ITEM	**14.074/17**	**PLANNING PROPOSAL FOR PALMERS ISLAND PROPOSED MARINE INDUSTRIAL PARK (REZ 2016/0001)**	
Meeting		Environment, Planning & Community Committee	11 July 2017
Directorate		Environment, Planning & Community	
Reviewed by		Director - Environment, Planning & Community (Des Schroder)	
Attachment		Yes	

SUMMARY

Council resolved on 15 November 2016 to support a Planning Proposal for a 40% reduction of the original site for a proposed marine industrial precinct. The Planning Proposal is returned for further Council consideration of the amended Planning Proposal including updated Traffic and Noise Assessment reports which were forwarded to the Department of Planning with the request for a Gateway Determination in accordance with Council's resolution.

OFFICER RECOMMENDATION

That Council:

1. As the relevant planning authority, resubmit the revised Planning Proposal to the Gateway, over Lot 2 DP598769, School Road, Palmers Island to amend Clarence Valley Local Environmental Plan 2011 to enable the rezoning of part of the land from RU1 to Part RU1, Primary Production, Part IN4 Working Waterfront and Part W3 Working Waterway as outlined in the Planning Proposal Report titled 'Palmers Island Marine Industrial Park' by Rob Donges dated 10/04/2017 (Attachment 1); subject to:

    1.1 Further assessment prior to exhibition, of the potential impact and mitigation measures of the proposed acoustic walls:
    - on the rural landscape character by provision for substantial landscaping which will require a setback from the southern boundary of the subject site,
    - on flood behaviour.

    1.2 Assessment of the matters previously resolved by Council to be supplied prior to exhibition, being:
    - additional clarification of intersection requirements,
    - impacts on the riverbank in the vicinity of the site due to the proposed dry dock construction,
    - site contamination, and
    - Aboriginal cultural heritage.

2. Advise the Department that it will accept plan making delegations that may be offered to Council.

3. Require the applicant to provide additional information as required prior to carrying out community consultation regarding the Planning Proposal subject to the determination of the Gateway process.

COMMITTEE RECOMMENDATION

Simmons/Ellem

That the item be deferred to the Council meeting.

Voting recorded as follows:
For: Baker, Clancy, Ellem, Simmons, Williamson
Against: Nil

Having declared an interest in this item, Cr Simmons (Mayor) left the Chamber at 5.09 pm and Cr Kingsley (Deputy Mayor) assumed the Chair. Cr Simmons returned at 5.33 pm and assumed the Chair.

MOTION

Williamson/Novak

That the matter be deferred to the August 2017 Environment, Planning & Community Committee meeting.

Voting recorded as follows:
For: Williamson, Novak, Ellem, Clancy
Against: Toms, Kingsley, Lysaught, Baker

The Motion was put and declared LOST on the casting vote of the Chair. The Foreshadowed Motion was then considered.

COUNCIL RESOLUTION – 14.074/17

Lysaught/Toms

That Council:

1. **As the relevant planning authority, resubmit the revised Planning Proposal to the Gateway, over Lot 2 DP598769, School Road, Palmers Island to amend Clarence Valley Local Environmental Plan 2011 to enable the rezoning of part of the land from RU1 to Part RU1, Primary Production, Part IN4 Working Waterfront and Part W3 Working Waterway as outlined in the Planning Proposal Report titled 'Palmers Island Marine Industrial Park' by Rob Donges dated 10/04/2017 (Attachment 1); subject to:**

   1.1 Further assessment prior to exhibition, of the potential impact and mitigation measures of the proposed acoustic walls:
   - **on the rural landscape character by provision for substantial landscaping which will require a setback from the southern boundary of the subject site,**
   - **on flood behaviour.**

   1.2 Assessment of the matters previously resolved by Council to be supplied prior to exhibition, being:
   - **additional clarification of intersection requirements,**
   - **impacts on the riverbank in the vicinity of the site due to the proposed dry dock construction,**
   - **site contamination, and**
   - **Aboriginal cultural heritage.**

2. **Advise the Department that it will accept plan making delegations that may be offered to Council.**

3. **Require the applicant to provide additional information as required prior to carrying out community consultation regarding the Planning Proposal subject to the determination of the Gateway process.**

Voting recorded as follows:
For: Lysaught, Toms, Kingsley, Baker
Against: Novak, Ellem, Clancy, Williamson

The Foreshadowed Motion was then put and declared CARRIED on the casting vote of the Chair. The Motion became the Council Resolution.

LINKAGE TO OUR COMMUNITY PLAN

Theme 5 Leadership

Objective 5.1 We will have a strong, accountable and representative Government

Strategy 5.1.4 Ensure transparent and accountable decision making for our community

BACKGROUND

The original Planning Proposal for this site was declined at the Gateway Determination by NSW Planning on 18 November 2014 on the basis that *"there was insufficient justification that Council's proposal for a 100m setback from the existing dwellings would adequately address the acoustic and land use conflict impacts, and that the proposal lacked sufficient information on the suitability and viability of the proposed mitigation measures".*

A revised Planning Proposal was submitted with Noise Assessment and Traffic Reports and considered by Council in November 2016. This application was recommended for refusal as it still had not been demonstrated that the proposal could adequately address the acoustic and land use conflicts with adjoining and nearby development (and occupants) due to future operation of the proposed Marine Industrial Precinct.

