BUSHFIRE ASSESSMENT REPORT CERTIFICATE

THIS CERTIFICATE HAS BEEN COMPLETED BY A RECOGNISED CONSULTANT IN BUSHFIRE RISK ASSESSMENT IN ACCORDANCE WITH SECTION *4.14* 1(b) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 NO 203

PROPERTY ADDRESS:	LOT 436 DP 808415 FLATROCK ROADMUNDAMIA
DESCRIPTION OF PROPOSAL:	MODIFICATION APPLICATION - RA21/1002 PROPOSED MATERIALS RECYCLING FACILITY
PLAN REFERENCE: **(relied upon in report preparation)**	SITE PLAN PREPARE BY MI ENGINEERS
BAL RATING:	-
DOES THE PROPOSAL RELY ON ALTERNATE SOLUTIONS:	~~**YES**~~ **NO**

I David Cannon of SET Consultants Pty Ltd have carried out a bushfire risk assessment on the above mentioned proposal and property. A detailed Bushfire Assessment Report is attached which includes the submission requirements set out in *Appendix 2* of *Planning for Bushfire Protection 2019* together with recommendations as to how the relevant specifications and requirements are to be achieved.

REPORT REFERENCE:	BRA – S021424
REPORT DATE:	29 November 2023
CERTIFICATION NO/ACCREDITED SCHEME:	BPAD 23829 (LEVEL 3)

I David Cannon hereby certify, in accordance with *Section 4.14 of the Environmental Planning and Assessment Act 1979 No 203*:

1. That I am a person recognised by the *NSW Rural Fire Service* as a qualified consultant in bushfire risk assessment; and
2. That subject to the recommendations contained in the attached Bushfire Risk Assessment Report the proposed development conforms to the relevant specifications and requirements.

I am aware that the Bushfire Assessment Report, prepared for the abovementioned site is to be submitted in support of a development application for this site and will be relied upon by Shoalhaven City Council as the basis for ensuring that the bushfire risk management aspects of the proposed development have been addressed in accordance with *Planning for Bushfire Protection 2019*.

SIGNATURE:  DATE: 29 November 2023

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

BUSHFIRE ASSESSMENT REPORT

Modification Application - RA21/1002
Proposed Materials Recycling Facility

Lot 436 DP 808415
Flatrock Road
Mundamia

29 November 2023
Reference: S021424

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

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		Ver 1 Original Final Issue	29 July 2021
		Ver 2 Original Final Issue	20 May 2022
		Ver 3 Mod Final Issue	27 April 2023
		Ver 4 Mod Final Issue	25 July 2023
		Ver 5 Mod Final Issue	26 October 2023
		Ver 6 – RFI Final Issue	29 November 2023

The assessment has been prepared in accordance with Planning for Bushfire Protection - A Guide for Councils, Planners, Fire Authorities and Developers, 2019, NSW Rural Fire Service (RFS) and Planning NSW.

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Attachments

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1 INTRODUCTION

This Bushfire Assessment Report has been prepared for Shoalhaven City Council to accompany a modification application to Regional Application RA21/1002 to amend inconsistencies with the recommended bushfire construction requirements and the proposed design. RA21/1002 relates to a material recovery facility at Flatrock Road, Mundamia, Lot 436 DP 808415. Shoalhaven City Council's Bushfire Prone Land Map indicates the subject site as bushfire prone (Figure 1).

For the purposes of this assessment, the subject development is considered a Class 8 building in accordance with the NCC. The NCC does not provide for any bush fire specific performance requirements for these particular classes of building and AS3959 (2018) and NASH Standard do not apply as a set of deem to satisfy construction requirements. However, compliance with AS 3959 and the NASH Standard must be considered when meeting the aims and objectives of PBP. A development application for commercial development in a bushfire prone area is required to be assessed by the relevant consent authority under Section 4.14 of the Environmental Planning and Assessment Act 1979.

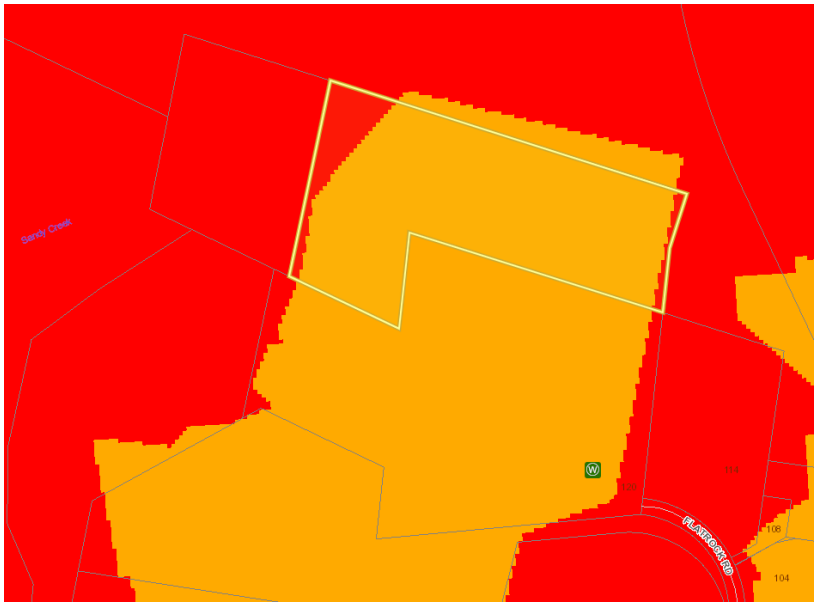


Figure 1: Shoalhaven City Councils Bushfire Prone Land Map. The subject lot is outlined in yellow.

The assessment of the site is based on the results of a field survey conducted by Mr. David Cannon and Mr. Jacob Duff on Tuesday 8th June 2021. The following pieces of current legislation and guidelines were referred to when preparing this report:

- Planning for Bushfire Protection, A Guide for Council, Planner, Fire Authorities and Developers' (NSW Rural Fire Service (RFS) in cooperation with the Department of Planning (2019);
- Rural Fires Act 1997;
- Australian Standard 3959-2018 Construction of Buildings in Bushfire Prone Areas; and
- Rural Fires Regulation 2022.

NOTE: *that the 'Planning for Bushfire Protection, A Guide for Council, Planners, Fire Authorities, and Developers (NSW Rural Fire Service (RFS) in cooperation with the Department of Planning (NSW) (2019) mentioned above, will herein be referred to as the* ***'PBP 2019****".*

1.1 OBJECTIVES

All development on Bushfire Prone Land must satisfy the aim and objectives of PBP 2019. PBP 2019 states:

"The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.

More specifically, the objectives are to:

a) *afford buildings and their occupants protection from exposure to a bush fire;*
b) *provide for a defendable space to be located around buildings;*
c) *provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;*
d) *ensure that appropriate operational access and egress for emergency service personnel and occupants is available;*
e) *provide for ongoing management and maintenance of BPMs; and*
f) *ensure that utility services are adequate to meet the needs of firefighters.*

Whilst bush fire is not captured in the NCC for Class 5-8 buildings, the following objectives will be applied in relation to access, water supply and services, and emergency and evacuation planning:

- to provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation;
- to provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development;
- to provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building; and
- provide for the storage of hazardous materials away from the hazard wherever possible.

The general fire safety construction provisions of the NCC are taken as acceptable solutions however construction requirements for bush fire protection will need to be considered on a case-by-case basis.

This assessment includes an analysis of the potential hazard persisting and affecting the subject site and the standards and bushfire mitigation measures that should be introduced to address the objectives of the PBP 2019 and AS3959-2018. The mitigation measures have been derived from the provisions (performance criteria and acceptable solutions) as outlined within the PBP 2019 and AS3959-2018.

1.2 PROPOSAL

The proposal is for the construction of a new Council operated Materials Recovery Facility (MRF) at the existing waste management facility.

Key data concerning the proposed MRF is as follows:

- Maximum operational capacity: 24,000 tonnes per annum (or 15 tonnes per hour);
- Availability considering scheduled (and unscheduled) downtime: 95%;
- Equipment and internal stockpiling area: 4,500m^2;
- Building area: 7,500m^2;
- Building Height: 9.5m (gutter height);
- Fully enclosed operations including receival hall and bunker;
- Sealed roads;
- Community education and viewing platform; and
- Fire protection and control system.

It is understood that the primary purpose of the proposed MRF is to temporarily store and then sort and sperate commingled kerbside recycling (from yellow bins). Figure 2 shows an extract of the site plan prepared by *MIEngineers* (**Attachment 1**).

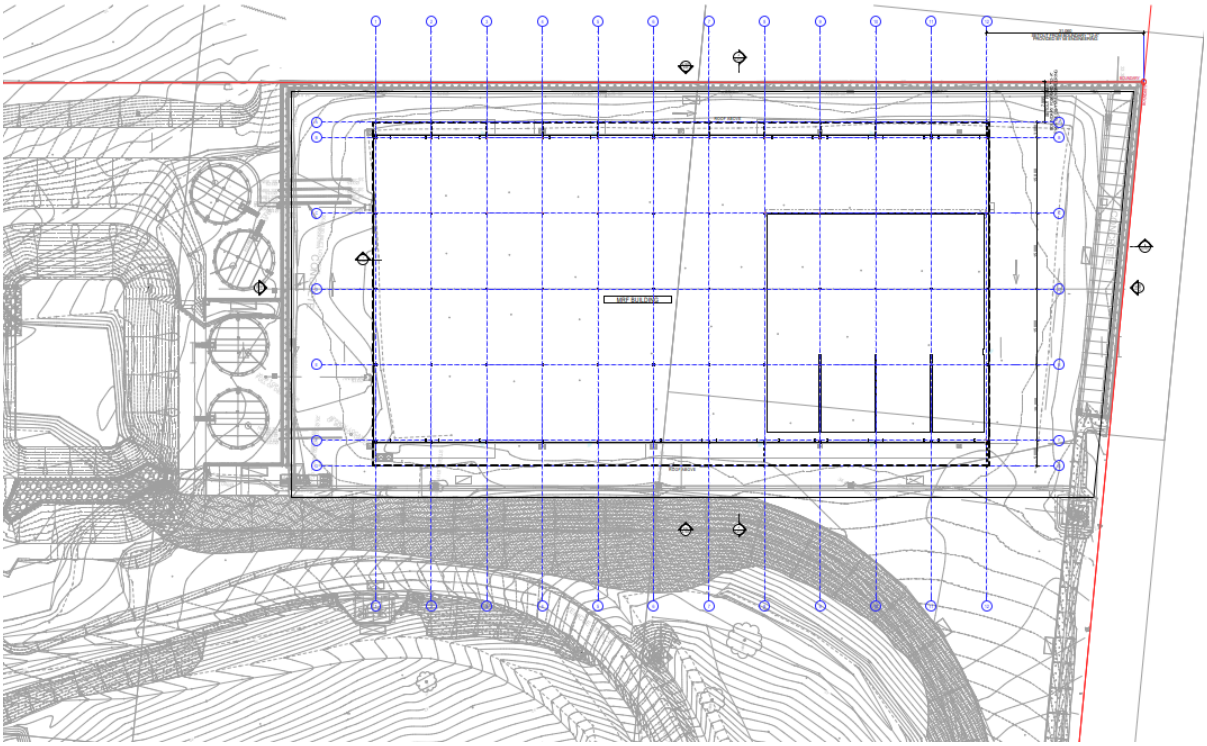


Figure 2: Extract of the Site Plan prepared by *MIEngineers*.

