PERFORMANCE BUSH FIRE ASSESSMENT REPORT

Residential Development
Integrated Subdivision

Lots 3 & 4 DP 22392
Noroy Place
Old Bar

March 2022

Amended

March 2023 Version 1
July 2023 Version 2

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1.0 INTRODUCTION

An amended Performance Bush Fire Assessment has been carried out for a proposed residential development at Lots 3 & 4 DP 22392 Noroy Place, Old Bar.

This report is based on site assessments in May 2021 and September 2021 for compliance with respect to NSW Rural Fire Services, Planning for Bush Fire Protection 2019 (PBP, 2019) and AS3959 (2018).

This report has been discussed at a Fire Design Brief Meeting (FDBM) and the outcomes are detailed in this report.

March 2023 Version 1 amended report was in response to the Rural Fire Service (RFS) request for further information with respect to the Bush Fire Safety Authority.

This amended report, July 2023 Version 2, is in response to plan changes.

The main changes with respect to bushfire include:

a. The western road south of Noroy Place extension is now a 16m wide public road (seven (7) metre carriageway).

b. Access onto the southern road and not Noroy Place for the Residential Flat Buildings.

No further site inspections have been completed.

The development would be integrated and has a requirement for a Bushfire Safety Authority under Section 100B of the *Rural Fires Act 1997*.

NOTE

The report has been prepared with all reasonable skill, care and diligence.

The information contained in this report has been gathered from field survey, experience and has been completed in consideration of the following legislation.

1. Rural Fires Act 1997.
2. Environmental Planning and Assessment Act 1979 No 203.
3. Building Code of Australia.
4. Council Local Environment Plans and Development Control Plans where applicable.
5. NSW Rural Fire Services, Planning for Bushfire Protection, 2019 (PBP, 2019).
6. AS 3959-2018 Construction of Buildings in Bushfire Prone Areas.

The report recognizes the fact that no property and lives can be guaranteed to survive a bushfire attack.

The report examines ways the risk of bushfire attack can be reduced and where the site falls within the scope of the legislation.

The report is confidential, the writer accepts no responsibility of whatsoever nature, to third parties who use this report or part thereof is made known.

Any such party relies on this report at their own risk.

1.1 Objectives

The objectives of this report are to:

- Ensure that the proposal meets the aims and objectives of NSW Rural Fire Services, *Planning for Bushfire Protection*, 2019 and has measures sufficient to minimize the impact of bushfires; and
- Reduce the risk to property and the community from bushfire; and
- Comply where applicable with AS3959 – 2018.

1.2 Legislative Framework

In NSW, the bushfire protection provisions of the BCA are applied to Class 1, 2, 3, Class 4 parts of buildings, some Class 10 and Class 9 buildings that are Special Fire Protection Purposes (SFPPs).

The BCA references AS3959 – 2018 as the deemed-to-satisfy (DTS) solution for construction requirements in bushfire prone areas for NSW.

All development on bushfire prone land in NSW should comply with the requirements of the bushfire protection measures identified within NSW Rural Fire Service, Planning for Bushfire Protection, 2019**.**

The subdivision is required to obtain a Bushfire Safety Authority from the NSW Rural Fire Service (RFS).

1.3 Location

Locality – Old Bar
Local Government Area - MidCoast Council
Closest Rural Fire Service – Old Bar
Closest Fire Control Centre – Taree

Figure 1 – Topographic Map

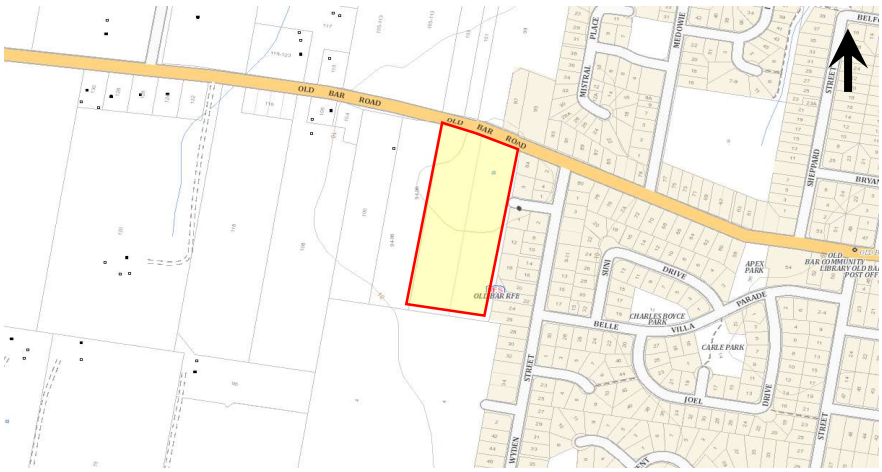


Figure 2 – Aerial View

1.4 Development Proposal and History

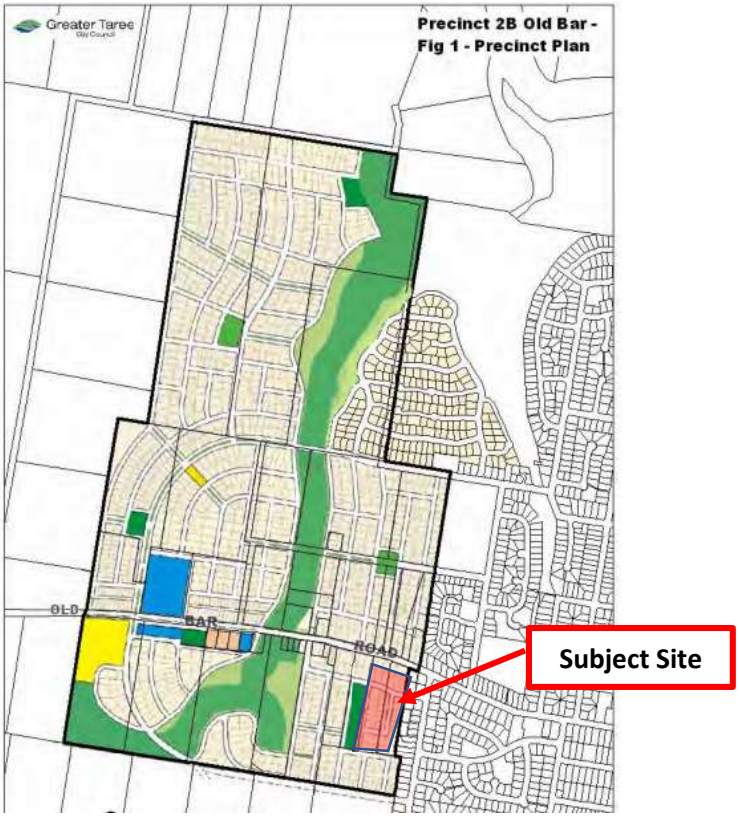
The proposal is for the development of two (2) adjoining lots (Lots 3 & 4 in DP 22392).

The subject site is approximately 3.35 hectares in size and is part of L5 Precinct 2B plan created by MidCoast Council as part the DCP 2010.

The Precinct Plan provides an indicative layout for the development of Precinct 2B.

Development Plans can be seen in **Appendix 1** and Engineering Plans are currently being completed after discussions regarding bushfire compliance.

Figure 3 – Precinct Plan



2.0 BUSH FIRE ASSESSMENT

2.1 Assessment Methodology

Several factors need to be considered in determining the bushfire hazard.

These factors are slope, vegetation type, and distance from hazard, access/egress and fire weather.

Each of these factors has been reviewed in determining the bushfire protection measures.

The assessment of slope and vegetation being carried out in accordance with NSW Rural Fire Service, Planning for Bushfire Protection, 2019.

2.2 Slope Assessment

Slope is a major factor to consider when assessing the bushfire risk.

The slopes were measured using a RangeFinder True Pulse 200.

The hazard vegetation on adjacent land was also identified and the slopes within the vegetation measured.

Table 1 – Hazard Vegetation Slopes

Hazard Aspect	Slope	Upslope/Downslope or Flat
West	3°	Downslope
South	2°	Downslope
North	0-5°	Downslope

The western hazard varies between a 2-3° downslope.

