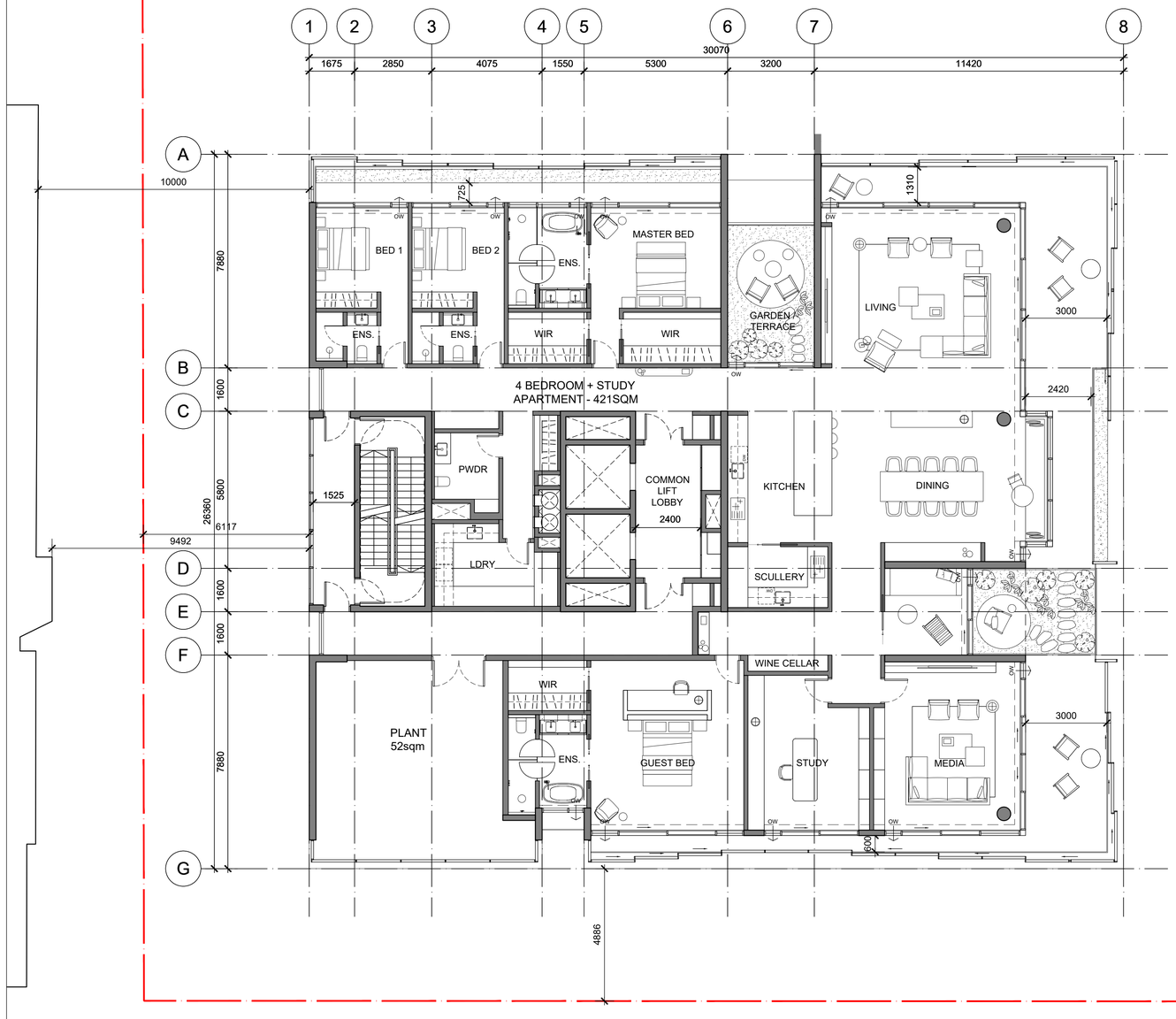
ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA
SCALE (@ A1)	1:100
DATE	18.09.2024

NORTH

DRAWING TITLE
TOWER - LEVELS 3,5,7,9,11,15,17, 19,21,23,25 PLAN

DRAWING NUMBER	ISSUE
A1003	3



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DRAWN	KHA
SCALE (@ A1)	1:100
DATE	18.09.2024

NORTH

DRAWING TITLE
TOWER - LEVEL 13 PLAN

DRAWING NUMBER	ISSUE
A1013	3



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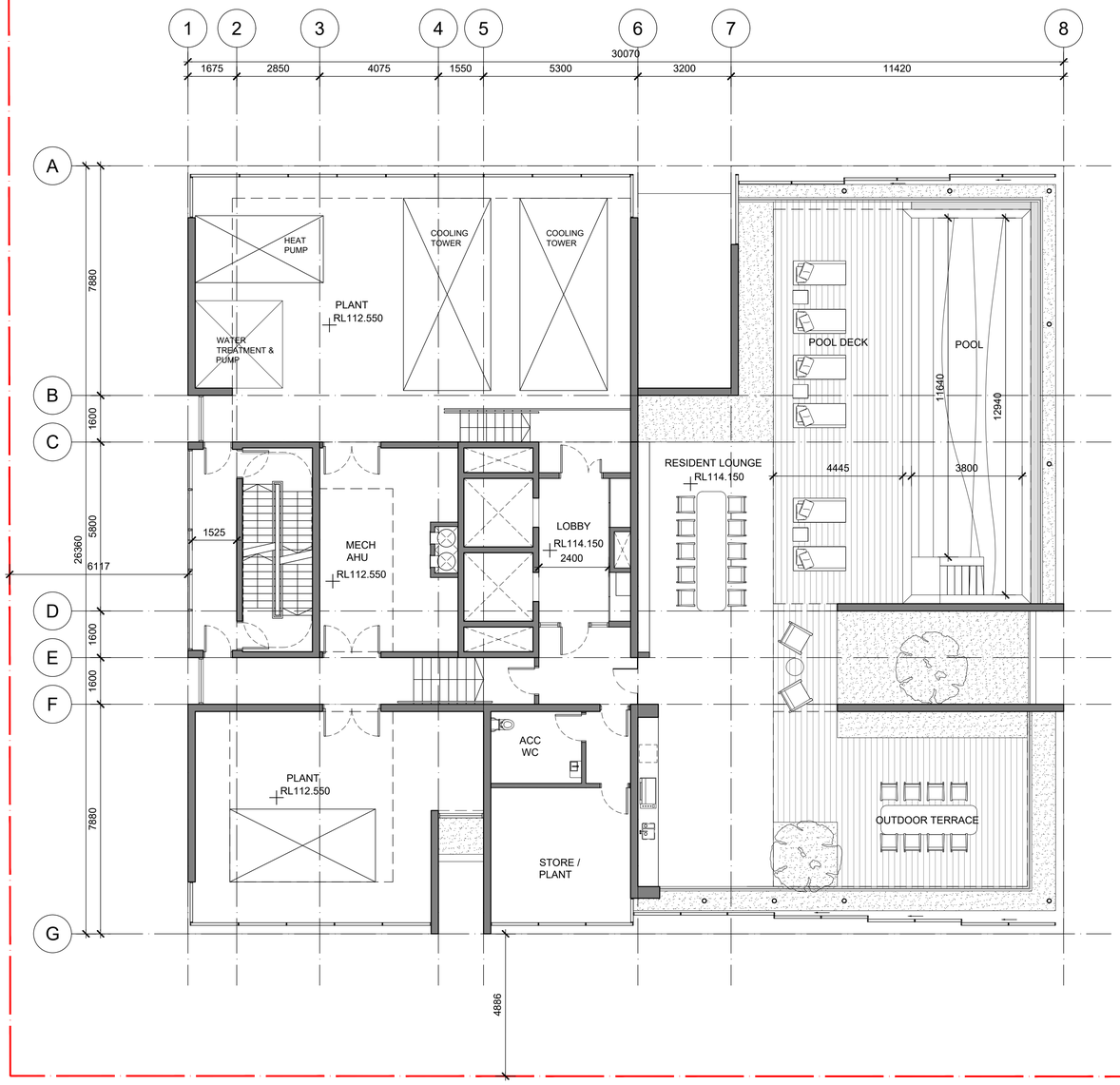
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DRAWN	KHA	NORTH
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DRAWING TITLE
TOWER - LEVEL 26 PLAN

DRAWING NUMBER	ISSUE
A1026	3



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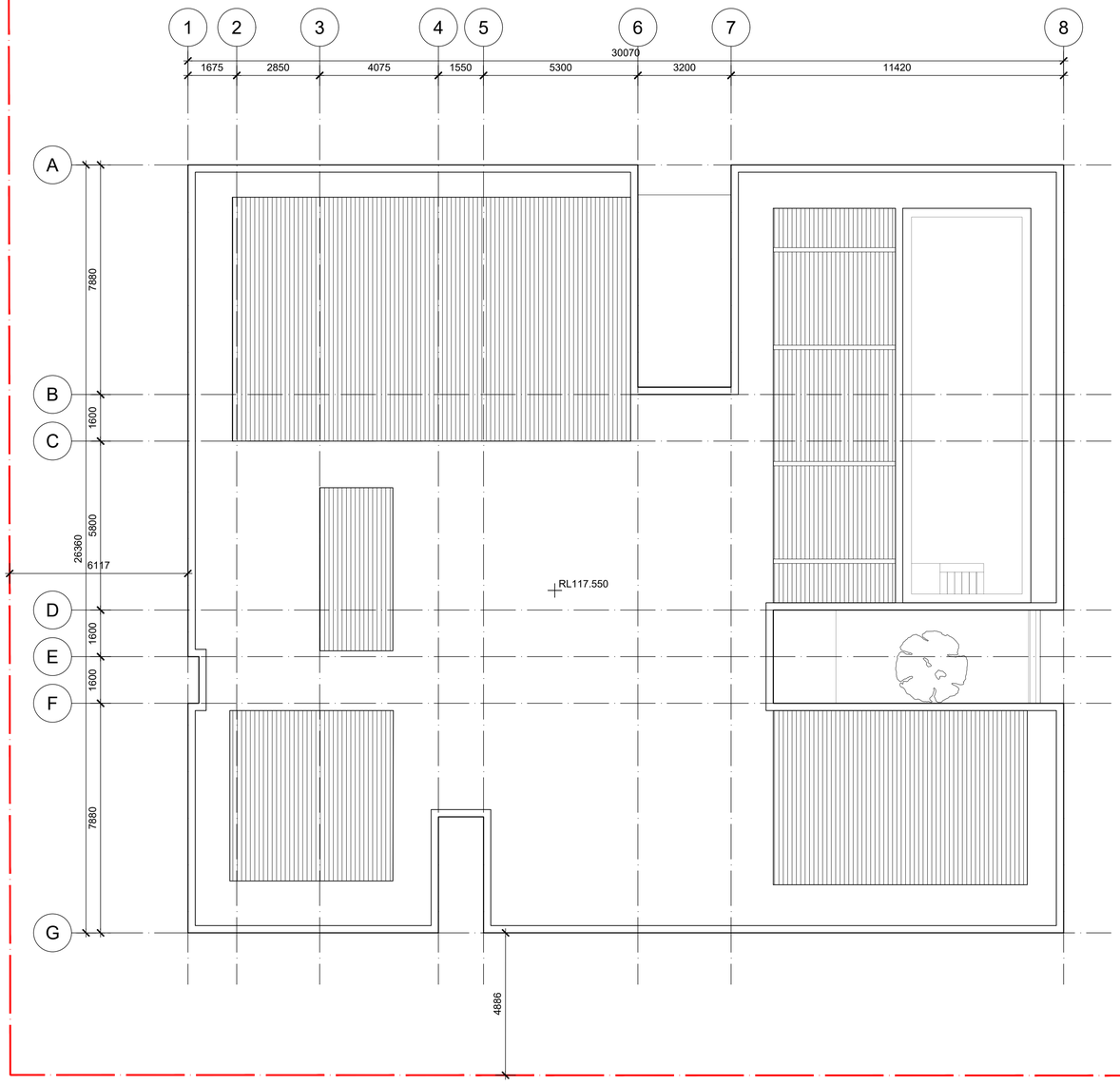
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DRAWING TITLE
TOWER - LEVEL 27 PLAN

DRAWING NUMBER	ISSUE
A1027	3



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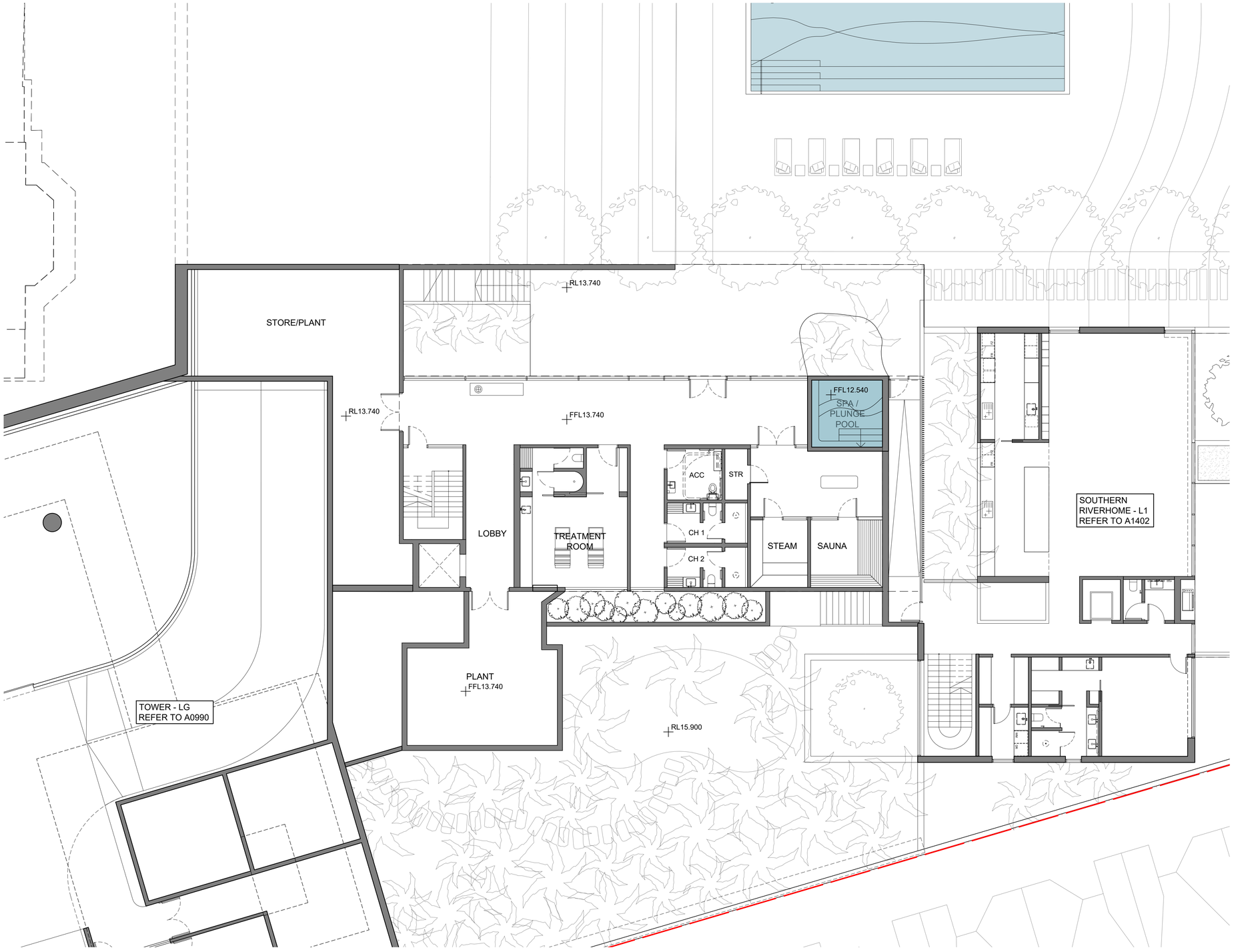
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23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA
SCALE (@ A1)	1:100
DATE	18.09.2024

NORTH

DRAWING TITLE
TOWER - ROOF PLAN

DRAWING NUMBER	ISSUE
A1028	3



NOTES / LEGEND / MATERIAL

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   - SHAFSTON HOUSE - LEVEL 1 PLAN
   - WARDS BUILDING - GROUND FLOOR PLAN
   - ORDERLIES BUILDING - GROUND FLOOR PLAN
   - GUEST HOUSE (OLD POSTAL DEPOT) - GROUND FLOOR PLAN

   - FINAL LEVELS WILL BE DOCUMENTED AS PART OF DETAILED DESIGN

LEGEND

- SITE BOUNDARY
- RIPARIAN SETBACK
- DA APPROVED ENVELOPE

ISSUE	DATE	AMENDMENT	CHECKED
1	09.08.24	70% DEVELOPMENT APPLICATION	KHA
2	02.09.24	WORK IN PROGRESS	KHA
3	18.09.24	FINAL DRAFT DA	KHA

STATUS

FINAL DRAFT
DEVELOPMENT APPLICATION

CLIENT

BURGUNDY GROUP

ARCHITECT

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PROJECT	REF
SHAFTSTON ESTATE	638

ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA
SCALE (@ A1)	1:100
DATE	18.09.2024

NORTH

DRAWING TITLE
WARDS BUILDING
LOWER GROUND PLAN

DRAWING NUMBER	ISSUE
A1201	3



NOTES / LEGEND / MATERIAL

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LEGEND

- SITE BOUNDARY
- RIPARIAN SETBACK
- DA APPROVED ENVELOPE

ISSUE	DATE	AMENDMENT	CHECKED
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3	18.09.24	FINAL DRAFT DA	KHA

STATUS

FINAL DRAFT
DEVELOPMENT APPLICATION

CLIENT

BURGUNDY GROUP

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PROJECT	REF
SHAFTSTON ESTATE	638

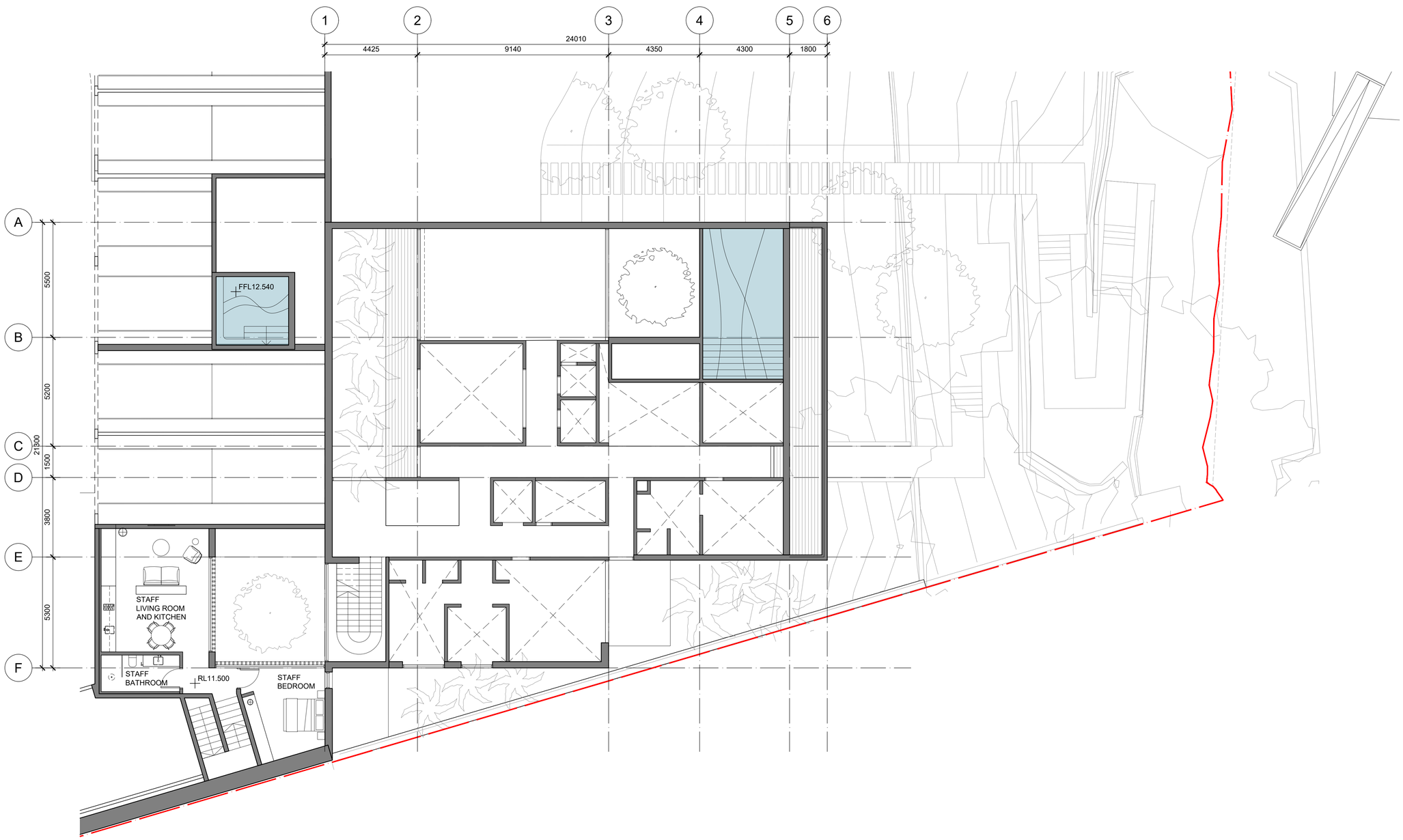
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23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA
SCALE (@ A1)	1:100
DATE	18.09.2024

NORTH

DRAWING TITLE
SOUTHERN RIVER HOME
GROUND FLOOR PLAN (SITE B2)

DRAWING NUMBER	ISSUE
A1400	3



NOTES / LEGEND / MATERIAL

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LEGEND

- SITE BOUNDARY
- RIPARIAN SETBACK
- DA APPROVED ENVELOPE

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3	18.09.24	FINAL DRAFT DA	KHA

STATUS

FINAL DRAFT
DEVELOPMENT APPLICATION

CLIENT

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PROJECT	REF
SHAFTSTON ESTATE	638

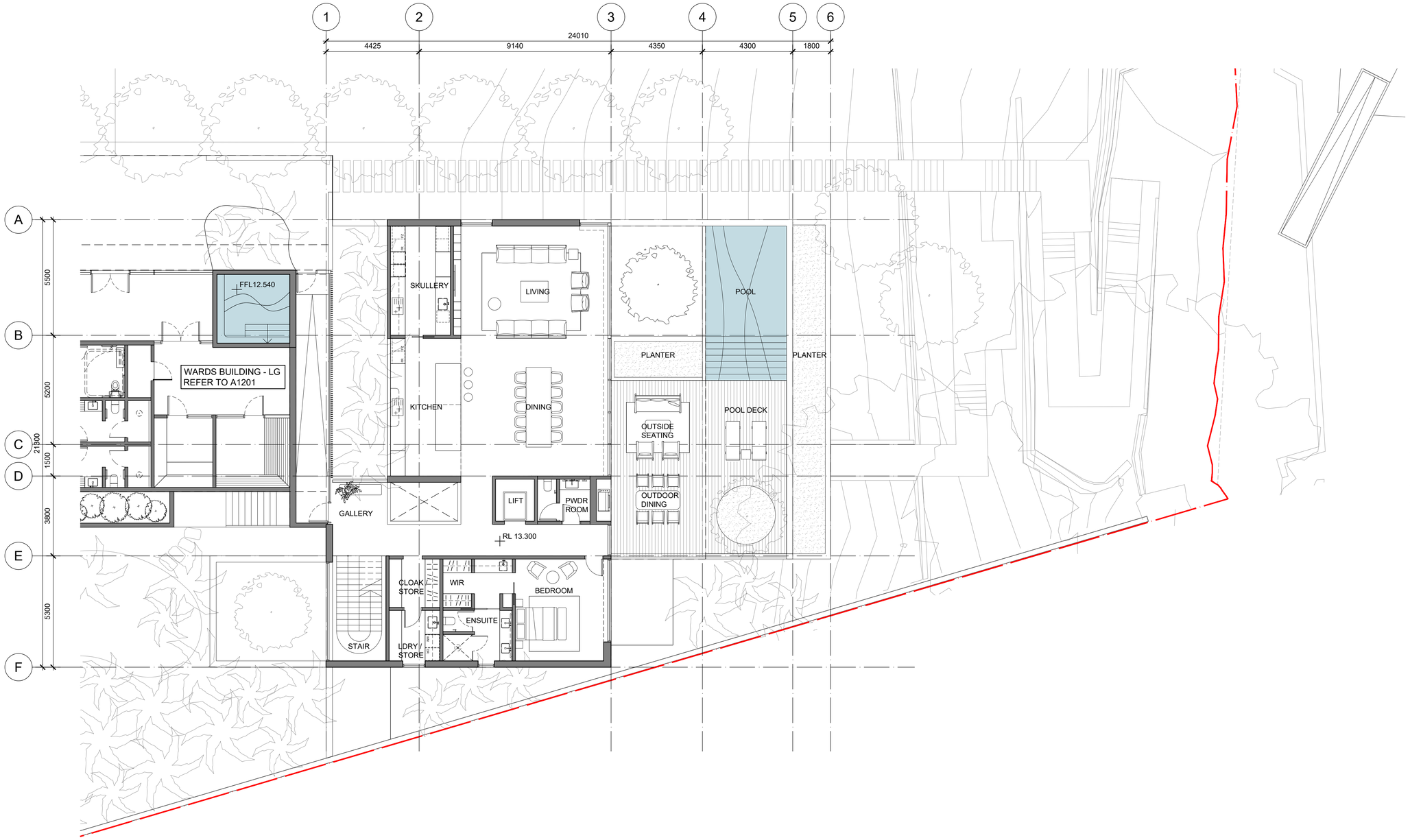
ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA
SCALE (@ A1)	1:100
DATE	18.09.2024

NORTH

DRAWING TITLE
SOUTHERN RIVER HOME
UPPER GROUND FLOOR PLAN (SITE B1)

DRAWING NUMBER	ISSUE
A1401	3



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LEGEND

- SITE BOUNDARY
- RIPARIAN SETBACK
- DA APPROVED ENVELOPE

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STATUS

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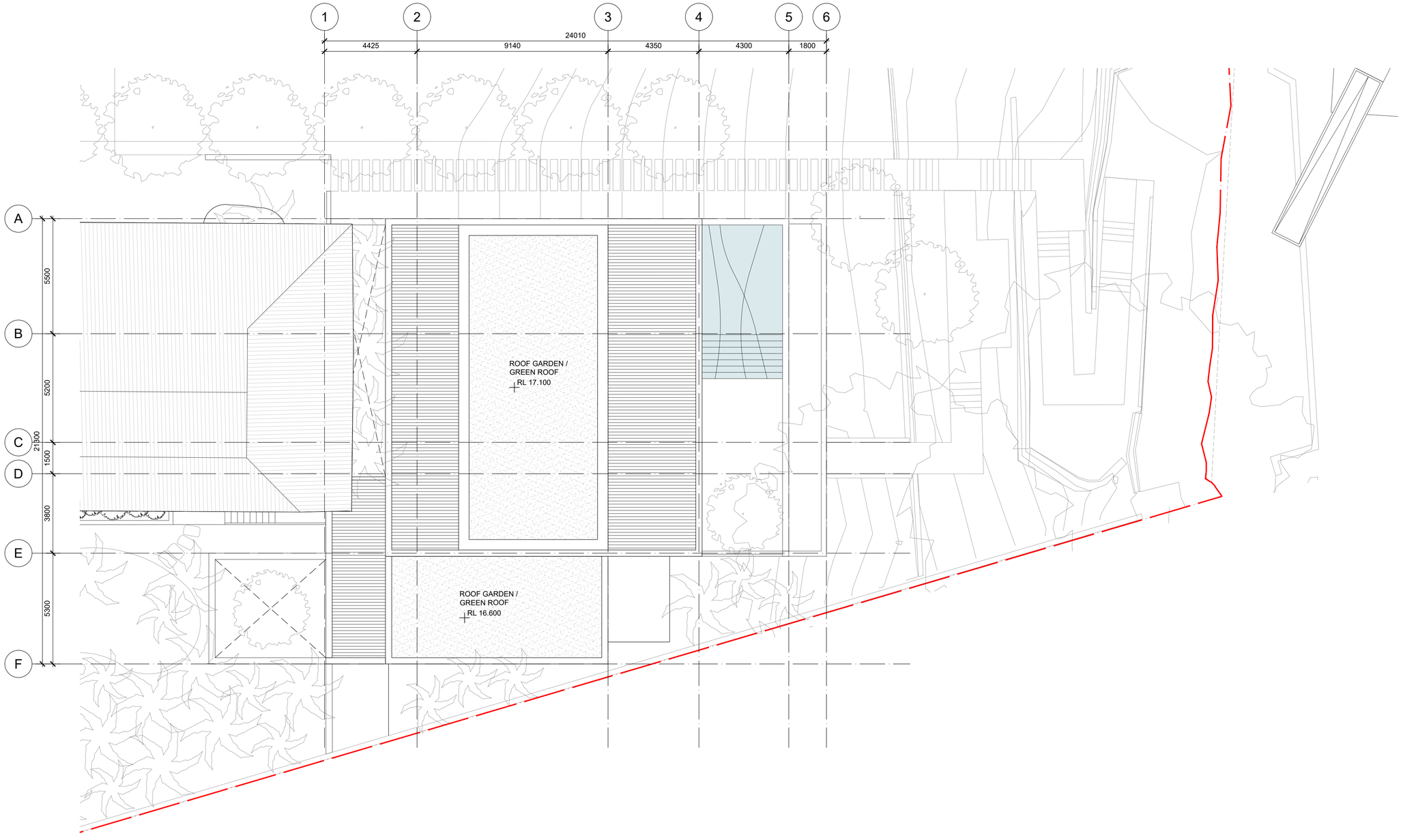
PROJECT	REF
SHAFTSTON ESTATE	638

ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA	NORTH
SCALE (@ A1)	1:100	
DATE	18.09.2024	

DRAWING TITLE
SOUTHERN RIVER HOME
LEVEL 1 PLAN (SITE LG)

DRAWING NUMBER	ISSUE
A1402	3



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LEGEND

- SITE BOUNDARY
- RIPARIAN SETBACK
- DA APPROVED ENVELOPE

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1	09.08.24	70% DEVELOPMENT APPLICATION	KHA
2	02.09.24	WORK IN PROGRESS	KHA
3	18.09.24	FINAL DRAFT DA	KHA

STATUS

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DEVELOPMENT APPLICATION

CLIENT

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PROJECT	REF
SHAFTSTON ESTATE	638

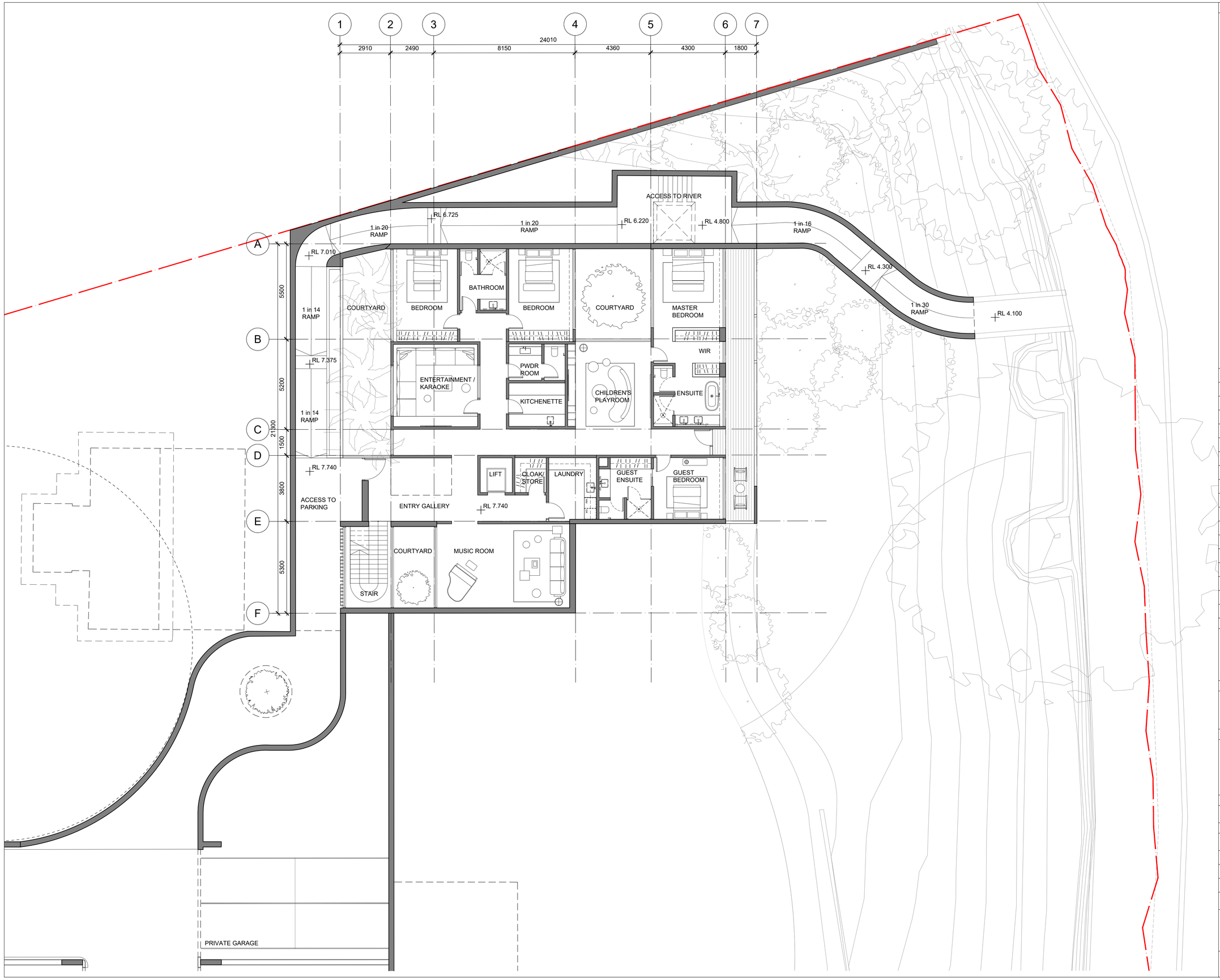
ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA
SCALE (@ A1)	1:100
DATE	18.09.2024