2 PROPERTY DETAILS

2.1 DESCRIPTION OF PROPERTY

The subject site has a legal description of Lot 436 DP 808415, Flatrock Road, Mundamia. The subject site is located approximately 5.7km west of the Nowra town centre. Mundamia is a small New South Wales Rural Location within the local government area of Shoalhaven, it is located approximately 129kms from the capital Sydney covering an area of 12.087km^2. Figure 3 shows the general site location with respect to surrounding towns and major road networks.

The subject site is an irregular shaped parcel of land with a total area of approximately 8.3ha and is located at the end of Flatrock Road. Flatrock Road is accessed from Yalwal Road to the south. The site is generally cleared of all vegetation and topographically variable.

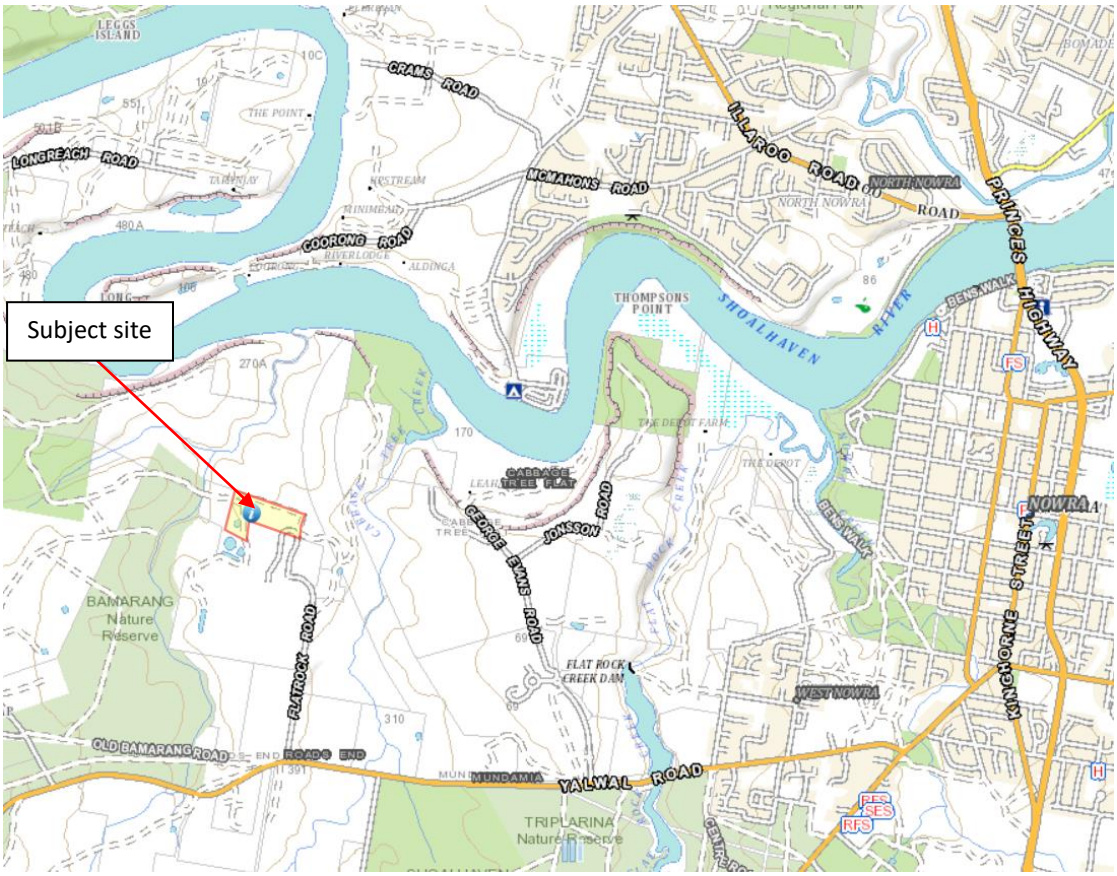


Figure 3: Location of subject site, outlined in red.

Figure 4: Aerial photo showing the approximate site boundaries outlined in blue.

2.2 CLASS OF VEGETATION

The vegetation types have been classified using the formations and sub-formations provided in Figure A1.2 of the bushfire guideline. Vegetation descriptions are as per Keith D, 2004 in Keith (2004) "Ocean Shores to Desert Dunes" published by DECC (except heathlands which is provided two sub-formations rather than one based largely on vegetation height) the main categories are as follows:

- Forests (wet sclerophyll forests and dry sclerophyll forests);
- Woodlands;
- Forested wetlands;
- Tall heaths;
- Freshwater wetlands;
- Short heaths;
- Alpine complex;
- Semi-arid woodlands;
- Arid shrublands;
- Rainforests; and
- Grasslands.

Fuel loads are based on recent information provided by:

- The University of Wollongong's (UoW) Fuels Modelling Project;
- The University of Melbourne (UoM) which reference the fuel classifications found in Keith (2004); and
- CSIRO Ecosystems Sciences and Bushfire Dynamics and Applications.

Where a mix of vegetation types exist, the type providing the greatest bushfire hazard has been used. Vegetation that is to be cleared as part of the development has not been included in this assessment. It should also be noted that remnant vegetation (a parcel of vegetation < 1 ha or fire run of < 50m) and Riparian vegetation are considered a low hazard and APZ setbacks and building construction standards for these will be the same as required for rainforest vegetation.

The following are not required to be considered a bushfire threat for the purposes of PBP, as detailed below:

- Single areas of vegetation less than 1 hectare in area and greater than 100 metres separation from other areas of Category 1 or 2 vegetation.
- Multiple areas of vegetation less than 0.25 hectares in area and not within 20m of the site, or each other or of other areas of vegetation being classified vegetation.
- Strips of vegetation less than 20 metres in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20m of the site or 2 each other, or other areas of vegetation being Category 1, 2 or 3 vegetation.
- Vegetation regarded as low threat due to factors such as flammability, moisture content or fuel load, including grassland managed in a minimal fuel condition, mangroves and other saline wetlands, maintained lawns, golf courses such as playing areas and fairways, maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens and other non-curing crops, cultivated gardens, arboretums, commercial nurseries, nature strips and windbreaks.

  Note: 1. Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bush fire attack (recognizable as short cropped grass for example, to a nominal height of 100 mm). 2. A windbreak is considered a single row of planted trees located on a boundary and used as a screen or to reduce the effect of wind on the leeward side of the trees.
- Existing areas of managed gardens and lawns within curtilage of buildings. Non-vegetated areas, including waterways, roads, footpaths, buildings, and rocky outcrops.

The characteristics of the surrounding vegetation communities were obtained using, Compilation Map: Biometric Vegetation Types & Endangered Ecological Communities of the Shoalhaven, Eurobodalla & Bega Valley Local Government Areas, A Living Map, (2013) NSW Office of Environment and Heritage, V2.0. Vegetation posing the dominate threat to the development is located to the north and west. Vegetation in this area has been classified as a community of Sydney Coastal Dry Sclerophyll Forest.

According to Keith (2004) the Sydney Coastal Dry Sclerophyll Forest vegetation posing a threat to the proposed development would be classified as Forest.

Figure 5: Development footprint surrounded by managed rural land.

2.3 ASSESSMENT OF SLOPE

The slope in all directions over a distance of 100m from the existing property boundary or building footprint has been assessed in terms of the following classes:

(i) all upslope vegetation (considered 0°)
(ii) >0 to 5° downslope vegetation
(iii) >5 to 10° downslope vegetation
(iv) >10 to 15° downslope vegetation
(v) >15 to 18° downslope vegetation.

During the assessment of the slope, if it was found that there were a number of different slope classes present over the 100m in any one direction, the slope of the area, which will most significantly influence the fire behavior, has been adopted.

The effective bushfire slopes most influencing bushfire behaviour to the north and west are 0 to 5° Downslope.

2.4 SIGNIFICANT ENVIRONMENTAL FEATURES

The proposed development site contains no known significant environmental features.

2.5 THREATENED SPECIES

There are no known threatened species on the subject land at the time of writing this report.

2.6 ABORIGINAL RELICS

There are no known aboriginal relics located on the subject land at the time of writing this report.

2.7 ZONING

The site is subject to the provisions of Shoalhaven City Council LEP 2014, under which it is zoned **SP2 Infrastructure**. Figure 6 shows the zoning map of the subject site and surrounding lands.