2.3 Vegetation Assessment

The vegetation on and surrounding the subject site was assessed over a distance of 140m.

The vegetation formations were classified using the vegetation formation as detailed in Planning for Bush Fire Protection, 2019.

2.3.1 Vegetation on the Subject Lot

The vegetation on the subject lot consists of grassland that is currently managed.

2.3.2 Vegetation adjacent and adjoining the Subject Lot

The adjoining lot to the west consists of remnant forest, 30-35m in the southern section and 38-42m in the northern section.

Beyond the remnant forest is grassland vegetation with similar slopes, these dimensions are detailed in the hazard mapping.

To the south of the lots is grassland vegetation and to the north across Old Bar Road is grassland vegetation.

Figure 4

Photo 1 – Currently managed land adjacent to the western boundary

Photo 2 - Northern section of the western hazard

Photo 3 – Section of the western hazard

Photo 4 - Grassland vegetation behind remnant forest

Photo 5 – Further section of the western hazard

Photo 6 – Southern part of the western hazard

Photo 7 – Grassland hazard to the south

Photo 8 – Grassland hazard to the south

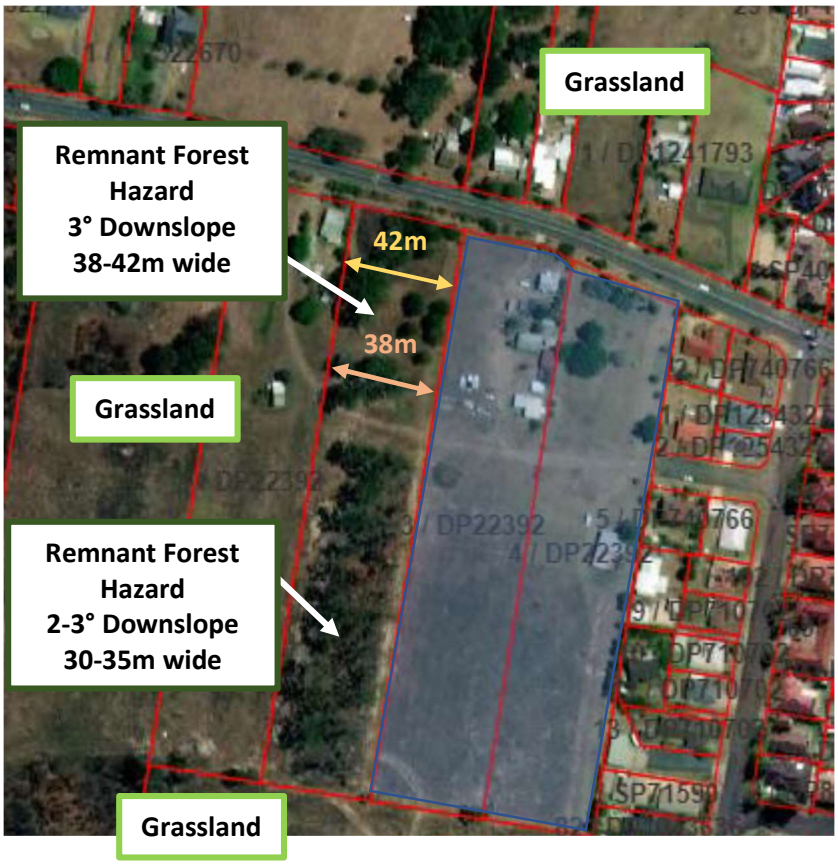
Table 2 – Hazard Vegetation

Hazard Aspect	Vegetation
West	Remnant Forest
South	Grassland
North	Grassland

2.4 Hazard

The dominant hazards are located to the west and south.

Figure 5 - Hazards



With respect to the hazards, the remnant forest has been considered, similar to rainforest after discussions with the RFS.

This was based on possible further development of the grassland vegetation on the lot to the west and the remnant forest not developing into a forest fire considering the grassland vegetation to the west.

The southern hazard has been considered a grassland hazard. (See **Photos**).

The northern hazard has been considered as grassland vegetation.

Figure 6 - Bushfire Mapping

Table 3 – Summary of Hazard Characteristics

Hazard Aspect	Hazard	Slope	Upslope/Downslope or Flat
West	Similar to Rainforest	0-5°	Downslope
South	Grassland	0-5°	Downslope
North	Grassland	0-5°	Downslope

2.5 Fire Danger Index

The fire weather for the site is assumed on the worst-case scenario.

In accordance with NSW Rural Fire Service the fire weather for the site is based upon the 1:50 year fire weather scenario and has a Fire Danger Index (FDI) of 80.

3.0 BUSHFIRE THREAT REDUCTION MEASURES

3.1 NSW Rural Fire Services, *Planning for Bushfire Protection*, 2019

The following provisions of NSW Rural Fire Service, *Planning for Bushfire Protection*, 2019 have been identified:

3.1.1 Defendable Space/Asset Protection Zone (APZ)

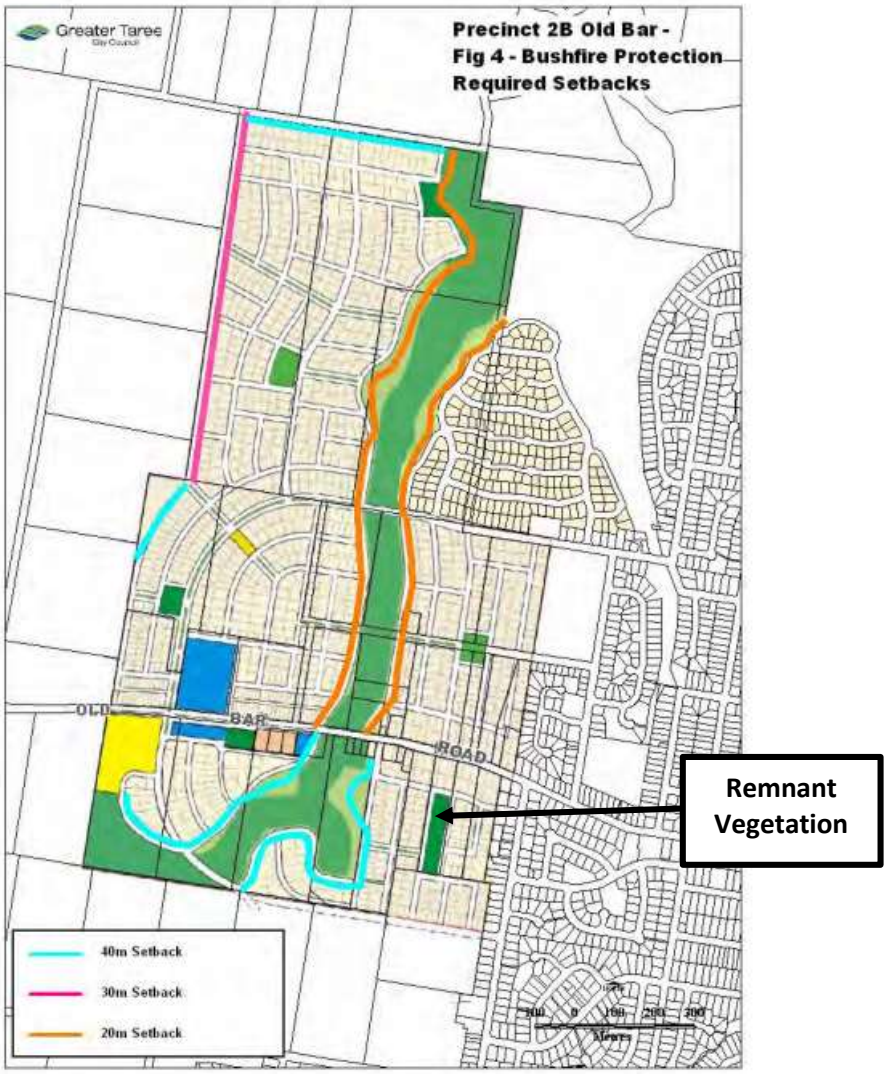
To ensure that the aims and objectives of NSW Rural Fire Services, PBP, 2019, a defendable space between the asset and the hazard should be provided. The defendable space provides for, minimal separation for safe firefighting, reduced radiant heat, reduced influence of convection driven winds, reduced ember viability and dispersal of smoke.