NORTH

DRAWING TITLE
SOUTHERN RIVER HOME
ROOF PLAN (SITE GF)

DRAWING NUMBER	ISSUE
A1403	3



NOTES / LEGEND / MATERIAL

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LEGEND

- SITE BOUNDARY
- RIPARIAN SETBACK
- DA APPROVED ENVELOPE

ISSUE	DATE	AMENDMENT	CHECKED
1	09.08.24	70% DEVELOPMENT APPLICATION	KHA
2	02.09.24	WORK IN PROGRESS	KHA
3	18.09.24	FINAL DRAFT DA	KHA

STATUS

FINAL DRAFT
DEVELOPMENT APPLICATION

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PROJECT	REF
SHAFTSTON ESTATE	638

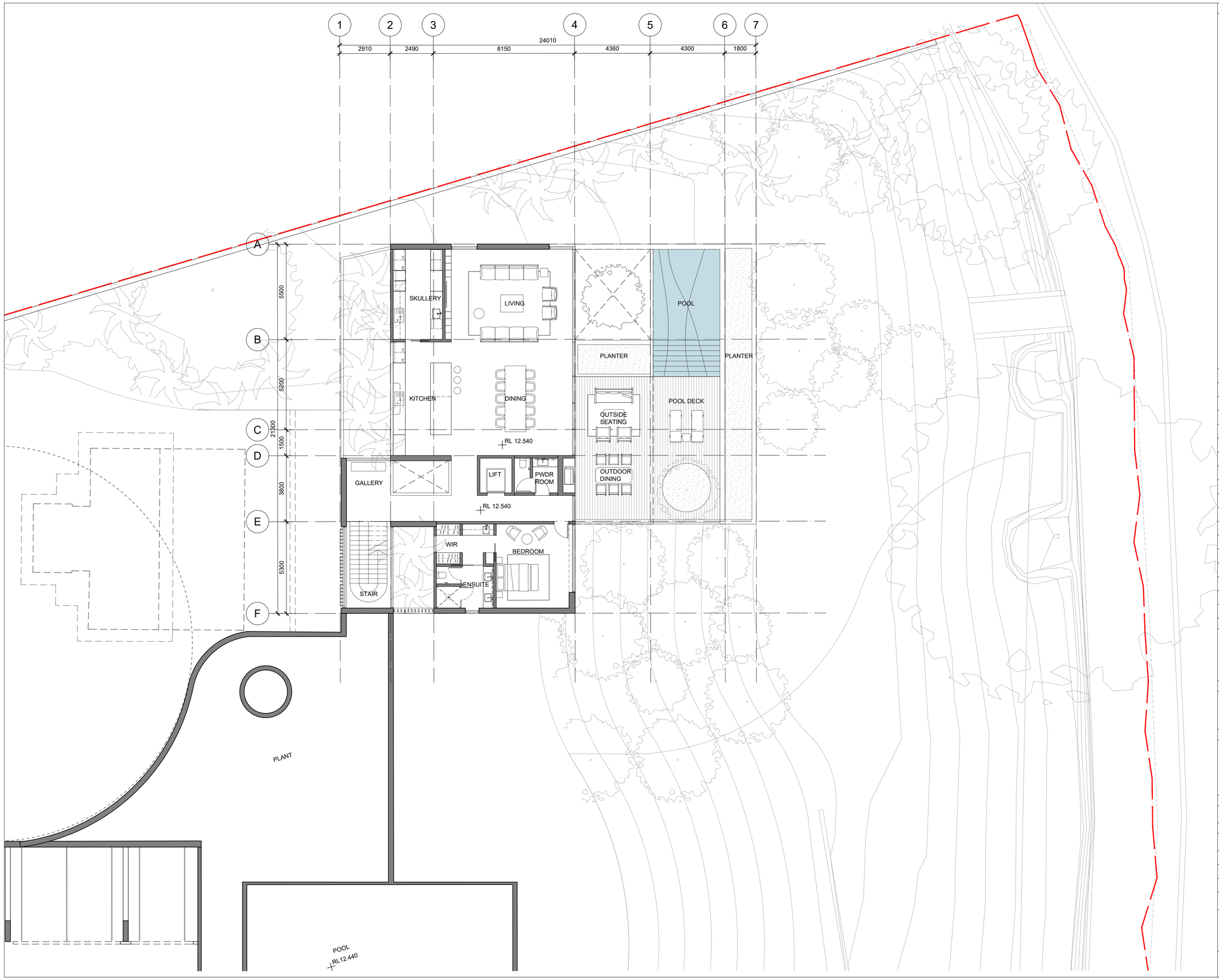
ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA
SCALE (@ A1)	1:100
DATE	18.09.2024

NORTH

DRAWING TITLE
NORTHERN RIVER HOME
GROUND FLOOR PLAN (SITE B2)

DRAWING NUMBER	ISSUE
A1500	3



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LEGEND

- SITE BOUNDARY
- RIPARIAN SETBACK
- DA APPROVED ENVELOPE

ISSUE	DATE	AMENDMENT	CHECKED
1	09.08.24	70% DEVELOPMENT APPLICATION	KHA
2	02.09.24	WORK IN PROGRESS	KHA
3	18.09.24	FINAL DRAFT DA	KHA

STATUS

FINAL DRAFT
DEVELOPMENT APPLICATION

CLIENT

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ARCHITECT

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PROJECT	REF
SHAFTSTON ESTATE	638

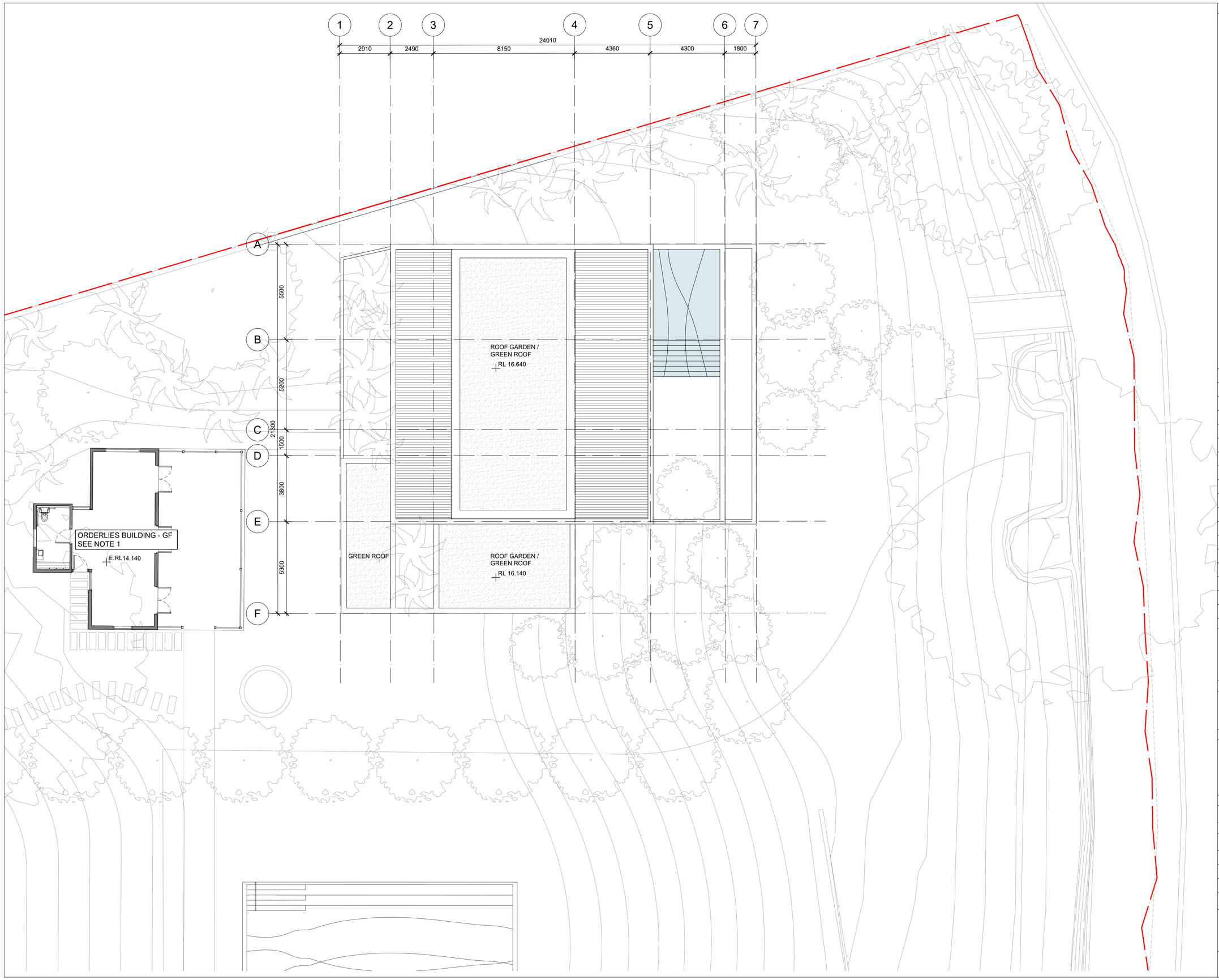
ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA
SCALE (@ A1)	1:100
DATE	18.09.2024

NORTH

DRAWING TITLE
NORTHERN RIVER HOME
LEVEL 1 PLAN (SITE B1)

DRAWING NUMBER	ISSUE
A1501	3



NOTES / LEGEND / MATERIAL

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LEGEND

- SITE BOUNDARY
- RIPARIAN SETBACK
- DA APPROVED ENVELOPE

ISSUE	DATE	AMENDMENT	CHECKED
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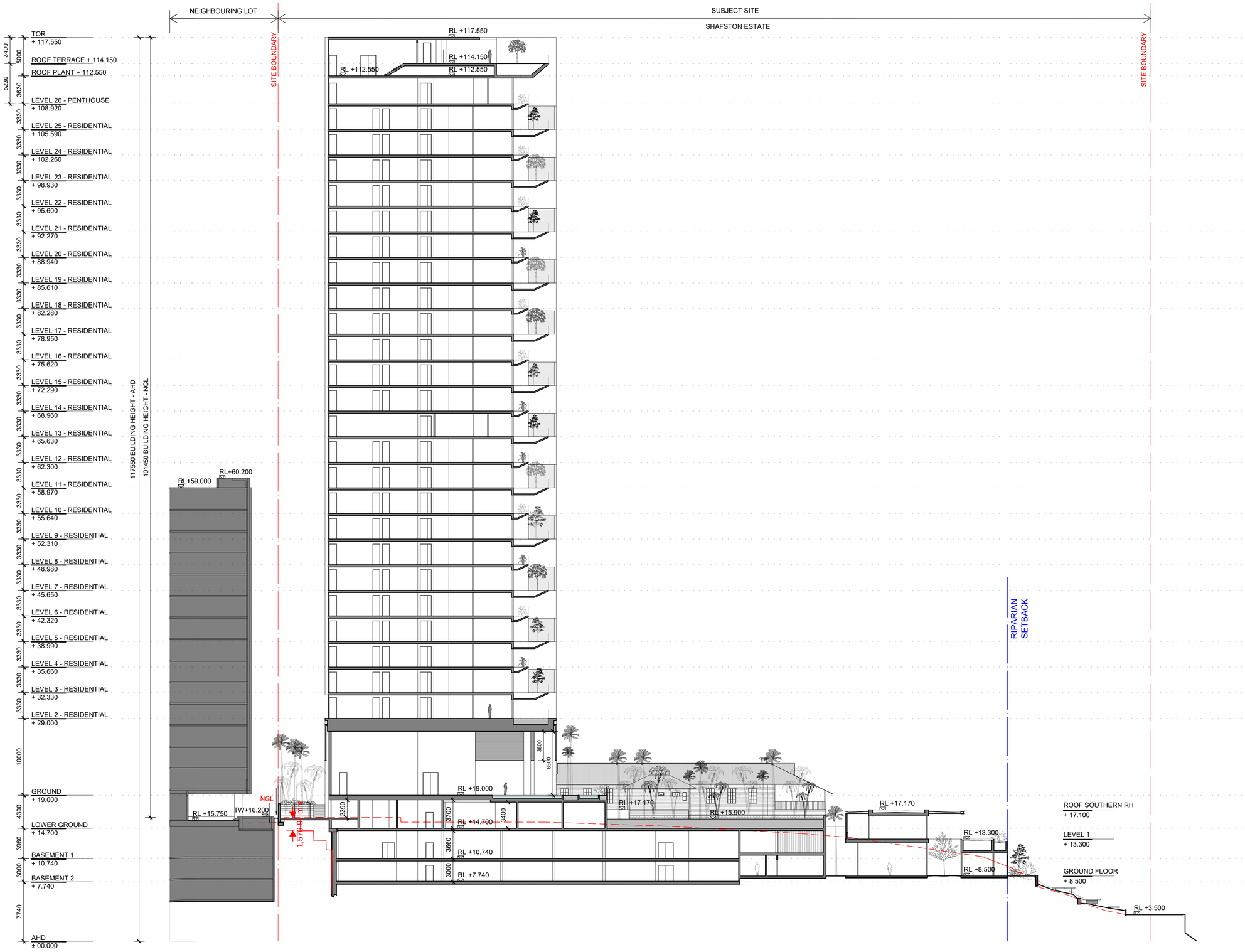
ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA
SCALE (@ A1)	1:100
DATE	18.09.2024

NORTH

DRAWING TITLE
NORTHERN RIVER HOME
ROOF PLAN (SITE LG)

DRAWING NUMBER	ISSUE
A1502	3



NOTES / LEGEND / MATERIAL

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LEGEND

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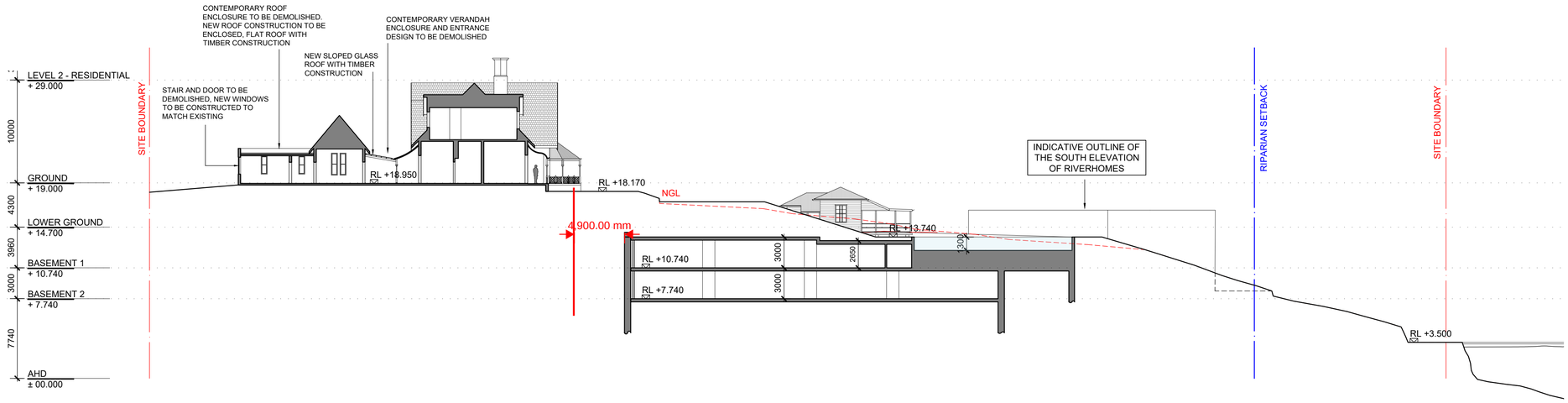
PROJECT	REF
SHAFSTON ESTATE	638

ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA	NORTH
SCALE (@ A1)	1:250	
DATE	18.09.2024	

DRAWING TITLE
SITE SECTION A-A
TOWER,WARDS, SOUTHERN RH

DRAWING NUMBER	ISSUE
A2001	3



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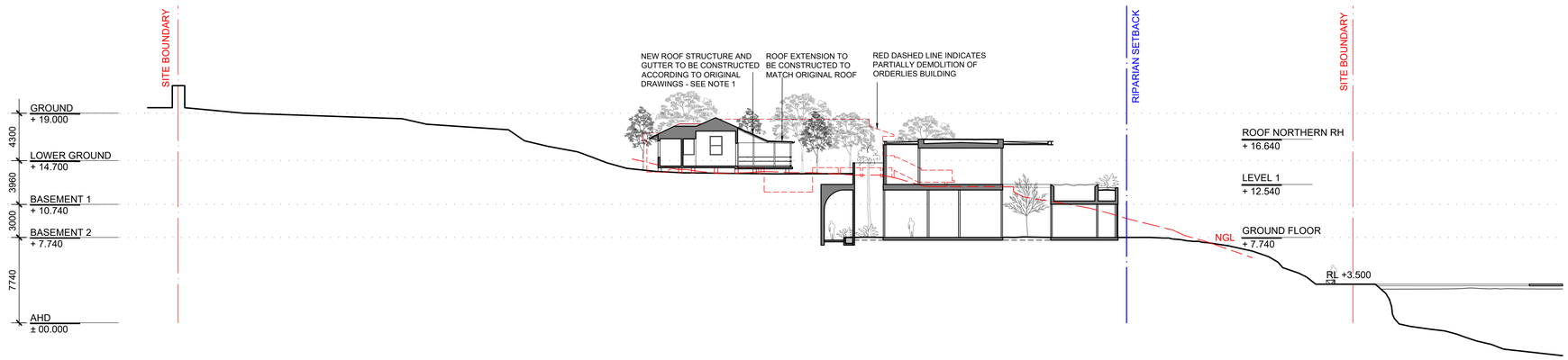
PROJECT	REF
SHAFTSTON ESTATE	638

ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA	NORTH
SCALE (@ A1)	1:250	
DATE	18.09.2024	

DRAWING TITLE
SITE SECTION B-B
SHAFSTON, POOL, BASEMENT

DRAWING NUMBER	ISSUE
A2002	3



NOTES / LEGEND / MATERIAL

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   - SHAFSTON HOUSE - LEVEL 1 PLAN
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   - ORDERLIES BUILDING - GROUND FLOOR PLAN
   - GUEST HOUSE (OLD POSTAL DEPOT) - GROUND FLOOR PLAN

   - FINAL LEVELS WILL BE DOCUMENTED AS PART OF DETAILED DESIGN

LEGEND

- SITE BOUNDARY
- RIPARIAN SETBACK
- DA APPROVED ENVELOPE

ISSUE	DATE	AMENDMENT	CHECKED
1	09.08.24	70% DEVELOPMENT APPLICATION	KHA
2	02.09.24	WORK IN PROGRESS	KHA
3	18.09.24	FINAL DRAFT DA	KHA

STATUS

FINAL DRAFT
DEVELOPMENT APPLICATION

CLIENT

BURGUNDY GROUP

ARCHITECT

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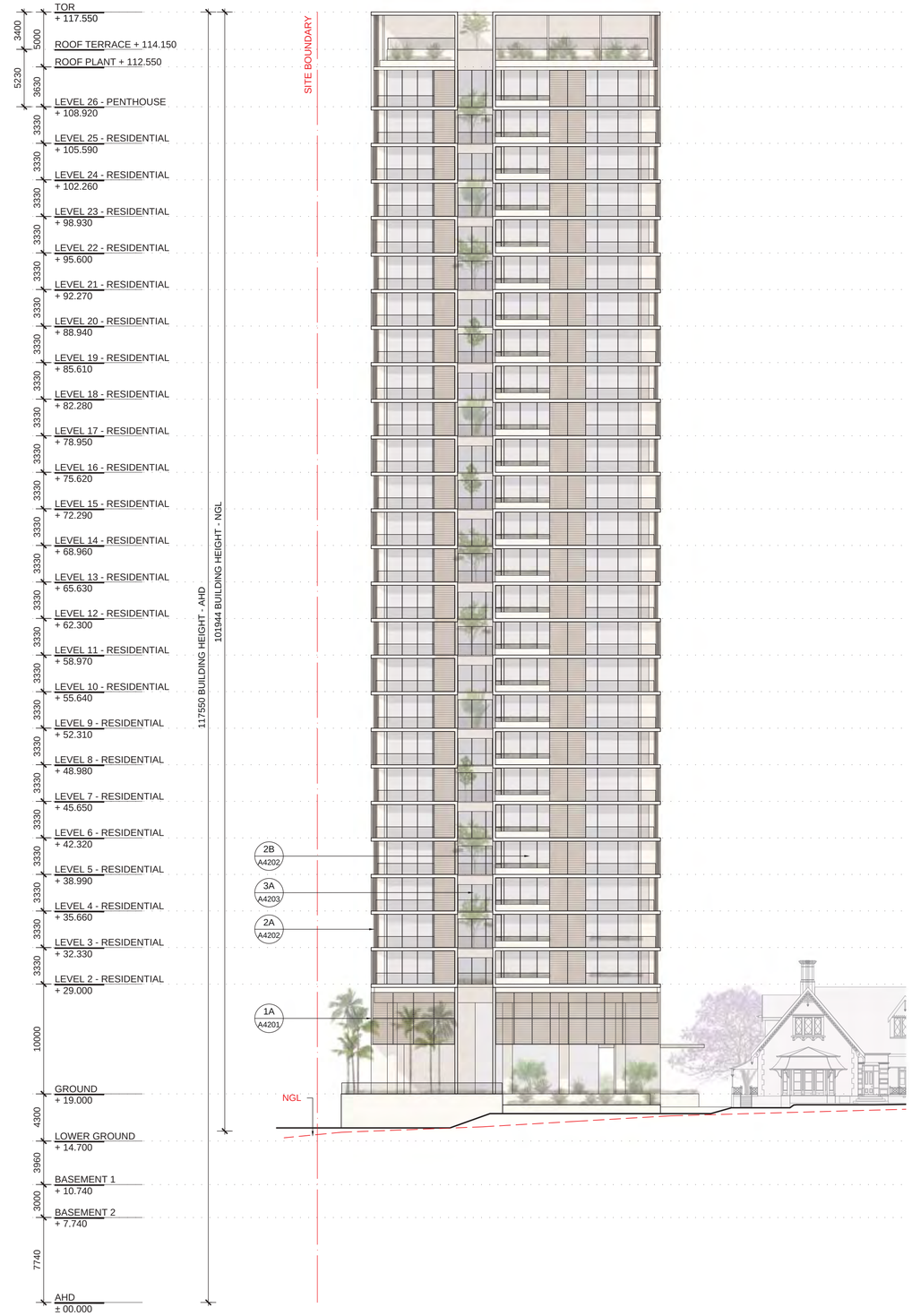
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SHAFTSTON ESTATE	638

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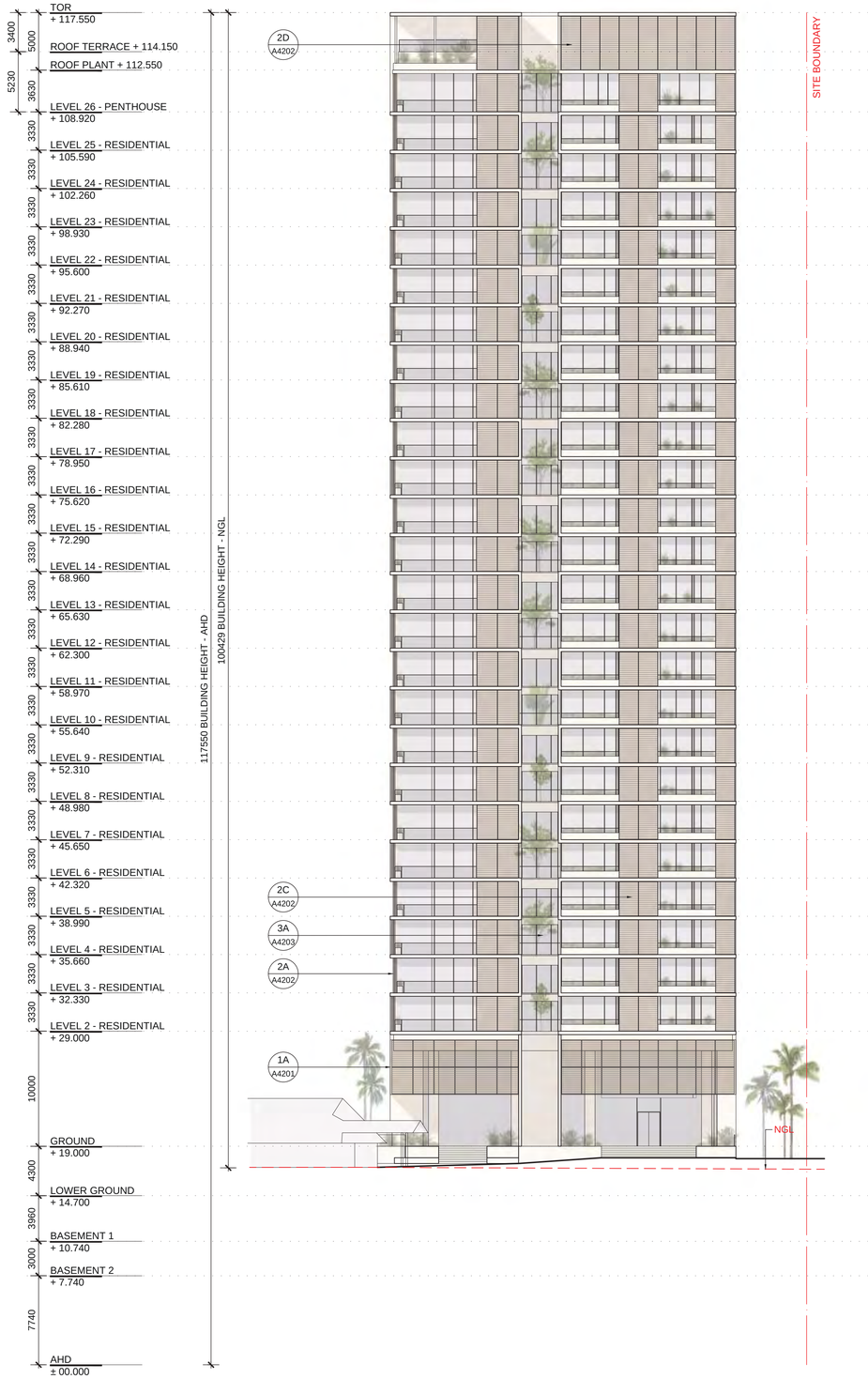
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SCALE (@ A1)	1:250	
DATE	18.09.2024	

DRAWING TITLE
SITE SECTION C-C
ORDERLIES, NORTHERN RH

DRAWING NUMBER	ISSUE
A2003	3



01 NORTH ELEVATION
A3001 ELEVATION 1:200



02 WEST ELEVATION
A3001 ELEVATION 1:200

NOTES / LEGEND / MATERIAL

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   - ORDERLIES BUILDING - GROUND FLOOR PLAN
   - GUEST HOUSE (OLD POSTAL DEPOT) - GROUND FLOOR PLAN

   - FINAL LEVELS WILL BE DOCUMENTED AS PART OF DETAILED DESIGN

EXTERNAL MATERIAL LEGEND TBD

EXTERNAL MATERIAL LEGEND

- **CN-01**: CONCRETE, COLOUR: SAND
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- **BL-01**: CLEAR VISION GLASS BALUSTRADE
- **AL-01**: DARK BRONZE COLOURED ALUMINIUM
- **PT-01**: DARK BRONZE COLOURED METALLIC PAINT
- **ST-01**: SAND COLOURED GRANITE STONE PAVING

LEGEND

- SITE BOUNDARY
- RIPARIAN SETBACK
- DA APPROVED ENVELOPE

ISSUE	DATE	AMENDMENT	CHECKED
1	09.08.24	70% DEVELOPMENT APPLICATION	KHA
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STATUS

FINAL DRAFT
DEVELOPMENT APPLICATION

CLIENT

BURGUNDY GROUP

ARCHITECT

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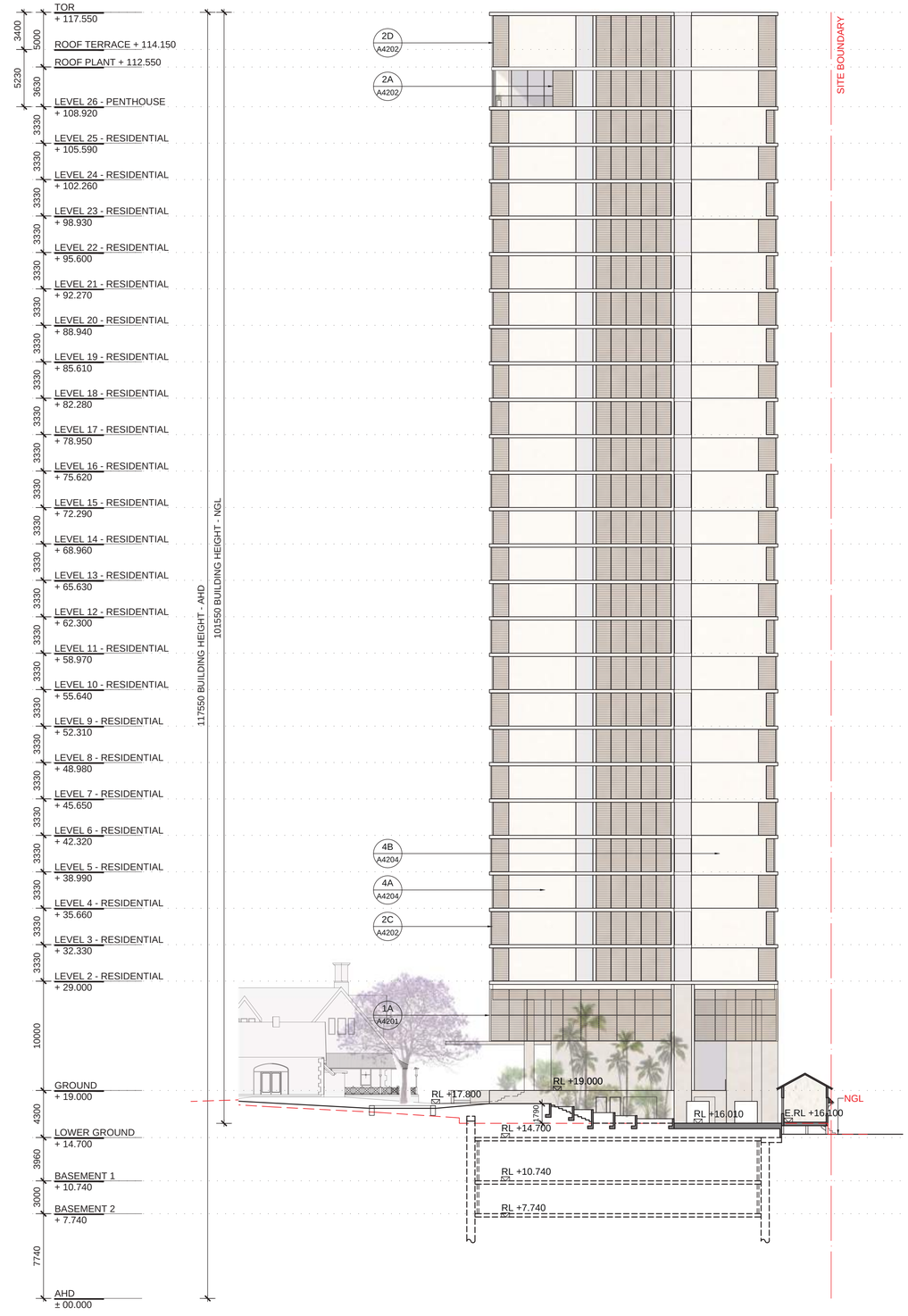
PROJECT	REF
SHAFTSTON ESTATE	638