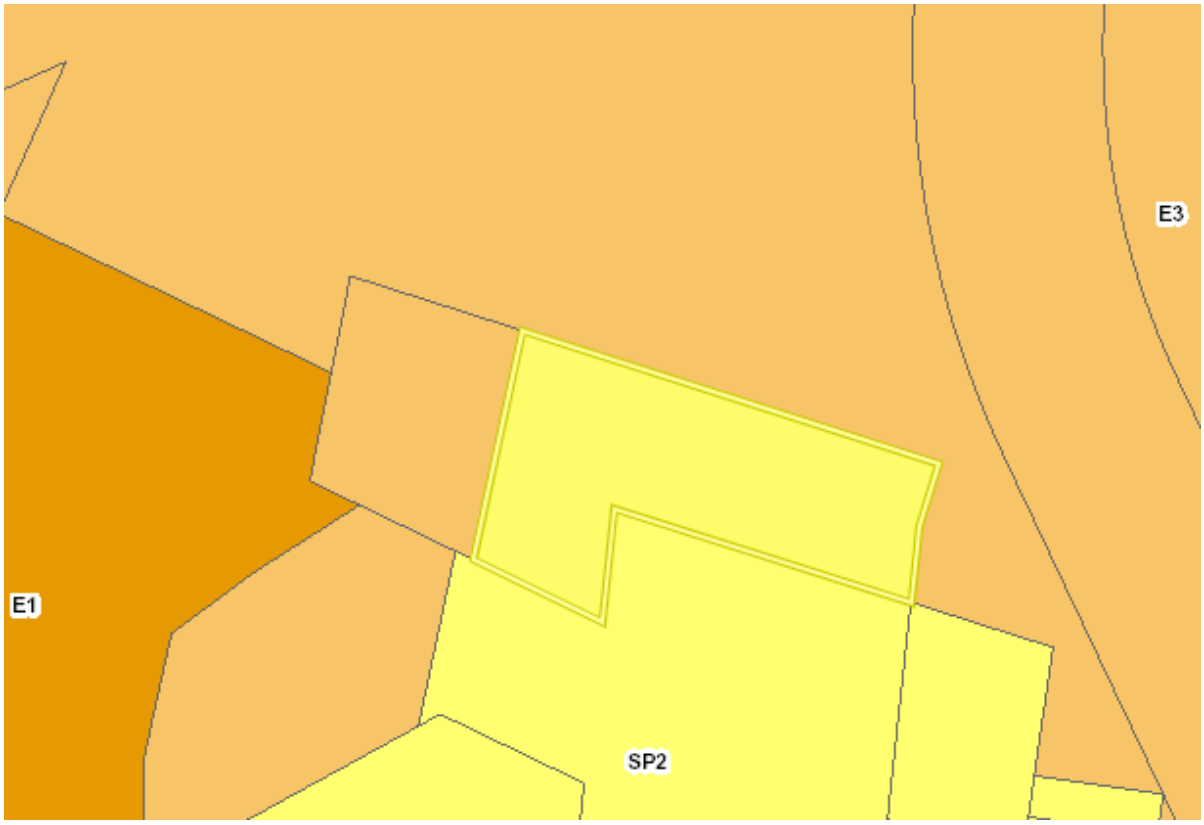


Figure 6: Zoning map of approximate site boundaries outlined in yellow.

The objectives of the SP2 zone are:

- *To provide for infrastructure and related uses.*
- *To prevent development that is not compatible with or that may detract from the provision of infrastructure.*

3 PROPERTIES ADEQUACY FOR BUSHFIRE PROTECTION

3.1 ASSESSMENT METHODOLOGY

A site inspection was conducted to determine the direction and scale of any potential bush fire event based on an analysis of slope, aspect, vegetation type and density, current fuel loading and evidence of past fire history.

The information contained in the appendices of the PBP 2019 has been used to categorise vegetation type and slope class in the locality, as discussed in Sections 2.2 and 2.3 of this report. Section A1.6 of the PBP 2019 was used to determine the appropriate fire area and corresponding FDI rating. Following on from this, Table A1.12.5 of PBP 2019 was used to determine APZs for each respective vegetation class and the bushfire exposure level (construction requirements) for the proposed development.

3.2 SPECIFICATIONS FOR ASSET PROTECTION ZONE

The aim of APZs is to ensure that there is a progressive reduction in flammable material towards any building. In relation to APZs for infill development the performance criteria are to provide a defendable space onsite and to provide and maintain asset protection zones for the life of the development as to prevent the spread of a fire towards the building. The intent of the measures is to provide sufficient space and maintain reduced fuel loads, so as to ensure radiant heat levels at buildings are below critical limits and to prevent direct flame contact with the building. The performance criteria and acceptable solutions for asset protection zones for infill development in accordance with PBP 2019 are provided in Table 1.

Table 1: Provides the performance criteria and acceptable solutions for APZ for residential development in accordance with PBP 2019.

Performance Criteria	Acceptable Solutions	Compliance
The intent may be achieved where:		
APZs are provided commensurate with the construction of the building. A defendable space is provided.	• An APZ is provided in accordance with Table A1.12.2 and A1.12.3 of Appendix 1 of PBP 2019.	APZ's are wholly contained within the subject site.
APZs are managed and maintained to prevent the spread of a fire towards the building.	APZs are managed in accordance with the requirements of Appendix 4 of PBP.	The APZs on the subject site should have no problem being maintained in accordance with the requirements of Standards for Asset Protection Zones (RFS, 2005).
The APZ is provided in perpetuity. APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimized.	APZs are wholly within the boundaries of the development site. The APZ is located on lands with a slope less than 18 degrees.	The subject site does not contain slopes greater than 18 degrees.

Table 2 provides a breakdown of the vegetation type, slope class and the required APZ for the proposed development. The APZs have been calculated for the Illawarra/Shoalhaven region using a FFDI of 100. The distance for the asset protection zone/separation distance has been measured in accordance with Table A1.12.5 PBP 2019 (Determination of BAL, FFDI 100 – Residential Development) which is between each of the vegetation stands identified (from the edge of the foliage cover) and the building. The separation distances have been measured onsite using a Nikon Forestry Pro Range Finder and Clinometer.

Table 2: Breakdown of the vegetation type, slope class and the required APZ in accordance with Appendix 1 with Table A1.12.5.

Direction	*Dominate Vegetation Type*	*Effective Bushfire Slope*	*APZ Provided (m)*	*BAL*	*Comments*
Proposed Material Recovery Facility					
North	Forest	0 to 5° Downslope	23.9m	**BAL 40**	APZs already established.
West	Forest	0 to 5° Downslope	7.9m	**BAL-FZ**	APZs already established.
All Other Directions	Managed Land	-	>100m	**BAL Low**	Managed land

3.3 ASSESSING THE BUSHFIRE RISK

The main factors directly affecting the behavior of fire are:

- Wind (strength and direction);
- Fuel Moisture and content (how dry it is, relative humidity);
- Type quantity and arrangement of fuel (vegetation density); and
- Slope (fire spreads quicker upslope due to preheating).

The prevailing weather conditions associated with the bushfire season in the Shoalhaven (Mundamia) region are strong north-westerly winds, low relative humidity, and high temperatures. With the combination of the current vegetation (after the land is developed) and slope, the overall bushfire risk associated with the proposed development ranges from **Extreme** to **High**, with the foremost bushfire risk coming from north and west of the subject site.

The following combination of mitigation measures are recommended to provide an appropriate level of safety for occupants of the MRF and a level consistent with that required by PBP 2019:

- The subject site shall continue to be maintained, as an Inner Protection Area – IPA (Figure 7) for the life of the development and comply with section 7.4 and Appendix 4 of Planning for Bush Fire Protection 2019 and the NSW Rural Fire Service's document 'Standards for asset protection zones', as outlined below:

  Trees

  - tree canopy cover should be less than 15% at maturity;
  - trees at maturity should not touch or overhang the building;
  - lower limbs should be removed up to a height of 2m above the ground;
  - tree canopies should be separated by 2 to 5m; and
  - preference should be given to smooth barked and evergreen trees.

Shrubs

- create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings should be provided;
- shrubs should not be located under trees;
- shrubs should not form more than 10% ground cover; and
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

Grass

- grass should be kept mown (as a guide grass should be kept to no more than 100mm in height); and
- leaves and vegetation debris should be removed.

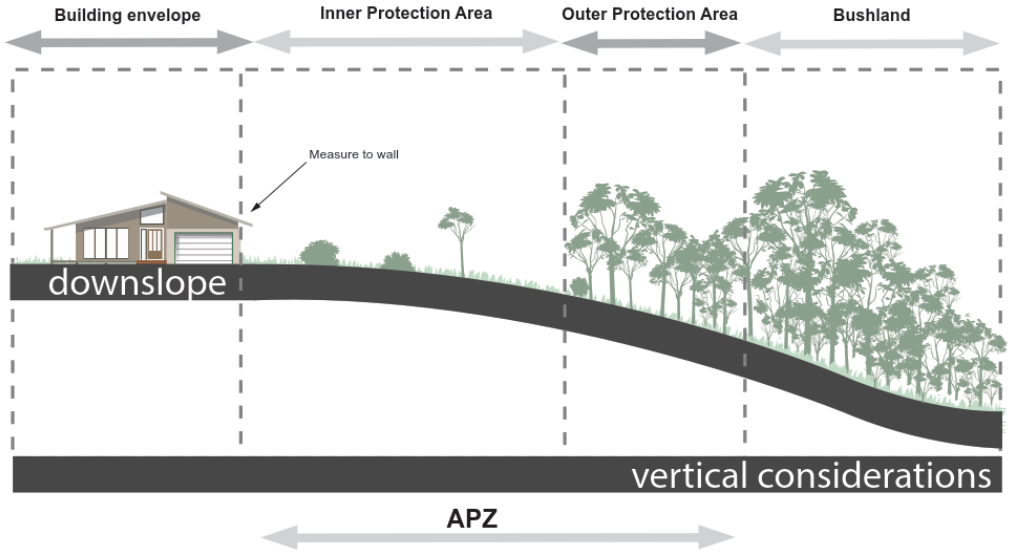


Figure 7: Diagrammatic representation of an Asset Protection Zone.

3.4 CONSTRUCTION STANDARDS

The construction standards and associated performance criteria for infill development require that the proposed building can withstand bushfire attack in the form of wind, smoke, embers, radiant heat and flame contact. Section 3.3 of PBP 2019 requires that the construction standards be determined in accordance with AS3959 or NASH Standards.