The Precinct Plan, with respect to Bush Fire Protection (see **Figure 7),** remnant vegetation to the west of the development has been identified:

a. There are required setbacks around the remnant vegetation. For the purposes of the report the remnant to the west of the development has unmanaged vegetation therefore the area has been considered a hazard.

b. The northern section of the remnant beyond the extension of Noroy Place is proposed to be developed.

Figure 7



The proposal consists of town houses, residential unit development and residential lots for future dwellings in the northern section.

The requirements for APZs have been considered for each of these types of development.

For the purposes of the report, the vegetation similar to rainforest hazard, has been considered to extend to the boundary of the remnant vegetation and the lots being developed.

Table 4 - APZ Requirements (PBP 2019)

Hazard Aspect	Vegetation Type	Slope	IPA	OPA	Total APZ Required (IPA + OPA)
West	Similar to Rainforest	0-5° Downslope	12m	-	12m
South	Grassland	0-5° Downslope	11m	-	11m
North	Grassland	0-5° Downslope	11m	-	11m

3.1.2 Inner (IPAs) and Outer (OPAs) Protection Area Requirements

Inner: The IPA is the area closest to the building and creates a fuel managed area which can minimise the impact of direct flame contact and radiant heat on the development and act as a defendable space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 1cm in height and be discontinuous.

In practical terms the IPA is typically the curtilage around the building, consisting of a mown lawn and well-maintained gardens.

When establishing and maintaining an IPA the following requirements apply:

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

- The creation of 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.

Outer: An OPA is located between the IPA and the unmanaged vegetation. It is an area where there is maintenance of the understorey and some separation in the canopy. The reduction of fuel in this area aims to decrease the intensity of an approaching fire and restricts the potential for fire spread from crowns; reducing the level of direct flame, radiant heat and ember attack on the IPA.

Because of the nature of an OPA, they are only applicable in forest vegetation.

When establishing and maintaining an OPA the following requirements apply:

Trees

- Tree canopy cover should be less than 30%; and
- Canopies should be separated by 2m to 5m.

Shrubs

- Shrubs should not form a continuous canopy; and
- Shrubs should form no more than 20% of ground cover.

Grass

- Grass should be kept mown to a height of less than 100mm; and
- Leaf and other debris should be removed.

An APZ should be maintained in perpetuity to ensure ongoing protection from the impact of bushfires.

Maintenance of the IPA and the OPA as described above should be undertaken regularly, particularly in advance of the bushfire season.

See **Appendix 2** for the Asset Protection Lines (i.e. BAL-29 contour lines).

3.1.3 Operational Access and Egress

Access to and egress from each of the proposed lots will be via public roads to be completed as part of the residential development and integrated subdivision.

An eight (8)m wide road with perimeter road specifications will be provided for Noroy Place that runs east to west.

A seven (7) metre road is proposed south of Noroy Place and a six (6) metre wide road is proposed north of Noroy Place between the western hazard and the proposed development with all other roads a minimum of 5.5m and it is recommended that all other roads comply with the NSW Fire and Rescue Guidelines "***Access for Fire Brigade Vehicles and Firefighters***".

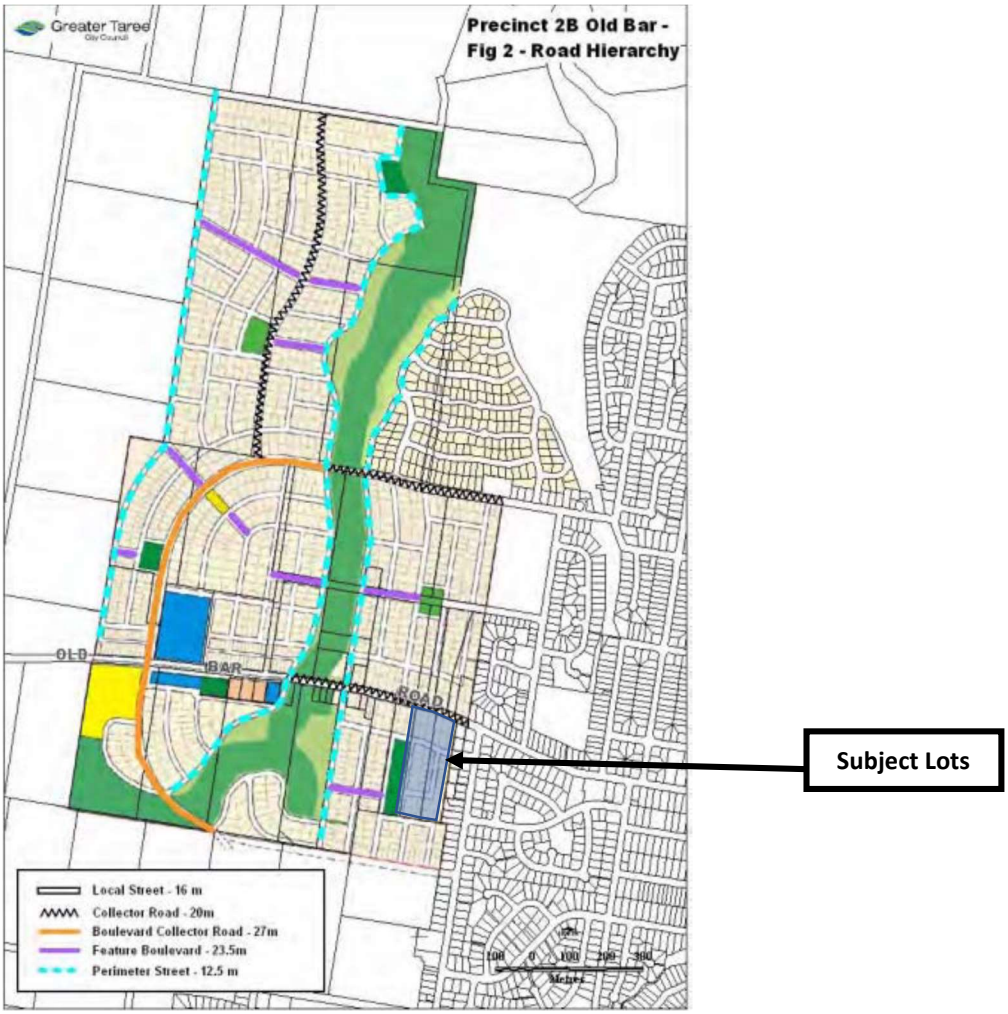
As proposed, there is one (1) access of approximately 100m long and it is surrounded by residential development.

The Precinct Plan, **Figure 8,** shows the road network proposed which will allow for alternate access/egress.

To facilitate better access before the alternate access is provided an Emergency Access to Old Bar Road is proposed.

Discussions were held with the RFS with respect to the road layout and the hazard to the south.

Figure 8



Performance Reporting has been completed with respect to the exclusion of the perimeter road and the single access/egress.

1. Use of non-perimeter roads

a. The Acceptable Solutions

Table 5.3b:

- Perimeter roads are provided for residential subdivisions of three or more lots.
- Minimum 8m carriageway width kerb to kerb.
- APZs are located on lands with a slope less than 18°.

b. Performance Criteria

Table 5.3b also states that the performance criteria may be achieved where:

- Firefighting vehicles are provided with safe, all weather access to structures.
- Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management at the interface.

c. Assumptions

All roads to meet the minimum requirements of non-perimeter roads as detailed in PBP, 2019 with the exception of the road widths which is addressed further in the reporting.

d. Discussion

The Performance Reporting considers the road located between the proposed subdivision and the western hazard. There is a precinct plan for the area which shows the road layout with respect subject lots. A perimeter road for the road nominated above has not been nominated in the Precinct Plan.

The western hazard is isolated in the Precinct Plan and will not join with other hazards except by way of a Feature Boulevarde from the central hazard, the current hazard to the west is mostly grassland and the strip of forest vegetation.

It is now proposed to increase the width of western road (south of Noroy Place) to a seven (7)m carriageway and a 16m road reserve which will improve access/egress in this area. It is now also proposed to access and egress the residential flat buildings from the western road instead of Noroy Place. This road will have a minimum carriageway of six (6)m and access/egress will be available in two directions when entering this western road.