Council, at its meeting of 15 November 2016 resolved to support a Planning Proposal for a reduced area of the original proposal and to refer it to the Planning Gateway. The Planning Proposal included a Marine Industrial Park with 10.56ha of the subject land proposed to be zoned IN4 Working Waterfront; 1.1ha to be zoned W3 Working Waterways and the residue 9.5ha to be retained as RU1 Primary Production zone.

Council's resolution on 15 November 2016 in relation to this matter was as follows.

COUNCIL RESOLUTION – 14.108/16 Baker/Kingsley

That Council refer the planning proposal REZ2016/0001 to the Gateway, subject entirely to the proponent amending the proposal in such a way the IN4 Working Waterway area is reduced by 40% percent of the current Plan area, and noting that each of the following is to be provided prior to public exhibition:

a) additional clarification of intersection requirements,
b) impacts on the riverbank in the vicinity of the site due to the proposed dry dock construction,
c) site contamination and
d) Aboriginal cultural heritage.

The proponent updated the attached Planning Proposal document dated 28.11.16 following the Council resolution of 15 November 2016 and it was forwarded to the Department of Planning with a request for a Gateway Determination.

The Department of Planning on 19 December 2016 required updated Traffic Impact Assessment and Noise Impact Studies to specifically relate to the reduced size of the proposed rezoning area.

The proponent supplied updated reports in April 2017 and an updated Planning Proposal report dated April 2017. This was reviewed by Council's technical officers and forwarded to the Department with another request for a Gateway Determination in accordance with Council's resolution.

The Department of Planning in a letter dated 5 July 2017 has now requested that another resolution of Council is sought to determine if Council still supports the proposal as the updated reports include

information which is different to the original proposal, notably the inclusion of proposed acoustic barrier walls of a minimum height of 8 metres in order to meet the noise attenuation requirements.

The proposal is now returned to Council for further review and consideration.

KEY ISSUES

Noise and traffic impacts were raised in the previous Gateway Determination, as issues which need to be assessed at an early stage of determining the Gateway for this proposal.

NOISE

The updated Environmental Noise Assessment report by TTM dated 20 March 2017 concludes that noise generated at the development is predicted to comply with the criteria of the *NSW Industrial Noise Policy* when assessed at the nearest residential receivers. This was reviewed by Council's Environmental Officer who concurred with the results based on the submitted information.

Review of the Environmental Noise Assessment Report submitted to Council dated 20 March 2017 identifies that proposed development can adequately address noise generated from the proposal to comply with the NSW EPA Industrial Noise Policy 2000.

Providing the attenuation measures can achieve the intrusiveness criteria of LAeq, 15 minute ≤ rating background level plus 5dB(A) then the rezoning proposal with respect to noise would be supported.

Attenuation measures to meet this requirement, included the provision of acoustic walls of a minimum height of 8 metres along the length of the working area of the site to the north, and along part of the southern boundary with walls up to 3.8 metres high to the rest of this section as shown on the plan on page 27 of the report. Extract below. In addition, proposed management measures for operation of machinery and hours of operation, building construction including location of openings and travel routes would be applied.

The proposed acoustic walls will have potential visual impacts on the rural character of the landscape and amenity and outlook for dwellings in the vicinity. This is an issue which would be dealt with as part of a development application and would also have to be considered in terms of impact on flooding if the proposal was to proceed, however further details are requested prior to public exhibition, if a Gateway Determination is issued.