AS3959-2018 states that the construction requirements for the next lower BAL than that determined for the site may be applied to an elevation of the building where the elevation is not exposed to the source of bushfire attack. An elevation is deemed to be not exposed to the source of bushfire attack if all of the straight lines between that elevation and the source of bushfire attack are obstructed by another part of the building. The construction requirements for a shielded elevation shall be not less than that required for BAL—12.5, except where the exposed elevations have been determined as BAL—LOW.

Recommendations

A3959-2018 – *Construction of Buildings in Bushfire Prone Areas* does not apply to this class of building (Class 8) and thus the building has no specific bushfire construction requirements. The subject site shall continue to be maintained, as an IPA for the life of the development.

However, to prevent material ignition and afford occupants of the building adequate protection from exposure to a bush fire, the proposed building shall be designed and constructed to comply with the following:

WALLS

The exposed components of external walls shall be non-combustible.

JOINTS

All joints in the external surface material of walls shall be covered, sealed, overlapped, backed or butt - jointed.

VENTS AND WEEPHOLES

Vents and weepholes in external walls shall be screened with a mesh made of corrosion-resistant steel or bronze.

VEHICLE ACCESS DOORS

The following applies to vehicle access doors:

(a) Vehicle access doors shall be non-combustible.
(b) Where the garage is attached to the building, the requirements of Clause 3.2.2(b) shall apply.
(c) All vehicle access doors shall be protected with suitable weather strips, draught excluders, draught seals or brushes. Door assemblies fitted with guide tracks do not need edge gap protection.
(d) Weather strips, draught excluders, draught seals or brushes to protect edge gaps or thresholds shall be manufactured from materials having a flammability index not exceeding 5.
(e) Vehicle access doors shall not include ventilation slots.

EXTERNAL DOOR

External door systems, including door frames and doors with glazed panels, shall—

(a) Shall be non – combustible.
(b) Doors shall be tight-fitting to the door frame and to an abutting door, if applicable.
(c) Weather strips, draught excluders or draught seals shall be installed at the base of side-hung external doors.
(d) Seals shall not compromise the FRL or the performance achieved in AS 1530.4.

ROOF SYSTEM

The roof system shall be designed to comply with Section 8.6 (BAL 40) of Australian Standard AS3959-2018 Construction of Buildings in Bush Fire-Prone Areas (2018).

3.5 SITING AND ADEQUACY OF WATER ELECTRICITY AND GAS SUPPLIES

The performance criteria and acceptable solutions for water, electricity, and gas for residential infill development are provided in PBP 2019. The intent of the measures are to provide adequate water services for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building.

Table 3: Provides the performance criteria and acceptable solutions for water, electricity, and gas for residential infill development in accordance with PBP 2019.

Performance Criteria	Acceptable Solutions	Compliance
Water Supply		
An adequate water supply is provided for firefighting purposes.	• Reticulated water is to be provided to the development, where available; and • A static water supply is provided where no reticulated water is available.	The development will be serviced by a ring main system. Hydrants shall comply with the acceptable solutions.
Water supplies are located at regular intervals; and The water supply is accessible and reliable for firefighting operations.	• Fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2005; • Hydrants are not located within any road carriageway; and • Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.	
Flows and pressure are appropriate.	• Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.	
The integrity of the water supply is maintained.	• All above-ground water service pipes external to the building are metal, including and up to any taps.	
Electricity Services		
Location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings.	• Where practicable, electrical transmission lines are underground. • Where overhead electrical transmission lines are proposed: ○ Lines are installed with short pole spacing (30 metres), unless crossing gullies, gorges, or riparian areas; and ○ No part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 Guideline for Managing Vegetation Near Power Lines.	The area is serviced by existing above ground electrical transmission lines. The augmentation of that service should have no problem satisfying the acceptable solution for electricity.

Performance Criteria	Acceptable Solutions	Compliance
Gas Services		
Location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings	• Reticulated or bottled gas is installed and maintained in accordance with AS 1596:2014 and the requirements of relevant authorities. Metal piping is to be used. • All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side. • Connections to and from gas cylinders are metal. • polymer-sheathed flexible gas supply lines are not used. • above-ground gas service pipes are metal, including and up to any outlets.	Reticulated piped gas is not available to the subject site. Any future gas bottles shall be installed and maintained in accordance with AS 1596. Gas cylinders are to be positioned in accordance with the acceptable solution outlined in this table. From the site inspection there is no reason why the installation of gas cylinders for future buildings associated with the proposal cannot comply with the acceptable solutions outlined in this table.

3.6 ADEQUACY OF ACCESS AND EGRESS FROM SITE FOR EMERGENCY RESPONSES

In relation to access requirements for infill development the performance criteria are for safe, operational access to be provided (and maintained) for emergency services personnel in suppressing a bushfire while residents are seeking to relocate, in advance of a bushfire. The acceptable solution for access is to satisfy the intent and performance criteria for access roads in section 5.3.2 of PBP 2019. An assessment of the proposed development against these requirements is provided in Table 4.

Table 4: Provides the performance criteria and acceptable solutions for Property Access Roads for residential and rural development in accordance with section 5.3.2 of PBP 2019.

Performance Criteria	Acceptable Solutions	Compliance
Firefighting vehicles are provided with safe, all-weather access to structures	• Property access roads are two-wheel drive, all weather roads;	Property access road is a two-wheel drive all weather road.
• The capacity of access roads is adequate for firefighting vehicles	The capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges/causeways are to clearly indicate load rating.	The proposed property access does not transverse any areas subject to periodic inundation.
There is appropriate access to water supply	• Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005 - Fire hydrant installations System design, installation and commissioning; and • There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	It is proposed to install a ring main hydrant system complying with the provisions of AS2419.1:2005.

Performance Criteria	Acceptable Solutions	Compliance
Firefighting vehicles can access the development and exit the property safely.	• At least one alternative property access road is provided for individual buildings or groups of buildings that are located more than 200 metres from a public through road; • There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed building and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles. • In circumstances where this cannot occur, the following requirements apply: - Minimum 4m carriageway width; - In forest, woodland and heath situations, rural property roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m, at the passing bay; - A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches; - Property access must provide a suitable turning area in accordance with Appendix 3; - Curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress; - The minimum distance between inner and outer curves is 6m; - The crossfall is not more than 10 degrees; - Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; and a development comprising more than three dwellings has formalised access by dedication of a road and not by right of way. • *Note: Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.*	Access shall be upgraded where required to comply with the following: - Minimum 4m carriageway width; - In forest, woodland and heath situations, rural property roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m, at the passing bay; - A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches; - Property access must provide a suitable turning area in accordance with Appendix 3; - Curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress; - The minimum distance between inner and outer curves is 6m; - The crossfall is not more than 10 degrees; - Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads. The existing access road generally complies with the access requirements of PBP 2019.

3.7 ADEQUACY OF BUSHFIRE MAINTENANCE PLANS FOR EMERGENCY

Shoalhaven Rural Fire District (92 Albatross Rd, PO Box 372 Nowra) currently administers bushfire maintenance plans and fire emergency procedures in this particular area.

Legislation requires occupants of land to immediately extinguish fires or notify fire-fighting authorities, on becoming aware of fire during a fire danger period. The most appropriate course of action is to telephone "000" and report the fire.

3.8 LANDSCAPING

The performance criteria is for landscaping to be designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind driven embers to cause ignitions. The general principles of landscaping for bushfire protection aim to:

- Prevent flame impingement on the building;
- Provide a defendable space for property protection;
- Reduce fire spread;
- Deflect and filter embers;
- Provide shelter from radiant heat; and
- Reduce wind speed".

It is recommended that any future landscaping be designed and maintained in accordance with the following practices:

- maintaining a clear area of low cut lawn or pavement adjacent to the house;
- keeping areas under fences, fence posts and gates and trees raked and cleared of fuel;
- utilising non-combustible fencing and retaining walls;
- breaking up the canopy of trees and shrubs with defined garden beds;
- organic mulch should not be used in bushfire prone areas and non-flammable material should be used as ground cover, e.g. Scoria, pebbles, recycled crushed bricks.
- planting trees and shrubs such that:
    - the branches will not overhang the roof; and
    - the tree canopy is not continuous.

4. CONCLUSION AND RECOMMENDATIONS

This Bushfire Assessment Report has been prepared for Shoalhaven City Council to accompany a modification application to Regional Application RA21/1002 to amend inconsistencies with the recommended bushfire construction requirements and the proposed design. RA21/1002 related to a materials recovery facility at Flatrock Road, Mundamia, Lot 436 DP 808415.

The subject site is an irregular shaped parcel of land with a total area of approximately 8.3ha and is located at the end of Flatrock Road. Flatrock Road is accessed from Yalwal Road to the south. The site is generally cleared of all vegetation and topographically variable.

With the combination of the current vegetation (after the land is developed) and slope, the overall bushfire risk associated with the proposed development ranges from **Extreme** to **High**, with the foremost bushfire risk coming from north and west of the subject site.

The following combination of mitigation measures are recommended to provide an appropriate level of safety for occupants of the building and a level consistent with that required by PBP 2019:

- The subject site shall continue to be maintained, as an IPA for the life of the development and comply with section 7.4 and Appendix 4 of Planning for Bush Fire Protection 2019 and the NSW Rural Fire Service's document 'Standards for asset protection zones'.

- The provision of water, electricity and gas services to comply with section 7.4 of Planning for Bush Fire Protection 2019.

- Access shall be upgraded where required to comply with the following:
    - Minimum 4m carriageway width;
    - In forest, woodland and heath situations, rural property roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m, at the passing bay;
    - A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches;
    - Property access must provide a suitable turning area in accordance with Appendix 3;
    - Curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress;
    - The minimum distance between inner and outer curves is 6m;
    - The crossfall is not more than 10 degrees; and
    - Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads.