A further engineering road layout has been completed as seen in **Appendix 1** and this shows the Unit Development traffic exiting onto Noroy Place which will mean the only traffic using the subject road will be the residents at the interface which will reduce congestion for firefighters.

A separate access a 4m wide emergency trail is to be provided along the western boundary to link with Road 02.

e. Conclusion

It is recommended that after consideration of the extent of the hazard, the limited number of residents evacuating along Road 02 and the provision of the Emergency Access/Egress trail that the 6m/7m non-perimeter road complying with PBP, 2019, will allow for safe access and egress for fire fighting vehicles while residents are evacuating, as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.

2. Alternate Access/Egress

a. The Acceptable Solutions

Table 5.3b:

- All roads are through roads.
- Subdivisions of three or more allotments have more than one access in and out of the development.

b. Performance Criteria

Table 7.4a also states that the performance criteria may be achieved where:

- Firefighting vehicles are provided with safe, all weather access to structures.
- Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management at the interface.

c. Assumptions

All roads to meet the requirements as detailed in PBP, 2019.

d. Discussion

It is proposed that an eight (8)m access is provided into the Development. As part of the Precinct Planning there will be multiple ways to access and egress the Development. In consideration of the short term limitation and Emergency Access/Egress four (4)m wide is proposed directly from Old Bar Road along to western boundary to Road 02.

e. Conclusion

The Emergency Access/Egress will provide for an alternative access and egress to the interface if the main access/egress is not usable.

Table 5

Table 5.3b			
Performance criteria		**Acceptable Solution**	**Comment**
ACCESS – GENERAL REQUIREMENTS	**The intent may be achieved where:**		
	Firefighting vehicles are provided with safe, all weather access to structures	• Property access roads are two wheel drive, all weather roads. • Perimeter roads are provided for residential subdivisions of three or more allotments. • Subdivision of three or more allotments have more than one access in and out of the development. • Traffic management devices are constructed to not prohibit access by emergency services vehicles. • Maximum grades for sealed roads do not exceed 15° and an average grade of not more than 10 ° or other gradient specified by road design standards, whichever is the lesser gradient. • All roads are through roads.	To comply See Report See Report To comply Will comply See Report

		• Dead end roads are not recommended, but if avoidable, are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle and are clearly sign posted as a dead end. • Where kerb and guttering are provided on perimeter roads, roll top kerbing should be used to the hazard side of the road. • Where access/egress can only be achieved through forest, woodland and heath vegetation, secondary access shall be provided to an alternate point on the existing public road system. • One way only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression.	N/A To comply N/A Roads to comply with NSW Fire and Rescue Guidelines
	The capacity of access roads is adequate for firefighting vehicles There is appropriate access to water supply	• The capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23tonnes) bridges/causeways are to clearly indicate load rating. • Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression. • Hydrants are provided in accordance with the relevant clauses of AS2419.1:2005 – Fire Hydrant Installations Systems design, installation and commissioning; and • There is suitable access for a Category 1 fire appliance to within 4 metres of the static water supply where no reticulated supply is available.	To comply To comply To comply To comply

NON-PERIMETER ROADS	Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating	• Minimum 5.5 metres width kerb to kerb; • Parking is provided outside of the carriageway width; • Hydrants are located clear of parking areas; • Roads are through roads and these are linked to the internal road system at an interval of no greater than 500 metres; • Curves of roads have a minimum inner radius of 6 metres; • The road crossfall does not exceed 3°; • A minimum vertical clearance distance of 4 metres to any overhanging obstructions, including tree branches is provided.	See Reporting To comply To comply To comply To comply To comply To comply

3.1.4 Services - Water, Gas and Electricity

As set out in *Planning for Bushfire Protection*, 2019, developments in bushfire prone areas must maintain a water supply for firefighting purposes.

Electricity supply is available and will be connected to the site. Electricity supply is to comply with requirements of **Table 6** in accordance with PBP, 2019.

Reticulated water supply will be available and connected to the site.

Table 6

Table 5.3c			
	Performance Criteria	**Acceptable Solutions**	**Comment**
WATER SUPPLIES	**The intent may be achieved where:**		
	Inadequate water supplies are provided for firefighting purposes	• Reticulated water supply is to be provided to the development where available. • A static water and hydrant supply are provided for non-reticulated developments or where reticulated water supply cannot be guaranteed. • Static water supplies shall comply with Table 5.3d of the NSW Planning for Bushfire Protection 2019.	Reticulated water to be provided. Assume reticulated water supply is guaranteed. N/A
	Water supplies are located at regular intervals	• Fire hydrant, spacing, design and sizing complies with the relevant clauses of the Australian Standard AS 2419.1 – 2005.	To comply

	The water supply is accessible and reliable for firefighting operations	• Hydrants are not located within any road carriageway. • Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter road.	To comply To comply
	Flows and pressures are appropriate	• Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.	To comply
	The integrity of the water supply is maintained	• All above ground water service pipes are metal, including and up to any taps. • Above ground water storage tanks shall be of concrete or metal.	To comply N/A
ELECTRICITY SERVICES	Location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings Regular inspection of lines is undertaken to ensure they are not fouled by branches	• Where practical, electrical transmission lines are underground. • Where overhead electrical transmission lines are proposed: 1. Lines are installed with short pole spacing (30 metres) unless crossing gullies, gorges or riparian areas; and 2. No part of a tree is closer to a power line than the distance set out in ISSC3 "Guideline for Managing Vegetation near Power Lines.	To comply
GAS SERVICES	Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings	• Reticulated or bottle gas is installed and maintained in accordance with AS 1596:2014 – The storage and handling of LP Gas, the requirements of relevant authorities and 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 of the installation. • 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.	To comply To comply To comply To comply To comply

It is considered that the relevant acceptable solutions as provided for by 4.1.3 of NSW Rural Fire Services, PBP, 2019 are capable of being complied with and as such the intent for the provision of services can be achieved.

3.1.5 Landscaping

Landscaping is a major cause of fire spreading to buildings, and therefore any landscaping will need consideration when planning, to produce gardens that do not contribute to the spread of a bushfire.

When planning any future landscaping, consideration should be given to the following:

- The choice of vegetation – consideration should be given to the flammability of the plant and the relation of their location to their flammability and on-going maintenance to remove flammable fuels.
- Trees as windbreaks/firebreaks – Trees in the landscaping can be used as windbreaks and also firebreaks by trapping embers and flying debris.
- Vegetation management – Maintain a garden that does not contribute to the spread of bushfire.
- Maintenance of property – Maintenance of the property is an important factor in the prevention of losses from bushfire.

Appendix 4 of NSW Rural Fire Services, *Planning for Bushfire Protection*, 2019, contains standards that are applicable to the provision and maintenance of Asset Protection Zones.

For a complete guide to APZs and landscaping download the NSW RFS document Standards for Asset Protection Zones at the RFS *www.rfs.nsw.gov.au*.

4.0 MULTI STOREY BUILDINGS

The planning consultant has advised that Strata Plan 3 is likely to be multi-storey development.

Buildings exceeding three storeys in height are considered to be multi-storey.

There are additional considerations associated with multi-storey buildings and the key issues include population, location, egress, construction and height.

The plans are in the concept stage.

Table 7 provides the considerations for multi-storey buildings in bushfire prone areas to ensure that the design of a building and its warning and suppression system adequately addresses the bushfire risk.