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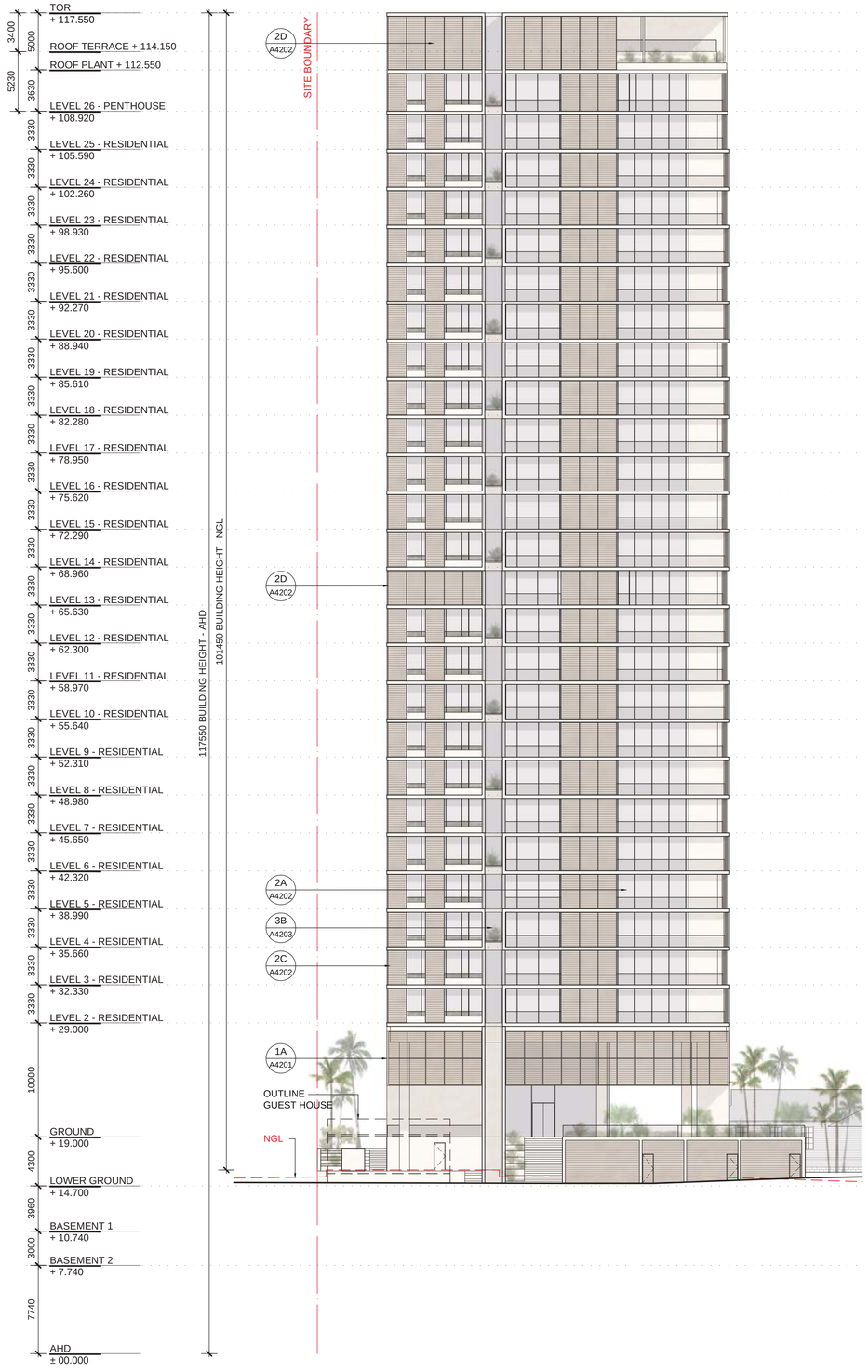
DRAWN	KHA	NORTH
SCALE (@ A1)	1:250	
DATE	18.09.2024	

DRAWING TITLE
TOWER ELEVATIONS
NORTH AND WEST

DRAWING NUMBER	ISSUE
A3001	3



01 SOUTH ELEVATION
A3002 ELEVATION 1:200



02 EAST ELEVATION
A3002 ELEVATION 1:200

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EXTERNAL MATERIAL LEGEND TBD

EXTERNAL MATERIAL LEGEND

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LEGEND

- SITE BOUNDARY
- RIPARIAN SETBACK
- DA APPROVED ENVELOPE

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STATUS

FINAL DRAFT
DEVELOPMENT APPLICATION

CLIENT

BURGUNDY GROUP

ARCHITECT

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PROJECT	REF
SHAFSTON ESTATE	638

ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA	NORTH
SCALE (@ A1)	1:250	
DATE	18.09.2024	

DRAWING TITLE
TOWER ELEVATIONS
SOUTH AND EAST

DRAWING NUMBER	ISSUE
A3002	3



NOTES / LEGEND / MATERIAL

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EXTERNAL MATERIAL LEGEND

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LEGEND

- SITE BOUNDARY
- RIPARIAN SETBACK
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STATUS

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CLIENT

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PROJECT	REF
SHAFTSTON ESTATE	638

ADDRESS
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DRAWN	KHA	NORTH
SCALE (@ A1)	1:100	
DATE	18.09.2024	

DRAWING TITLE
SOUTHERN RIVERHOME
SOUTH ELEVATION

DRAWING NUMBER	ISSUE
A3401	3



NOTES / LEGEND / MATERIAL

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EXTERNAL MATERIAL LEGEND TBD

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LEGEND

- SITE BOUNDARY
- RIPARIAN SETBACK
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PROJECT	REF
SHAFTSTON ESTATE	638

ADDRESS
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DRAWN	KHA
SCALE (@ A1)	1:100
DATE	18.09.2024

NORTH

DRAWING TITLE
SOUTHERN RIVERHOME
EAST ELEVATION

DRAWING NUMBER	ISSUE
A3402	3

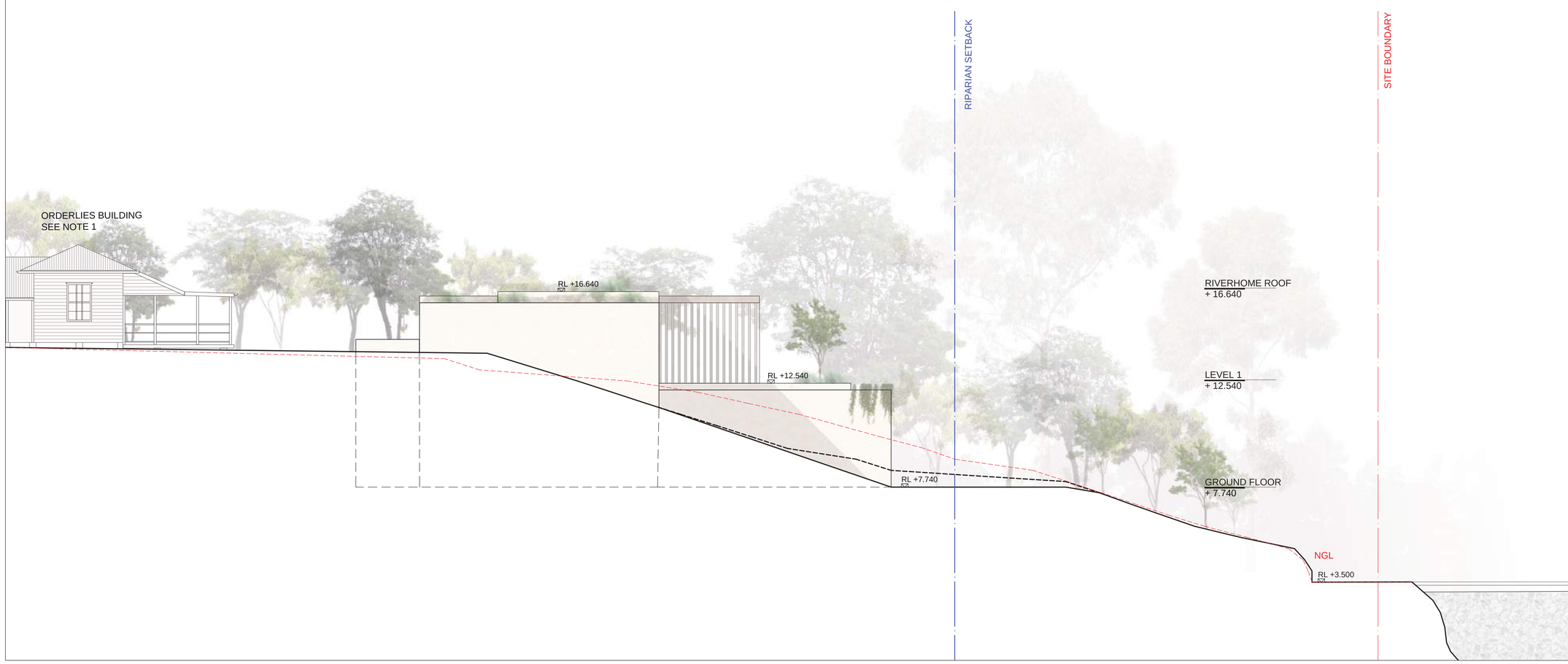
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LODGED

18/11/2024

APPLICATION REF

A006656931



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EXTERNAL MATERIAL LEGEND

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LEGEND

- SITE BOUNDARY
- RIPARIAN SETBACK
- DA APPROVED ENVELOPE

ISSUE	DATE	AMENDMENT	CHECKED
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STATUS

FINAL DRAFT
DEVELOPMENT APPLICATION

CLIENT

BURGUNDY GROUP

ARCHITECT

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PROJECT	REF
SHAFTSTON ESTATE	638

ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA
SCALE (@ A1)	1:100
DATE	18.09.2024

NORTH

DRAWING TITLE
NORTHERN RIVERHOME
SOUTH ELEVATION

DRAWING NUMBER	ISSUE
A3501	3



NOTES / LEGEND / MATERIAL

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LEGEND

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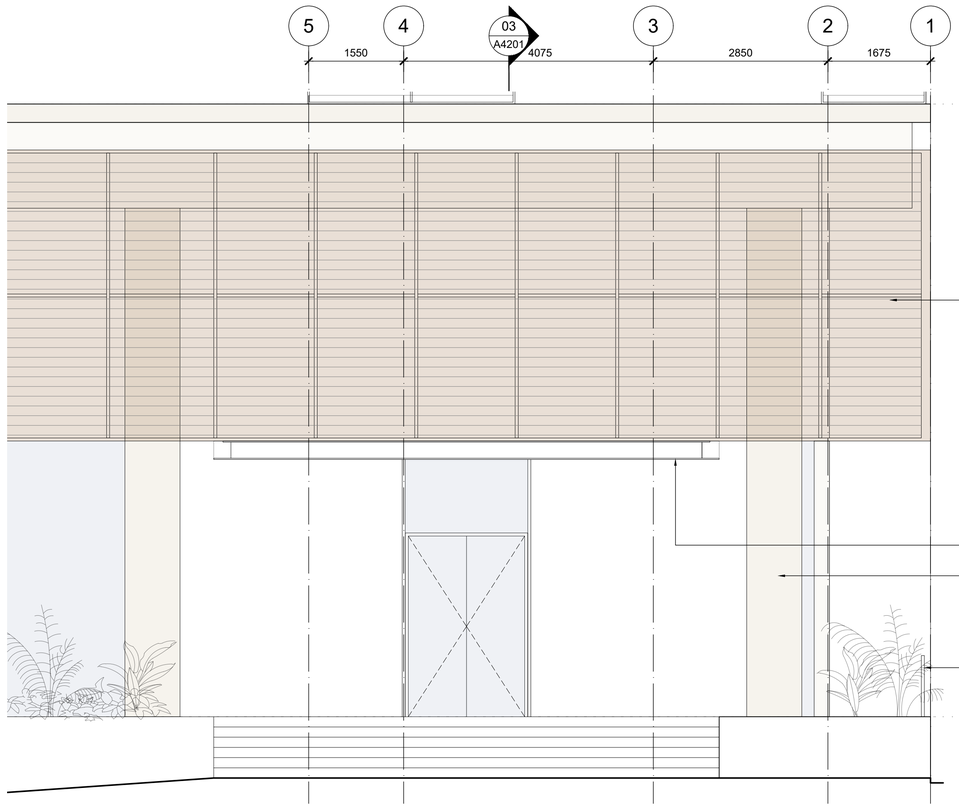
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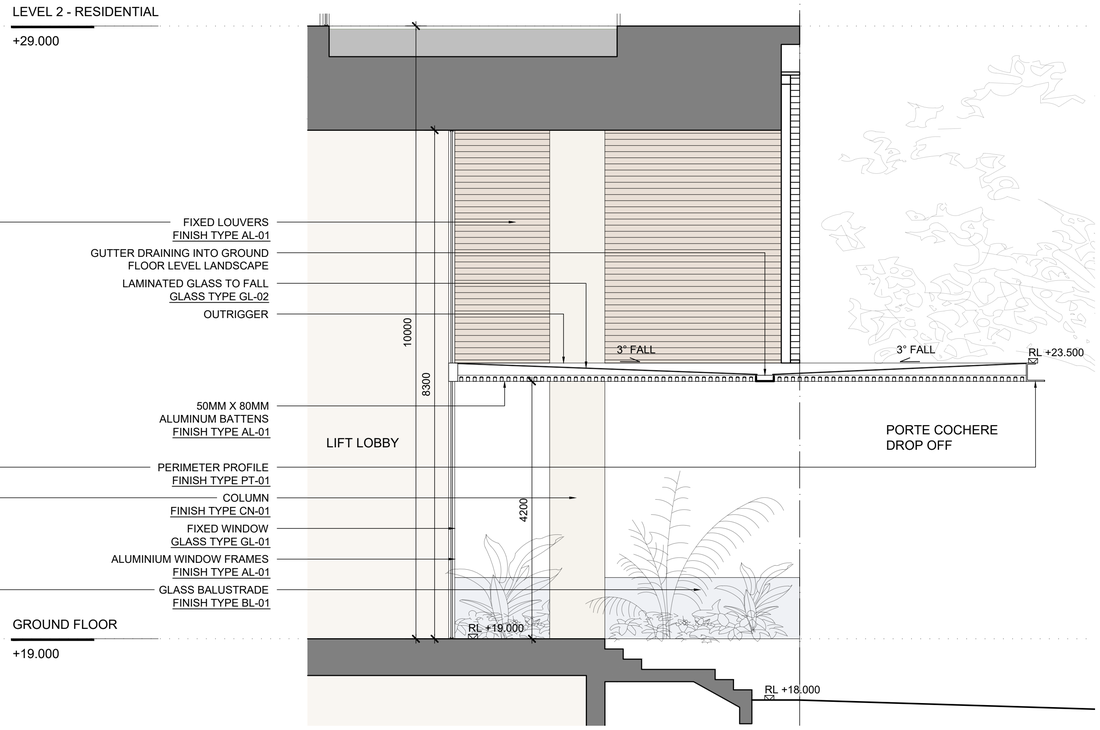
NORTH

DRAWING TITLE
NORTHERN RIVERHOME
EAST ELEVATION

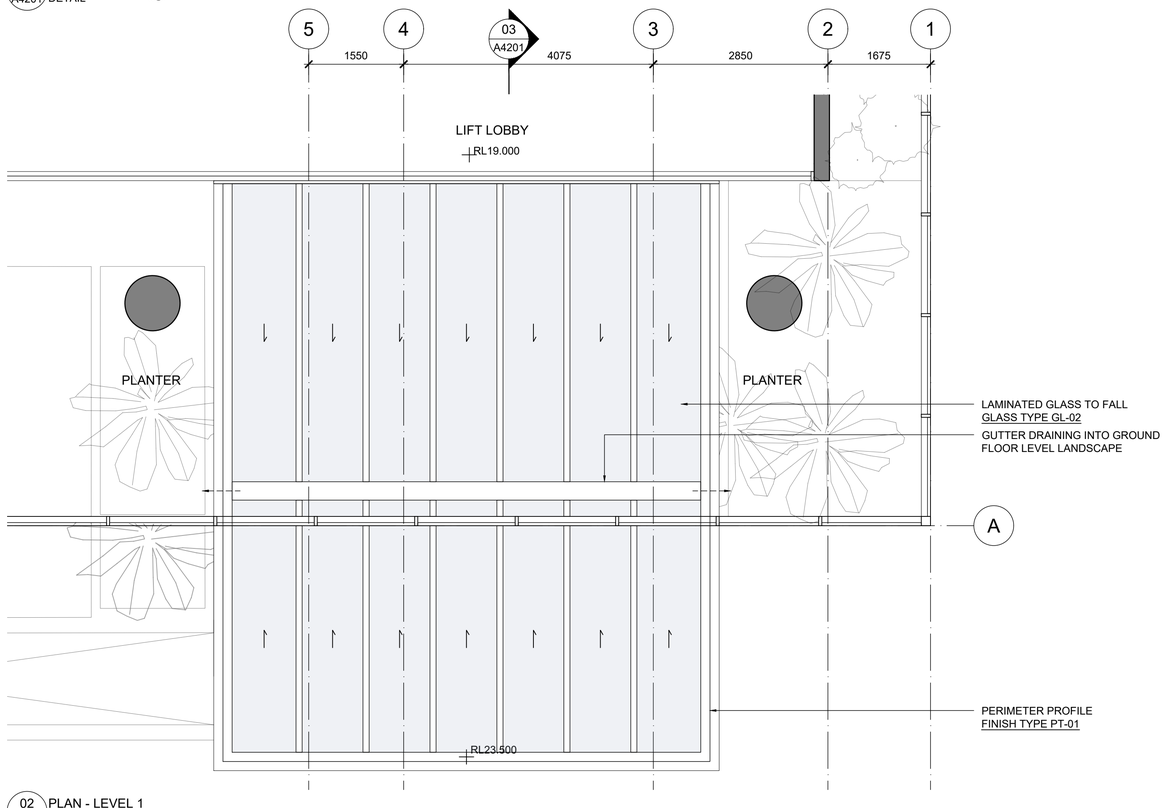
DRAWING NUMBER	ISSUE
A3502	3



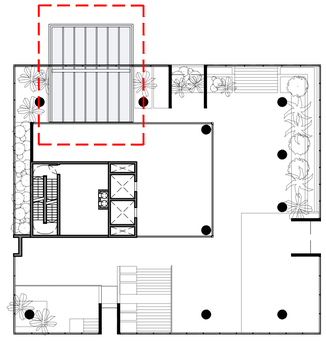
01 ELEVATION
A4201 DETAIL 1:50@A1



03 SECTION
A4201 DETAIL 1:50@A1



02 PLAN - LEVEL 1
A4201 DETAIL 1:50@A1



NOTES / LEGEND / MATERIAL

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EXTERNAL MATERIAL LEGEND TBD

EXTERNAL MATERIAL LEGEND

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6. **PT-01**: DARK BRONZE COLOURED METALLIC PAINT
7. **ST-01**: SAND COLOURED GRANITE STONE PAVING

LEGEND

- SITE BOUNDARY
- RIPARIAN SETBACK
- DA APPROVED ENVELOPE

ISSUE	DATE	AMENDMENT	CHECKED
1	09.08.24	70% DEVELOPMENT APPLICATION	KHA
2	02.09.24	WORK IN PROGRESS	KHA
3	18.09.24	FINAL DRAFT DA	KHA

STATUS

FINAL DRAFT
DEVELOPMENT APPLICATION

CLIENT

BURGUNDY GROUP

ARCHITECT

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admin_perth@khastudio.com.au

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PROJECT	REF
SHAFTSTON ESTATE	638

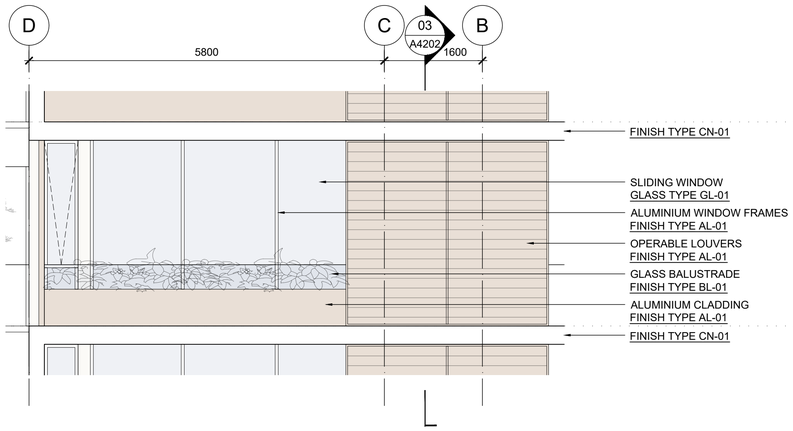
ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA
SCALE (@ A1)	1:50
DATE	18.09.2024

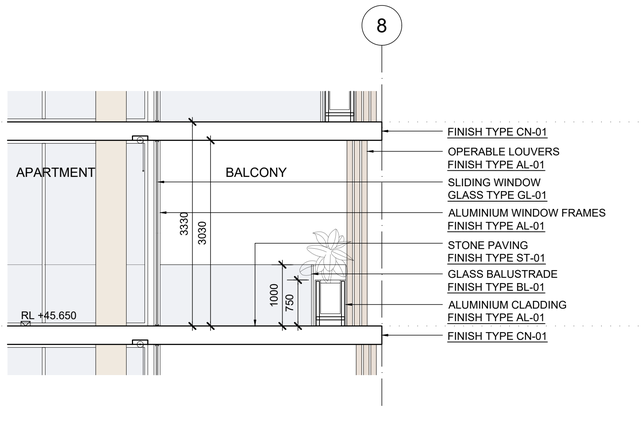
NORTH

DRAWING TITLE
TYPICAL FACADE TYPE 1
TOWER GF - FIXED LOUVERS AND AWNING

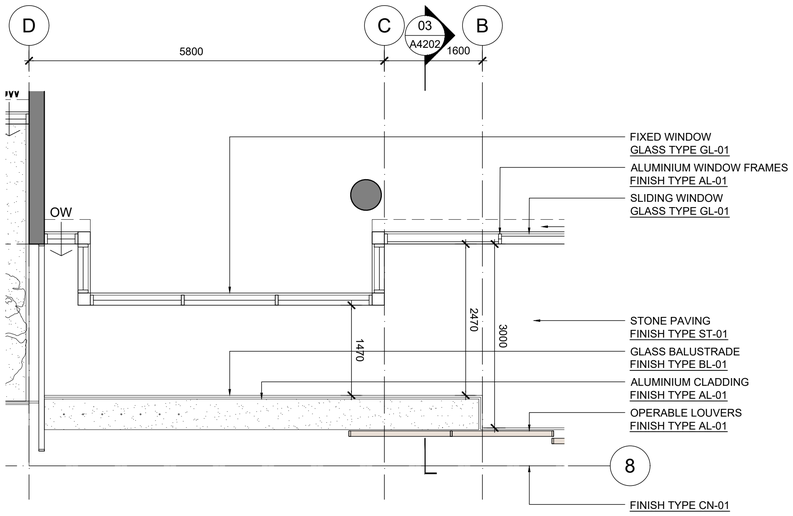
DRAWING NUMBER	ISSUE
A4201	3



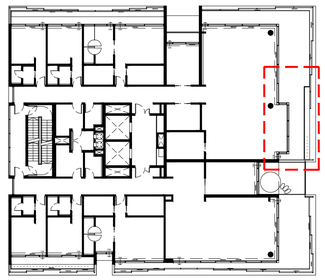
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03 A4202 SECTION DETAIL 1:50@A1



02 A4202 PLAN - LEVEL 1 DETAIL 1:50@A1



NOTES / LEGEND / MATERIAL

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   - GUEST HOUSE (OLD POSTAL DEPOT) - GROUND FLOOR PLAN

   - FINAL LEVELS WILL BE DOCUMENTED AS PART OF DETAILED DESIGN

EXTERNAL MATERIAL LEGEND TBD

EXTERNAL MATERIAL LEGEND

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3. **GL-02**: BRIGHT COLOURED, REFLECTIVE LAMINATED GLAZING
4. **BL-01**: CLEAR VISION GLASS BALUSTRADE
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6. **PT-01**: DARK BRONZE COLOURED METALLIC PAINT
7. **ST-01**: SAND COLOURED GRANITE STONE PAVING

LEGEND

- SITE BOUNDARY
- RIPARIAN SETBACK
- DA APPROVED ENVELOPE

ISSUE	DATE	AMENDMENT	CHECKED
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2	02.09.24	WORK IN PROGRESS	KHA
3	18.09.24	FINAL DRAFT DA	KHA

STATUS

FINAL DRAFT
DEVELOPMENT APPLICATION

CLIENT

BURGUNDY GROUP

ARCHITECT

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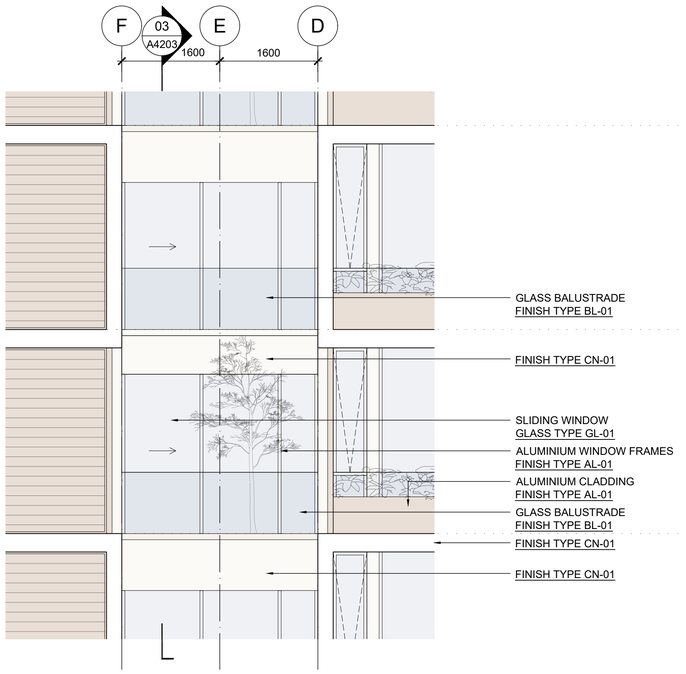
PROJECT	REF
SHAFTSTON ESTATE	638

ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

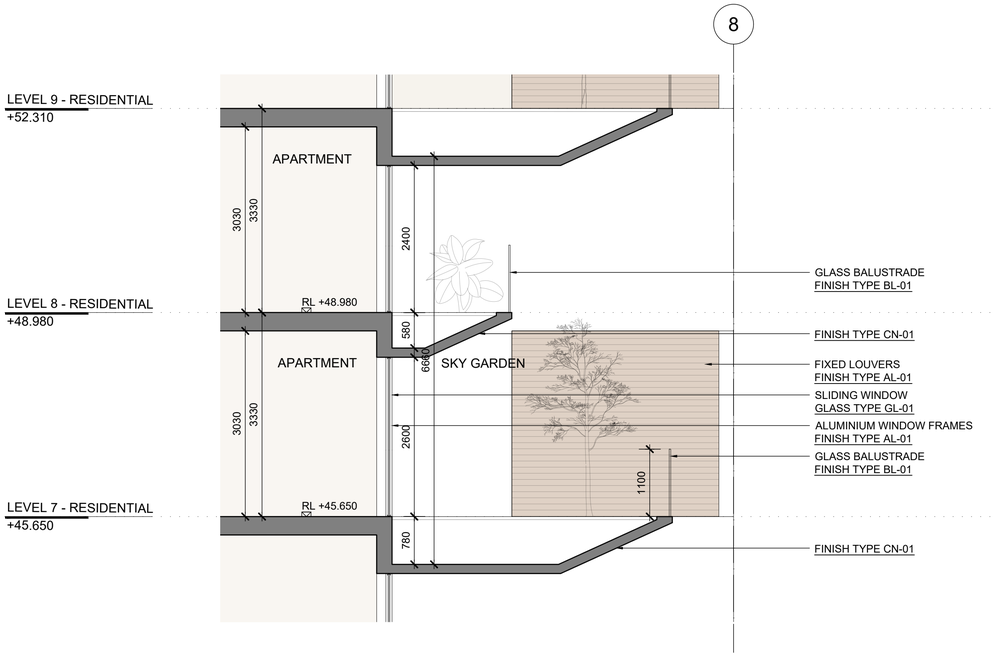
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SCALE (@ A1)	1:50	
DATE	18.09.2024	

DRAWING TITLE
TYPICAL FACADE TYPE 2
TOWER APARTMENT BALCONY/PLANTER

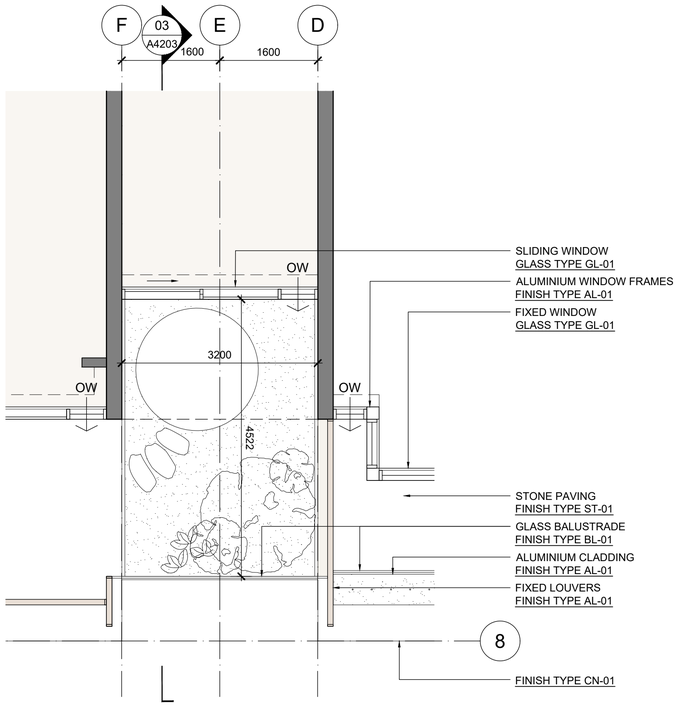
DRAWING NUMBER	ISSUE
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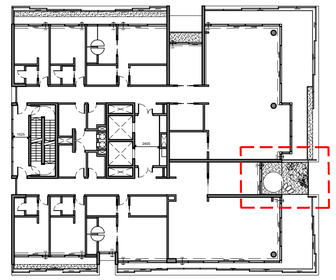
01 ELEVATION
A4203 DETAIL 1:50@A1



03 SECTION
A4203 DETAIL 1:50@A1



02 PLAN - LEVEL 1
A4203 DETAIL 1:50@A1



NOTES / LEGEND / MATERIAL

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   - ORDERLIES BUILDING - GROUND FLOOR PLAN
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7. **ST-01**: SAND COLOURED GRANITE STONE PAVING

LEGEND

- SITE BOUNDARY
- RIPARIAN SETBACK
- DA APPROVED ENVELOPE

ISSUE	DATE	AMENDMENT	CHECKED
1	09.08.24	70% DEVELOPMENT APPLICATION	KHA
2	02.09.24	WORK IN PROGRESS	KHA
3	18.09.24	FINAL DRAFT DA	KHA

STATUS

FINAL DRAFT
DEVELOPMENT APPLICATION

CLIENT

BURGUNDY GROUP

ARCHITECT

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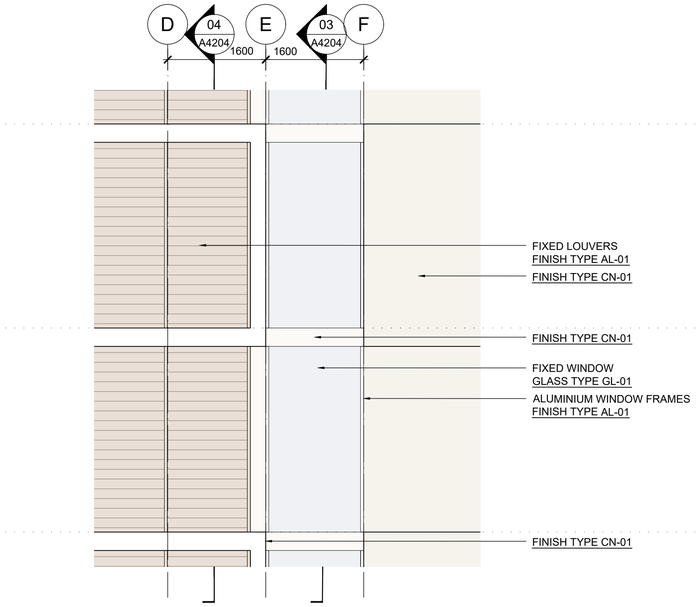
PROJECT	REF
SHAFTSTON ESTATE	638

ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

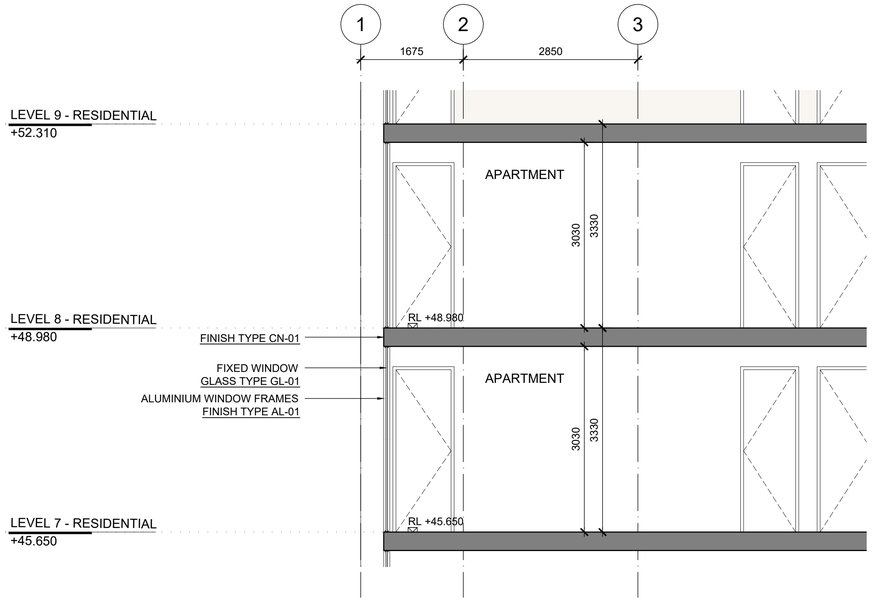
DRAWN	KHA	NORTH
SCALE (@ A1)	1:50	
DATE	18.09.2024	

DRAWING TITLE
TYPICAL FACADE TYPE 3
TOWER APARTMENT - SKY GARDEN

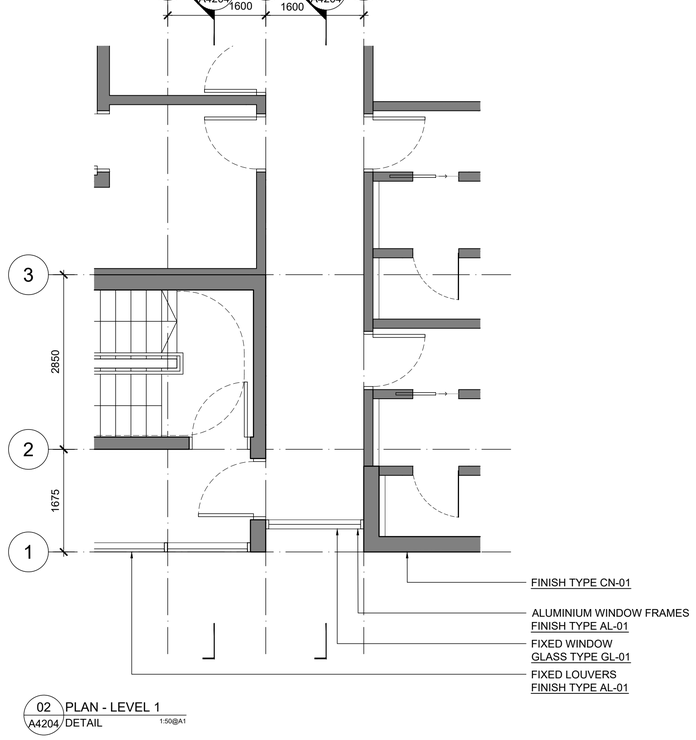
DRAWING NUMBER	ISSUE
A4203	3



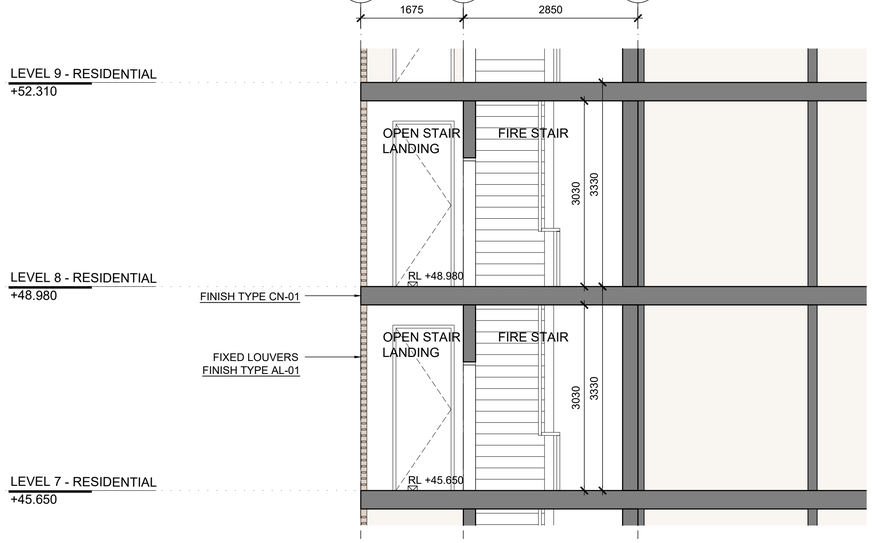
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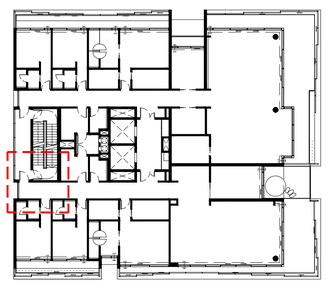
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02 A4204 PLAN - LEVEL 1 DETAIL 1:50@A1



04 A4204 SECTION DETAIL 1:50@A1



NOTES / LEGEND / MATERIAL

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   - GUEST HOUSE (OLD POSTAL DEPOT) - GROUND FLOOR PLAN

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EXTERNAL MATERIAL LEGEND TBD

EXTERNAL MATERIAL LEGEND

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7. **ST-01**: SAND COLOURED GRANITE STONE PAVING

LEGEND

- SITE BOUNDARY
- RIPARIAN SETBACK
- DA APPROVED ENVELOPE

ISSUE	DATE	AMENDMENT	CHECKED
1	09.08.24	70% DEVELOPMENT APPLICATION	KHA
2	02.09.24	WORK IN PROGRESS	KHA
3	18.09.24	FINAL DRAFT DA	KHA

STATUS

FINAL DRAFT
DEVELOPMENT APPLICATION

CLIENT

BURGUNDY GROUP

ARCHITECT

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admin_perth@khastudio.com.au

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PROJECT	REF
SHAFSTON ESTATE	638

ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA	NORTH
SCALE (@ A1)	1:50	
DATE	18.09.2024	

DRAWING TITLE
TYPICAL FACADE TYPE 4
TOWER SOUTH FACADE - FIRE STAIR

DRAWING NUMBER	ISSUE
A4204	3

TO BE UPDATED



NOTES / LEGEND / MATERIAL

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LEGEND

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SHAFTSTON ESTATE	638

ADDRESS
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DRAWN	KHA	NORTH
SCALE (@ A1)	-	
DATE	18.09.2024	

DRAWING TITLE
PERSPECTIVE VIEW 1
RIVER VIEW - EAST

DRAWING NUMBER	ISSUE
A4700	3

TO BE UPDATED



NOTES / LEGEND / MATERIAL

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LEGEND

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ADDRESS
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DRAWN	KHA	NORTH
SCALE (@ A1)	-	
DATE	18.09.2024	

DRAWING TITLE
PERSPECTIVE VIEW 2
ARIEL VIEW - SOUTH EAST

DRAWING NUMBER	ISSUE
A4701	3

TO BE UPDATED



NOTES / LEGEND / MATERIAL

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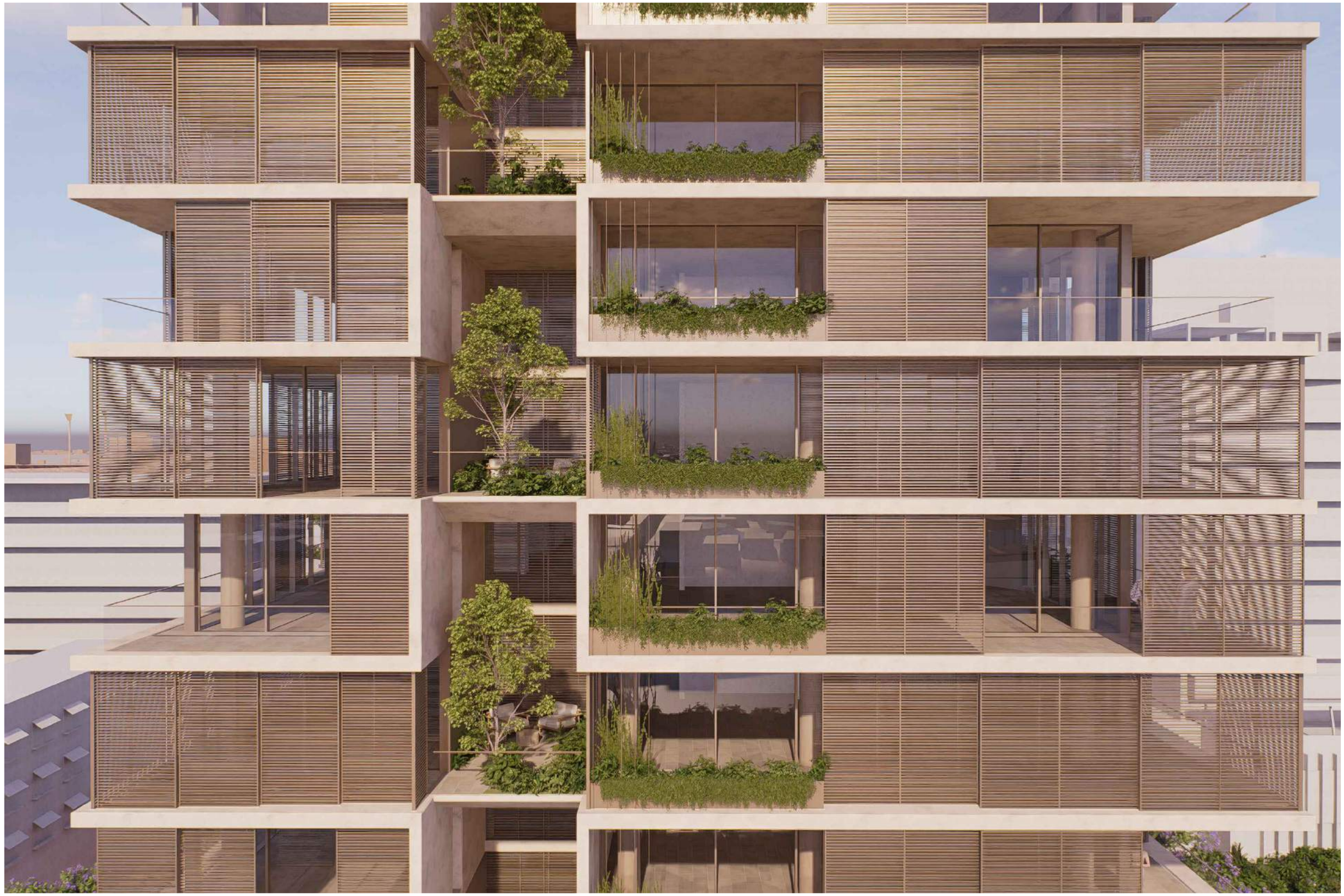
ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA	NORTH
SCALE (@ A1)	-	
DATE	18.09.2024	

DRAWING TITLE
PERSPECTIVE VIEW 3
ARIEL VIEW - TOWER

DRAWING NUMBER	ISSUE
A4702	3

TO BE UPDATED



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DRAWN	KHA	NORTH
SCALE (@ A1)	-	
DATE	18.09.2024	

DRAWING TITLE
PERSPECTIVE VIEW 4
ARIEL VIEW - TOWER

DRAWING NUMBER	ISSUE
A4703	3

TO BE UPDATED



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1. REFER TO HERITAGE CONSULTANT (URBIS) DRAWINGS FOR:
   - SHAFSTON HOUSE - GROUND FLOOR PLAN
   - SHAFSTON HOUSE - LEVEL 1 PLAN
   - WARDS BUILDING - GROUND FLOOR PLAN
   - ORDERLIES BUILDING - GROUND FLOOR PLAN
   - GUEST HOUSE (OLD POSTAL DEPOT) - GROUND FLOOR PLAN

   - FINAL LEVELS WILL BE DOCUMENTED AS PART OF DETAILED DESIGN

LEGEND

- SITE BOUNDARY
- RIPARIAN SETBACK
- DA APPROVED ENVELOPE

ISSUE	DATE	AMENDMENT	CHECKED
1	09.08.24	70% DEVELOPMENT APPLICATION	KHA
2	02.09.24	WORK IN PROGRESS	KHA
3	18.09.24	FINAL DRAFT DA	KHA

STATUS

FINAL DRAFT
DEVELOPMENT APPLICATION

CLIENT

BURGUNDY GROUP

ARCHITECT

KHA
30 Mouat St, Fremantle, WA 6160
T:+618 93364545 F:+618 93364546
admin_perth@khastudio.com.au

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PROJECT	REF
SHAFTSTON ESTATE	638

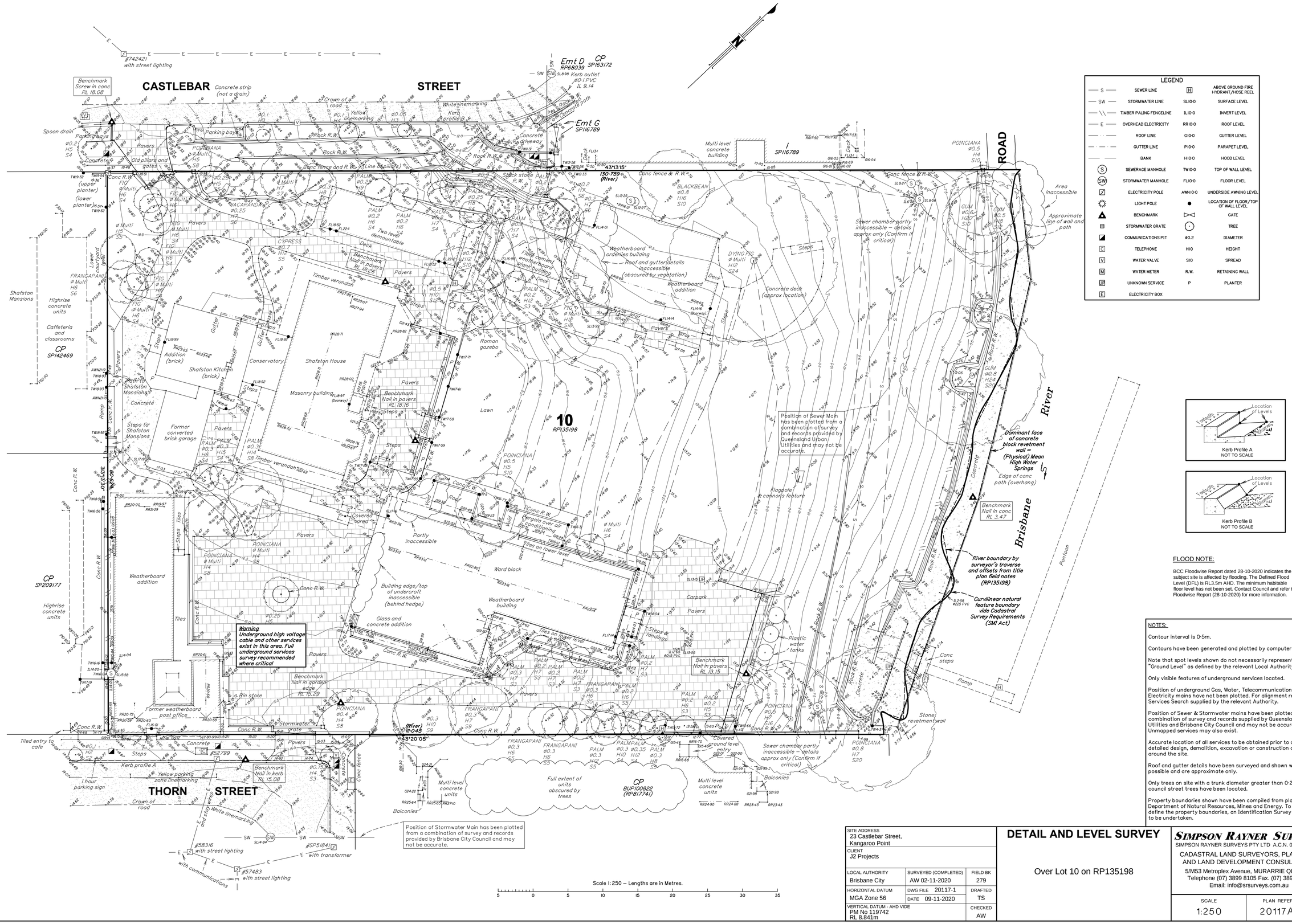
ADDRESS
23 CASTLEBAR ST, KANGAROO POINT, QLD 4169

DRAWN	KHA	NORTH
SCALE (@ A1)	-	
DATE	18.09.2024	

DRAWING TITLE
PERSPECTIVE VIEW 5
STREET VIEW - NORTH WEST

DRAWING NUMBER	ISSUE
A4704	3

Appendix B
Site Survey



LEGEND

S	SEWER LINE	H	ABOVE GROUND FIRE HYDRANT/HOSE REEL
SW	STORMWATER LINE	SLI0-0	SURFACE LEVEL
\\	TIMBER PALING FENCELINE	ILI0-0	INVERT LEVEL
E	OVERHEAD ELECTRICITY	RRI0-0	ROOF LEVEL
	ROOF LINE	GI0-0	GUTTER LEVEL
	GUTTER LINE	PI0-0	PARAPET LEVEL
	BANK	HI0-0	HOOD LEVEL
S	SEWERAGE MANHOLE	TWI0-0	TOP OF WALL LEVEL
SW	STORMWATER MANHOLE	FLI0-0	FLOOR LEVEL
	ELECTRICITY POLE	AWNI0-0	UNDERSIDE AWNING LEVEL
	LIGHT POLE		LOCATION OF FLOOR/TOP OF WALL LEVEL
	BENCHMARK		GATE
	STORMWATER GRATE		TREE
	COMMUNICATIONS PIT	ø0.2	DIAMETER
C	TELEPHONE	H10	HEIGHT
V	WATER VALVE	S10	SPREAD
M	WATER METER	R.W.	RETAINING WALL
UP	UNKNOWN SERVICE	P	PLANTER
E	ELECTRICITY BOX		

FLOOD NOTE:

BCC Floodwise Report dated 28-10-2020 indicates the subject site is affected by flooding. The Defined Flood Level (DFL) is RL3.5m AHD. The minimum habitable floor level has not been set. Contact Council and refer to Floodwise Report (28-10-2020) for more information.

NOTES:

Contour interval is 0·5m.

Contours have been generated and plotted by computer program.

Note that spot levels shown do not necessarily represent Natural "Ground Level" as defined by the relevant Local Authority.

Only visible features of underground services located.

Position of underground Gas, Water, Telecommunications and Electricity mains have not been plotted. For alignment refer to Services Search supplied by the relevant Authority.

Position of Sewer & Stormwater mains have been plotted from a combination of survey and records supplied by Queensland Urban Utilities and Brisbane City Council and may not be accurate. Unmapped services may also exist.

Accurate location of all services to be obtained prior to any detailed design, demolition, excavation or construction on or around the site.

Roof and gutter details have been surveyed and shown where possible and are approximate only.

Only trees on site with a trunk diameter greater than 0·2m and council street trees have been located.

Property boundaries shown have been compiled from plans in the Department of Natural Resources, Mines and Energy. To accurately define the property boundaries, an Identification Survey will need to be undertaken.

SITE ADDRESS: 23 Castlebar Street, Kangaroo Point		
CLIENT: J2 Projects		
LOCAL AUTHORITY: Brisbane City	SURVEYED (COMPLETED): AW 02-11-2020	FIELD BK: 279
HORIZONTAL DATUM: MGA Zone 56	DWG FILE: 20117-1	DRAFTED: TS
VERTICAL DATUM - AHD VIDE: PM No 119742 RL 8.841m	DATE: 09-11-2020	CHECKED: AW

DETAIL AND LEVEL SURVEY

Over Lot 10 on RP135198

SIMPSON RAYNER SURVEYS
SIMPSON RAYNER SURVEYS PTY LTD A.C.N. 078 818 167
CADASTRAL LAND SURVEYORS, PLANNERS AND LAND DEVELOPMENT CONSULTANTS
5/M53 Metroplex Avenue, MURARRIE QLD 4172
Telephone (07) 3899 8105 Fax. (07) 3899 8107
Email: info@srsurveys.com.au

SCALE	PLAN REFERENCE
1:250	20117A1/1

Appendix C
BCC Erosion Hazard Assessment Form

BRISBANE CITY COUNCIL ABN 72 002 765 795

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

23 CASTLEBAR ST
KANGAROO POINT
Postcode 4169

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*

MARCELLUS NG

Certifier's signature

Date

01 / 08 / 24

© Brisbane City Council - Corporate eForms
Stock Code no. 262006

Assessment Table

Table 1: Low Risk Test

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

Have you answered 'yes' to any of the questions in Table 1?	*Yes*	*No*	
	X		**If '*No*' then site is <u>low risk</u> with respect to erosion and sediment control**

If '*Yes*' then proceed to Table 2

Table 2: Medium Risk Test

		Yes	*No*	
2.1	is the area of land disturbance > 1 hectare		X	**If '*No*' then site is <u>medium risk</u> with respect to erosion and sediment control**

If '*Yes*' then proceed to Table 3

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 '*No*' then site is <u>medium risk</u> with respect to erosion and sediment control

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

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Appendix D
BCC Flood Wise Property Report

FloodWise Property Report

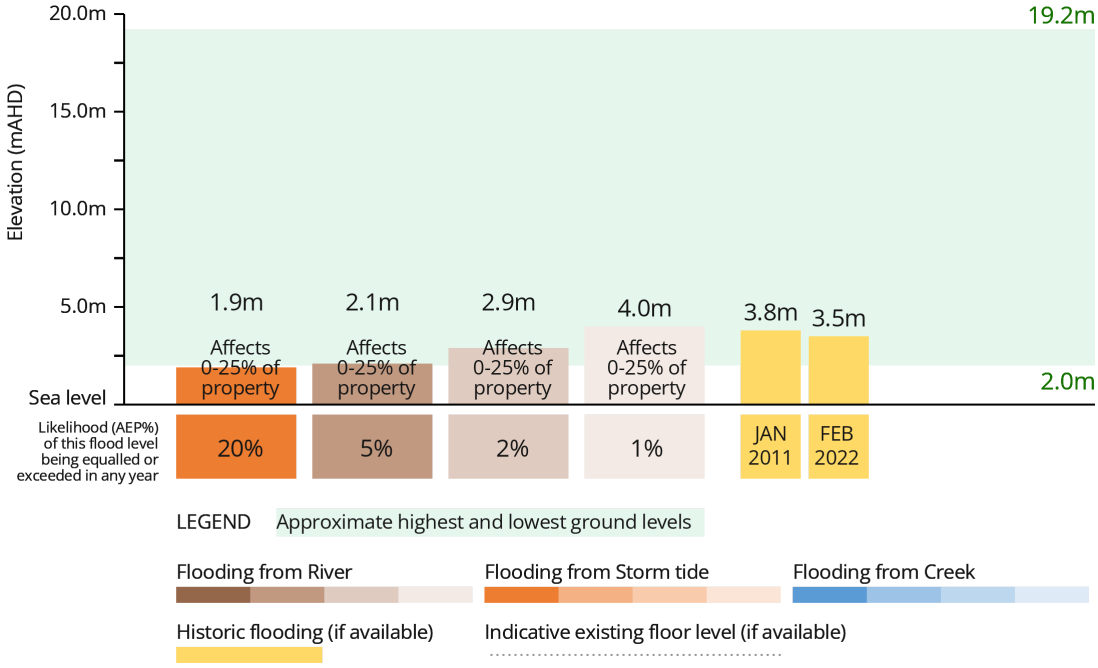
23 CASTLEBAR ST, KANGAROO POINT 4169
Lot 10 on SP339299

Dedicated to a better Brisbane

THE PURPOSE OF THIS REPORT IS FOR BUILDING AND DEVELOPMENT

Brisbane City Council's FloodWise Property Report **provides technical flood planning information** including estimated flood levels, habitable floor level requirements and more. **This report uses the adopted flood planning information in Brisbane City Plan 2014**, that guides how land in Brisbane is used and developed for the future. Find out more about planning and building. To understand how to be **resilient and prepare for floods**, visit Council's Be Prepared webpage. Find more information about how to read a FloodWise Property Report.

Graph showing only the highest source/type of flooding for 1%, 2%, 5% and 20% likelihoods. Also shows historic flood levels. Other flood types and levels may be present and will be listed in the Flood Planning Information table below. This graph does not include overland flow flooding. If applicable, overland flow information is shown in the Planning and Development Information section below.
NOTE: See Useful Definitions section to explain terminology.



Combined 1% AEP for river, creek and storm tide flood extent (if applicable) from the adopted Brisbane City Plan 2014.
Read more about Brisbane City Plan 2014.





Are you resilient and ready for flood?

- Sign up to the Brisbane Severe Weather Alert at **brisbane.qld.gov.au/beprepared**
- Visit bom.gov.au for the latest weather updates.
- Have an evacuation plan, emergency kit and important phone numbers ready.
- Observe where water flows from and to during heavy rain.
- Consider how flood-resilient building techniques will have you home faster and with less damage.

Life threatening emergencies **000** Police/fire/ambulance (mobiles **000** and **112**)

State Emergency Service (SES) **132 500**
Energex **13 19 62**
Brisbane City Council **3403 8888**

Technical Summary

This section of the FloodWise Property Report contains more detailed flood information for this property so **surveyors, builders, certifiers, architects, and engineers can plan and build** in accordance with Council's planning scheme.

Find more information about planning and building in Brisbane or talk to a Development Services Planning Information Officer via Council's Contact Centre on (07) 3403 8888.

Property Information Summary

The following table provides a summary of flood information for this property. More detailed flood level information is provided in the following sections of this report.

Property Summary	Level (mAHD) / Comment	Data Quality Code
Minimum ground level	2.0	C
Maximum ground level	19.2	C
Source of highest flooding	Brisbane River and Creek/Waterway	
Flooding may also occur from:	Storm tide	

Flood Planning Information

The table below displays the peak estimated flood levels by probability for this property. Estimated flood level data should be used in conjunction with applicable planning scheme requirements - Refer to Flood Planning and Development Information section below for further information.

Note this table does not include overland flow. If overland flow is applicable to this property, refer to the Flood Planning and Development section below for further information.

Likelihood / Description	Level (mAHD)	Source
20%	1.7	River (Brisbane River)
20%	1.9	Stormtide (Moreton Bay)
5%	2.1	River (Brisbane River)
5%	2.1	Stormtide (Moreton Bay)
2%	2.9	River (Brisbane River)
2%	2.2	Stormtide (Moreton Bay)
1%	4.0	River (Brisbane River)
1%	2.5	Stormtide (Moreton Bay)
0.2%	6.1	River (Brisbane River)
January 2011	3.8	River (Brisbane River)
February 2022	3.5	River (Brisbane River and Creeks/Waterways)
Defined Flood Level (DFL)	3.5	River (Brisbane River)
Residential Flood Level (RFL)	4.0	River (Brisbane River)
Minimum Habitable Floor Level (dwelling house)	N/A*	

* Council may not have this data available. Customers are recommended to engage a Registered Professional Engineer of QLD (RPEQ) for further advice. For information on seeking Planning Advice, please visit www.brisbane.qld.gov.au/planning-and-building.

Flood Planning and Development Information

This section of the FloodWise Property Report contains information about Council's planning scheme overlays. Overlays identify areas within the planning scheme that reflect distinct themes that may include constrained land and/or areas sensitive to the effects of development.

Flood overlay code

The Flood overlay code of Council's planning scheme uses the following information to provide guidelines when developing properties. The table below summarises the flood planning areas (FPAs) that apply to this property. Development guidelines for the FPAs are explained in **Council's planning scheme**.

Flood planning areas (FPA)		
River	**Creek / waterway**	**Overland flow**
FPA1		Not Applicable
FPA2a		
FPA2b		
FPA5		

To find more information about Council's flood planning areas (FPAs) for Brisbane River and Creek/waterway flooding to guide future building and development in flood prone areas, please review **Council's Flood Planning Provisions**.

Coastal hazard overlay code

The Coastal hazard overlay code of Council's planning scheme uses the following information to provide guidelines when conducting new developments. The table below summarises the coastal hazard categories that apply to this property. Development guidelines for the following Coastal hazard overlay sub-categories are explained in Council's **planning scheme**.

Coastal hazard overlay sub-categories
Coastal management district
Erosion prone area - coastal erosion
Erosion prone area - permanent inundation due to sea level rise at 2100
High storm-tide inundation area
Medium storm-tide inundation area

Note: Where land is identified within one for more flood planning areas on the Flood overlay or is identified within one of the Storm tide inundation area sub-categories on the Coastal hazard overlay, the assessment criteria that provides the highest level of protection from any source of flooding applies.

Property development flags
Waterway corridor - This property may also be located within a mapped waterway corridor as identified in the Waterway corridors overlay map of Council's planning scheme. Please consider this in conjunction with Council's planning scheme requirements.
Large allotment - This property is either a Large Allotment of over 1000 square metres or is located within a Large Allotment. Flood levels may vary significantly across allotments of this size. Further investigations may be warranted in determining the variation in flood levels and the minimum habitable floor level across the site. For more information or advice, please consult a Registered Professional Engineer of Queensland (RPEQ).

Useful Flood Information Definitions

Australian Height Datum (AHD) - The reference level for defining ground levels in Australia. The level of 0.0m AHD is approximately mean sea level.

Annual Exceedance Probability (AEP) - The probability of a flood event of a given size occurring in any one year, usually expressed as a percentage annual chance.

- **0.2% AEP** - A flood event of this size is considered rare but may still occur. A flood of size or larger has a 1 in 500 chance or a 0.2% probability of occurring in any year.
- **1% AEP** - A flood of this size or larger has a 1 in 100 chance or a 1% probability of occurring in any year.
- **2% AEP** - A flood of this size or larger has a 1 in 50 chance or a 2% probability of occurring in any year.
- **5% AEP** - A flood of this size or larger has a 1 in 20 chance or a 5% probability of occurring in any year.
- **20% AEP** - A flood of this size or larger has a 1 in 5 chance or a 20% probability of occurring in any year.

Data quality

- **Data Quality Code A** - Level data based on recent surveyor report or approved as-constructed drawings.
- **Data Quality Code B** - Level data based on ground-based mobile survey or similar.
- **Data Quality Code C** - Level data derived from Airborne Laser Scanning or LiDAR information.

Defined Flood Level (DFL) - The DFL is used for commercial and industrial development. The Defined flood level (DFL) for Brisbane River flooding is a level of 3.7m AHD at the Brisbane City Gauge based on a flow of 6,800 m/s. DFL is only applicable for non-residential uses affected by Brisbane River flooding.

Flood planning area (FPA) - Council has developed five Flood planning areas (FPAs) as part of Brisbane City Plan 2014 Flood overlay mapping for Brisbane River, Creek/waterway flooding and Overland flow to guide future building and development in flood prone areas. Storm tide flooding is mapped separately. The FPAs are designed to recognise the flood hazard for different flooding types. Flood hazard is a combination of frequency of flooding, the flood depth, and the speed at which the water is travelling. **Find more information here**.

Maximum and minimum ground level - Highest and lowest ground levels on the property based on available ground level information. A Registered Surveyor can confirm exact ground levels.

Minimum habitable floor level (dwelling house) - The minimum level in metres AHD at which habitable areas of development (generally induding bedrooms, living rooms, kitchen, study, family, and rumpus rooms) must be constructed as required by the Brisbane City Plan 2014.