- Any future landscaping shall be designed and maintained in accordance with the following practices:
    - maintaining a clear area of low cut lawn or pavement adjacent to the house;
    - keeping areas under fences, fence posts and gates and trees raked and cleared of fuel;
    - utilising non-combustible fencing and retaining walls;
    - breaking up the canopy of trees and shrubs with defined garden beds;
    - organic mulch should not be used in bushfire prone areas and non-flammable material should be used as ground cover, e.g. Scoria, pebbles, recycled crushed bricks.
    - planting trees and shrubs such that:
        - the branches will not overhang the roof;
        - the tree canopy is not continuous.

- A3959-2018 – Construction of Buildings in Bushfire Prone Areas does not apply to this class of building (Class 8) and thus the building has no specific bushfire construction requirements. The subject site shall continue to be maintained, as an IPA for the life of the development.

- To prevent material ignition and afford occupants of the building adequate protection from exposure to a bush fire, the proposed building shall be designed and constructed to comply with the following:

  - **WALLS**
    - The exposed components of external walls shall be non-combustible.

  - **JOINTS**
    - All joints in the external surface material of walls shall be covered, sealed, overlapped, backed or butt - jointed.

  - **VENTS AND WEEPHOLES**
    - Vents and weepholes in external walls shall be screened with a mesh made of corrosion-resistant steel or bronze.

  - ***VEHICLE ACCESS DOORS***
    - The following applies to vehicle access doors:
      (a) Vehicle access doors shall be non-combustible.
      (b) Where the garage is attached to the building, the requirements of Clause 3.2.2(b) shall apply.
      (c) All vehicle access doors shall be protected with suitable weather strips, draught excluders, draught seals or brushes. Door assemblies fitted with guide tracks do not need edge gap protection.
      (d) Weather strips, draught excluders, draught seals or brushes to protect edge gaps or thresholds shall be manufactured from materials having a flammability index not exceeding 5.
      (e) Vehicle access doors shall not include ventilation slots.

  - **EXTERNAL DOOR**
    - External door systems, including door frames and doors with glazed panels, shall—
      (a) Shall be non – combustible.
      (b) Doors shall be tight-fitting to the door frame and to an abutting door, if applicable.
      (c) Weather strips, draught excluders or draught seals shall be installed at the base of side-hung external doors.
      (d) Seals shall not compromise the FRL or the performance achieved in AS 1530.4.

  - **ROOF SYSTEM**
    - The roof system shall be designed to comply with Section 8.6 (BAL 40) of Australian Standard AS3959-2018 Construction of Buildings in Bush Fire-Prone Areas (2018).

If the proposed development is constructed and maintained in accordance with the recommendations outlined in this report it will comply with performance requirements provided in *Planning for Bushfire Protection* (2019) and AS3959-2018 and will provided adequate provision for firefighting strategies. Ccompliance with the overall performance provided in *Planning for Bushfire Protection* (2019) and the deem to satisfy provisions provided in AS3959-2018 is provided Table 5.

Table 5: Compliance with the performance requirements of provided in Planning for Bushfire Protection (2019) and the deem to satisfy provisions provided in AS3959-2018.

Bushfire Protection Measure	Compliance
Asset Protection Zone	Refer to Sections 3.2, and 3.3
The siting and adequacy of water supplies for fire fighting	YES - Refer to Sections 3.5.
Capacity of public roads to handle increased volumes of traffic in the event of a bushfire emergency	Not applicable
Whether or not public roads in the vicinity that link with the fire trail network have two-way access	Not applicable.
Adequacy of emergency response access and egress	YES - Refer to Section 3.6.
Adequacy of bushfire maintenance plans and fire emergency procedures	YES - Refer to Sections 3.7.
Building construction standards	Not applicable.
Adequacy of sprinkler systems and other fire protection measures to be incorporated into the development	Internal sprinkler system proposed as part of NCC requirements.

This Bushfire Assessment Report should remain current for a period of twelve months (Dec 2024), at which time it should be subject to review to take into account changing land use and vegetation patterns. Any major bushfire event that affects the subject site should also trigger a review in order to determine the effectiveness of protection measures and annual hazard reduction activities.

The findings contained within this report are the result of discrete/specific methodologies used in accordance with recognised practices. To the best of our knowledge they represent a reasonable interpretation of the general conditions of the site. Having stated this, it is important to note that although designing a building to have an improved level of fire resistance will increase the likelihood of survival in a bushfire, their survival and that of the occupants cannot be guaranteed and therefore the decision whether to *stay* or *go* should be based on an understanding that the adoption of solutions outlined in this report will not guarantee safety.

ATTACHMENT 1

SITE PLANS

S4.55 APPLICATON
MATERIAL RECYCLING FACILITY
120 FLATROCK ROAD, MUNDAMIA, NSW 2540

MRF BUILDING

DRAWING LIST - S4.55		
DRAWING No.	**DESCRIPTION**	**REV**
A.1000	COVER PAGE	B
A.1001	SURVEY	B
A.1002	SITE PLAN	B
A.1003	GROUND FLOOR PLAN	B
A.1004	ROOF PLAN	B
A.1005	ELEVATIONS	B
A.1006	SECTIONS	B
A.1007	EXTERNAL FINISHES	B

SITE / LOCATION PLAN N.T.S

GENERAL NOTES:
- DO NOT SCALE FROM DRAWINGS. USE FIGURED DIMENSIONS ONLY.
- ANY DISCREPANCIES IN DOCUMENTATION-CONTACT THE ARCHITECT FOR CLARIFICATION.
- ALL SITE CONDITIONS INCLUDING LEVELS TO BE CONFIRMED. ANY DISCREPANCIES TO BE REFERRED TO ARCHITECT PRIOR TO CONSTRUCTION
- CHECK ALL DIMENSIONS ON SITE PROIR TO FABRICATING ANY ITEMS
- THESE DRAWINGS ARE SUBJECT TO COPYRIGHT
- SELECTED WINDOW & DOORS TO SUIT DESIGNATED WIND TERRAIN CATEGORY

ISSUE	DESCRIPTION	DATE	DRAWN	CHECKED
A	s4.55 ISSUE	17/07/2023	PN	RG
B	s4.55 ISSUE	11/10/2023	PN	RG
C	s4.55 ISSUE	23/10/2023	PN	RG

PROJECT:
WEST NOWRA MATERIAL RECYCLING FACILITY - BUILDING
120 FLATROCK ROAD MUNDAMIA, NSW 2540

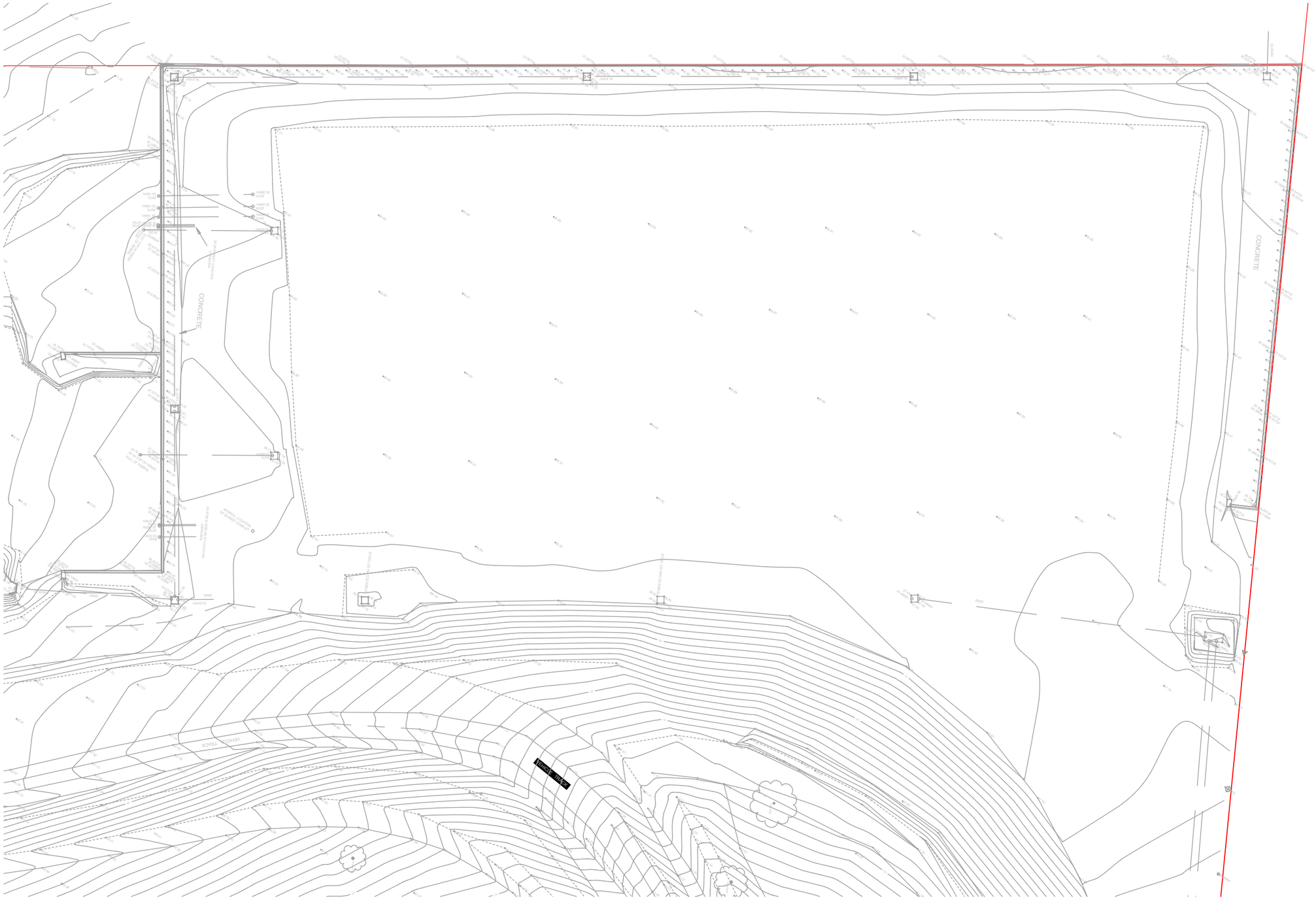
CLIENT:
SHOALHAVEN CITY COUNCIL

SYDNEY
KIAMA
WOLLONGONG
SUNSHINE COAST

BHI ARCHITECTS
NOMINATED ARCHITECT-
MARK HITCHCOCK (NSW 4763)

SCALE: @A3
DATE: 25/10/2023
PROJECT STATUS: S4.55 ISSUE
DRAWING TITLE: **COVER PAGE**
PROJECT NO. 8983
DRAWING NO. A.1000
ISSUE C

NORTH



NOTE:
REFER TO CIVIL ENGINEER PACKAGE DRAWING DN200244/C FOR ALL SITE EXCAVATION WORKS INCLUDING ANY CUT AND FILL TO SITE.