Table 7

Issue	Specific Concern	Technical Considerations	Comment
Population	Impact on existing community and infrastructure.	What capacity does the existing infrastructure have to allow evacuation of existing and proposed residents in the event of a bushfire?	The proposal is the first stage in a Strategic Plan which proposes road networks.
Location of Building	Locating on ridge tops emphasizes the	Consider locating the building away from ridge tops.	The proposed location is not considered additional risk when considering topography.

	risk of convective plume interaction and wind related impacts.	If unavoidable what is the impact on modelling and risk to the building? Is the risk appropriate for the building and occupant numbers?	
Design Fire	Differing elements of flame could have different impacts on different levels of the building; and The whole building could be impacted by ember attack and multiple floors could be alight simultaneously.	What are the flame dimensions, including the flame angle. Where is the hottest part of the flame located? How would this impact on the proposed building? How would the warning and suppression systems cope with this?	A possible Bushfire from the west was considered utilizing the Bush Fire Attack Assessor (Couch v4.1). the flame angle of 64° was estimated with a peak elevation of receiver at 4.67m. A flame length of 10.39m is also estimated. The deemed to satisfy provisions recognize with a 12m setback the building can be constructed to BAL 29. If a fire did start in the carpark or one of the units, the areas would be compartmented. The report assumes the building will be constructed to Type A Construction. With respect to Type A: 1. The smoke detection and alarm system will be throughout the buildings. 2. The buildings will need to comply with the requirements of C2.6 of the BCA with respect to vertical separation of openings in external walls. 3. All external walls are noncombustible. 4. Discussions with the Architect revealed that a performance report is to be completed with respect to the building and it is likely that the carpark will be the only section of the building with sprinklers.
Egress	Exposure to bush fire prone vegetation – which elevations?	How does the emergency evacuation procedure take account of the location of bushfire prone vegetation?	A Precinct Plan has been prepared. It is assumed emergency evacuation would have been considered in the plan.
Building Construction	Performance of the building	What wall and cladding materials are proposed for	External walls of the building will need to comply C1.9 of the Building Code of Australia (BCA) which requires external

	façade in a bush fire scenario. Balconies may contain external features which could ignite and contribute to building ignition and fuel loads.	openings/penetration (i.e doors and windows). How does the proposed building construction deal with fire spread from the vegetation to the inside of the building? Is compliance with AS 3959 sufficient to ensure that the bush fire risk is mitigated. Is this appropriate for the design fire scenario Are there balconies proposed? What may be stored on the balconies? Can there be restrictions on what is stored on the balconies due to fire risk?	walls including all components incorporated in them including the façade covering, framing and insulation to be non-combustible. As well as considering spread of fire on the façade of the building, the building also has to withstand the proposed radiant heat from the hazard. The building is recommended to be constructed to BAL 29. There is risk of fire spread from bush fire attack from the balconies which will permit the entry of embers. The concept plans do indicate balconies. With regards to balconies: 1. Any furnishings or furniture is to be non-combustible unless a Bushfire Emergency Plan is implemented for the building. This requirement is to be included as a measure on the Final Fire Safety Certificate.
Car parking	Lower storey car park could be subject to ember attack and high radiant heat loads igniting multiple vehicles at one time.	Is the warning and suppression system designed to account of bushfire impact. Where are exists located? Are they guiding occupants away from the car park?	A Smoke Detection and Alarm System will be required by the BCA for the building. On the activation of the alarm the occupants will be required to evacuate the building to an Assembly Area. The report also assumes there will be warning to get people out of the building if there was a fire in the carpark. It is likely there will be a sprinkler system in the carpark section of the building. It is recommended that the second egress is provided from the building away from the hazard, protected and available to all occupants.

Other Considerations	Access for fire fighters may be restricted or challenging. Risk implications of floor to floor fire spread.	What would this mean for suppression? How would warning and suppression systems take account of this? What would this mean for evacuation?	The building is required to be deigned in accordance with the Building Code of Australia and the RFS Guideline *Access for Fire Brigade Vehicles and Firefighters*. The BCA also considers structure fires and the use of an aerial appliance to fight an upper storey fire would need to be considered. Because of the rise in storeys all floors required to achieve fire rating. The carpark in the building is likely to be sprinklered protected. Fire fighters to access building through fire isolated stairs. The building will need to comply with the requirements of C2.6. Any openings may allow ember penetration into the building. This could occur in individual floors. Openings include intake and discharges from air conditioning units, exhaust systems. It is recommended that these openings are protected to ensure no ember entry. Smoke penetration issue is also an issue into the building. Consideration should be given in the design to stop smoke penetration into the building though any air intake points. The garbage room of the units is closest to the hazard. It is recommended that the external walls and roof of the garbage room are constructed to BAL 29 to ensure no internal part of the garbage room including garbage bins are exposed to the hazard.

With respect to the Multi-Storey proposal, in the Precinct Plan, this area is to be developed therefore removing the hazard directly to the west of the complex.

5.0 CONSTRUCTION OF BUILDINGS

5.1 General

The deemed-to-satisfy provisions for construction requirements are detailed in AS 3953-2018.

The relevant Bushfire Attack Level and construction requirements have been determined in accordance with PBP, 2019 and AS 3959-2018.

5.2 AS3959 – 2018 Construction of Buildings in Bushfire Prone Areas

The following construction requirements in accordance with AS 3959 – 2018 Construction of Buildings in Bushfire Prone Areas is required for the bushfire attack categories.

Table 8

Bushfire Attack Level (BAL)
BAL - LOW No construction requirements under AS 3959-2018
BAL - 12.5
BAL - 19
BAL - 29
BAL - 40
BAL - FZ

The following table indicates the Bushfire Attack Levels applicable once the recommended APZs have been established:

Table 9 – Categories of Attack/Construction Standard Assessment

Aspect	**Hazard Vegetation**	**Slope**	**Min Distance to Hazard once APZ Applied**	**AS 3959-2018 Bushfire Attack Level (BAL)**
West	Similar to Rainforest	0-5° Downslope	12m	BAL 29
South	Grassland	0-5° Downslope	11m	BAL 29
North	Grassland	0-5° Downslope	20m	BAL 19

To add a factor of safety to the report it is recommended that a 1.8m radiant heat fence is erected along the southern boundary.

5.3 Fences and Gates

Fences and gates may play a significant role in the vulnerability of structures during a bushfire.

With regards to new fences and gates:

a) All new fences in bush fire prone areas should be made of either hardwood or non-combustible material.
b) Where the fence is within 6m of the building or in areas of BAL 29, they should only be made of non-combustible material.

6.0 EMERGENCY EVACUATION PLANNING

It is recommended that the subsequent owners develop a bushfire survival plan with respect to the proposed lots.

The decision to stay and defend or to leave should be made well in advance of the arrival of the bushfire.

Any bush fire survival plan should consider the advice offered by the RFS website *www.rfs.nsw.gov.au*.

7.0 REQUIREMENTS

The following requirements are considered to be integral to this bushfire risk assessment:

1. An Asset Protection Zones as detailed in Section 3.1.1 of this report are to be provided.
2. The proposal is to comply with the relevant performance criteria/acceptable solutions as provided for by PBP, 2019.
3. Adopt landscaping principals in accordance with NSW Rural Fire Services, PBP, 2019.
4. Any future dwelling/s are to be constructed in accordance with Section 5 of this report.

8.0 CONCLUSION

It is suggested that with the implementation of this report, and its recommendations, that the bushfire risk is manageable and will be consistent with the acceptable bushfire protection measure solutions, provided for in NSW Rural Fire Services, PBP, 2019.

The report provides that the required APZ's can be achieved and that the proposal can be constructed so as to comply with the requirements of AS 3959-2018 and PBP, 2019.

This report is however contingent upon the following assumptions and limitations:

Assumptions

1. For a satisfactory level of bushfire safety to be achieved, regular inspection and testing of proposed measures, building elements and methods of construction, specifically nominated in this report, is essential and is assumed in the conclusion of this assessment.
2. There are no re-vegetation plans in respect to hazard vegetation and therefore the assumed fuel loading will not alter.
3. It is assumed that the building works will comply with the DTS provisions of the BCA including the relevant requirements of Australian Standard 3959 – 2018.
4. The proposed residential development and integrated subdivision is to be constructed and maintained in accordance with the risk reduction strategy in this report.
5. The vegetation characteristics of the subject site and surrounding land remains unchanged from that observed at the time of inspection.

Limitations

1. The data, methodologies, calculations and conclusions documented within this report specifically relate to the proposal and must not be used for any other purpose.
2. A reassessment will be required to verify consistency with this assessment if there is any alterations and/or additions, or changes to the risk reduction strategy contained in this report.