Indicative existing floor level - The approximate level in metres AHD of the lowest habitable floor in the existing building (excluding apartments). The data is sourced from a range of sources with varying accuracy levels.

Property - A property will contain 1 or more lots. The multiple lot warning is shown if you have selected a property that contains multiple lots.

Residential flood level (RFL) - This flood level for the Brisbane River equates to the 1% annual exceedance probability (AEP) flood level.

To learn more, visit **Brisbane City Council's Flood Information Hub**

Brisbane City Council's Online Flood Tools

Council provides several online flood tools:

- to guide planning and development
- to help residents and businesses understand their flood risk and prepare for flooding.

Council's online flood tools for planning and development purposes indude:

- **FloodWise Property Report**
- **Flood Overlay Code**

For more information on Council's planning scheme and online flood tools for planning and development:

- phone (07) 3403 8888 and ask to talk to a Development Services Planning Information Officer

- visit brisbane.qld.gov.au/planning-building

Council's Planning Scheme - The Brisbane City Plan 2014 (planning scheme) has been prepared in accordance with the Sustainable Planning Act as a framework for managing development in a way that advances the purpose of the Act. In seeking to achieve this purpose, the planning scheme sets out the Council's intention for future development in the planning scheme area, over the next 20 years.

Disclaimer

1. Defined flood levels and residential flood levels, minimum habitable floor levels and indicative existing floor levels are determined from the best available information to Council at the date of issue. These levels, for a particular property, may change if more detailed information becomes available or changes are made in the method of calculating levels.
2. Council makes no warranty or representation regarding the accuracy or completeness of a FloodWise Property Report. Council disdaims any responsibility or liability in relation to the use or reliance by any person on a FloodWise Property Report.



Planning to build or renovate?

For information, guidelines, tools and resources to help you track, plan or apply for your development visit brisbane.qld.gov.au/planning-building

You can also find the Brisbane City Plan 2014 and Neighbourhood Plans as well as other information and training videos to help, with your building and development plans.

Appendix E
Civil Engineering Drawings

PROPOSED ON GRADE INLET TRAP
PROTECTION TO EXISTING INLET GULLY

CONSTRUCTION VEHICLE EXIT

CASTLEBAR STREET

PROPOSED SEDIMENT FENCING

LIFT CORE TO HAVE SUMP AND PUMP INSTALLED. OUTLET TO BCC STORMWATER SYSTEM.

BEL. 7.490

SP116789

SP142469

RP135198

SP209177

RP817741

THORN STREET

BRISBANE RIVER

LEGEND

- EXISTING PROPERTY BOUNDARY
- 8.0 EXISTING CONTOURS (MAJ)
- 8.5 EXISTING CONTOURS (MIN)
- EXISTING BUILDING
- BASEMENT OUTLINE
- CONSTRUCTION VEHICLE EXIT REFER IECA STD DRG EXIT-03
- SEDIMENT FENCE REFER IECA STD DRG SF-01
- OG ON-GRADE INLET TRAP REFER IECA STD DRG OG-01

0 2.5 5.0 7.5 10 12.5 15m
SCALE 1:250 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD
C	24.09.24	ISSUED FOR APPROVAL	MN
B	05.08.24	ISSUED FOR APPROVAL	OJ
A	26.07.24	ISSUED FOR APPROVAL	MN

REVISIONS

CLIENT: BURGUNDY

ARCHITECT: KHA

BG&E Pty Ltd
Brisbane
P / +61 7 3167 3300
E / projects.qld@bgeeng.com

PROJECT: SHAFSTON ESTATE
KANGAROO POINT, QLD 4169

STATUS: ISSUED FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
JM	OJ	MN	MN

DATUM	GRID	SCALE	
AHD	MGA-56	1:250	AT A1 SIZE

TITLE: EROSION AND SEDIMENT CONTROL PLAN

PROJECT No. B23202 | DRAWING No. CI-0700 | REV. C

\\BGEBNEFS01\PROJECTS\BGE\BNE\B23202\100 DRAW\100.2 CIVIL\AUTOCAD\B23202-DRG-CI-0700.DWG
25/09/2024 12:12:19 AM

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LEGEND

- EXISTING PROPERTY BOUNDARY
- 8.0 EXISTING CONTOURS (MAJ)
- 8.5 EXISTING CONTOURS (MIN)
- EXISTING BUILDING
- BASEMENT OUTLINE
- CUT EXTENTS

CUT/FILL VOLUME	
TOTAL CUT	-31968.569
TOTAL FILL	0.000
TOTAL BALANCE	-31968.569

BCC DS
LODGED
18/11/2024
APPLICATION REF
A006656931

0 2.5 5.0 7.5 10 12.5 15m
SCALE 1:250 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD
C	24.09.24	ISSUED FOR APPROVAL	MN
B	05.08.24	ISSUED FOR APPROVAL	OJ
A	26.07.24	ISSUED FOR APPROVAL	MN

REVISIONS

CLIENT: BURGUNDY

ARCHITECT: KHA

BG&E Pty Ltd
Brisbane
P / +61 7 3167 3300
E / projects.qld@bgeeng.com

PROJECT: SHAFSTON ESTATE
KANGAROO POINT, QLD 4169

STATUS: ISSUED FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
JM	OJ	MN	MN

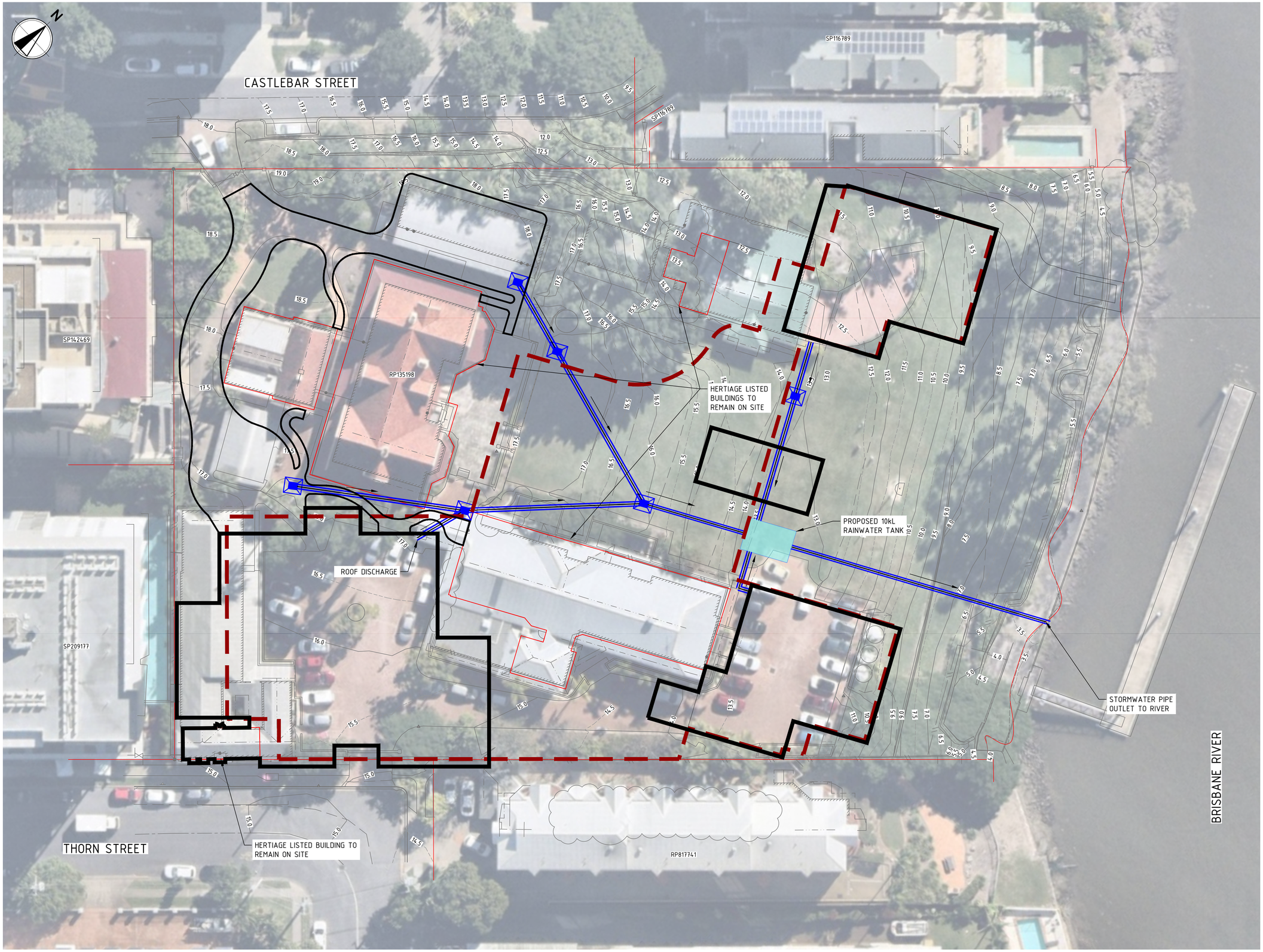
DATUM	GRID	SCALE	
AHD	MGA-56	1:250	AT A1 SIZE

TITLE: BULK EARTHWORKS PLAN

PROJECT No. B23202 | DRAWING No. CI-0100 | REV. C

© BG&E Pty Limited

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25/09/2024 12:16:52 AM



LEGEND

- EXISTING PROPERTY BOUNDARY
- 8.0 EXISTING CONTOURS (MAJ)
- 8.5 EXISTING CONTOURS (MIN)
- EXISTING BUILDING
- ARCHITECTURAL DESIGN
- S S PROPOSED UNDERGROUND SEWER
- BASEMENT OUTLINE

DRAINAGE LEGEND
PROPOSED (DESIGN)

- DRAINAGE PIPE UNDERGROUND
- STORMWATER PIT
- RAINWATER TANK
- TREATMENT TANK

0 2.5 5.0 7.5 10 12.5 15m
SCALE 1:250 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD
C	24.09.24	ISSUED FOR APPROVAL	MN
B	05.08.24	ISSUED FOR APPROVAL	OJ
A	26.07.24	ISSUED FOR APPROVAL	MN

REVISIONS

REV	DATE	DESCRIPTION	RVD

REVISIONS

CLIENT: BURGUNDY

ARCHITECT: KHA

BG&E Pty Ltd
Brisbane
P / +61 7 3167 3300
E / projects.qld@bgeeng.com

PROJECT: SHAFSTON ESTATE
KANGAROO POINT, QLD 4169

STATUS: ISSUED FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
JM	OJ	MN	MN

DATUM	GRID	SCALE	
AHD	MGA-56	1:250	AT A1 SIZE

TITLE: SITE WORKS AND DRAINAGE PLAN

PROJECT No.	DRAWING No.	REV.
B23202	CI-0300	C

\\BGEBNEFS01\PROJECTS\BGE\BNE\B23202\100 DRAWING\100.2 CIVIL\AUTOCAD\B23202-DRG-CI-0300.DWG
25/09/2024 12:17:39 AM

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LEGEND

- EXISTING PROPERTY BOUNDARY
- 8.0 EXISTING CONTOURS (MAJ)
- 8.5 EXISTING CONTOURS (MIN)
- EXISTING BUILDING
- ARCHITECTURAL DESIGN
- S S PROPOSED UNDERGROUND SEWER
- BASEMENT OUTLINE

EXISTING UTILITIES

- E UNDERGROUND ELECTRICAL
- S S UNDERGROUND SEWER
- D D UNDERGROUND DRAINAGE
- SW SW UNDERGROUND STORMWATER
- ELECTRICAL PIT
- LIGHTING
- E ELECTRICAL INSPECTION BOX
- S SEWER PIT
- W WATER MANHOLE
- V WATER VALVE
- H WATER HYDRANT
- SW STORMWATER PIT
- STORMWATER GULLY PIT
- C COMMS PIT
- COMMS MARKER
- UP UNKNOWN UTILITY PIT

0 2.5 5.0 7.5 10 12.5 15m
SCALE 1:250 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD
C	24.09.24	ISSUED FOR APPROVAL	MN
B	05.08.24	ISSUED FOR APPROVAL	OJ
A	26.07.24	ISSUED FOR APPROVAL	MN

REVISIONS

REVISIONS

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STATUS: ISSUED FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
JM	OJ	MN	MN

DATUM	GRID	SCALE	
AHD	MGA-56	1:250	AT A1 SIZE

TITLE: UTILITIES PLAN

PROJECT No. B23202 | DRAWING No. CI-0370 | REV. C

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Appendix F
BCC Codes

COASTAL HAZARD OVERLAY CODE
BRISBANE CITY COUNCIL 2014

Performance outcomes		Acceptable outcomes		Performance outcome
Section A—If for self-assessable or assessable development for a dwelling house **including a** secondary dwelling				
PO1	Development involving any habitable or non-habitable part of the dwelling house, including any secondary dwelling, is: (a) located and designed to minimise the risk to people and structures from coastal hazards; (b) located to minimise amenity impacts, disruption to residents, recovery time and rebuilding and restoration costs after a coastal hazard event.	**AO1**	Development for a dwelling house including, any secondary dwelling, complies with the flood planning levels in Table 8.2.6.3.B. Editor's note—Information about flooding from storm tide is provided in Council's FloodWise Property Report.	Complies with AO1: The proposed development will comply with the minimum flood planning levels. Refer to SBSMP.
Section B—If for self-assessable or assessable development other than for a dwelling house				
PO2	Development other than for a park is located and designed to: (a) minimise the risk to all persons from coastal hazards; (b) minimise flood damages to the development and contents of buildings; (c) provide suitable amenity; (d) minimise disruption to residents, recovery time, and rebuilding or restoration costs after coastal hazard events.	**AO2**	Development achieves minimum flood planning levels consistent with Table 8.2.6.3.C. Editor's note—Information about flooding from storm tide is provided in Council's FloodWise Property Report.	Complies with AO2: The proposed development will comply with the minimum flood planning levels. Refer to SBSMP.
PO3	Development for a park ensures that the design of the park and location of structures and facilities responds to coastal hazards and balances the safety of intended users with: (a) maintaining continuity of operations; (b) impacts of flooding on asset life and ongoing maintenance costs; (c) efficient recovery after flood events; (d) recreational benefits to the city; (e) availability of suitable land within the park. Note—The Infrastructure design planning scheme policy provides more detail on standards and specifications for public assets.	**AO3**	Development involving a building or structure in a park: (a) complies with the minimum flood planning levels in Table 8.2.6.3.C; or (b) is not located below the 20% AEP storm-tide level if Table 8.2.6.3.C does not apply to the type of structure.	Complies with AO3: Not applicable to this development.

Performance outcomes		Acceptable outcomes		Performance outcome
Section C—If assessable development other than for a dwelling house				
General				
PO4	Development has access which provides for safe vehicular and pedestrian movement in the development, including emergency services access during and after a coastal hazard event.	**AO4**	Development locates access points and driveways in the flood free area (or the area of the lowest flood risk) of the site.	Complies with AO4: Access points and driveways of the proposed development will comply with the minimum flood planning levels as conditioned in the Site Services Report and SBSMP.
PO5	Development for pedestrian and cyclist paths: (a) provides a suitable level of trafficability; (b) manages the impacts of flooding on asset life and ongoing maintenance costs; (c) balances route availability with recreational and transport connectivity benefits to the city.	**AO5.1**	Development for off-road pedestrian and cyclist paths: (a) is not located in the Erosion prone area – coastal erosion subcategory; or (b) complies with the minimum flood planning levels in Table 8.2.6.3.H. Note—If the site is subject to more than 1 type of flooding, the requirement that affords the highest flood planning level will apply.	Complies with AO5.1: Not applicable to this development.
		AO5.2	All new on-road cyclist and pedestrian facilities comply with the road flood immunity and trafficability standards for the applicable category of road in Table 8.2.6.3.H or Table 8.2.6.3.I	Complies with AO5.2: Not applicable to this development.
PO6	Development is designed, including any car parking areas and channel works to: (a) reduce property damage; (b) provide safe access to the site during the defined flood event.	**AO6**	Development does not concentrate, intensify or divert floodwater, erosion impacts or cause nuisance ponding onto other premises.	Complies with AO6: Refer to Site Services Report and SBSMP.
PO7	Development involving essential electrical services or a basement storage area is suitably located and designed to ensure public safety and minimise the need for flood recovery and economic consequences of damage during a flood.	**AO7.1**	Development ensures that: (a) all essential electrical services comply with the flood planning levels in Table 8.2.6.3.C; or (b) if a basement contains essential electrical services or a private basement storage area, the basement is a waterproof structure with walls and floors impermeable to the passage of water and all entry points and services are located at or above the relevant flood immunity level in Table 8.2.6.3.C.	Complies with AO7.1: Further details will be provided in the electrical consultant's documentation to be lodged with the Building Application Submission.

Performance outcomes		Acceptable outcomes		Performance outcome
			Note—A basement storage area is a basement-level area for private storage, other than a bike storage room, change room, building maintenance storage and noncritical electrical services.	
		AO7.2	Development involving a basement that relies on a pumping solution to manage floodwater ingress or for dewatering after a flood, provides an appropriately flood protected backup power source for those pumps.	Complies with AO7.2: The access to the basement will be designed such that the access point is above the required flood level as conditioned in the SBSMP.
PO8	Development involving the storage and handling of hazardous materials avoids or minimises risks to public health and safety and the environment, by: (a) protecting underground tanks for hazardous materials against the forces of buoyancy, velocity flow and debris impacts; (b) securing above-ground tanks against flotation and lateral movement; (c) preventing damage to pipework or entry of floodwater into pipework; (d) preventing damage to or off-site release of packages, drums or containers. Note—A chemical hazards flood risk report prepared in accordance with the Management of hazardous chemicals in flood affected areas planning scheme policy can assist in demonstrating achievement of this performance outcome. Note—A pump drainage system is not an acceptable measure to meet the performance outcome.	**AO8.1**	Development does not include the storage or handling of hazardous chemicals that are equivalent to or exceed the threshold quantities in Table 8.2.6.3.J.	Complies with AO8.1: Not applicable to this development.
		AO8.2	Development involving the processes listed in Table 8.2.6.3.F is consistent with the standards contained in the Management of hazardous chemicals in flood affected areas planning scheme policy and can operate without risk of environmental harm during a coastal hazard. Note—The Management of hazardous chemicals in flood affected areas planning scheme policy sets out further information and processes including risk assessment for the management of hazardous chemicals in coastal hazard areas.	Complies with AO8.2: Not applicable to this development.
Additional criteria for essential community infrastructure				
PO9	Development involving essential community infrastructure: (a) maintains function during and immediately after a coastal hazard event or is part of a	**AO9**	Development involving essential community infrastructure: (a) is ancillary and is not relied upon for the provision of the essential service during a	Complies with AO9: Not applicable to this development.

Performance outcomes		Acceptable outcomes		Performance outcome
	network that is able to maintain the function of the essential community infrastructure without parts of the development which are unable to function during a coastal hazard event; (b) is designed and sited to avoid adverse impacts on the community or the environment due to the impacts of coastal hazard on infrastructure, facilities or access and egress routes; (c) retains site access necessary to maintain function of the development during a coastal hazard event; (d) maintains function or is part of a network which is able to remain functional even when other infrastructure may be compromised in a flood event; (e) contains mitigation measures which are not entirely dependent on human activation to respond to a flood event.		coastal hazard event; or (b) is located above the flood immunity levels set out in Table 8.2.6.3.E; (c) has access to, or provides, the necessary backup emergency electricity and communications supply in times of flood; (d) if the essential community infrastructure has a city-wide emergency function, that part of the development is not located in an area that becomes isolated by a flood up to the event listed for that development type in Table 8.2.6.3.E.	
Additional criteria for vulnerable uses, difficult to evacuate uses **or** assembly uses.				
PO10	Development for vulnerable or difficult to evacuate uses and assembly uses optimises vehicular access and efficient evacuation from the development to parts of the road network unaffected by coastal hazard. Note—A coastal hazard risk assessment may be required to address the performance outcome or acceptable solution that deals with evacuation and isolation arrangements, and the ability to take refuge in place. Editor's note—Further guidance for risk assessment is contained in the Coastal hazard planning scheme policy and the Flood planning scheme policy.	**AO10**	Development for vulnerable uses, difficult to evacuate uses or assembly uses: (a) is not isolated in any event up to the relevant flood planning level as specified in Table 8.2.6.3.D; or (b) is supported by a critical route or interim critical route identified in the Critical infrastructure and movement network overlay; or (c) can achieve vehicular evacuation to a suitable coastal hazard-free location. Note—A suitable coastal hazard-free location is of a size and nature appropriate to provide for the size and characteristics of the population likely to need evacuation to that area.	Complies with AO10: Proposed development is above coastal flood level.
Section D—If reconfiguring a lot				

Performance outcomes		Acceptable outcomes		Performance outcome
General				
PO11	Development locates and designs all lots and roads resulting from reconfiguring a lot to: (a) ensure the safety of people; (b) minimise damage to property and services; (c) facilitate safe and efficient evacuation; (d) avoid isolation during a coastal hazard event; (e) provide suitable amenity in that it is not frequently flooded or subject to tidal inundation, or nuisance ponding. Note— Consideration of the 0.2% AEP flood is relevant to determining an acceptable level of safety for development. • Flood warning time is available for storm-tide flooding. • Filling for flood immunity cannot be assumed to mitigate the flood hazard for a flood event greater than the defined flood event.	**AO11.1**	Development ensures that the road and lot layout does not create new lots isolated by storm-tide flooding at the defined flood event.	Complies with AO11.1: No new lots will be created.
		AO11.2	Development involving reconfiguring a lot ensures flood immunity for all lots is provided in compliance with Table 8.2.6.3.G.	Complies with AO11.2: Not applicable to this development.
PO12	Development that results in 6 lots or less and no new road provides: (a) land with sufficient flood immunity to construct a dwelling house; (b) an open space area that is safe and has suitable amenity in that it is not frequently flooded or subject to tidal inundation, nuisance ponding or seepage; (c) a lot that is not substantially burdened by a stormwater easement or flood mitigation infrastructure; (d) appropriate amenity for any adjoining residential area.	**AO12**	Development for reconfiguring a lot that results in 6 lots or less and no new road in the High storm-tide inundation area sub-category or the Medium storm-tide inundation area sub-category provides at least 80% of each new lot at or above the flood planning levels in Table 8.2.6.3.G. Note—This is to ensure that each new lot will not be affected by tidal influences up to the highest astronomical tide event with an allowance for 800mm of sea level increase through climate change. The development will still need to meet the relevant flood immunity standards	Complies with AO12: No new lots will be created.
PO13	Development provides acceptable flood immunity for its purpose that minimises the risk to people	**AO13**	Development involving reconfiguring a lot that results in more than 6 lots or a new road provides	Complies with AO13: Not applicable to this development.

Performance outcomes		Acceptable outcomes		Performance outcome
	from coastal hazard, creates safe access and evacuation routes, minimises damage to property and services, and provides suitable amenity.		flood immunity for: (a) all lots in compliance with Table 8.2.6.3.G; (b) a new road in compliance with Table 8.2.6.3.H; (c) an existing road fronting the development, or providing primary access within 200m of the development, in compliance with Table 8.2.6.3.I. Note—The Flood planning scheme policy contains supporting information about existing roads and serviceability during floods.	
PO14	Development involving a new road, bridge or culvert is designed to minimise impacts to flood behaviour, minimise disruption to traffic during storm-tide inundation and allow for emergency access and evacuation.	**AO14**	Development for a new road provides flood immunity in compliance with Table 8.2.6.3.H.	Complies with AO14: Not applicable to this development.
PO15	Development for pedestrian and cyclist paths: (a) provides a suitable level of trafficability; (b) manages the impacts of flooding on asset life and ongoing maintenance costs; (c) balances route availability with recreational and transport connectivity benefits to the city.	**AO15.1**	Development for off-road pedestrian and cyclist paths: (a) are not located in the Erosion prone area – coastal erosion subcategory; or (b) complies with the minimum flood planning levels in Table 8.2.6.3.H. Note—If the site is subject to more than 1 type of flooding, the requirement that affords the highest flood planning level will apply.	Complies with AO15.1: Proposed development shall be higher than the flood level.
		AO15.2	All new on-road cyclist and pedestrian facilities comply with the road flood immunity and trafficability standards for the applicable category of road in Table 8.2.6.3.H or Table 8.2.6.3.I.	Complies with AO15.2: Not applicable to this development.

FILLING AND EXCAVATING CODE
BRISBANE CITY COUNCIL 2014

Performance outcomes		Acceptable outcomes		Performance outcome
PO1	Development for filling or excavation minimises visual impacts from retaining walls and earthworks.	**AO1**	Development ensures that the total height of any cut and fill, whether or not retained, does not exceed: (a) 2.5m in a zone in the Industry zones category; (b) 1m in all other zones, or if adjoining a sensitive zone.	Acceptable solution provided: The proposed development will have more than 1m of cut. The excavation is to create a basement that will not have any visual impacts. The design of basement retaining walls will be lodged with the building application.
PO2	Development of a retaining wall proposed as a result of filling or excavation: (a) is designed and constructed to be fit for purpose; (b) does not impact adversely on significant vegetation; (c) is capable of easy maintenance. Editor's note—A retaining wall also needs to comply with the Building Regulation and embankment gradients will need to comply with the Building Regulation. Note—Guidance on the protection of native vegetation is included in the Biodiversity areas planning scheme policy.	**AO2.1**	Development of a retaining structure, including footings, surface drainage and subsoil drainage: (a) is wholly contained within the site; (b) if the total height to be retained is greater than 1m, then: (i) the retaining wall at the property boundary is no greater than 1m above the ground level; (ii) all further terracing from the 1m high boundary retaining wall is 1 vertical unit:1 horizontal unit; (iii) the distance between each successive retaining wall (back of lower wall to face of higher wall) is no less than 1m horizontally to incorporate planting areas.	Complies with AO2.1: Any retaining walls will be designed and constructed in accordance with Council requirements and the code. The design of basement retaining walls will be lodged with the building application.
		AO2.2	Development of a retaining wall over 1m in height protects significant vegetation on the site and on adjoining land and is designed and constructed in accordance with the structures standards in the Infrastructure design planning scheme policy and certified by a Registered Professional Engineer Queensland.	Complies with AO2.2: Retaining wall structures will be certified structural engineers.
		AO2.3	Development provides a retaining wall finish that presents to adjoining land that is maintenance free if the setback is less than 750mm from the boundary.	Complies with AO2.3: Refer AO2.1 The design of basement retaining walls will be lodged with the building application.
		AO2.4	Development for filling only uses clean fill that does not include any construction rubble or debris.	AO2.4 can be complied with.

Performance outcomes		Acceptable outcomes		Performance outcome
PO3	Development ensures that a rock anchor is designed and constructed to be fit for purpose.	**AO3**	Development ensures that a rock anchor: (a) is constructed in accordance with the standards in the Infrastructure design planning scheme policy; (b) where it extends beyond the property boundary, is supported by a letter of consent from the adjoining land and building owners.	Complies with AO3: If any rock anchors are proposed, they will be designed and constructed in accordance with Council requirements and the code. The design of any rock anchors will be lodged with the operational works application.
PO4	Development protects all services and public utilities.	**AO4**	Development protects services and public utilities and ensures that any alteration or relocation of services or public utilities meets the standard design specifications of the responsible service authorities.	Complies with AO4: Should any relocation works associated with proposed services and/or public utilities be required, the works will be done in accordance with the relevant BCC standard specifications and the requirements of the responsible service authorities.
PO5	Development provides surface and sub-surface drainage to prevent water seepage, concentration of run-off or ponding of stormwater on adjacent land.	**AO5**	Development ensures all flows and subsoil drainage are directed to a lawful point of discharge of a surface water diversion drain, including to the top or toe of a retaining wall in accordance with the stormwater drainage section of the Infrastructure design planning scheme policy	Complies with AO5: Refer to Site Services Report and SBSMP. The lawful point of discharge is directly to the river. All flows from the site infrastructure and overland flow will be towards downstream into the river.
PO6	Development ensures that the design and construction of all open drainage works is undertaken in accordance with natural channel design principles, being the development of a stormwater conveyance system for major flows, by using a vegetated open channel or drain that approximates the features and functions of a natural waterway to enhance or improve riparian values of those stormwater conveyance systems.	**AO6**	No acceptable outcome is prescribed.	Complies with AO6: Not applicable to this project.

Performance outcomes		Acceptable outcomes		Performance outcome
	Editor's note—Guidance on natural channel design principles can be found in the Council's publication Natural channel design guidelines.			
PO7	Development for filling or excavation: (a) does not degrade water quality or adversely affect environmental values in receiving waters; (b) ensures site sediment and erosion control standards are best practice.	**AO7.1**	Development for filling or excavation provides water quality treatment that complies with the stormwater drainage section of the Infrastructure design planning scheme policy.	Complies with AO7.1: An erosion and sediment control program and sketch have been prepared as part of the Site Services Report and SBSMP, which comply with the Infrastructure design planning scheme policy. Further details will be lodged with the operational works submission.
		AO7.2	Development provides erosion and sediment control standards that are in accordance with the stormwater drainage section of the Infrastructure design planning scheme policy.	Complies with AO7.2: Refer AO7.1. Further details will be lodged with the operational works submission.
PO8	Development for filling or excavation is conducted such that adverse impacts at a sensitive use due to noise and dust are prevented or minimised. Note—A noise and dust impact management plan prepared in accordance with the Management plans planning scheme policy can assist in demonstrating achievement of this performance outcome.	**AO8.1**	Development ensures that no dust emissions extend beyond the boundary of the site, including dust from construction vehicles entering and leaving the site.	Complies with AO8.1: A noise and dust impact management plan will be prepared as part of the construction management plan to be lodged by contractor prior to the commencement of works.
		AO8.2	Development for filling or excavation activity only occurs between the hours of 6:30am and 6:30pm Monday to Saturday, excluding public holidays.	Complies with AO8.2. Refer to construction management plan.
PO9	Development ensures that vibration generated by the filling or excavation operation does not exceed the vibration criteria in Table 9.4.3.3.D, Table 9.4.3.3.E, Table 9.4.3.3.F and Table 9.4.3.3.G. Note—A noise management report	**AO9**	Development involving filling or excavation does not cause a ground-borne vibration beyond the boundary of the site.	AO9 can be complied: A noise and vibration management report will be provided as part of the construction management plan to be lodged by the contractor prior to the commencement of works.

Performance outcomes		Acceptable outcomes		Performance outcome
	prepared in accordance with the Noise impact assessment planning scheme policy can assist in demonstrating achievement of this performance outcome.			
PO10	Development ensures that heavy trucks hauling material to and from the site do not affect the amenity of established areas and limits environmental nuisance impact on adjacent land.	**AO10**	Development ensures that heavy trucks hauling material to and from the site: (a) occur for a maximum of 3 weeks; (b) use a major road to access the site; (c) only use a minor road for the shortest-most-direct route that has the least amount of environmental nuisance if there is no major road alternative.	Acceptable solution provided: Excavation works are likely to take more than 3 weeks to complete. A construction management plan will be developed and lodged by the contractor prior to the commencement of works.
PO11	Development for filling or excavation protects the environment and community health and wellbeing from exposure to contaminated land and contaminated material.	**AO11**	Development does not involve: (a) excavation on land previously occupied by a notifiable activity or on land listed on the Environmental Management Register or the Contaminated Land Register; (b) filling with material containing a contaminant.	Complies with AO11: The site is not included in the Contaminated Land Registers. If fill is to be used, it will be specified and will be in accordance with BCC development guidelines.
PO12	Development provides for: (a) landscaping for water conservation purposes; (b) water sensitive urban design measures which are employed within the landscape design to maximise stormwater use and to reduce any adverse impacts on the landscape; (c) stormwater harvesting to be maximised and any adverse impacts of stormwater minimised.	**AO12.1**	Development provides landscaping which is designed using the standards in the Landscape design guidelines for water conservation planning scheme policy.	Acceptable solution provided: Landscaping is to be designed in accordance with the landscape design guidelines for water conservation planning scheme policy where applicable. Refer to landscape architect's documentation for details.
		AO12.2	Development ensures that the design and requirements for irrigation are in compliance with the standards in the Landscape design guidelines for water conservation planning scheme policy.	Acceptable solution provided: Design and requirements for irrigation will be done in accordance with the landscape design guidelines for water conservation planning scheme policy. Refer to landscape architect's documentation for details.

Performance outcomes		Acceptable outcomes		Performance outcome
		AO12.3	Development provides areas of pavement, turf and mulched garden beds which are drained. Note—This may be achieved through the provision and/or treatment of swales, spoon drains, field gullies, sub-surface drainage and stormwater connections.	Complies with AO12.3: Further details will be lodged with the building works submission by relevant consultants.