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SCALE: 1:600 @A3
DATE: 25/10/2023
PROJECT STATUS: S4.55 ISSUE
DRAWING TITLE: **SURVEY**
PROJECT NO. 8983
DRAWING NO. A.1001
ISSUE C

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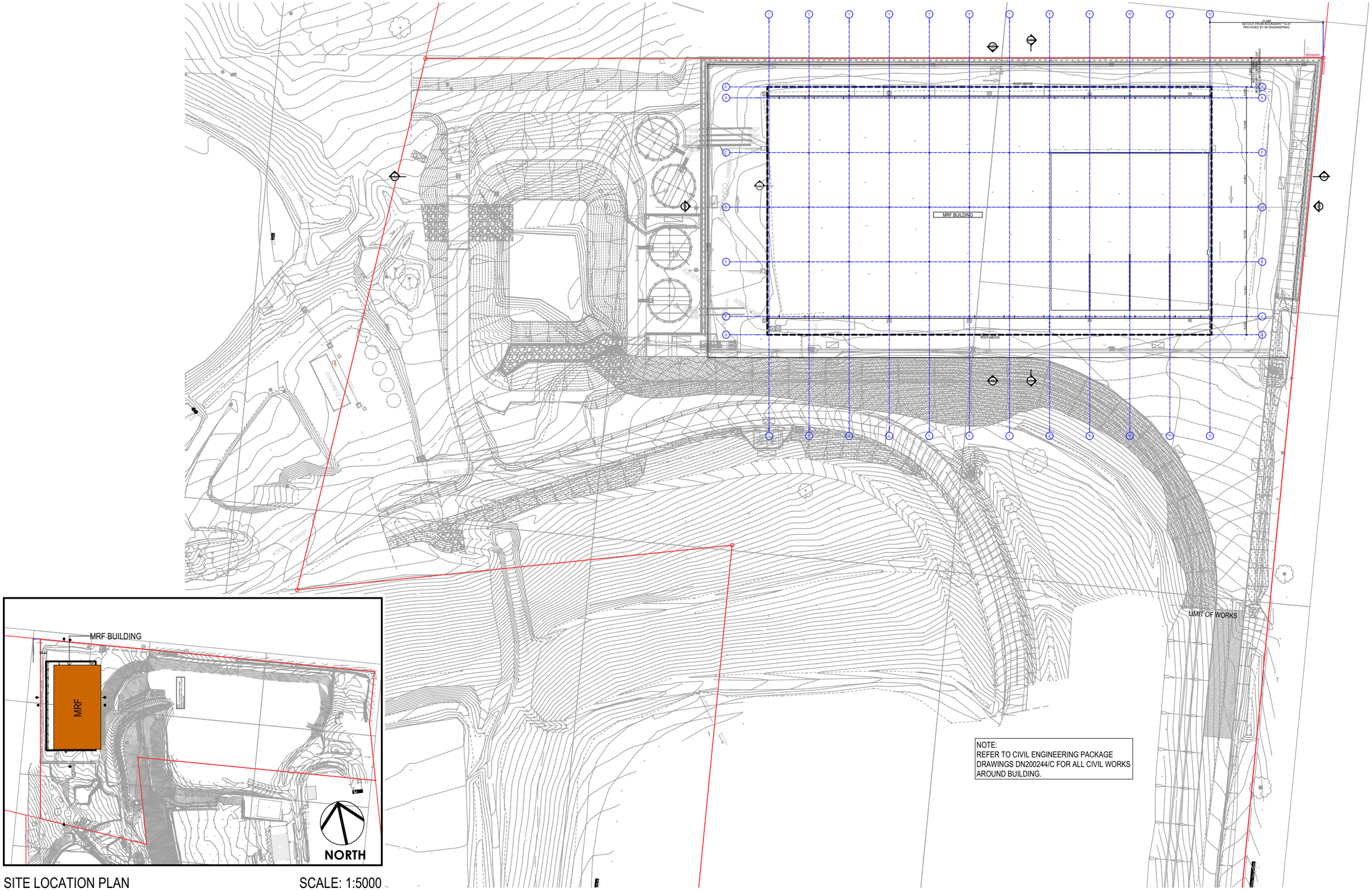

SITE LOCATION PLAN

SCALE: 1:5000

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120 FLATROCK ROAD MUNDAMIA, NSW 2540

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DATE: 25/10/2023
PROJECT STATUS: S4.55 ISSUE
DRAWING TITLE: **SITE PLAN**
PROJECT NO. 8983
DRAWING NO. A.1002
ISSUE C

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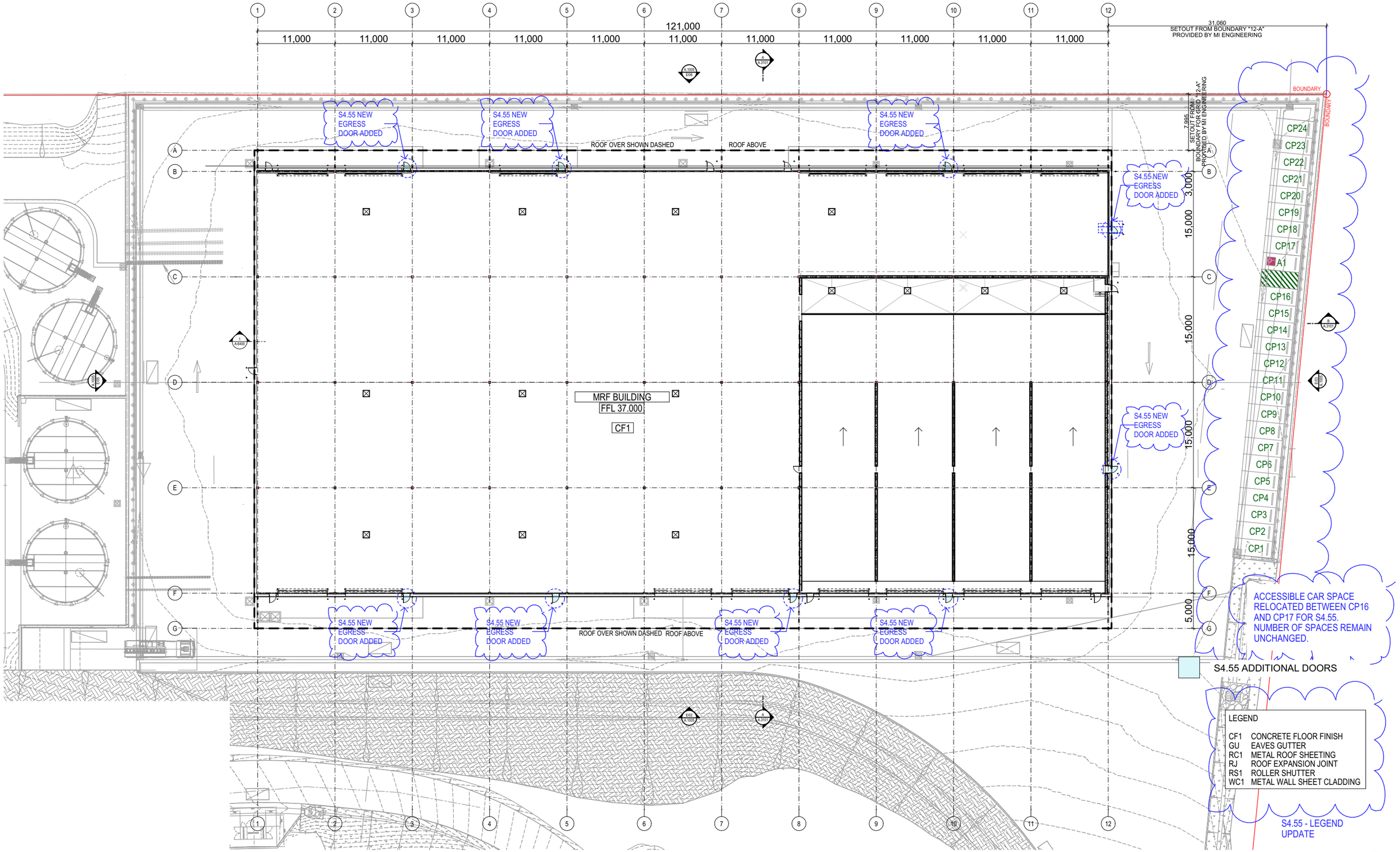

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C	s4.55 ISSUE	23/10/2023	PN	RG

PROJECT:
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120 FLATROCK ROAD MUNDAMIA, NSW 2540