Regards

Tim Mecham
Midcoast Building and Environmental

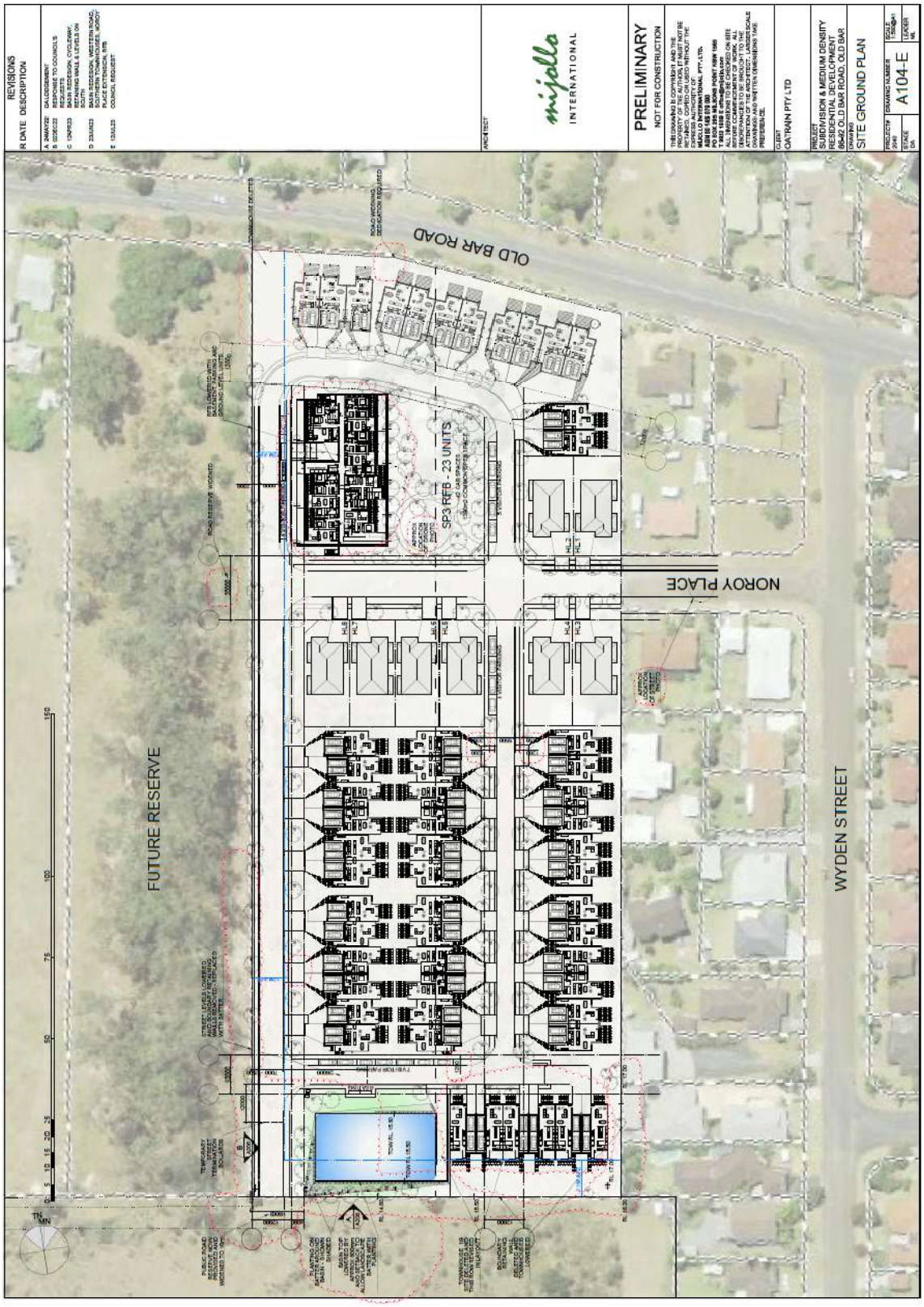
9.0 DISLCLAIMER

This report is not intended for or to be used where aluminium composite panels are proposed. The report is not to be construed as an assessment of the building material or compliance with the recommended bushfire attack level/s.

10.0 REFERENCES

NSW Rural Fire Services, ***Planning for Bushfire Protection***, 2019
AS 3959-2018 ***Construction of Buildings in Bushfire Prone Areas***
Keith David 2004, Ocean ***Shores to Desert Dunes, The Native Vegetation of New South Wales and the ACT***, Department of Environment and Conservation
NSW State Government (1997) Rural Fires Act 1997
NSW Rural Fire Service – ***Guideline for Bushfire Prone Land Mapping 2002***