Performance outcomes		Acceptable outcomes		Performance outcome
Section A—If for self-assessable or assessable development for a dwelling house **including a** secondary dwelling **Note – Development for a** dwelling house **does not require assessment against any other section of this code.**				
PO1	Development involving any habitable or non-habitable part of a dwelling house, including any secondary dwelling, is located and designed to: (a) minimise the risk to people from flood hazard; (b) achieve acceptable flood immunity; (c) minimise property impacts from a flood event up to and including the defined flood event; (d) minimise disruption to residents, recovery time and rebuilding or restoration costs after a flood event up to and including the defined flood event.	**AO1.1**	Development for a dwelling house including any secondary dwelling: (a) is not located in the Brisbane River flood planning area 1, 2a or 2b sub-categories or the Creek/waterway flood planning area 1 or 2 subcategories; or (b) is only located in these sub-categories, if a Registered Professional Engineer Queensland certifies that the dwelling house and any secondary dwelling are structurally designed to be able to resist hydrostatic and hydrodynamic loads associated with flooding up to and including the defined flood event.	Complies with AO1.1, AO1.2, AO1.3: Refer to SBSMP and architectural plans.
		AO1.2	Development for a dwelling house and any secondary dwelling complies with the minimum flood planning levels in Table 8.2.11.3.B. Note—If located in an area that has no flood level information available from the Council such as an overland flow path, a Registered Professional Engineer of Queensland with expertise in undertaking flood studies is to certify that the flood level and development levels for the dwelling house and any secondary dwelling achieve the required flood planning levels in Table 8.2.11.3.B.	
		AO1.3	Development involving a building undercroft complies with the minimum clearance requirements in Table 8.2.11.3.E. Editor's note—For creek/waterway, storm-tide and river flooding, applicable flood planning information is available from Council's FloodWise Property Report. Note—The Flood planning scheme policy provides guidance on undercroft design.	

Performance outcomes		Acceptable outcomes		Performance outcome
PO2	Development within the Creek/waterway flood planning area sub-categories or Overland flow flood planning area sub-category: (a) maintains the conveyance of flood waters to allow them to pass predominantly unimpeded through the site; (b) does not concentrate, intensify or divert floodwater onto upstream, downstream or adjacent properties; (c) will not result in a material increase in flood levels or flood hazard on upstream, downstream or adjacent properties	**AO2**	Development: (a) is not located within the Creek/waterway flood planning area 1, 2 or 3 sub-categories or the Overland flow flood planning area sub-category; or (b) provides an open undercroft area from natural ground level to habitable floor level for any area inundated by the defined flood event; or Note—This undercroft area is not suitable for providing non-habitable rooms, secure storage of valuables, or future enclosing for storage or car parking. The clear area may include structural elements such as columns and floor substructure. The Flood planning scheme policy provides guidance on undercroft design. Editor's note—An open undercroft design may be achieved through a 'valance' treatment around the perimeter of an otherwise internally clear undercroft. Editor's note—For Creek/waterway, storm-tide and river flooding, applicable flood planning information is available from Council's FloodWise Property Report. (c) a report from a Registered Professional Engineer Queensland certifies that the development in the Creek/waterway flood planning area or Overland flow flood planning area sub-categories will not result in a material increase in flood level or flood hazard on upstream, downstream or adjacent properties. Note—Flood studies demonstrate that the development and engineering design methods conform to the principles within the Flood planning scheme policy and the Infrastructure design planning scheme policy.	Complies with AO2: Refer to SBSMP and architectural plans.

Section B—If for self-assessable or assessable development other than for a dwelling house or reconfiguring a lot.
Note – If self-assessable development complies with the acceptable outcomes of this part, no further assessment against this code is required.

Performance outcomes		Acceptable outcomes		Performance outcome
PO3	Development: (a) is compatible with flood hazard in a defined flood event; (b) minimises the risk to people from flood hazard; (c) does not reduce the ability of evacuation resources including emergency services to access and evacuate the site in a flood emergency, with consideration to the scale of the development; (d) minimises impacts on property from flooding; (e) minimises disruption to residents, business or site operations and recovery time due to flooding; (f) minimises the need to rebuild structures after a flood event greater than the defined flood event. Note—Where Table 8.2.11.3.C identifies that a flood risk assessment is required, compliance with this performance outcome can be achieved by submitting a flood risk assessment, which may be included within a flood study, addressing the criteria within this performance solution. Preparing flood risk assessments and flood studies is required to be in accordance with the Flood planning scheme policy. Note—An emergency management plan prepared in accordance with the Flood planning scheme policy, which sets out procedures for evacuation due to flooding may be used to demonstrate compliance with this performance outcome.	**AO3**	Development for a material change of use complies with Table 8.2.11.3.C.	Complies with AO3: Refer to the Site SBSMP for flood risk assessment.
PO4	Development for a park ensures that the design of a park and location of structures and facilities responds to the flood hazard and balances the safety of intended users with: (a) maintaining continuity of operations; (b) impacts of flooding on asset life and ongoing maintenance costs; (c) efficient recovery after flood events; (d) recreational benefits to the city; (e) availability of suitable land within the park.	**AO4.1**	Development involving a building or structure in a park complies with the flood planning levels specified in Table 8.2.11.3.D.	Complies with AO4.1: Refer to structural design documentation.
		AO4.2	Development involving a building or structure where Table 8.2.11.3.D does not apply: (a) is not located within the 20% AEP flood extent of any creek/waterway or overland flow path; or (b) is located above the 20% AEP flood level of any creek/waterway or overland flow path.	Complies with AO4.2: Refer to structural design documentation.

Performance outcomes		Acceptable outcomes		Performance outcome
Section C—If assessable development other than for a dwelling house				
PO5	Development is located and designed to: (a) minimise the risk to people from flood hazard on the site; (b) minimise flood damage to the development and contents of buildings up to the defined flood event; (c) provide suitable amenity; (d) minimise disruption to residents, recovery time and the need to rebuild structures after a flood event up to and including the defined flood event.	**AO5.1**	Development complies with the flood planning levels specified in Table 8.2.11.3.D. Note—If located in an area with no Council-derived flood levels such as an overland flow path, a Registered Professional Engineer Queensland with expertise in undertaking flood studies is to derive the applicable flood level and certify that the development meets the required flood planning levels in Table 8.2.11.3.D. The study is to demonstrate that the development and engineering design methods conform to the principles within the Flood planning scheme policy and the Infrastructure design planning scheme policy.	Complies with AO5.1: Refer to SBSMP.
		A05.2	Development is: (a) not located in the: (i) Brisbane River flood planning area 1, 2a, or 2b sub-categories; (ii) Creek/waterway flood planning area 1 or 2 sub-categories; (iii) Overland flow flood planning area sub-category; or (b) only located in these sub-categories if a Registered Professional Engineer Queensland with expertise in undertaking flood studies certifies that: (i) the development design, siting and any mitigation measures will ensure the development is structurally adequate to resist hydrostatic, hydrodynamic and debris impact loads associated with flooding up to the defined flood event; and (ii) the risk to people is managed to an acceptable level.	Complies with AO5.2: Refer to SBSMP. Further details will be lodged with the Operational Works Submission.
PO6	Development involving essential electrical services or a basement storage area is suitably located and designed to ensure public safety and minimise flood recovery and economic consequences of damage during a flood.	**AO6.1**	Development ensures that: (a) all areas containing essential electrical services comply with the flood planning levels in Table 8.2.11.3.D; or (b) if a basement contains essential electrical services	Complies with AO6.1: Further details will be provided in the electrical consultant's documentation to be

Performance outcomes		Acceptable outcomes		Performance outcome
			or a private basement storage area, the basement is a waterproof structure with walls and floors impermeable to the passage of water with all entry points and services located at or above the relevant flood planning level in Table 8.2.11.3.D. Note—A basement storage area does not include a bike storage room, change room, building maintenance storage and non-critical electrical services.	lodged with the Building Application Submission.
		AO6.2	Development involving a basement that relies on a pumping solution to manage floodwater ingress or for dewatering after a flood provides a redundant pump system with a backup power source for those pumps.	Complies with AO6.2: The access to the basement will be designed such that the access point is above the required flood level.
PO7	Development does not directly or indirectly create a material adverse impact on flood behaviour or drainage on properties that are upstream, downstream or adjacent to the development.	**AO7.1**	Development: (a) does not block, or divert floodwaters for any area affected by creek/waterway or overland flow flooding, excluding storm-tide flooding and Brisbane River flooding sources; or (b) does not result in a material increase in flood level or hydraulic hazard on upstream, downstream or adjacent properties. Note—Compliance with this acceptable solution can be demonstrated by the submission of a flood study by a Registered Professional Engineer of Queensland with expertise in undertaking flood studies demonstrating that the development and engineering design methods conform to the principles within the Flood planning scheme policy and the Infrastructure design planning scheme policy.	Complies with AO7.1.
		AO7.2	Development retains existing overland flow paths and does not rely wholly on piped solutions to manage major flows.	Complies with AO7.2.
		AO7.3	Development which creates a new overland flow path or	Complies with AO7.3:

Performance outcomes		Acceptable outcomes		Performance outcome
			significantly modifies an existing overland flow path via earthworks does not materially worsen hydraulic hazard on the site from existing conditions. Note—Compliance with this acceptable solution can be demonstrated by the submission of a flood study by a Registered Professional Engineer of Queensland with expertise in undertaking flood studies demonstrating that the development and engineering design methods conform to the principles within the Flood planning scheme policy and the Infrastructure design planning scheme policy.	Not applicable to this development.
PO8	Development for filling or excavation in an area affected by creek/waterway flooding does not directly, indirectly or cumulatively cause any material increase in flooding or hydraulic hazard or involve significant redistribution of flood storage from high to lower areas in the floodplain. Note—This can be demonstrated by undertaking earthworks in compliance with the Compensatory earthworks planning scheme policy. Note—This part of the code applies to all development other than a dwelling house and any secondary dwelling which involves filling or excavation, whether or not the development application comprises a separate development application for operational work involving filling or excavation.	**AO8**	Development ensures that no filling or excavation greater than 100mm is located in the Creek/waterway flood planning area 1, 2 or 3 subcategories if contained in the 5% AEP flood extent of any Creek/waterway flood planning area subcategory for which no waterway corridor has been mapped in the Waterway corridors overlay.	Complies with AO8: The development is not affected by any creek/waterway other than the Brisbane River. Refer to the SBSMP.
PO9	Development ensures that the building and site design: (a) maintains the conveyance capacity of existing overland flow paths and creek/waterways; (b) ensures floodwaters and flood debris can pass predominantly unimpeded under a structure or building to minimise property or building damage, including for a flood larger than the defined flood event; (c) mitigates flood impacts by ensuring that filling,	**AO9.1**	Development involving a building undercroft in the Creek/waterway flood planning area sub-categories or the Overland flow flood planning area subcategory: (a) complies with the minimum building undercroft clearance requirements in Table 8.2.11.3.E; (b) not located directly above any part of a waterway corridor as mapped in the Waterway corridors overlay.	Complies with AO9.1: Not applicable to this development.

Performance outcomes		Acceptable outcomes		Performance outcome
	excavation and location of services are designed to allow for the conveyance of floodwater across the site. Note—The Flood planning scheme policy provides guidance on relevant considerations in determining minimum undercroft clearances and treatment of ground level in undercroft areas where floodwater conveyance is required underneath development.	**A09.2**	Development involving a building undercroft in the Creek/waterway flood planning area sub-categories or the Overland flow flood planning area sub category: (a) has a ground level within the undercroft area is free draining; (b) does not involve excavation below ground level of more than 300mm within the undercroft area.	Complies with AO9.2: Not applicable to this development.
PO10	Development for vulnerable uses, difficult to evacuate uses or assembly uses optimises vehicular access and efficient evacuation from the development to parts of the road network unaffected by flood hazard, in order to: (a) protect safety of users and emergency services personnel; (b) support efficient emergency services access and site evacuation with consideration to the scale of development. Note—A flood risk assessment may be required to address the performance outcomes or acceptable solutions which deal with evacuation and isolation arrangements, and the ability to take refuge. The Flood planning scheme policy provides information for undertaking flood risk assessments.	**AO10**	Development for vulnerable uses, difficult to evacuate uses or assembly uses: (a) is not isolated in any event up to the relevant flood planning level specified in Table 8.2.11.3.L; or (b) has direct vehicle access to a critical route or interim critical route in the Critical infrastructure and movement network overlay for evacuation in a flood; or (c) can achieve vehicular evacuation to a suitable flood-free location. Note—A suitable flood-free location is of a size and nature sufficient to provide for the size and characteristics of the population likely to need evacuation to that area..	Complies with AO10: Not applicable to this development.
PO11	Development has access which, having regard to hydraulic hazard provides for safe vehicular and pedestrian movement and emergency services access to adjoining roads.	**AO11.1**	Development provides an access or driveway into the site which is: (a) trafficable during the defined flood event; (b) not located in the Creek/waterway flood planning area 1 sub-category; (c) not located in the Overland flow flood planning area sub-category if the hydraulic hazard is unsafe in the defined flood event; (d) the access or driveway is not inundated by a 10% AEP flood.	Complies with AO11.1: Refer to the SBSMP.
		AO11.2	Development located in the Creek/waterway flood planning area 1, 2, 3 or 4 sub-categories locates any disabled access in the highest part of the site.	Complies with AO11.2: The development is not

Performance outcomes		Acceptable outcomes		Performance outcome
			Note—explanation of hydraulic hazard provided in the Flood planning scheme policy.	affected by any creek/waterway other than the Brisbane River.
PO12	Development involving a new road, a bridge or culvert is designed to minimise impacts to flood behaviour, minimise disruption to traffic during a flood and allow for emergency access.	**AO12**	Development involving a new road complies with the flood planning levels in Table 8.2.11.3.F.	Complies with AO12: Not applicable to this development.
PO13	Development for pedestrian and cyclist paths: (a) provides a suitable level of trafficability; (b) manages the impacts of flooding on asset life and ongoing maintenance costs; (c) balances route availability with recreational and transport connectivity benefits to the city.	**AO13.1**	Development for cyclist and pedestrian facilities other than on public roads, including those traversing through a park and adjacent to a watercourse and overland flow path, are located above the 39% AEP (2 year ARI) flood immunity from all flooding sources. Note—If the site is subject to more than one type of flooding, the requirement that affords the greatest level of protection will apply.	Complies with AO13.1: Not applicable to this development.
		AO13.2	All new on-road cyclist and pedestrian facilities comply with the flood planning levels and trafficability standards for the applicable category of road in Table 8.2.11.3.F or Table 8.2.11.3.K.	Complies with AO13.2: Not applicable to this development.
PO14	Development which increases the residential population within the Brisbane River flood planning area sub-categories minimises the risk to people in all flood events with consideration to flood hazard, including warning time.	**AO14**	Development in the Brisbane River flood planning area sub-categories in areas where the residential flood level is greater than 12.8m AHD involving: (a) an increase in the number of residential dwellings; or (b) additional residential lots; or (c) is not subject to an unsafe hydraulic hazard in the 0.2% AEP flood event. Note—Explanation of a hydraulic hazard is provided in the Flood planning scheme policy.	Complies with AO14: Not applicable to this development.
Additional criteria for essential community infrastructure				

Performance outcomes		Acceptable outcomes		Performance outcome
PO15	Development involving essential community infrastructure: (a) remains functional to serve community need during and immediately after a flood event, or is part of a network that is able to maintain the function of the essential community infrastructure when parts of the development are unable to function during or after a flood; (b) is designed, sited and operated to avoid adverse impacts on the community or the environment due to the impacts of flooding on infrastructure, facilities or access and egress routes; (c) is able to remain functional or is part of a network which is able to remain functional even when other infrastructure or services (such as electricity supply) may be compromised in a flood event; (d) contains mitigation measures which are not entirely dependent on human activation to respond to a flood event. Note—Protection of function is required up to and including the flood event in Table 8.2.11.3.G.	**AO15**	Development involving essential community infrastructure: (a) is ancillary to and not relied upon for the provision of the essential service during a flood; or (b) is located above the flood planning levels in Table 8.2.11.3.G; (c) has access to or provides the necessary backup emergency electricity and communications supply in times of flood; (d) is designed and constructed to resist hydrostatic and hydrodynamic forces as a result of inundation by the flood event listed for the development type in Table 8.2.11.3.G; (e) that services a local area: (i) is able to be accessed in times of flood to service local community needs up to the event listed for that development type in Table 8.2.11.3.G; or (ii) has a service continuity plan that demonstrates the continued provision of service during the relevant flood event.	Complies AO15: Not applicable to this development.
P016	Development involving the storage and handling of hazardous materials avoids or minimises risks to public health and safety and the environment, by: (a) protecting underground tanks for hazardous materials against the forces of buoyancy, velocity flow and debris impacts; (b) securing above-ground tanks for hazardous materials against flotation and lateral movement; (c) preventing damage to hazardous materials pipework or entry of floodwater into hazardous materials pipework; (d) preventing damage to or off-site release of packages, drums or containers storing hazardous materials. Note—A chemical hazards flood risk report prepared in accordance with the Management of hazardous chemicals in flood prone areas planning scheme policy	**A016**	(a) Development does not include the storage or handling of hazardous chemicals that are equivalent to or exceed the threshold quantities in Table 8.2.11.3.M. (b) Development involving the processes listed in Table 8.2.11.3.H: (i) where located in the Flood overlay area, occurs only in the Creek/waterway flood planning area 5 sub-category or the Brisbane River flood planning area 5 subcategory; or (ii) is consistent with the standards contained in the Management of hazardous chemicals in flood prone areas planning scheme policy and can operate without risk of environmental harm during a flood event.	Complies with AO16: Not applicable to this development.

Performance outcomes		Acceptable outcomes		Performance outcome
	can assist in demonstrating achievement of this performance outcome.		Note—The Management of hazardous chemicals in flood prone areas planning scheme policy sets out further information and processes including risk assessment for the management of hazardous chemicals in flood planning areas.	
P017	Development locates and designs all lots resulting from reconfiguring a lot to: (a) minimise the risk to people from flood hazard; (b) minimise damage to property from flood hazard; (c) facilitate safe and efficient evacuation. Note— • Consideration of all floods up to the probably maximum flood is relevant to minimising the risk to people. • Flood warning time is not considered sufficient in the Creek/waterway planning area sub-categories or the Overland flow flood planning area subcategory. • Filling above the flood planning level for a flood event greater than the defined flood event cannot be assumed to mitigate the flood hazard.	**A017.1**	Development creating new lots is to comply with Table 8.2.11.3.I.	Complies with AO17.1: Not applicable to this development. No new lots will be created.
		A017.2	Development provides for reconfiguring a lot design that achieves a road and lot layout which: (a) provides trafficable vehicular egress for evacuation during a defined flood event; (b) optimises hazard-free movement away from sources of flood hazard within the development. Note—Further advice on road and lot layout is contained in the Flood planning scheme policy.	Complies with AO17.2: Refer AO17.1.
		A017.3	Development which creates a new residential lot in an area subject to Brisbane River flooding, if the residential flood level is greater than 12.8m AHD is not subject to a hydraulic hazard greater than 0.6m2/s DV or 0.6m deep in a 0.2% AEP flood. Note—Refer to the Flood planning scheme policy for further explanation on the 0.2% AEP flood.	Complies with AO17.3: Refer AO17.1.
P018	Development involving reconfiguring a lot: (a) minimises the risk to people from flood hazard; (b) creates safe evacuation routes or avoids isolation of the development during a flood greater than the defined flood event;	**A018.1**	Development involving reconfiguring a lot ensures: (a) all lots comply with the flood planning levels in Table 8.2.11.3.J; (b) a new road complies with the flood planning levels in Table 8.2.11.3.F.	Complies with AO18.1: Not applicable to this development. No new lots will be created.

Performance outcomes		Acceptable outcomes		Performance outcome
	(c) minimises damage to property and services; (d) provides lots and roads that are not frequently flooded or subject to nuisance ponding or seepage; (e) ensures lots created for park or private open space minimise the risk to people from flood hazard and are fit for purpose; (f) provides a lot that is not substantially burdened by flood mitigation infrastructure.	**A018.2**	Development involving reconfiguring a lot creating more than 6 residential lots or a lot for industry ensures the flood planning levels of a dedicated road fronting the development or providing primary access within 200m of the development: (a) complies with Table 8.2.11.3.K; or (b) has acceptable trafficability in accordance with the requirements in the Flood planning scheme policy and the Queensland Urban Drainage Manual. Note—The Flood planning scheme policy contains supporting information about trafficability on existing roads and serviceability during floods.	Complies with AO18.2: Refer AO18.1.
		A018.3	Development protects the conveyance of flood hazard area by providing an easement over the: (a) 2% AEP flood extent for overland flow flooding; (b) 1% AEP flood extent for creek/waterway flooding.	Complies with AO18.3: Refer AO18.1

Performance outcomes		Acceptable outcomes		Performance outcome
PO1	Development provides roads, pavement, edging and landscaping which: (a) are designed and constructed in accordance with the road hierarchy; (b) provide for safe travel for pedestrians, cyclists and vehicles; (c) provide access to properties for all modes; (d) provide utilities; (e) provide high levels of aesthetics and amenity, improved liveability and future growth; (f) provide for the amelioration of noise and other pollution; (g) provide a high-quality streetscape; (h) provide a low-maintenance asset with a minimal whole-of-life cost. Note—This can be demonstrated in an engineering report prepared and certified by a Registered Professional Engineer Queensland in accordance with the Infrastructure design planning scheme policy.	**AO1**	Development provides roads and associated pavement, edging and landscaping which are designed and constructed in compliance with the road corridor design standards in the Infrastructure design planning scheme policy.	Complies with AO1: The proposed development will not be affected by the road corridor, but will provide pedestrian walking areas that comply with the infrastructure design planning scheme policy. Should any existing infrastructure require replacement, these details will be lodged with the operational works submission.
PO2	Development provides road pavement surfaces which: (a) are well designed and constructed; (b) durable enough to carry the wheel loads of the intended types and numbers of travelling and parked vehicles; (c) ensures the safe passage of vehicles, pedestrians and cyclists, the discharge of stormwater run-off and the preservation of all-weather access; (d) allows for reasonable travel comfort.	**AO2**	Development provides road pavement surfaces which are designed and constructed in compliance with the road corridor design standards in the Infrastructure design planning scheme policy.	Complies with AO2: The proposed development fronts existing Castlebar Street with the vehicle access. Should any existing infrastructure require replacement, these details will be lodged with the operational works submission.
PO3	Development provides a pavement edge which is designed and constructed to: (a) control vehicle movements by delineating the carriageway for all users; (b) provide for people with disabilities by allowing safe passage of wheelchairs and other mobility aids.	**AO3**	Development provides pavement edges which are designed and constructed in compliance with the road corridor design standards in the Infrastructure design planning scheme policy.	Complies with AO3: The proposed development fronts existing Castlebar Street with the vehicle access. Should any existing infrastructure require replacement, these details will be lodged with the

Performance outcomes		Acceptable outcomes		Performance outcome
				operational works submission.
PO4	Development provides verges which are designed and constructed to: (a) provide safe access for pedestrians clear of obstructions and access areas for vehicles onto properties; (b) provide a sufficient area for public utility services; (c) be maintainable by the Council.	**AO4**	Development provides verges which are designed and constructed in compliance with the road corridor design and streetscape locality advice standards in the Infrastructure design planning scheme policy.	Complies with AO4: The proposed development is adjacent to existing verges on Castlebar St and Thron St. The existing verges will be assessed for conformance with the Infrastructure design planning scheme policy. Should any existing infrastructure require replacement, these details will be lodged with the operational works submission.
PO5	Development provides a lane or laneway identified in a neighbourhood plan which: (a) allows equitable access for all modes; (b) is safe and secure; (c) has 24-hour access; (d) is a low-speed shared zone environment; (e) has a high-quality streetscape.	**AO5**	Development provides a lane or laneway identified in a neighbourhood plan which is embellished in compliance with the streetscape locality advice standards in the Infrastructure design planning scheme policy.	Complies with AO5: Not applicable to this development.
PO6	Development of an existing premises provides at the frontage to the site, if not already provided, the following infrastructure to an appropriate urban standard: (a) an effective, high-quality paved roadway; (b) an effective, high-quality roadway kerb and channel; (c) safe, high-quality vehicle crossings over channels and verges; (d) safe, accessible, high-quality verges compatible and integrated with the surrounding environment; (e) safe vehicle access to the site that enables ingress and egress in a forward gear;	**AO6**	Development of an existing premises provides at the frontage of the site, if not already existing, the following infrastructure to the standard that would have applied if the development involved new premises as stated in the road corridor design standards in the Infrastructure design planning scheme policy: (a) concrete kerb and channel; (b) forming and grading to verges; (c) crossings over channels and verges; (d) a constructed bikeway; (e) a constructed verge or reconstruction of any damaged verge; (f) construction of the carriageway; (g) payment of costs for required alterations to public utility mains, services or installations; (h) construction of and required alterations to public utility mains, services or installations;	Complies with AO6: The proposed development fronts existing Castlebar Street with the vehicle access. Should any existing infrastructure require replacement, these details will be lodged with the operational works submission. Temporary access to the site during the construction period will be detailed in the construction management plan, to be submitted by the contractor prior to commencement of works. Should any existing infrastructure

Performance outcomes		Acceptable outcomes		Performance outcome
	(f) provision of and required alterations to public utilities; (g) effective drainage; (h) appropriate conduits to facilitate the provision of required street-lighting systems and traffic signals.		(i) drainage works; (j) installation of electrical conduits.	require replacement, these details will be lodged with the operational works submission. Any infrastructure damaged as a result of the proposed development will be reinstated at no cost to Council.
PO7	Development provides both cycle and walking routes which: (a) are located, designed and constructed to their network classification (where applicable); (b) provide safe and attractive travel routes for pedestrians and cyclists for commuter and recreational purposes; (c) provide safe and comfortable access to properties for pedestrians and cyclists; (d) incorporate water sensitive urban design into stormwater drainage; (e) provide for utilities; (f) provide for a high level of aesthetics and amenity, improved liveability and future growth; (g) are a low-maintenance asset with a minimal whole-of-life cost; (h) minimise the clearing of significant native vegetation. Note—This can be demonstrated in an engineering report prepared and certified by a Registered Professional Engineer Queensland in accordance with the Infrastructure design planning scheme policy.	**AO7**	Development provides cycle and walking routes which are located, designed and constructed in compliance with the road corridor design and off-road pathway design standards in the Infrastructure design planning scheme policy.	AO7 can be complied: Refer to architectural plans.
PO8	Development provides refuse and recycling collection, separation and storage facilities that are located and managed so that adverse impacts on building occupants, neighbouring properties and the public realm are minimised.	**AO8.1**	Development provides refuse and recycling collection and storage facilities in accordance with the Refuse planning scheme policy.	Refer to the Traffic and Transport Report.
		AO8.2	Development ensures that refuse and recycling collection and storage location and design do not have any adverse impact including odour, noise or visual impacts on the	Refer to the Traffic and Transport Report.

Performance outcomes		Acceptable outcomes		Performance outcome
			amenity of land uses within or adjoining the development. Note—Refer to the Refuse planning scheme policy for further guidance.	
PO9	Development ensures that: (a) land used for an urban purpose is serviced adequately with regard to water supply and waste disposal; (b) the water supply meets the stated standard of service for the intended use and fire-fighting purposes.	**AO9.1**	Development ensures that the reticulated water and sewerage distribution system for all services is in place before the first use is commenced.	Complies with AO9.1: The site is serviced by existing water and sewer network.
		AO9.2	Development provides the lot with reticulated water supply and sewerage to a standard acceptable to the distributor–retailer.	Complies with AO9.2: The capacity of the existing and proposed sewer and water reticulation will be assessed by UU.
PO10	Development provides public utilities and street lighting which are the best current or alternative technology and facilitate accessibility, easy maintenance, minimal whole-of-life costs, and minimal adverse environmental impacts.	**AO10.1**	Development provides public utilities and street lighting which are located and aligned to: (a) avoid significant native vegetation and areas identified within the Biodiversity areas overlay map; (b) minimise earthworks; (c) avoid crossing waterways, waterway corridors and wetlands or if a crossing is unavoidable, tunnel-boring techniques are used to minimise disturbance, and a disturbed area is reinstated and restored on completion of the work. Note—Guidance on the restoration of habitat is included in the Biodiversity areas planning scheme policy.	Complies with AO10.1: Not applicable to this development.
		AO10.2	Development provides compatible public utility services and street-lighting services which are co-located in common trenching for underground services.	Complies with AO10.2: Refer to AO10.1.
		AO10.3	Development provides public utilities and street lighting which are designed and constructed in compliance with the public utilities standards in the Infrastructure design planning scheme policy.	Complies with AO10.3: Refer to AO10.1.
PO11	Development ensures that land used for urban purposes is serviced adequately with telecommunications and energy supply.	**AO11**	Development provides land with the following services to the standards of the approved supplier: (a) electricity; (b) telecommunications services; (c) gas service where practicable.	Services to the site will be provided by the relevant services authorities.
PO12	Development ensures that major public	**AO12**	Development provides conduits which are provided in all	Refer to the relevant services

Performance outcomes		Acceptable outcomes		Performance outcome
	projects promote the provision of affordable, high-bandwidth telecommunications services throughout the city.		major Council and government works projects to enable the future provision of fibre optic cabling, if: (a) the additional expense is unlikely to be prohibitive; or (b) further major work is unlikely or disruption would be a major concern, such as where there is a limited capacity road; or (c) there is a clear gap in the telecommunications network; or (d) there is a clear gap in the bandwidth available to the area. Editor's note—An accurate, digital 'as built' three-dimensional location plan is to be supplied for all infrastructure provided in a road.	providers and/or authorities.
PO13	Development provides public art identified in a neighbourhood plan or park concept plan which: (a) is provided commensurate with the status and scale of the proposed development; (b) is sited and designed: (i) as an integrated part of the project design; (ii) as conceptually relevant to the context of the location; (iii) to reflect and respond to the cultural values of the community; (iv) to promote local character in a planned and informed manner.	**AO13**	Development provides public art identified in a neighbourhood plan or park concept plan which is sited and designed in compliance with the public art standards in the Infrastructure design planning scheme policy.	Complies with AO13: Not applicable to this development.
PO14	Development provides signage of buildings and spaces which promote legibility to help users find their way.	**AO14**	Development provides public signage: (a) at public transport interchanges and stops, key destinations, public spaces, pedestrian linkages and at entries to centre developments; (b) which details the location of the key destinations, public spaces and pedestrian linkages in the vicinity, the services available within the development and where they are located. Editor's note—Signage is to be in accordance with Local Law Number 1 (Control of Advertisements Local Law).	Complies with AO14: Refer to Architectural Design.

Performance outcomes		Acceptable outcomes		Performance outcome
PO15	Development that provides community facilities which form part of the development is functional, safe, low maintenance, and fit for purpose.	**AO15**	Development that provides community facilities which form part of the development is designed in compliance with the community facilities standards in the Infrastructure design planning scheme policy.	Complies with AO15: Not applicable to this development.
PO16	Development provides public toilets which: (a) are required as part of a community facility or park; (b) are located, designed and constructed to be: (i) safe; (ii) durable; (iii) resistant to vandalism; (iv) able to service expected demand; (v) fit for purpose.	**AO16**	Development that provides public toilets is designed and constructed in compliance with the public toilets standards in the Infrastructure design planning scheme policy.	Complies with AO16: Not applicable to this development.
PO17	Development provides bridges, tunnels, elevated structures and water access structures that are designed and constructed using proven methods, materials and technology to provide for: (a) safe movement of intended users; (b) an attractive appearance appropriate to the general surroundings and any adjacent structures; (c) functionality and easy maintenance; (d) minimal whole-of-life cost; (e) longevity; (f) current and future services. Note—All bridges and elevated and associated elements must be designed and certified by a Registered Professional Engineer Queensland in accordance with the Infrastructure design planning scheme policy.	**AO17**	Development that provides bridges, tunnels, elevated structures and water access structures is designed and constructed in compliance with the standards in the Infrastructure design planning scheme policy.	Complies with AO17: Refer to Architectural Design.
PO18	Development provides culverts which are designed and constructed using proven methods, materials and technology to provide for: (a) safety; (b) an attractive appearance appropriate to the general surroundings;	**AO18**	Development that provides culverts is designed and constructed in compliance with the structures standards in the Infrastructure design planning scheme policy.	Complies with AO18: Not applicable to this development.