CLIENT:
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NOMINATED ARCHITECT-
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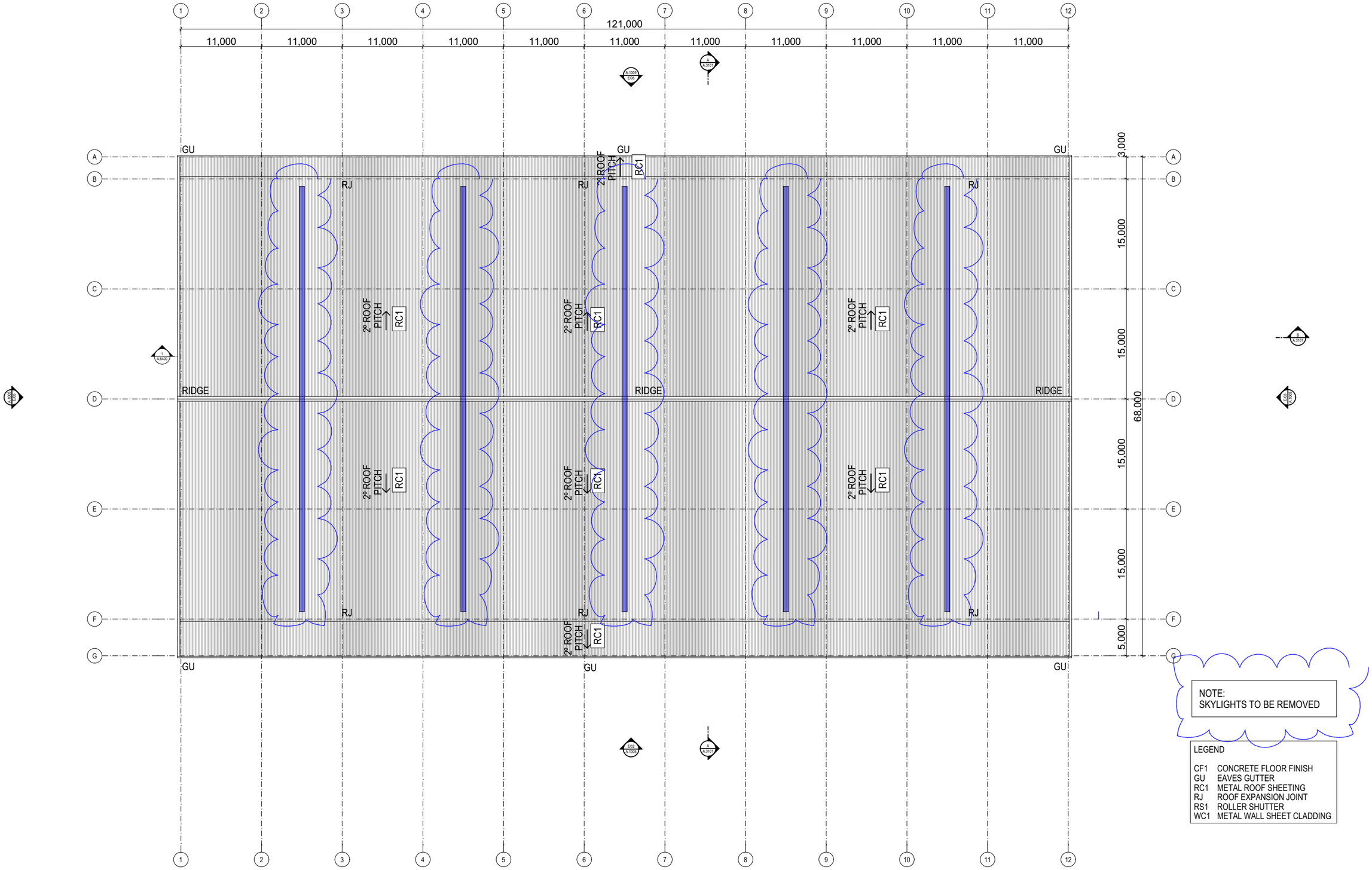
SCALE: 1:500 @A3
DATE: 25/10/2023
PROJECT STATUS: S4.55 ISSUE
DRAWING TITLE: **GROUND FLOOR PLAN**

PROJECT NO.	DRAWING NO.	ISSUE
8983	A.1003	C

NORTH



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120 FLATROCK ROAD MUNDAMIA, NSW 2540

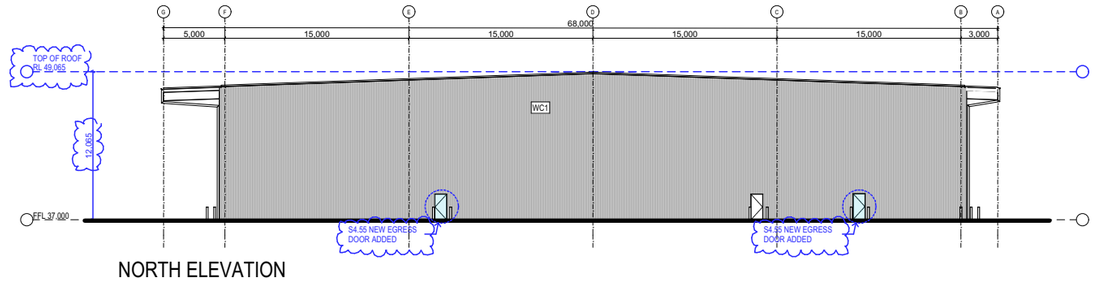
CLIENT:
SHOALHAVEN CITY COUNCIL

SYDNEY
KIAMA
WOLLONGONG
SUNSHINE COAST

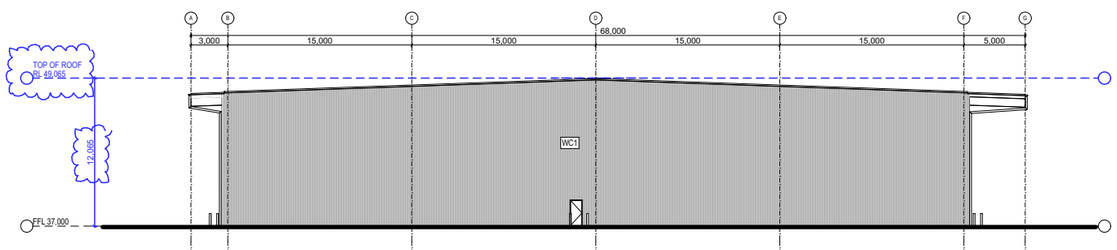
BHI ARCHITECTS
NOMINATED ARCHITECT-
MARK HITCHCOCK (NSW 4763)

SCALE: 1:500 @A3
DATE: 25/10/2023
PROJECT STATUS: S4.55 ISSUE
DRAWING TITLE: **ROOF PLAN**
PROJECT NO. 8983
DRAWING NO. A.1004
ISSUE C

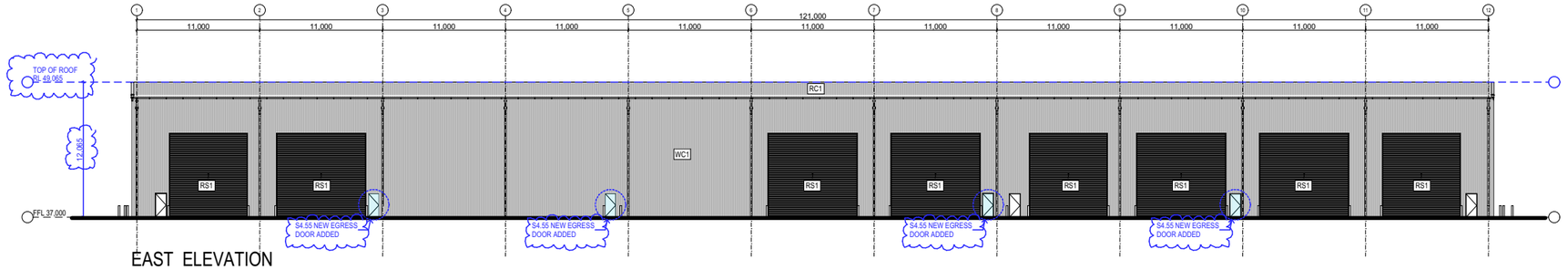
NORTH



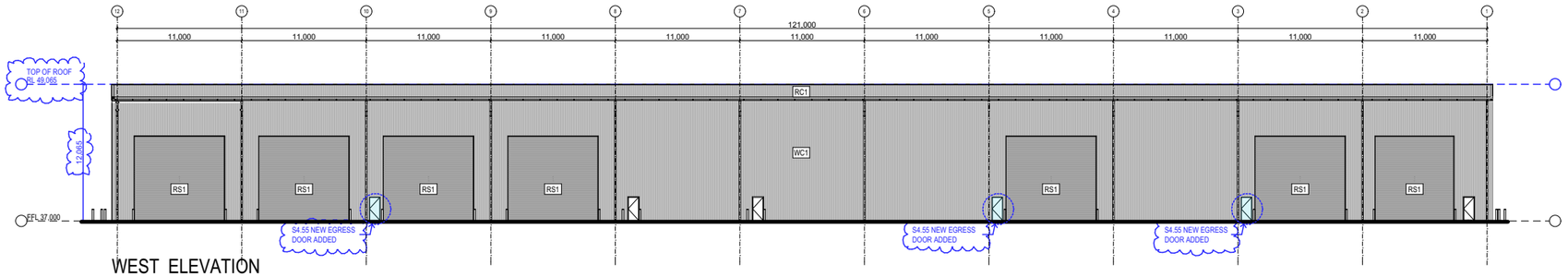
NORTH ELEVATION



SOUTH ELEVATION



EAST ELEVATION



WEST ELEVATION

NOTE:
REFER TO STRUCTURAL ENGINEERS
FOR ALL FRAMING STRUCTURES

S4.55 ADDITIONAL DOORS AND
BUILDING HEIGHT CHANGE

LEGEND

CF1	CONCRETE FLOOR FINISH
GU	EAVES GUTTER
RC1	METAL ROOF SHEETING
RJ	ROOF EXPANSION JOINT
RS1	ROLLER SHUTTER
WC1	METAL WALL SHEET CLADDING

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120 FLATROCK ROAD MUNDAMIA, NSW 2540

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SCALE: 1:500 @A3
DATE: 25/10/2023
PROJECT STATUS: S4.55 ISSUE
DRAWING TITLE: **ELEVATIONS**
PROJECT NO. 8983
DRAWING NO. A.1005
ISSUE C