APPENDIX 1 – Subdivision Plan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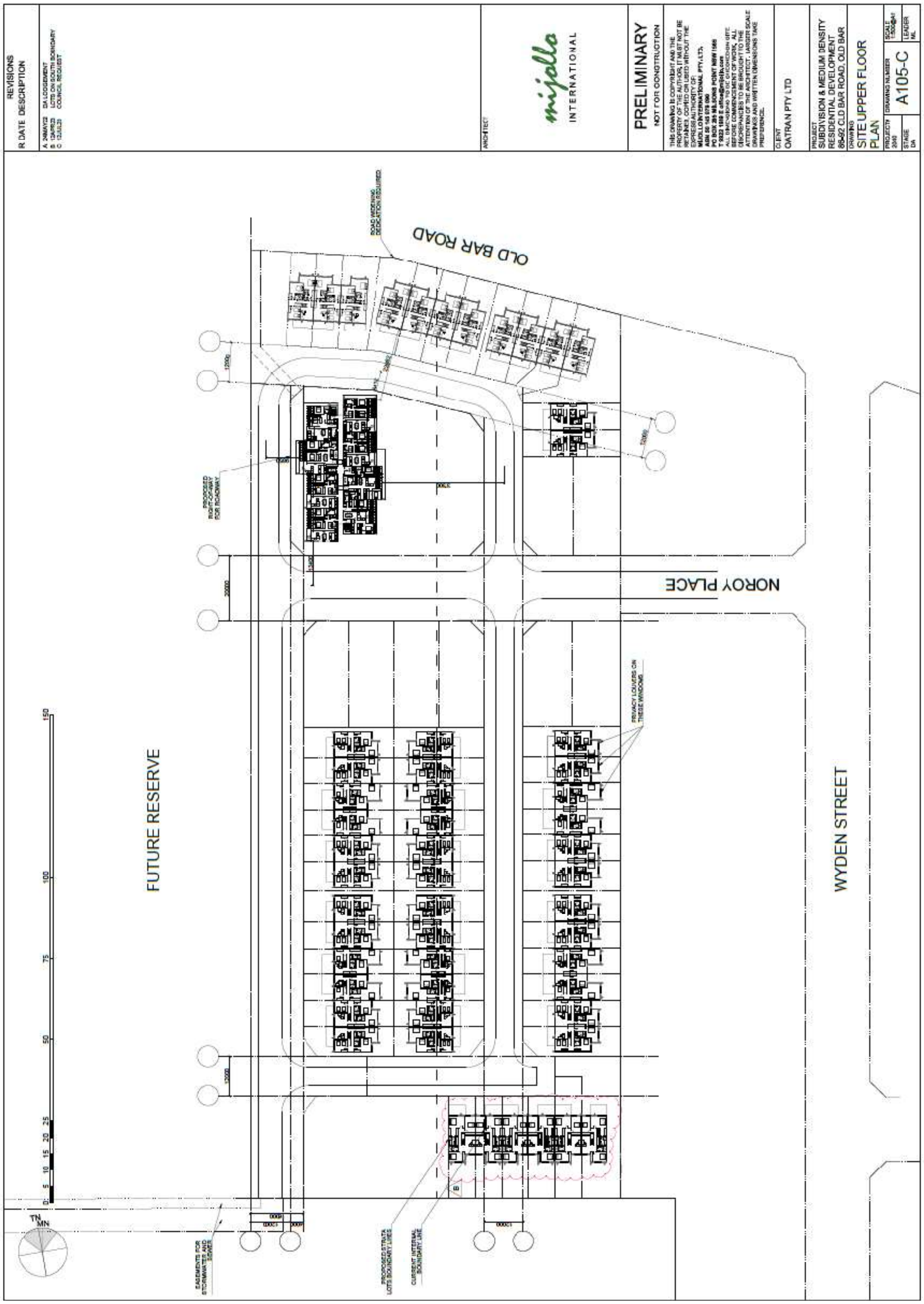
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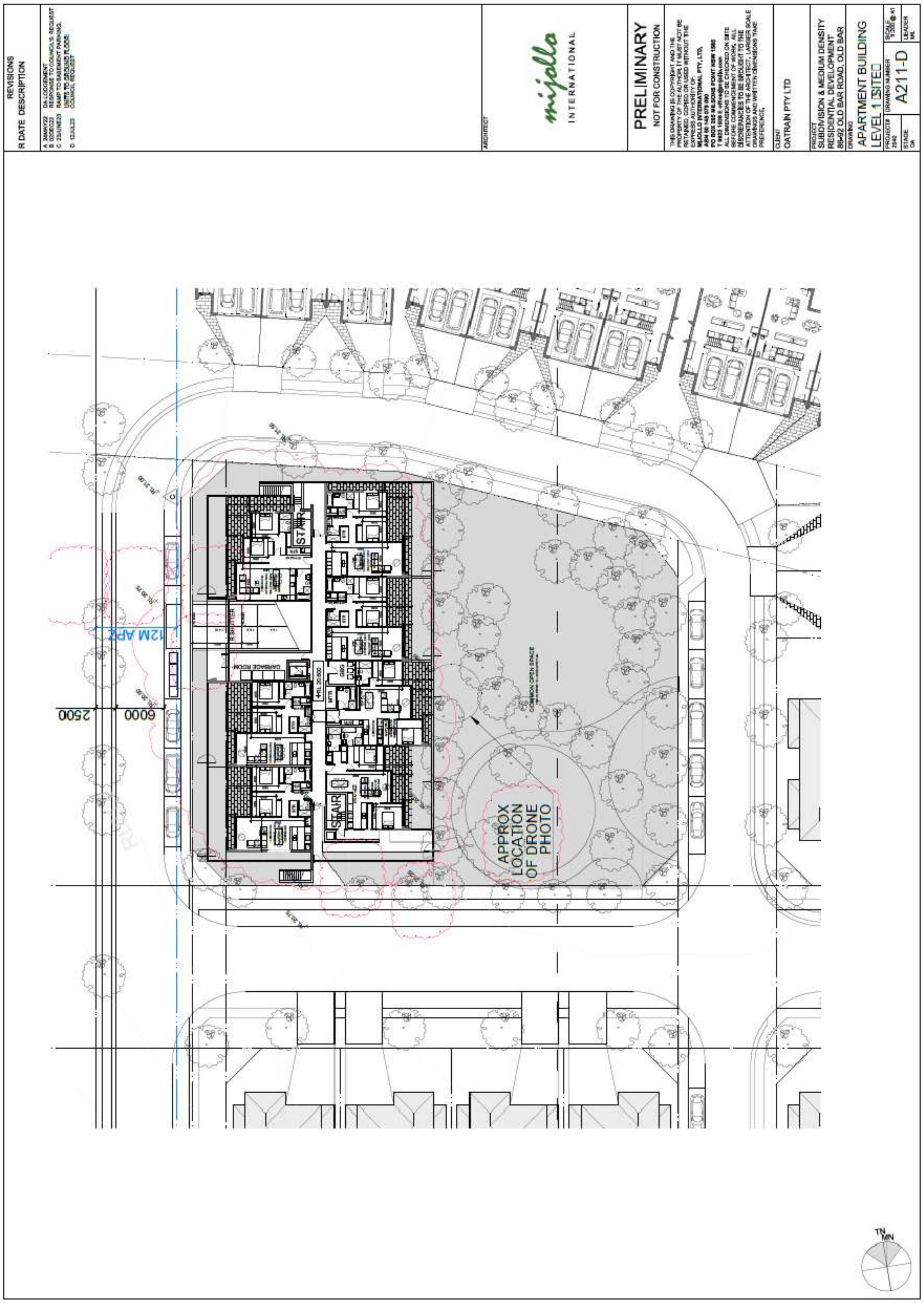
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LOCATION
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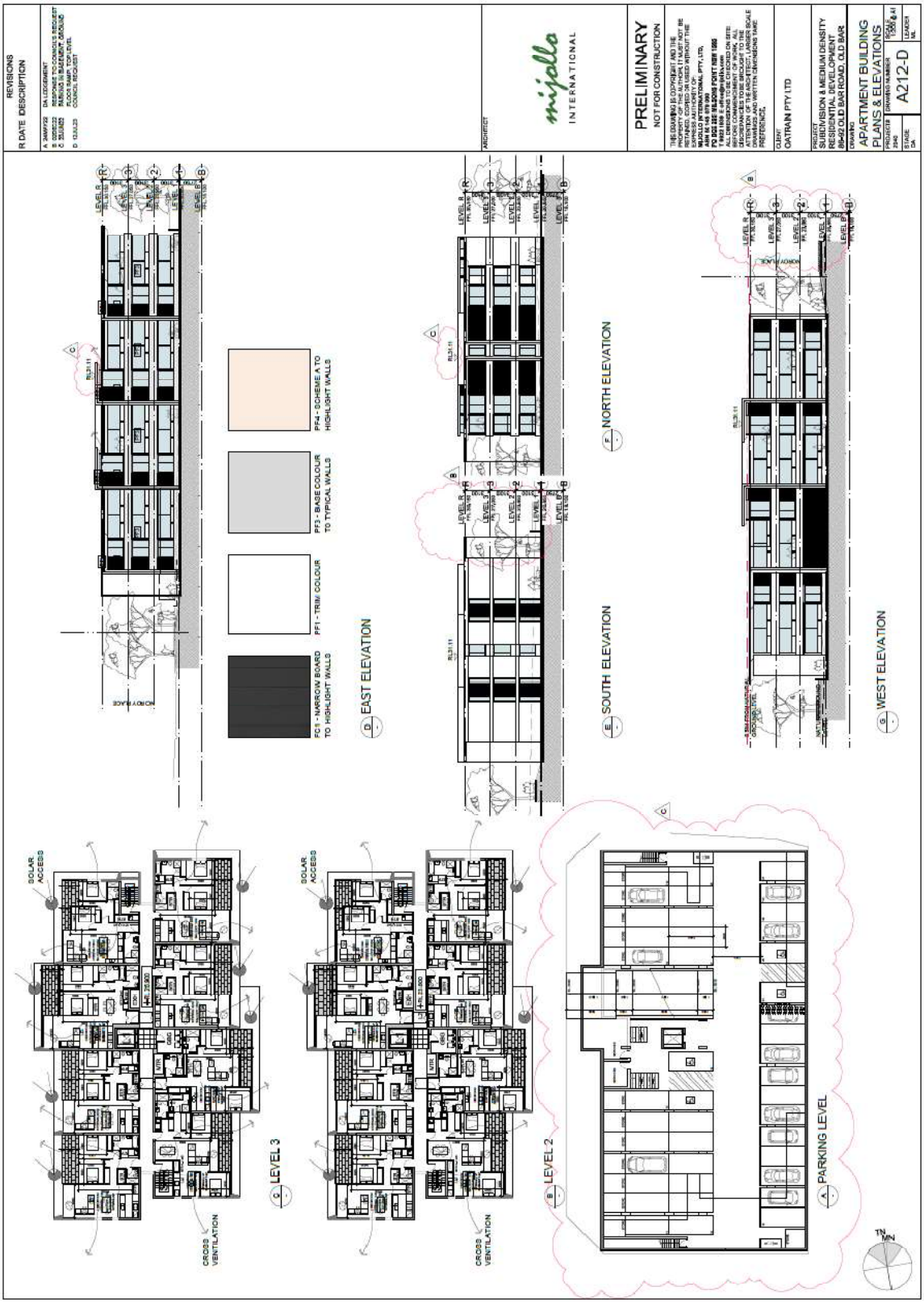
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FC1 - NARROW BOARD TO HIGHLIGHT WALLS
FF1 - TRIM COLOUR
FF3 - BASE COLOUR TO TYPICAL WALLS
FF4 - SCHEME A TO HIGHLIGHT WALLS
D EAST ELEVATION
E NORTH ELEVATION
E SOUTH ELEVATION
G WEST ELEVATION
C LEVEL 3
B LEVEL 2
A PARKING LEVEL
SOLAR ACCESS
CROSS VENTILATION
NORTH