Performance outcomes		Acceptable outcomes		Performance outcome
	(c) functionality and easy maintenance; (d) minimal whole-of-life cost; (e) longevity; (f) future widening; (g) current and future services; (h) minimal adverse impacts, such as increase in water levels or flow velocities, and significant change of flood patterns. Note—All culverts and associated elements are to be designed and certified by a Registered Professional Engineer Queensland in accordance with the applicable design standards.			
PO19	Development provides batters, retaining walls, and seawalls and river walls which are designed and constructed using proven methods, materials and technology to provide for: (a) safety; (b) an attractive appearance appropriate to the surrounding area; (c) easy maintenance; (d) minimal whole-of-life cost; (e) longevity; (f) minimal water seepage. Note—All retaining walls and associated elements are to be designed and certified by a Registered Professional Engineer Queensland in accordance with the applicable design standards.	**AO19**	Development that provides batters, retaining walls, seawalls and river walls is designed and constructed in compliance with the structures standards in the Infrastructure design planning scheme policy.	Complies with AO19: The design of basement retaining walls will be lodged with the building application.
If for development with a gross floor area greater than 1,000m^2				
PO20	Development ensures that construction is managed so that use of public spaces and movement on pedestrian, cyclist and other traffic routes is not unreasonably disrupted and existing landscaping is adequately protected from short- and long-term impacts. Note—The preparation of a construction management	**AO20**	Development ensures that during construction: (a) the ongoing use of adjoining and surrounding parks and public spaces, such as malls and outdoor dining, is not compromised; (b) adjoining and surrounding landscaping is protected from damage; (c) safe, legible, efficient and sufficient pedestrian, cyclist and vehicular accessibility and connectivity to the wider network are maintained.	Complies with AO20: Details will be provided in the construction management plan to be submitted by contractor, prior to commencement of works.

Performance outcomes		Acceptable outcomes		Performance outcome
	plan can assist in demonstrating achievement of this performance outcome. Note—The Transport, access, parking and servicing planning scheme policy provides advice on the management of vehicle parking and deliveries during construction.			
PO21	Development ensures that construction and demolition activities are guided by measures that prevent or minimise adverse impacts including sleep disturbance at a sensitive use, due to noise and dust, including dust from construction vehicles entering and leaving the site. Note—A noise and dust impact management plan prepared in accordance with the Management plans planning scheme policy can assist in demonstrating achievement of this performance outcome.	**AO21.1**	Development ensures that demolition and construction: (a) only occur between 6:30am and 6:30pm Monday to Saturday, excluding public holidays; (b) do not occur over periods greater than 6 months.	AO21.1 can be complied with. A construction management plan will be developed and submitted by the contractor, prior to commencement of works.
		AO21.2	Development including construction and demolition does not release dust emissions beyond the boundary of the site.	Complies with AO21.2: A soil erosion and sedimentation control plan will be developed and lodged with the Operational Works submission. Additional dust suppression measures will be detailed in the construction management plan, to be submitted by the contractor prior to commencement of works.
		AO21.3	Development construction and demolition does not involve asbestos-containing materials.	Complies with AO21.3: If asbestos is found during demolition, the removal of asbestos will be carried out by licensed and trained personnel.
PO22	Development ensures that: (a) construction and demolition do not result in damage to surrounding property as a result of vibration; (b) vibration levels achieve the vibration criteria in Table 9.4.4.3.B, Table 9.4.4.3.C, Table 9.4.4.3.D and Table 9.4.4.3.E. Note—A vibration impact assessment report prepared in accordance with the Noise impact assessment planning scheme policy can assist in demonstrating	**AO22**	Development ensures that the nature and scale of construction and demolition do not generate noticeable levels of vibration.	AO22 can be complied: A noise and vibration management report will be provided as part of the construction management plan.

Performance outcomes		Acceptable outcomes		Performance outcome
	achievement of this performance outcome.			

POTENTIAL AND ACTUAL ACID SULPHATE SOILS OVERLAY CODE
BRISBANE CITY COUNCIL 2014

Performance outcomes		Acceptable outcomes		Performance outcome
PO1	Development protects the environmental values and ecological health of receiving waters and does not subject assets to accelerated corrosion.	**AO1**	Development ensures that: (a) no potential or actual acid sulphate soils are disturbed; or Note—This can be demonstrated through the submission of an acid sulphate soil investigation report with reference to the Potential and actual acid sulphate soils planning scheme policy. (b) the disturbance impacts in an area that hosts potential acid sulphate soils are appropriately managed, if less than 500m^3 of soil is disturbed and the watertable is not affected; or Note—This can be demonstrated through the submission of an acid sulphate soil investigation report and a preliminary acid sulphate soil management plan, with reference to the Potential and actual acid sulphate soils planning scheme policy. (c) impacts are appropriately managed if 500m^3 or more of soil is disturbed or the watertable in an area that hosts potential or actual acid sulphate soils is affected. Note—This can be demonstrated through the submission of an acid sulphate soil investigation report and a full acid sulphate soil management plan, with reference to the Potential and actual acid sulphate soils planning scheme policy. Using levels of testing commensurate with the level of risk. If the investigation demonstrates that an acid sulphate soil management plan is not required, only an investigation report is required.	An acid sulphate soil investigation report will be prepared by a suitably qualified Geotechnical Engineer in accordance with the Potential and actual acid sulphate soils planning scheme policy. An acid sulphate management plan will also be prepared by a suitably qualified Geotechnical Engineer if required as a result of the outcome of the acid sulphate soil investigation report. These reports will be lodged with the Operational Works Submission.

STORMWATER CODE
BRISBANE CITY COUNCIL 2014

Performance outcomes		Acceptable outcomes		Performance outcome
Section A—If for a material change of use, reconfiguring a lot, operational work or building work Note—Compliance with the performance outcomes and acceptable outcomes in this section should be demonstrated by the submission of a site-based stormwater management plan for high risk development only.				
PO1	Development provides a stormwater management system which achieves the integrated management of stormwater to: (a) minimise flooding; (b) protect environmental values of receiving waters; (c) maximise the use of water sensitive urban design; (d) minimise safety risk to all persons; (e) maximise the use of natural waterway corridors and natural channel design principles. Editor's note—The stormwater management system to be developed to address PO1 is not intended to require management of stormwater quality.	**AO1**	Development provides a stormwater management system designed in compliance with the Infrastructure design planning scheme policy	Complies with AO1: Refer to the Site Based Stormwater Management Plan prepared by BG&E, which details the design of the stormwater drainage to be lodged with the operational works submission in compliance with the Infrastructure design planning scheme policy.
PO2	Development ensures that the stormwater management system and site work does not adversely impact flooding or drainage characteristics of premises which are up slope, down slope or adjacent to the site.	**AO2.1**	Development does not result in an increase in flood level or flood hazard on up slope, down slope or adjacent premises.	Complies with AO2.1: Refer to AO1.
		AO2.2	Development provides a stormwater management system which is designed in compliance with the standards in the Infrastructure design planning scheme policy.	Complies with AO2.2: Refer AO1.
PO3	Development ensures that the stormwater management system does not direct stormwater run-off through existing or proposed lots and property where it is likely to adversely affect the safety of, or cause nuisance to properties.	**AO3.1**	Development ensures that the location of the stormwater drainage system is contained within a road reserve, drainage reserve, public pathway, park or waterway corridor.	Complies with AO3.1: Refer to AO1.
		AO3.2	Development provides a stormwater management system which is designed in compliance with the standards in the Infrastructure design planning scheme policy.	Complies with AO3.2: Refer AO1.
		AO3.3	Development obtains a lawful point of discharge in compliance with the standards in the Infrastructure design planning scheme policy	Complies with AO3.3: Refer AO1.

Performance outcomes		Acceptable outcomes		Performance outcome
		AO3.4	Where on private land, all underground stormwater infrastructure is secured by a drainage easement.	Complies with AO3.4: Not applicable to this development.
PO4	Development provides a stormwater management system which has sufficient capacity to safely convey run-off taking into account increased run-off from impervious surfaces and flooding in local catchments.	**AO4.1**	Development provides a stormwater conveyance system which is designed to safely convey flows in compliance with the standards in the Infrastructure design planning scheme policy.	Complies with AO4.1: Refer to SBSMP.
		AO4.2	Development provides sufficient area to convey run-off which will comply with the standards in the Infrastructure design planning scheme policy.	Complies with AO4.2: Refer to AO4.1.
PO5	Development designs stormwater channels, creek modification works, bridges, culverts and major drains to protect and enhance the value of the waterway corridor or drainage path for fauna movement.	**AO5**	Development ensures the design of stormwater channels, creek modifications or other infrastructure, permits terrestrial and aquatic fauna movement.	Complies with AO5: Not applicable to this development.
PO6	Development ensures that location and design of stormwater detention and water quality treatment: (a) minimises risk to people and property; (b) provides for safe access and maintenance; (c) minimises ecological impacts to creeks and waterways.	**AO6.1**	Development locates stormwater detention and water quality treatment: (a) outside of a waterway corridor; (b) offline to any catchment not contained within the development.	Complies with AO6.1: Refer to SBSMP.
		AO6.2	Development providing for stormwater detention and water quality treatment devices are designed in compliance with the standards in the Infrastructure design planning scheme policy	Complies with AO6.2: Refer to AO6.1.
PO7	Development is designed, including any car parking areas and channel works to: (a) reduce property damage; (b) provide safe access to the site during the defined flood event.	**AO7.1**	Development (including any ancillary structures and car parking areas) is located above minimum flood immunity levels in Table 9.4.9.3.B, Table 9.4.9.3.C, Table 9.4.9.3.D, Table 9.4.9.3.E and Table 9.4.9.3.F. Note—Compliance with this acceptable outcome can be demonstrated by the submission of a hydraulic and hydrology report identifying flood levels and development design levels (as part of a site-based stormwater management plan).	Complies with AO7.1.
		AO7.2	Development including the road network provides a stormwater management system that provides safe	Complies with AO7.2: Not applicable to this development.

Performance outcomes		Acceptable outcomes		Performance outcome
			pedestrian and vehicle access in accordance with the standards in the Infrastructure design planning scheme policy.	
PO8	Development designs stormwater channels, creek modification works and the drainage network to protect and enhance the environmental values of the waterway corridor or drainage path.	**AO8.1**	Development ensures natural waterway corridors and drainage paths are retained.	Complies with AO8.1.
		AO8.2	Development provides the required hydraulic conveyance of the drainage channel and floodway, while maximising its potential to maximise environmental benefits and minimise scour. Editor's note—Guidance on natural channel design principles can be found in the Council's publication Natural channel design guidelines	Complies with AO8.2: Not applicable to this development.
		AO8.3	Development provides stormwater outlets into waterways, creeks, wetlands and overland flow paths with energy dissipation to minimise scour in compliance with the standards in the Infrastructure design planning scheme policy	Complies with AO8.3: Refer to SBSMP.
		AO8.4	Development ensures that the design of modifications to the existing design of new stormwater channels, creeks and major drains is in compliance with the standards in the Infrastructure design planning scheme policy	Complies with AO8.4: Not applicable to this development.
PO9	Development is designed to manage run-off and peak flows by minimising large areas of impervious material and maximising opportunities for capture and re-use.	**AO9**	No acceptable outcome is prescribed.	Complies with AO9: Refer to SBSMP.
PO10	Development ensures that there is sufficient site area to accommodate an effective stormwater management system. Note—Compliance with the performance outcome should be demonstrated by the submission of a site-based stormwater management plan for high-risk development only.	**AO10**	No acceptable outcome is prescribed.	Complies with AO10: Refer to SBSMP.
PO11	Development provides for the orderly development of stormwater infrastructure	**AO11.1**	Development with up-slope external catchment areas provides a drainage connection sized for ultimate	Complies with AO11.1: Not applicable to this development.

Performance outcomes		Acceptable outcomes		Performance outcome
	within a catchment, having regard to the: (a) existing capacity of stormwater infrastructure within and external to the site, and any planned stormwater infrastructure upgrades; (b) safe management of stormwater discharge from existing and future up-slope development; (c) implication for adjacent and down-slope development.		catchment conditions that is directed to a lawful point of discharge.	
		AO11.2	Development ensures that existing stormwater infrastructure that is undersized is upgraded in compliance with the Priority infrastructure plan and the standards in the Infrastructure design planning scheme policy	Complies with AO11.2: Refer to SBSMP.
PO12	Development provides stormwater infrastructure which: (a) remains fit for purpose for the life of the development and maintains full functionality in the design flood event; (b) can be safely accessed and maintained cost effectively; (c) ensures no structural damage to existing stormwater infrastructure.	**AO12.1**	The stormwater management system is designed in compliance with the Infrastructure design planning scheme policy	Complies with AO12.1: Refer to SBSMP.
		AO12.2	Development provides a clear area with a minimum of 2m radius from the centre of an existing manhole cover and with a minimum height clearance of 2.5m.	Complies with AO12.2: Not applicable to this development.
PO13	Development ensures that all reasonable and practicable measures are taken to manage the impacts of erosion, turbidity and sedimentation, both within and external to the development site from construction activities, including vegetation clearing, earthworks, civil construction, installation of services, rehabilitation, revegetation and landscaping to protect: (a) the environmental values and water quality objectives of waters; (b) waterway hydrology; (c) the maintenance and serviceability of stormwater infrastructure. Note—The Infrastructure design planning scheme policy outlines the appropriate measures to be taken into account to achieve the performance outcome.	**AO13**	No acceptable outcome is prescribed.	Complies with AO13: Refer to SBSMP.

Performance outcomes		Acceptable outcomes		Performance outcome
PO14	Development ensures that: (a) unnecessary disturbance to soil, waterways or drainage channels is avoided; (b) all soil surfaces remain effectively stabilised against erosion in the short and long term.	**AO14**	No acceptable outcome is prescribed.	Complies with AO14: Refer to SBSMP.
PO15	Development does not increase: (a) the concentration of total suspended solids or other contaminants in stormwater flows during site construction; (b) run-off which causes erosion either on site or off site.	**AO15**	No acceptable outcome is prescribed.	Complies with AO15: Refer to SBSMP.

Section B—Additional criteria which apply to high-risk development, being one or more of the following: (a) a material change of use for an urban purpose which involves greater than 2,500m^2 of land that: (i) will result in an impervious area greater than 25% of the net developable area; or (ii) will result in 6 or more dwellings. (b) reconfiguring a lot for an urban purpose that involves greater than 2,500m^2 of land and will result in 6 or more lots; (c) operational work for an urban purpose which involves disturbing greater than 2,500m^2 of land.				
PO16	Development ensures that the entry and transport of contaminants into stormwater is avoided or minimised to protect receiving water environmental values. Note—Prescribed water contaminants are defined in the *Environmental Protection Act 1994*. Note—Compliance with the performance outcome should be demonstrated by the submission of a site-based stormwater management plan for high-risk development only.	**AO16**	Development provides a stormwater management system which is designed in compliance with the standards in the Infrastructure design planning scheme policy.	Complies with AO16: Refer to Stormwater management plan.
PO17	Development ensures that: (a) the discharge of wastewater to a waterway or external to the site is avoided; or (b) if the discharge cannot practicably be avoided, the development minimises wastewater discharge through re-use, recycling, recovery and treatment. Note—The preparation of a wastewater management plan can assist in demonstrating achievement of this performance outcome. Editor's note—This code does not deal with sewerage which is the subject of the Wastewater code.	**AO17**	No acceptable outcome is prescribed.	Complies with AO17: Not applicable to this development.

Appendix G
SQID Maintenance Manual

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OCEAN PROTECT

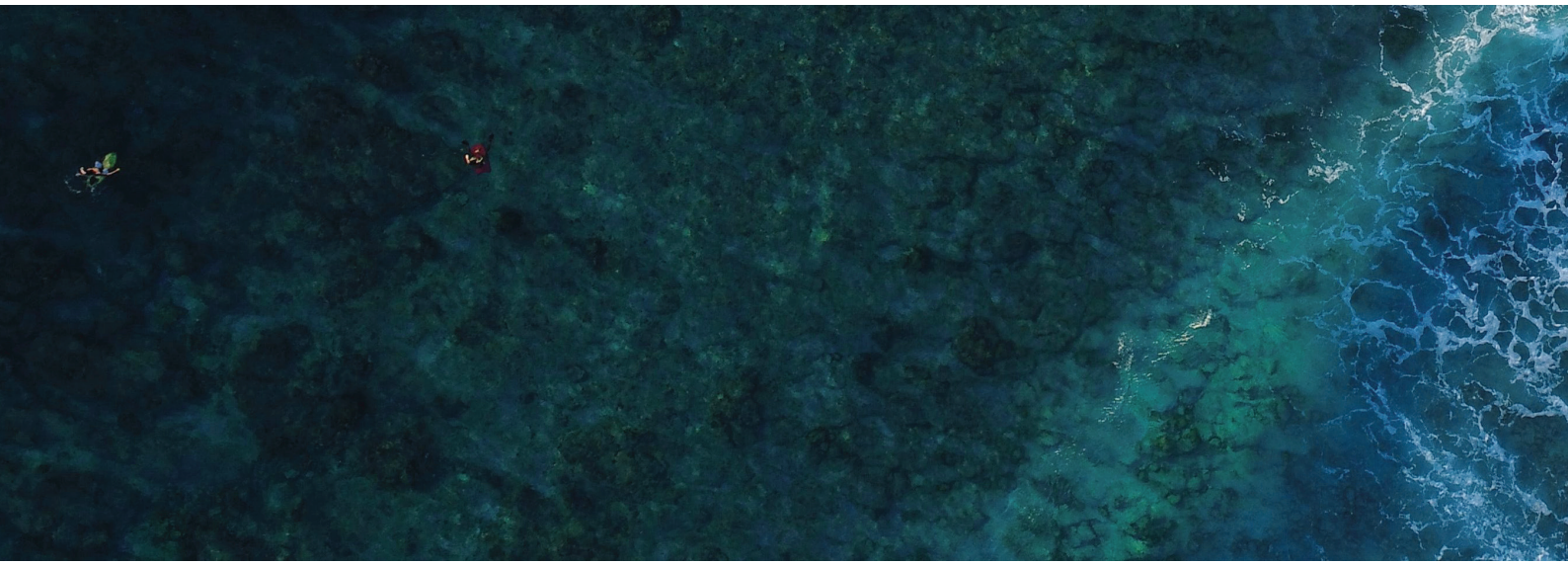
OceanGuard®

Operations & Maintenance Manual



Stopping Pollution Entering Waterways

09/22



www.oceanprotect.com.au

Introduction	3
Health and Safety	4
How does it work?	5
Maintenance Procedures	6
Maintenance Services	7



Introduction

The primary purpose of stormwater treatment devices is to capture and prevent pollutants from entering waterways, maintenance is a critical component of ensuring the ongoing effectiveness of this process. The specific requirements and frequency for maintenance depends on the treatment device and pollutant load characteristics of each site. This manual has been designed to provide details on the cleaning and maintenance processes for the OceanGuard® as recommended by the manufacturer (Ocean Protect).

The OceanGuard® technology is a gully pit basket designed to fit within new and existing gully pits to remove pollution from stormwater runoff. The system has a choice of filtration liners, designed to remove gross pollutants, solids, and other attached pollutants as either a standalone technology or as part of a 'treatment train' (e.g. with StormFilter®, Jellyfish® or biofiltration). OceanGuards are highly effective, easy to install and simple to maintain.

Why do I need to perform maintenance?

Adhering to the inspection and maintenance schedule of any stormwater treatment device is essential to ensuring that it functions properly throughout its design life.

During each inspection and clean, details of the mass, volume and type of material that has been collected by the device should be recorded. This data will assist with the revision of future management plans and help determine maintenance interval frequency. It is also essential that qualified and experienced personnel carry out all maintenance (including inspections, recording and reporting) in a systematic manner.

Maintenance of your stormwater management system is essential to ensuring ongoing at-source control of stormwater pollution. Maintenance also helps prevent structural failures (e.g. prevents blocked outlets) and aesthetic failures (e.g. debris build up), but most importantly ensures the long term effective operation of the OceanGuard®.

Health and Safety

Access to pits containing an OceanGuard® typically requires removing (heavy) access covers/grates, but typically it is not necessary to enter into a confined space. Pollutants collected by the OceanGuard® will vary depending on the nature of your site. There is potential for these materials to be harmful. For example, sediments may contain heavy metals, carcinogenic substances or sharp objects such as broken glass and syringes. For these reasons, there should be no primary contact with the waste collect and all aspects of maintaining and cleaning your OceanGuard® require careful adherence to Occupational Health and Safety (OH&S) guidelines.

It is important to note that the same level of care needs to be taken to ensure the safety of non-work personnel, as a result it may be necessary to employ traffic/pedestrian control measures when the device is situated in, or near areas with high vehicular/pedestrian activity.

Personnel health and safety

Whilst performing maintenance on the OceanGuard®, precautions should be taken in order to minimise (or when possible prevent) contact with sediment and other captured pollutants by maintenance personnel. In order to achieve this the following personal protective equipment (PPE) is recommended:

- Puncture resistant gloves
- Steel capped safety boots
- Long sleeve clothing, overalls or similar skin protection
- Eye protection
- High visibility clothing or vest

During maintenance activities it may be necessary to implement traffic control measures. Ocean Protect recommend that a separate site specific traffic control plan is implemented as required to meet the relevant governing authority guidelines.

The OceanGuard® is designed to be maintained from surface level, without the need to enter the pit. However depending on the installation configuration, location and site specific maintenance requirements it may be necessary to enter a confined space occasionally. It is recommended that all maintenance personnel evaluate their own needs for confined space entry and compliance with relevant industry regulations and guidelines. Ocean Protect maintenance personnel are fully trained and carry certification for confined space entry.

How does it work?

OceanGuard® is designed to intercept stormwater as it enters the stormwater pits throughout a site. The OceanGuard® has diversion panels that sit flush with the pit walls, this ensures that as stormwater enters at the top of the pit it is directed to the middle of the insert where the Filtration bag is situated. The filtration bag allows for screening to occur removing 100% of pollutants greater than the opening of the filtration material (200micron, 1600micron bags available).

During larger rain events the large flows overflow slots in the flow diverter of the OceanGuard® ensure that the conveyance of stormwater is not impeded thus eliminating the potential for surface flooding. As the flow subsides, the captured pollutants are held in the OceanGuard® filtration bag. The waste then starts to dry which reduces the magnitude of organic material decomposition transitioning between maintenance intervals.

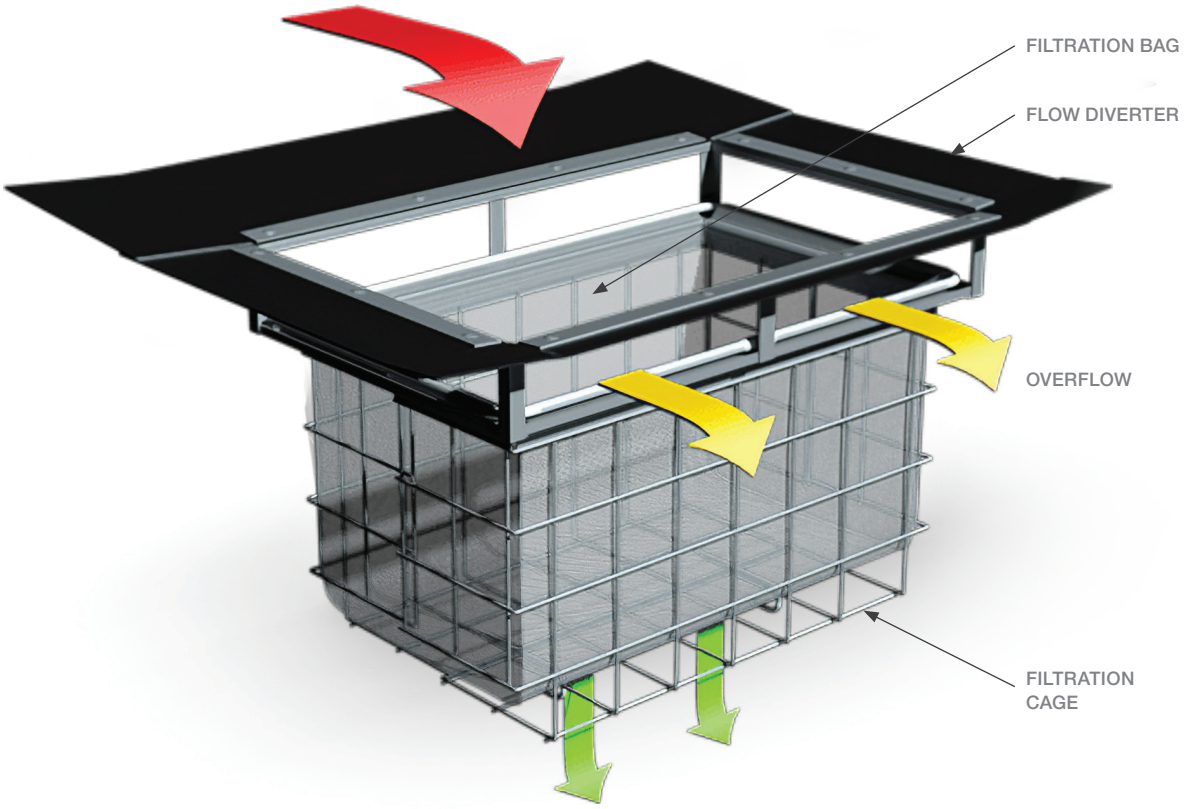


Figure 1: OceanGuard® components

Maintenance Procedures

To ensure that each OceanGuard® achieves optimal performance, it is advisable that regular maintenance is performed. The OceanGuard® requires 1-6 minor services annually (3 to 4 typical), pending the outcome of these inspections additional maintenance servicing may be required.

Primary types of maintenance

The table below outlines the primary types of maintenance activities that typically take place as part of an ongoing maintenance schedule for the OceanGuard®.

Service Type	Description of Typical Activities	Frequency
Minor Service	Filter bag inspection and evaluation Removal of capture pollutants Disposal of material	1-6 Times Annually
Major Service	Filter Bag Replacement Support frame rectification	As required

Maintenance requirements and frequencies are dependent on the pollutant load characteristics of each site. The frequencies provided in this document represent what the manufacturer considers to be best practice to ensure the continuing operation of the device is in line with the original design specification.

Minor Service

This service is designed to return the OceanGuard® back to optimal operating performance. This type of service can be undertaken either by hand or with the assistance of a Vacuum unit.

Hand Maintenance

1. Establish a safe working area around the OceanGuard®
2. Remove access cover/grate
3. Use two lifting hooks to remove the filtration bag
4. Empty the contents of the filtration bag into a disposal container
5. Inspect and evaluate the filtration bag
6. Inspect and evaluate remaining OceanGuard® components (i.e. flow diverter, filtration cage and supporting frame)
7. Rejuvenate filtration bag by removing pollutant build up with a stiff brush, additionally the filtration bag can be washed using high pressure water
8. Re-install filtration bag and replace access cover/grate

Vacuum Maintenance

1. Establish a safe working area around the OceanGuard®
2. Remove access cover/grate
3. Vacuum captured pollutants from the filtration bag
4. Remove filtration bag
5. Inspect and evaluate the filtration bag
6. Inspect and evaluate remaining OceanGuard® components (i.e. flow diverter, filtration cage and supporting frame)
7. Rejuvenate filtration bag by removing pollutant build up with a stiff brush, additionally the filtration bag can be washed using high pressure water
8. Re-install filtration bag and replace access cover/grate

Major Service (Filter Bag Replacement)

For the OceanGuard®, a major service is a reactionary process based on the outcomes from the minor service.

Trigger Event from Minor Service	Maintenance Action
Filtration bag inspection reveals damage	Replace the filtration bag[1]
Component inspection reveals damage	Perform rectification works and if necessary replace components[1]

[1] Replacement filtration bags and components are available for purchase from Ocean Protect

Additional Types of Maintenance

Occasionally, events on site can make it necessary to perform additional maintenance to ensure the continuing performance of the device.

Hazardous Material Spill

If there is a spill event on site, all OceanGuard® pits that potentially received flow should be inspected and cleaned. Specifically, all captured pollutants from within the filtration bag should be removed and disposed in accordance with any additional requirements that may relate to the type of spill event. All filtration bags should be rejuvenated (replaced if required) and re-installed.

Blockages

The OceanGuard's internal high flow bypass functionality is designed to minimise the potential of blockages/ flooding and this configuration has been field proven for over twenty years. Flooding caused by an OceanGuard® style of pit basket is extremely rare and in the unlikely event that flooding occurs around the stormwater pit the following steps should be undertaken to assist in diagnosing the issue and implementing the appropriate response.

1. Inspect the OceanGuard® flow diverter, ensuring that they are free of debris and pollutants
2. Perform a minor service on the OceanGuard®
3. Remove the OceanGuard® to access the pit and inspect both the inlet and outlet pipes, ensuring they are free of debris and pollutants

Major Storms and Flooding

In addition to the scheduled activities, it is important to inspect the condition of the OceanGuard® after a major storm event. The inspection should focus on checking for damage and higher than normal sediment accumulation that may result from localised erosion. Where necessary damaged components should be replaced and accumulated pollutants disposed.

Disposal of Waste Materials

The accumulated pollutants found in the OceanGuard® must be handled and disposed of in a manner that is in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. If the filtration bag has been contaminated with any unusual substance, there may be additional special handling and disposal methods required to comply with relevant government/authority/industry regulations.

Maintenance Services

With over a decade and a half of maintenance experience Ocean Protect has developed a systematic approach to inspecting, cleaning and maintaining a wide variety of stormwater treatment devices. Our fully trained and professional staff are familiar with the characteristics of each type of system, and the processes required to ensure its optimal performance.

Ocean Protect has several stormwater maintenance service options available to help ensure that your stormwater device functions properly throughout its design life. In the case of our OceanGuard®, we offer long term pay-as-you-go contracts, pre-paid once off servicing and replacement filter bags.

For more information please visit www.oceanprotect.com.au

Ocean Protect supplies and maintains a complete range of filtration, hydrodynamic separation, screening and oil/water separation technologies.

Call 1300 354 722

www.oceanprotect.com.au

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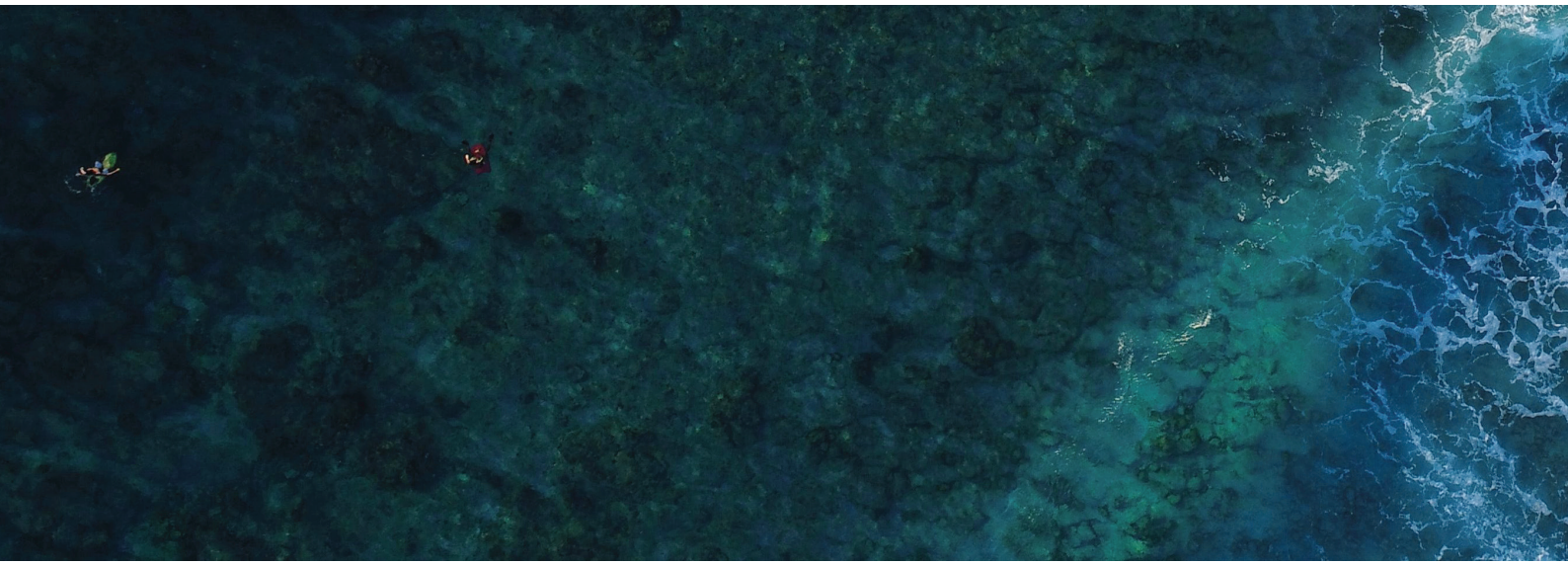
StormFilter®

Operations & Maintenance Manual



Stopping Pollution Entering Waterways

09/22



www.oceanprotect.com.au

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Health and Safety	4
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Introduction

The primary purpose of stormwater treatment devices is to capture and prevent pollutants from entering waterways, maintenance is a critical component of ensuring the ongoing effectiveness of this process. The specific requirements and frequency for maintenance depends on the treatment device and pollutant load characteristics of each site. This manual has been designed to provide details on the cleaning and maintenance processes for the StormFilter®, as recommended by the manufacturer (Ocean Protect).