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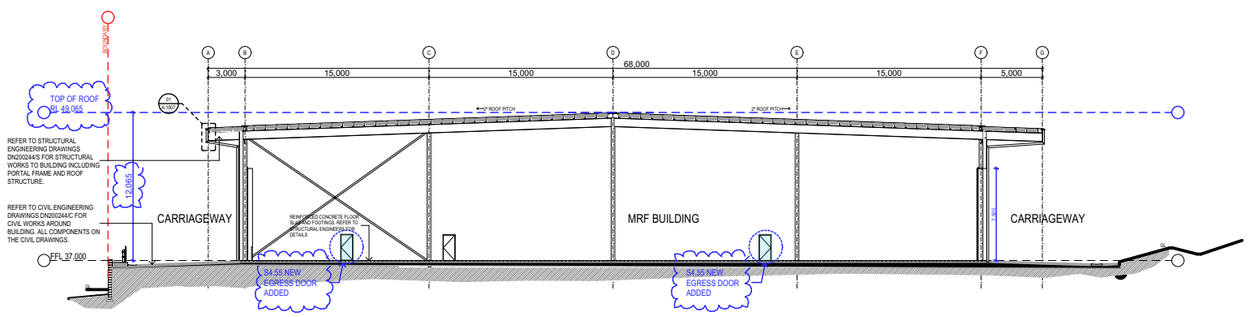
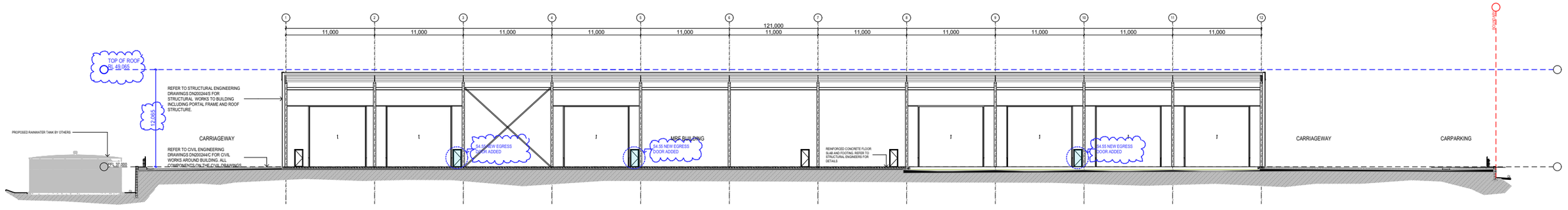


SECTION A-A



SECTION B-B

S4.55 ADDITIONAL DOORS AND BUILDING HEIGHT CHANGE

LEGEND

CF1	CONCRETE FLOOR FINISH
GU	EAVES GUTTER
RC1	METAL ROOF SHEETING
RJ	ROOF EXPANSION JOINT
RS1	ROLLER SHUTTER
WC1	METAL WALL SHEET CLADDING

GENERAL NOTES:

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120 FLATROCK ROAD MUNDAMIA, NSW 2540

CLIENT:
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SYDNEY
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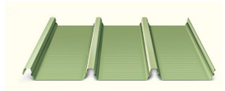
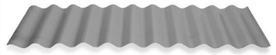
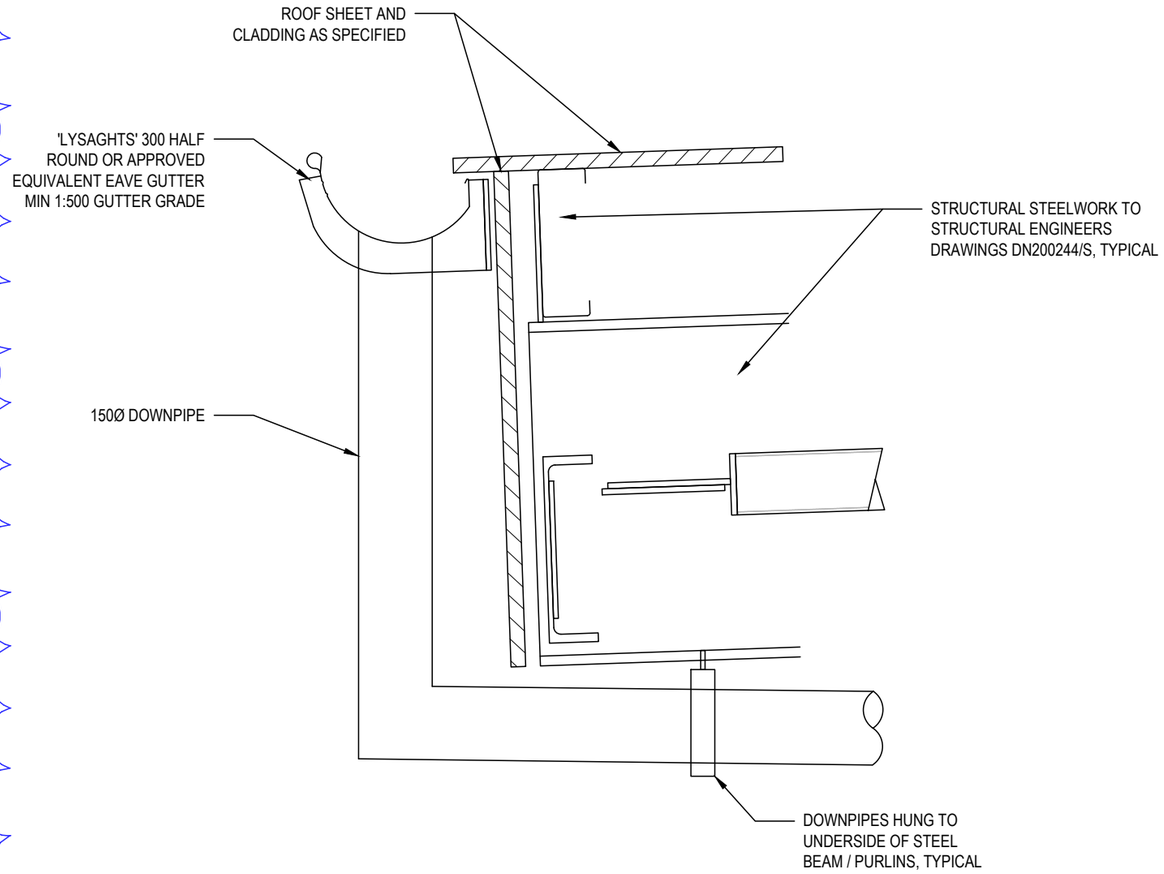
NOMINATED ARCHITECT-
MARK HITCHCOCK (NSW 4763)

SCALE: 1:500 @A3
DATE: 25/10/2023
PROJECT STATUS: S4.55 ISSUE
DRAWING TITLE: **SECTIONS**
PROJECT NO. 8983
DRAWING NO. A.1006
ISSUE C

NORTH

EXTERIOR FINISHES SCHEDULE				
TAG	DESCRIPTION	MATERIAL FINISH	COLOUR	SAMPLE
CF1	CONCRETE FLOOR FINISH	CLASS 2 STEEL TROWEL	CONCRETE	
GU	EAVES GUTTER	COLORBOND HALF ROUND GUTTER	PALE EUCALYPT	
RC1	ROOF CLADDING INCLUDING FLASHING, ROOF ACCESSORIES AND DOWNPIPES	LYSAGHT'S ' KLIP-LOK' ROOF PROFILE	PALE EUCALYPT	
RS1	ROLLER SHUTTER	MOTORISED REMOTE FUNCTION INDUSTRIAL METAL ROLLER SHUTTER	PALE EUCALYPT	
WC1	METAL WALL CLADDING	LYSAGHT'S 'CUSTOM ORB' PROFILE FOR WALLING	PALE EUCALYPT	

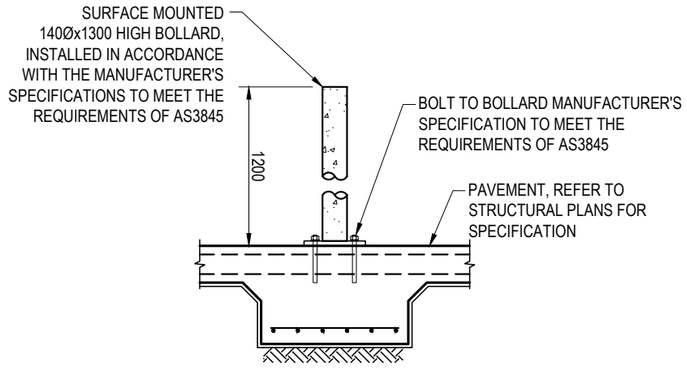
UPDATED EXTERIOR FINISHES SCHEDULE FOR S4.55



01 - TYPICAL EAVES GUTTER DETAIL

SCALE 1:10

TYPICAL DETAIL FOR S4.55



TYPICAL INTERNAL BOLLARD FOOTING DETAIL

SCALE 1:20

GENERAL NOTES:

- DO NOT SCALE FROM DRAWINGS. USE FIGURED DIMENSIONS ONLY.
- ANY DISCREPANCIES IN DOCUMENTATION-CONTACT THE ARCHITECT FOR CLARIFICATION.
- ALL SITE CONDITIONS INCLUDING LEVELS TO BE CONFIRMED, ANY DISCREPANCIES TO BE REFERRED TO ARCHITECT PRIOR TO CONSTRUCTION
- CHECK ALL DIMENSIONS ON SITE PROIR TO FABRICATING ANY ITEMS
- THESE DRAWINGS ARE SUBJECT TO COPYRIGHT
- SELECTED WINDOW & DOORS TO SUIT DESIGNATED WIND TERRAIN CATEGORY

ISSUE	DESCRIPTION	DATE	DRAWN	CHECKED
A	s4.55 ISSUE	17/07/2023	PN	RG
B	s4.55 ISSUE	11/10/2023	PN	RG
C	s4.55 ISSUE	23/10/2023	PN	RG

PROJECT:
WEST NOWRA MATERIAL RECYCLING FACILITY - BUILDING
120 FLATROCK ROAD MUNDAMIA, NSW 2540

CLIENT:
SHOALHAVEN CITY COUNCIL

SYDNEY
KIAMA
WOLLONGONG
SUNSHINE COAST

BHI ARCHITECTS
NOMINATED ARCHITECT-
MARK HITCHCOCK (NSW 4763)

SCALE: @A3
DATE: 25/10/2023
PROJECT STATUS: S4.55 ISSUE
DRAWING TITLE: **EXTERNAL FINISHES**
PROJECT NO. 8983
DRAWING NO. A.1007
ISSUE C

NORTH