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SUBDIVISION & MEDIUM DENSITY
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STAIR
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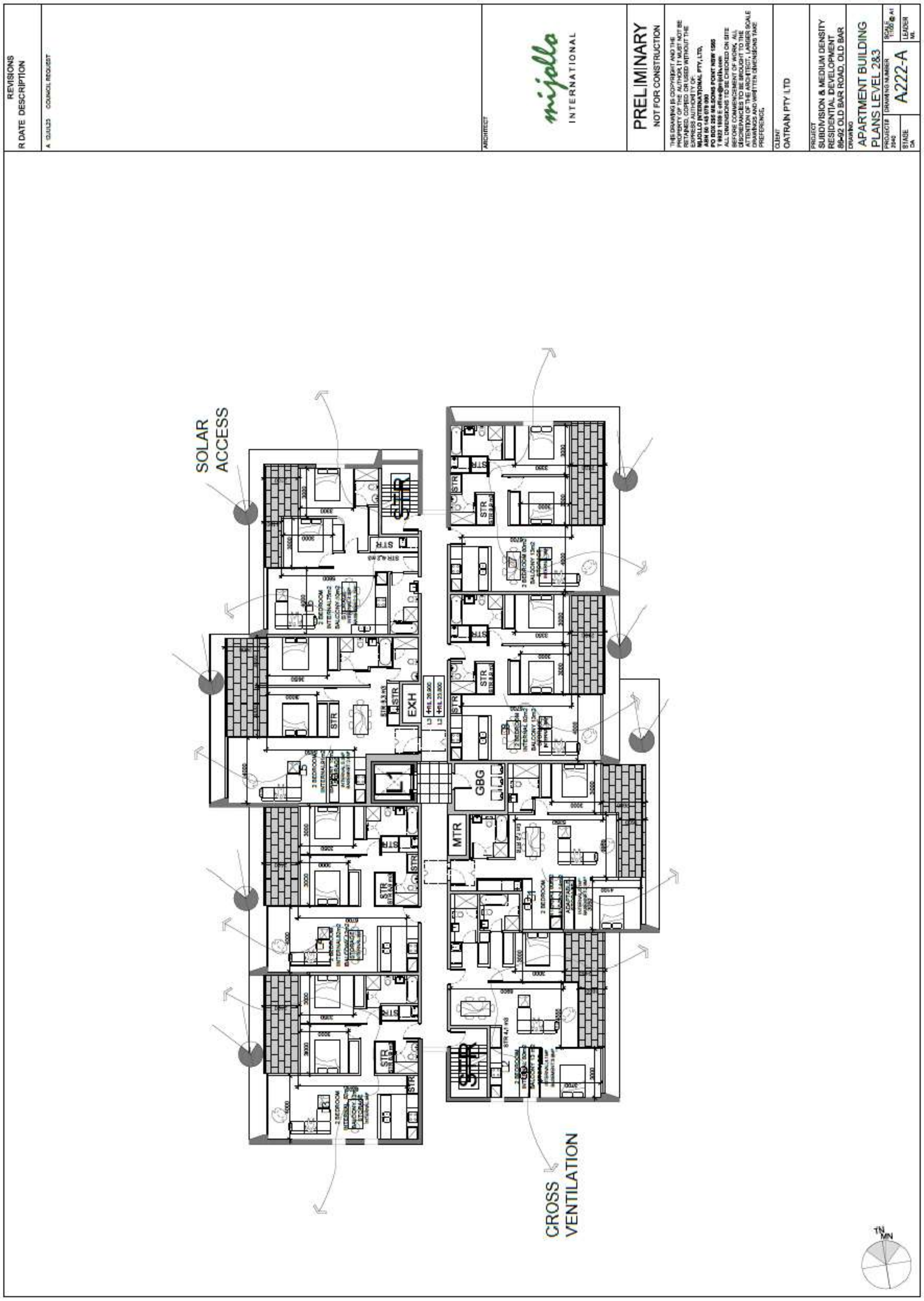
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89-92 OLD BAR ROAD, OLD BAR
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APARTMENT BUILDING PLANS LEVEL 2&3
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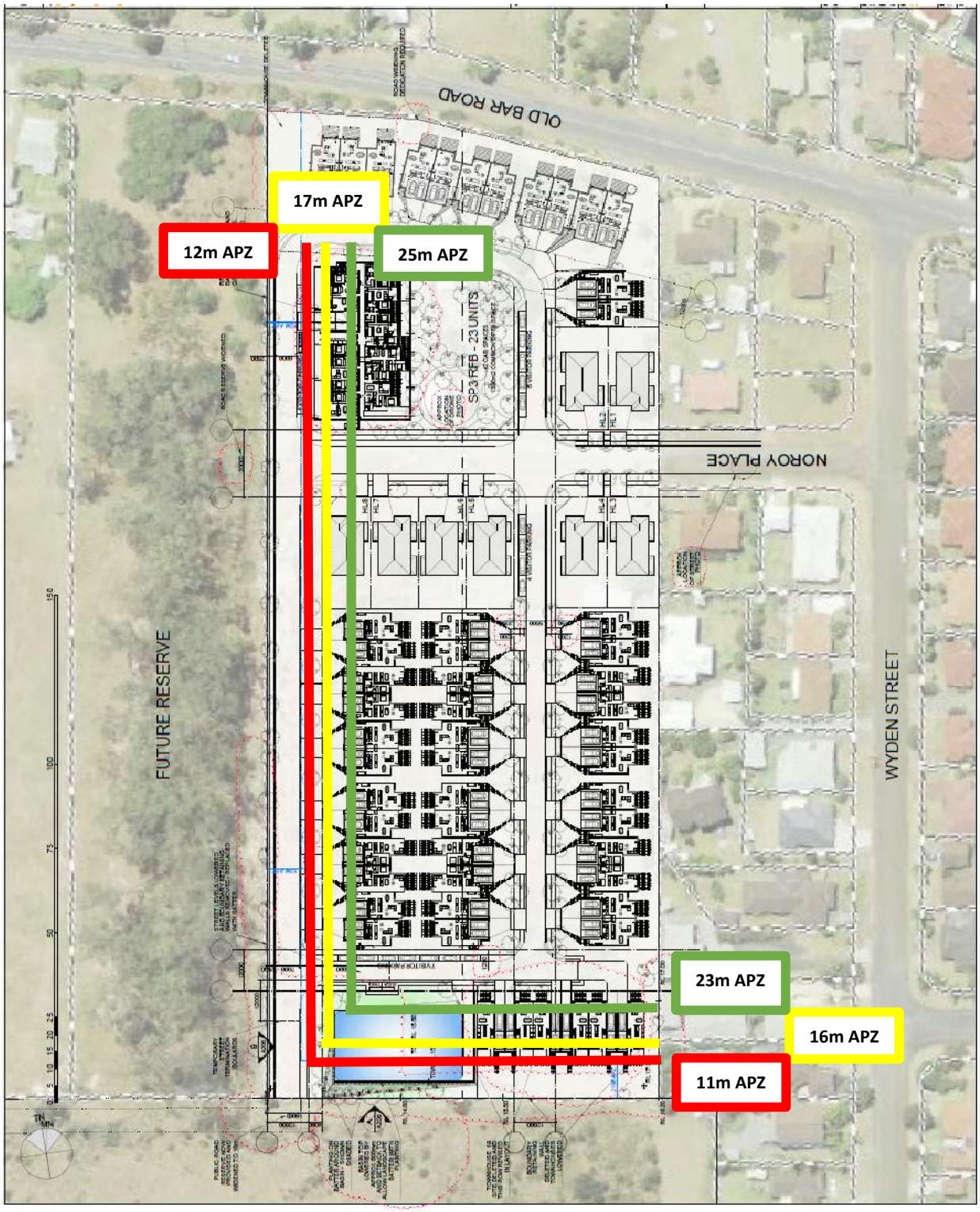
APPENDIX 2 - BAL Contour Lines



Not to Scale Indicative Only