The StormFilter® is designed and sized to meet stringent regulatory requirements. It removes the most challenging target pollutants (including fine solids, soluble heavy metals, oil, and soluble nutrients) using a variety of media. For more than two decades, StormFilter® has helped clients meet their regulatory needs and, through ongoing product enhancements, the design continues to be refined for ease of use and improved performance.

Why do I need to perform maintenance?

Adhering to the inspection and maintenance schedule of any stormwater treatment device is essential to ensuring that it functions properly throughout its design life.

During each inspection and clean, details of the mass, volume and type of material that has been collected by the device should be recorded. This data will assist with the revision of future management plans and help determine maintenance interval frequency. It is also essential that qualified and experienced personnel carry out all maintenance (including inspections, recording and reporting) in a systematic manner.

Maintenance of your stormwater management system is essential to ensuring ongoing at-source control of stormwater pollution. Maintenance also helps prevent structural failures (e.g. prevents blocked outlets) and aesthetic failures (e.g. debris build up), but most of all ensures the long term effective operation of the StormFilter®.

Health and Safety

Access to a StormFilter® unit requires removing heavy access covers/grates, and it is necessary to enter a confined space. Pollutants collected by the StormFilter® will vary depending on the nature of your site. There is potential for these materials to be harmful. For example, sediments may contain heavy metals, carcinogenic substances or objects such as broken glass and syringes. For these reasons, all aspects of maintaining and cleaning your StormFilter® require careful adherence to Occupational Health and Safety (OH&S) guidelines.

It is important to note that the same level of care needs to be taken to ensure the safety of non-work personnel. As a result, it may be necessary to employ traffic/pedestrian control measures when the device is situated in, or near areas with high vehicular/pedestrian activity.

Personnel health and safety

Whilst performing maintenance on the StormFilter®, precautions should be taken in order to minimise (or, if possible, prevent) contact with sediment and other captured pollutants by maintenance personnel. The following personal protective equipment (PPE) is subsequently recommended:

- Puncture resistant gloves
- Steel capped safety boots
- Long sleeve clothing, overalls or similar skin protection
- Eye protection
- High visibility clothing or vest

During maintenance activities, it may be necessary to implement traffic control measures. Ocean Protect recommend that a separate site-specific traffic control plan is implemented as required to meet the relevant governing authority guidelines.

Whilst some aspects of StormFilter® maintenance can be performed from surface level, there will be a need to enter the StormFilter® system (confined space) during a major service. It is recommended that all maintenance personnel evaluate their own needs for confined space entry and compliance with relevant industry regulations and guidelines. Ocean Protect maintenance personnel are fully trained and carry certification for confined space entry applications.

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How does it work?

Stormwater enters the cartridge chamber, passes through the filtration media and begins filling the cartridge center tube. When water reaches the top of the cartridge the float valve opens and filtered water is allowed to drain at the designed flow rate. Simultaneously, a one-way check valve closes activating a siphon that draws stormwater evenly throughout the filter media and into the center tube. Treated stormwater is then able to discharge out of the system through the underdrain manifold pipework.

As the rain event subsides, the water level outside the cartridge drops and approaches the bottom of the hood, air rushes through the scrubbing regulators releasing the water column and breaking the siphon. The turbulent bubbling action agitates the surface of the cartridge promoting trapped sediment to drop to the chamber floor. After a rain event, the chamber is able to drain dry by way of an imperfect seal at the base of the float valve.

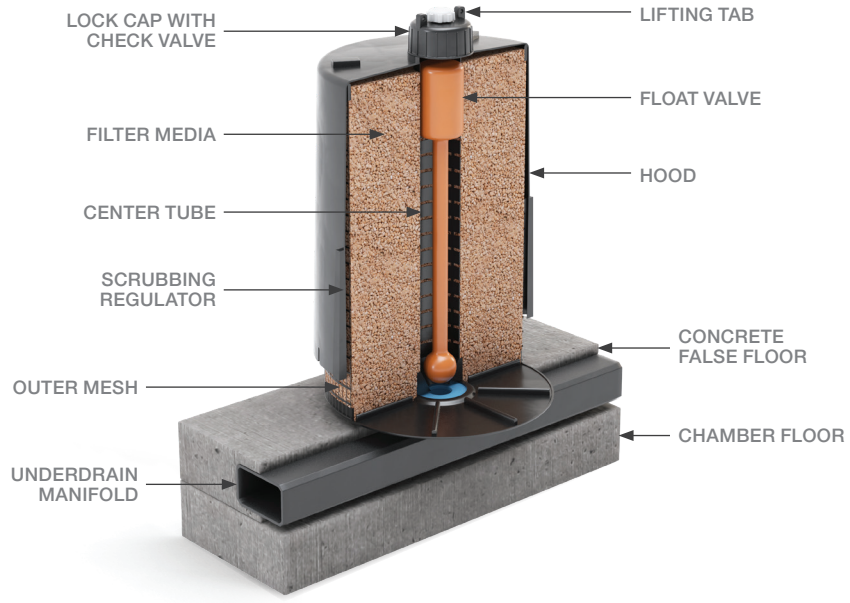


Figure 1: StormFilter® components

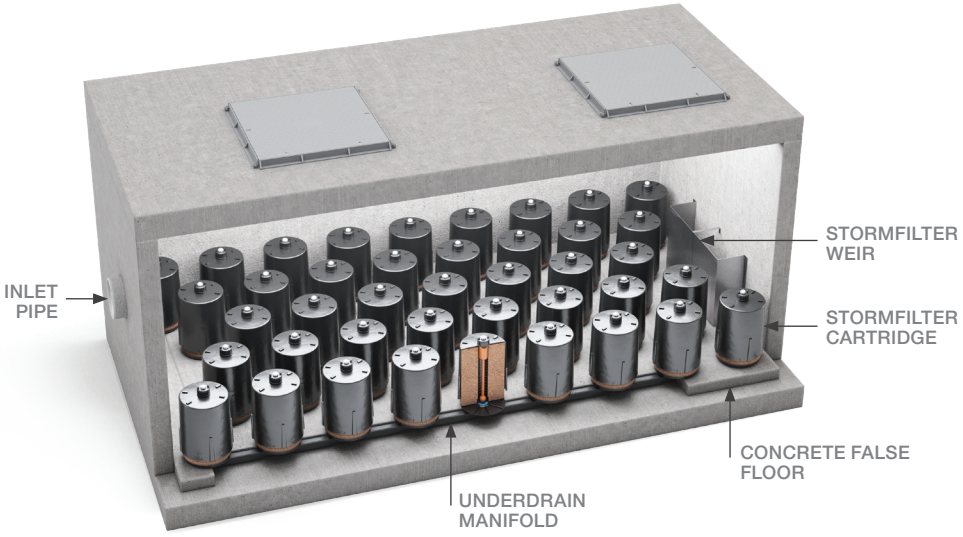


Figure 2: Example conceptual diagram of a StormFilter® system

Maintenance Procedures

To ensure optimal performance, it is advisable that regular maintenance is performed. Typically, the StormFilter® requires an inspection every 6 months with a minor service at 12 months. Additionally, as the StormFilter® cartridges capture pollutants the media will eventually become occluded and require replacement (expected media life is 1-3 years).

Primary types of maintenance

The table below outlines the primary types of maintenance activities that typically take place as part of an ongoing maintenance schedule for the StormFilter®.

Service Type	Description of Typical Activities	Frequency
Inspection	Visual Inspection of cartridges & chamber Remove larger gross pollutants Perform minimal rectification works (if required)	Every 6 Months
Minor Service	Evaluation of cartridges and media Removal of accumulated sediment (if required) Wash-down of StormFilter® chamber (if required)	Every 12 Months
Major Service	Replacement of StormFilter® cartridge media	As required

Maintenance requirements and frequencies are dependent on the pollutant load characteristics of each site. The frequencies provided in this document represent what the manufacturer considers to be best practice to ensure the continuing operation of the device is in line with the original design specification.

Inspection

The purpose of the inspecting the StormFilter® system is to assess the condition of the StormFilter® chamber and cartridges. When inspecting the chamber, particular attention should be taken to ensure all cartridges are firmly connected to the connectors. It is also an optimal opportunity to remove larger gross pollutants and inspect the outlet side of the StormFilter® weir.

Minor Service

This service is designed to ensure the ongoing operational effectiveness of the StormFilter® system, whilst assessing the condition of the cartridge media.

1. Establish a safe working area around the access point(s)
2. Remove access cover(s)
3. Evaluate StormFilter® cartridge media (if exhausted schedule major service within 6 months)
4. Measure and record the level of accumulated sediment in the chamber (if sediment depth is less than 100 mm skip to step 9)
5. Remove StormFilter® cartridges from the chamber
6. Use vacuum unit to removed accumulated sediment and pollutants in the chamber
7. Use high pressure water to clean StormFilter® chamber
8. Re-install StormFilter® cartridges
9. Replace access cover(s)

Major Service (Filter Cartridge Replacement)

For the StormFilter® system a major service is reactionary process based on the outcomes from the minor service, specifically the evaluation of the cartridge media.

Trigger Event	Maintenance Action
Cartridge media is exhausted[1]	Replace StormFilter® cartridge media[2]

[1] Multiple assessment methods are available, contact Ocean Protect for assistance

[2] Replacement filter media and components are available for purchase from Ocean Protect

This service is designed to return the StormFilter® device back to optimal operating performance.

1. Establish a safe working area around the access point(s)
2. Remove access cover(s)
3. By first removing the head cap, remove each individual cartridge hood to allow access to the exhausted media
4. Utilise a vacuum unit to remove exhausted media from each cartridge
5. Use vacuum unit to remove accumulated sediment and pollutants in the chamber
6. Use high pressure water to clean StormFilter® chamber
7. Inspect each empty StormFilter® cartridges for any damage, rectify damage as required
8. Re-fill each cartridge with media in line with project specifications
9. Re-install replenished StormFilter® cartridges
10. Replace access cover(s)

Additional Types of Maintenance

Occasionally, events on site can make it necessary to perform additional maintenance to ensure the continuing performance of the device.

Hazardous Material Spill

If there is a spill event on site, the StormFilter® unit should be inspected and cleaned. Specifically, all captured pollutants and liquids from within the unit should be removed and disposed in accordance with any additional requirements that may relate to the type of spill event. Additionally, it will be necessary to inspect the filter cartridges and assess them for contamination – and, depending on the type of spill event, it may be necessary to replace the filtration media.

Blockages

In the unlikely event that flooding occurs upstream of the StormFilter® system, the following steps should be undertaken to assist in diagnosing the issue and determining the appropriate response.

1. Inspect the upstream diversion structure (if applicable) ensuring that it is free of debris and pollutants
2. Inspect the StormFilter® unit checking the underdrain manifold as well as both the inlet and outlet pipes for obstructions (e.g. pollutant build-up, blockage), which if present, should be removed

Major Storms and Flooding

In addition to the scheduled activities, it is important to inspect the condition of the StormFilter® after a major storm event. The focus is to inspect for damage and abnormally high sediment accumulation that may result from localised erosion. Where necessary damaged components should be replaced and accumulated pollutants should be removed and disposed

.

Disposal of Waste Materials

The accumulated pollutants found in the StormFilter® must be handled and disposed of in a manner that is in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. If the filter media has been contaminated with any unusual substance, there may be additional special handling and disposal methods required to comply with relevant government/authority/industry regulations.

Maintenance Services

With over a decade and a half of maintenance experience, Ocean Protect has developed a systematic approach to inspecting, cleaning and maintaining a wide variety of stormwater treatment devices. Our fully trained and professional staff are familiar with the characteristics of each type of system, and the processes required to ensure its optimal performance.

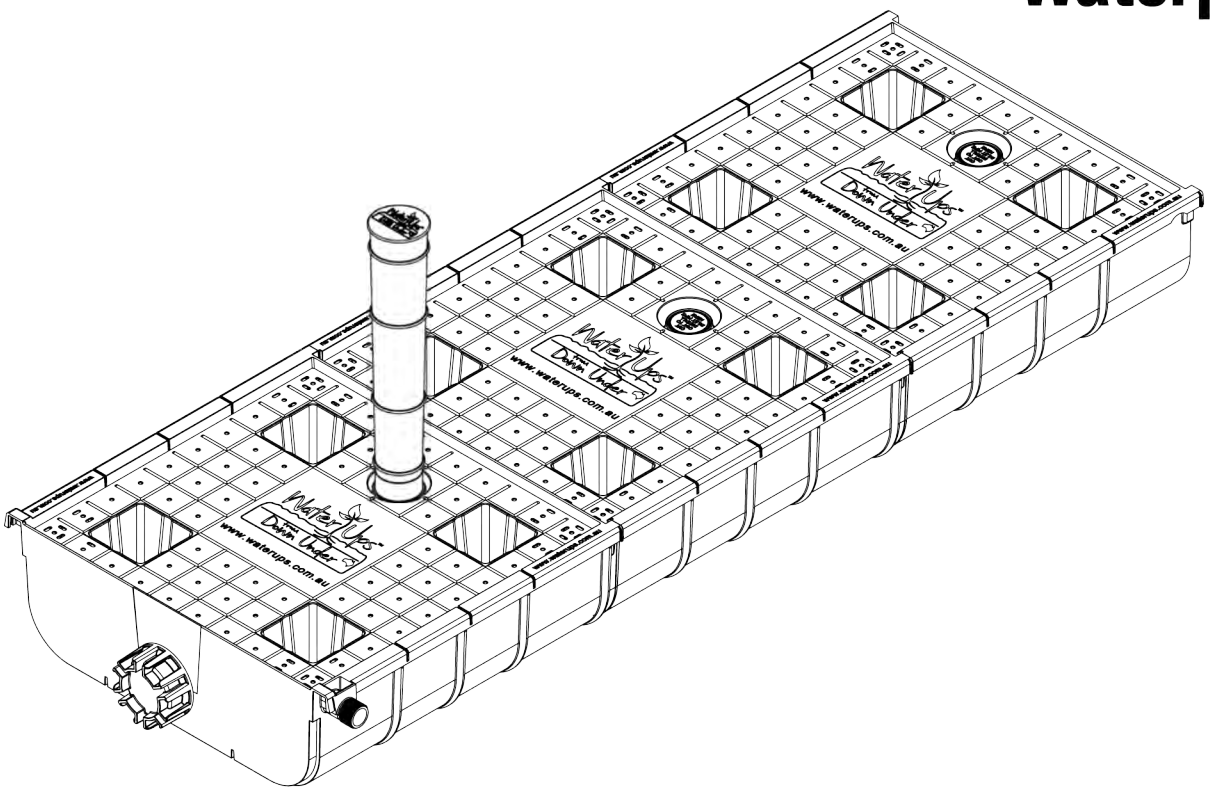
Ocean Protect has several stormwater maintenance service options available to help ensure that your stormwater device functions properly throughout its design life. In the case of StormFilter®, we offer long term pay-as-you-go contracts, pre-paid once off servicing and replacement media for cartridges.

For more information please visit www.oceanprotect.com.au

Ocean Protect supplies and maintains a complete range of filtration, hydrodynamic separation, screening and oil/water separation technologies.

Call 1300 354 722

www.oceanprotect.com.au



Assembly Guide

Sub-Irrigation Channel

17000
17000-1

WaterUps® Getting Started page

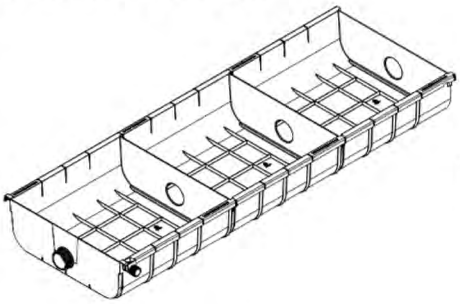
Our Getting Started page contains lots of helpful information. You can go to it using the link or the QR code below.

Getting Started page

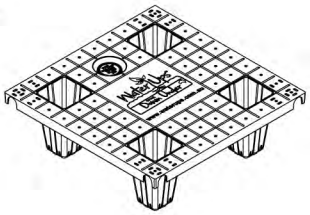
Wicking our World™

www.waterups.com.au

Contents - Basic Kit



1 x WaterUps® Channel



3 x WaterUps Wicking Cell



1 x Inlet Pipe and Cap



1 x Channel End Cap



1 x Spigot

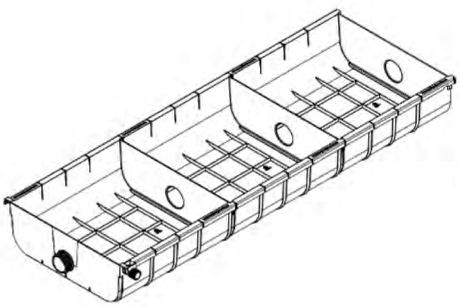


1 x Channel Nut

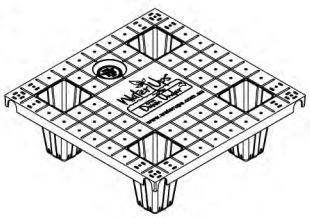


1 x Overflow Connector Extension Fitting

Contents - Extension Kit



1 x WaterUps Channel



3 x WaterUps Wicking Cell



1 x Channel Nut

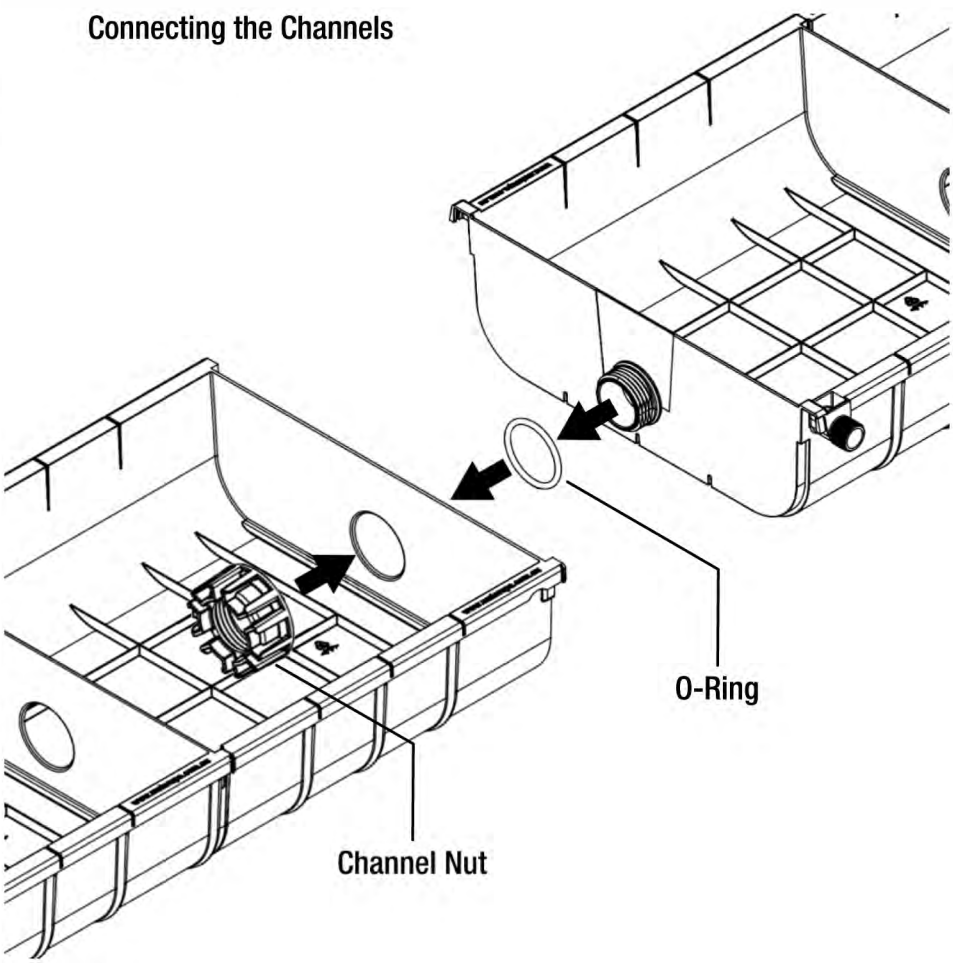
You will need

- Approximately 2 square metres of level ground to build each SIC on
- A spirit or laser level
- A sharp knife
- Drill
- 16mm speedbor drill bit
- 6 litres of perlite for each SIC

IMPORTANT NOTE:

You will need to purchase the Basic Kit plus the number of Extension Kits that you will need, based on the length of the channel required for your job.

Connecting the Channels



Connecting Parallel Channels

Contents - Parallel Connector Set



1 x Wedge Washer

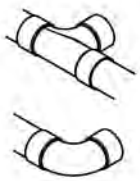


1 x Channel Nut

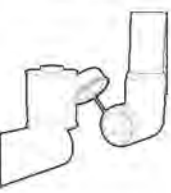
You will need



40mm low pressure PVC pipe

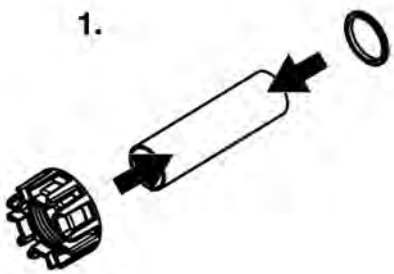


40mm PVC Fittings

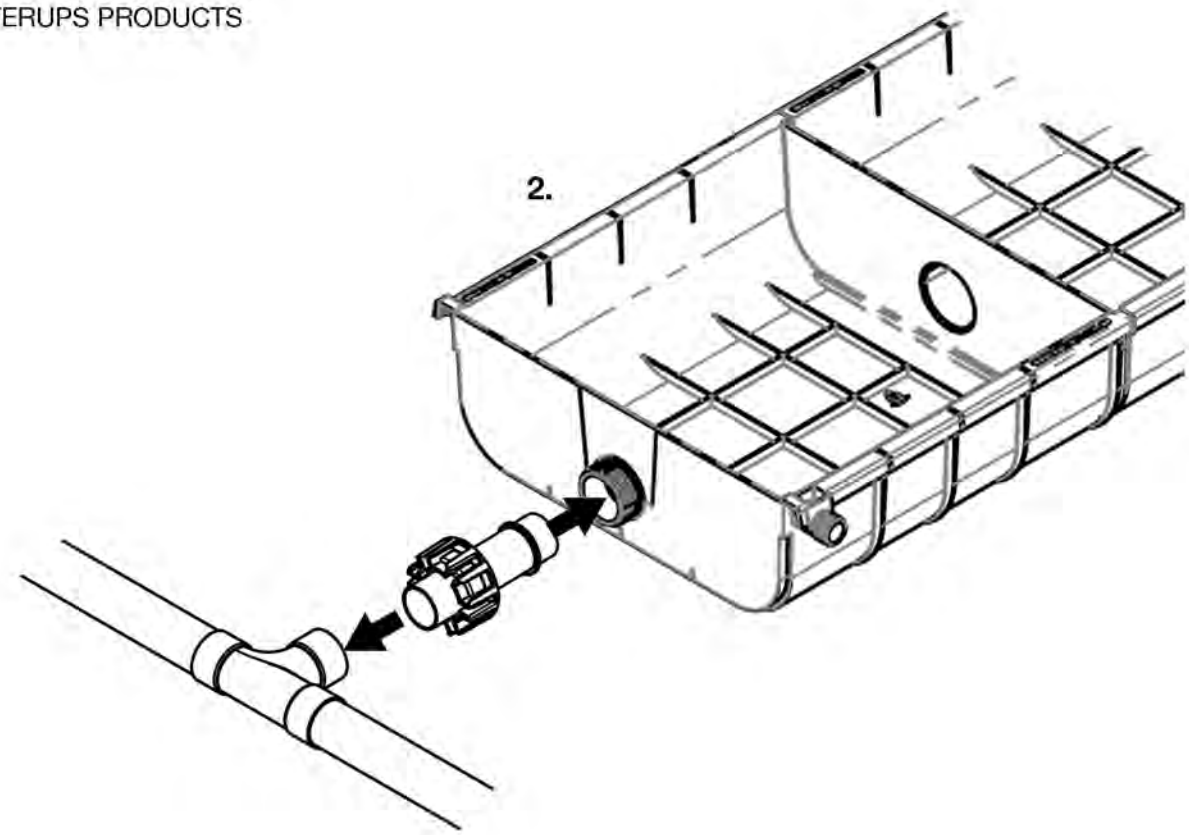


PVC Glue -For use on PVC only
NOT TO BE USED ON ANY WATERUPS PRODUCTS

1.



2.



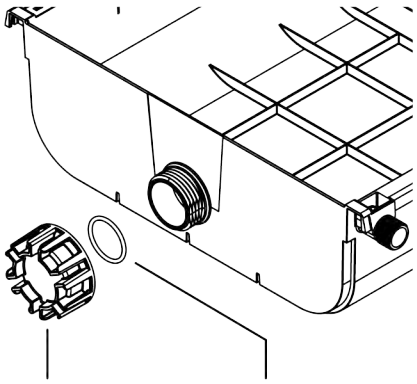
1. Assembly preparation.

Make sure that the position you are installing the Sub-Irrigation Channel ("SIC") in is completely level using a spirit or laser level.

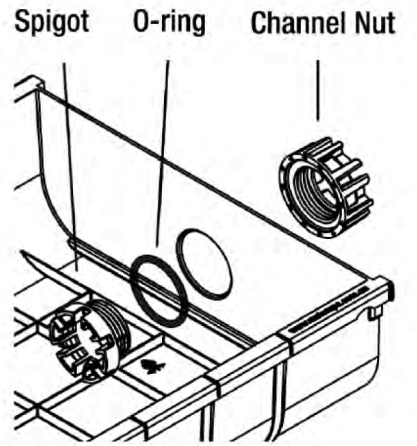
Make sure that the base on which you are going to install the SIC on is compacted.

2. Assembling the Basic Kit.

Start with the Basic Kit. Take the End Cap and check that the small o-ring is in position on the inside of the cap. Then screw the End Cap to the threaded 'male' end of the Channel and tighten.



If the SIC that you are installing is only 1.2m long, then locate the Spigot and Nut. The Spigot should be placed on the inside of the channel connection hole and pushed through so that the threaded section of the Spigot is on the outside. Then add the large O-ring and screw on the Nut and tighten.



3. Connecting the Channels.

The Channels can be connected by placing the threaded piece at the end of one Channel into the matching hole at the opposing end.

Screw together with the Nut and O-ring that come with the Extension Kit.

Refer to the large image at the bottom of page 2.

4. Cutting the SIC.

The Channel can be cut using a hand saw or circular saw between the lines marked on the underside of the Channel.

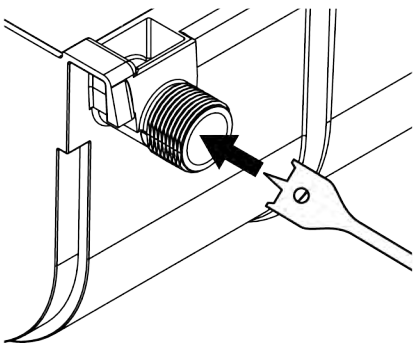


5 Overflow Hole.

It is important that close attention is given to the placement of the overflow on your sub-irrigation wicking system. The channel overflow is defined by the threaded piece adjacent to the top corner of the channel.

IMPORTANT NOTE:

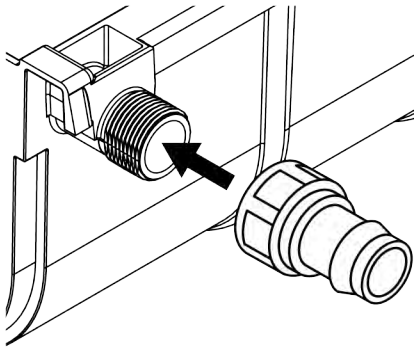
You will need to drill out the hole on the inside of the threaded overflow connection piece using a 16mm speedbor drill bit.



Drill out the hole on the inside of the overflow connection

How you connect the overflow will depend on the nature of your installation.

If you are installing the SIC in a planter or adjacent to a retaining wall, then screw on overflow pipe extension connector piece. Then attach a sufficient length of standard 19mm poly irrigation pipe so that the end of the pipe extends through the wall and is visible.



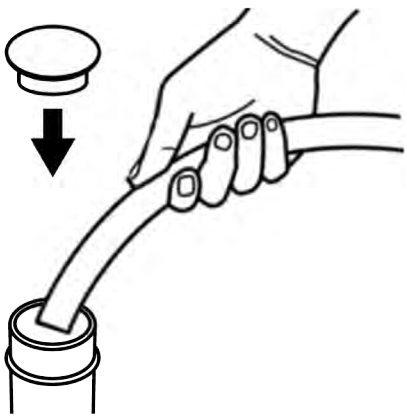
Fitting the Overflow Connector Extension Fitting

If you are installing in-ground or in a planter with a bottom drainage hole then you will need to run the overflow into an ag line or sump covered with aggregate. With this alternative you will not have visibility of when the channel system is full and overflowing.

6 Filling the SIC.

There are 2 methods for filling the SIC:

- The normal method would be to use the WaterUps® Inlet Pipe that comes with the Basic Kit (see below); and

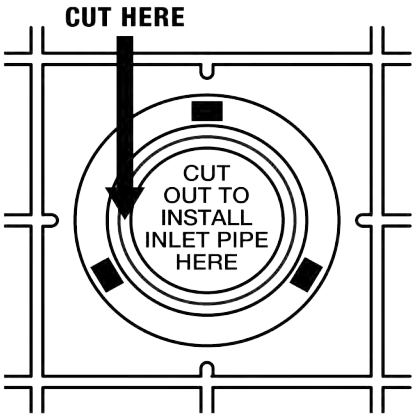


- If you have a channel system that will have more than one potential overflow holes. One of these could be used as the inlet for filling the SIC. This would require attaching poly irrigation pipe as was done for the overflow extension and connecting this to the water supply/tap.

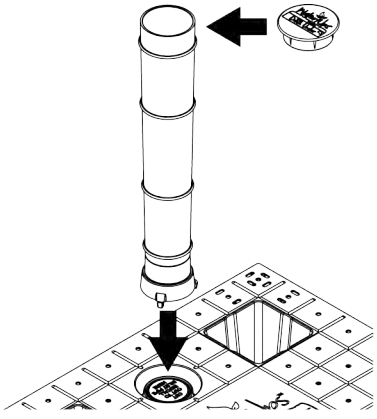
7. Inserting the water inlet pipe.

To fit the WaterUps Inlet Pipe you must first cut a hole in the top of one of the WaterUps Cells.

Using a sharp knife cut along the circular groove around the type on the top of the WaterUps Cell as shown in the image at the top of page 4.

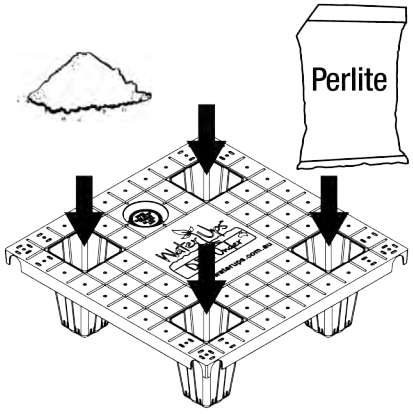


The three tabs on the bottom of the water inlet pipe must lock into the three holes in the top of the WaterUps Cell. Apply some pressure to the inlet pipe as you insert it, until it clicks into place in the WaterUps Cell.



8. Adding perlite to the feet of the WaterUps Cell.

Adding Perlite to the ‘wicks‘ will improve airflow through to the soil. Both fine and medium grain perlite work effectively for this purpose.



The wicks, which are the 4 feet at the base of each cell, should be filled with perlite. This will require approximately 2 litres of perlite per WaterUps cell.

To work out how much Perlite you will need, we suggest that you use the calculator tool on our website which you can go to using the link or the QR code at the bottom of page 1.

9. Potting mix and soil.

For information on potting mix and soil please refer to the *WaterUps Installation Guide* and the *Soil Considerations Guide* which you will find on our Getting Started page. You can go to them using the link or QR code at the bottom of page 1.

10. Watering your WaterUps Sub-Irrigation Chanel.

The reservoir of each SIC will hold 51.6 litres of water. How often you need to refill the reservoir will depend on what plants you are growing, the time of year, and the amount of natural rainfall that you receive. However, in our experience, periods of up to four weeks are achievable before you will need to refill your water reservoir.

It is recommended that you allow the water level in the SIC to go down to at least 1/4 full before refilling. This will assist soil aeration.

To check how much water is in the reservoir simply use a dipstick or set up a moisture sensor system.

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Published: 16 June 2022

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