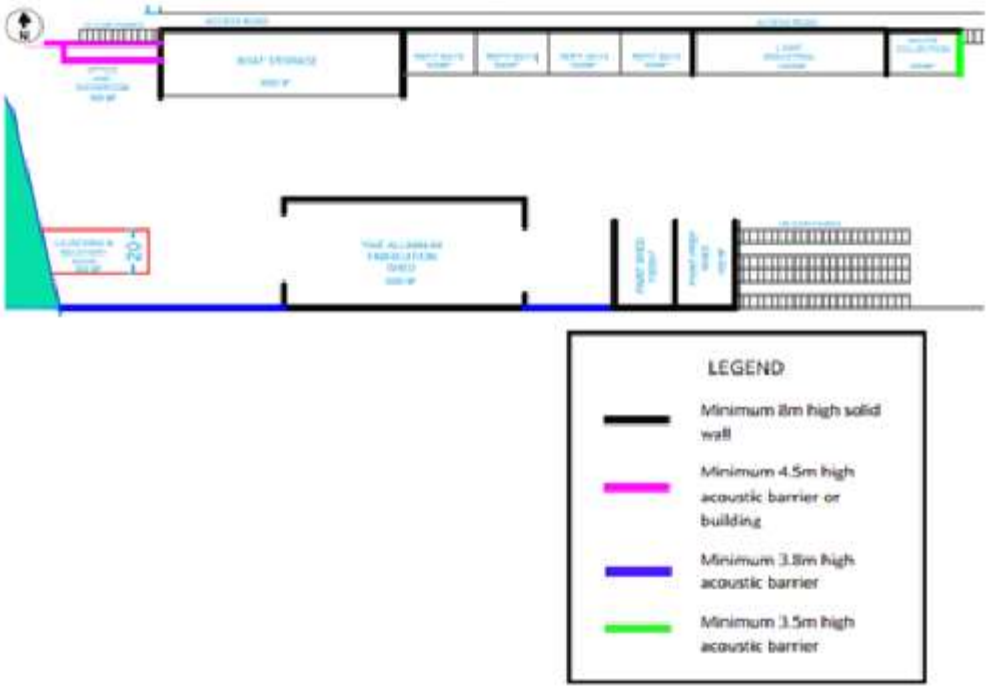
9.1. Acoustic Barriers

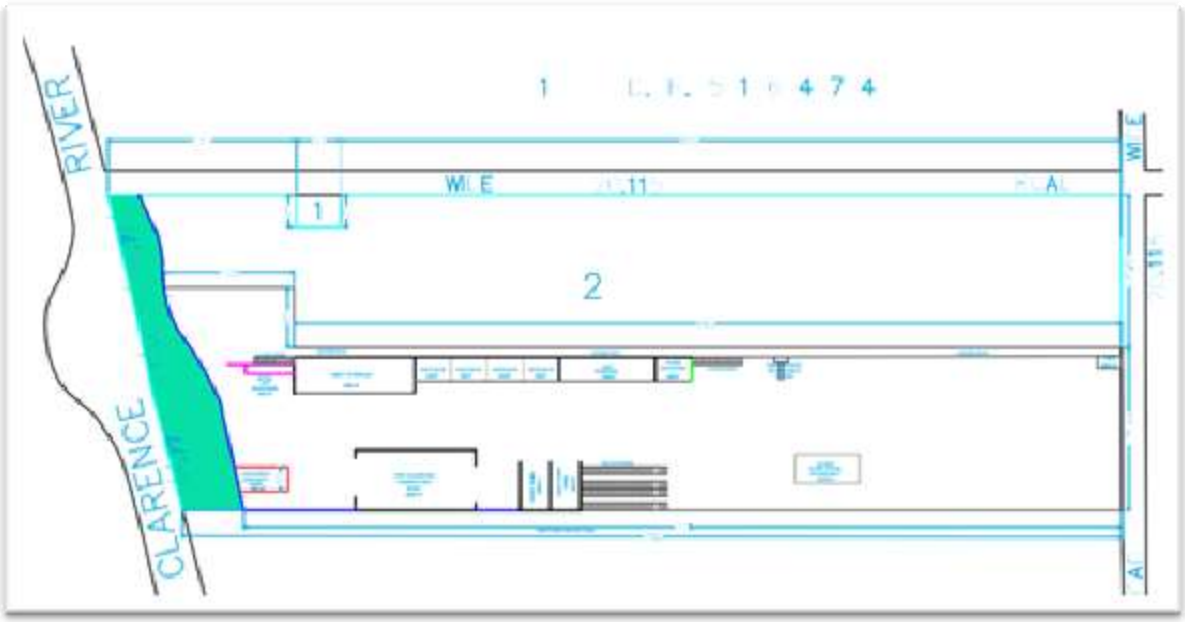
Acoustic barriers are required to reduce noise levels and will need to be implemented to achieve predicted compliance. The location and extent of the barriers are identified on the development plan and shown in Figure 5. The barrier details are as follows:

a. Barriers are to achieve the minimum heights specified below and be relative to the finished pad level of the site.

b. The barriers should have a minimum mass (surface density) of 12.5kg/m^2 and be free of gaps and holes. Suitable materials include masonry, compressed fibre cement, lapped timber palings (with 40% overlap), Perspex, glass, earth mound, or any other appropriate material.

Figure 5: Recommended Acoustic Barriers





TRAFFIC

With regard to traffic generation, the updated traffic report includes an amendment dated 5 April 2017.

The following items are recommended by the TTM report:

1. Provision of 127 car parking spaces;
2. Provision of 3 service bays for commercial vehicles;
3. Staged approach for intersection upgrade of School/Yamba Rd
   - Stage 1 – upgrade to priority intersection treatment (AUL and CHR).
   - Stage 2 – upgrade to a roundabout (30m diameter).

Council's Development Engineer has reviewed the proposal and recommended that there would need to be additional car parking to meet Council's DCP requirements and that a sensitivity analysis must be undertaken to determine when the priority treatment would fail and determine roundabout treatment construction completion year.

Car Parking

Council's Development Engineer has reviewed the revised parking assessment and has concluded that there is a potential parking deficit of 32 spaces as compared to DCP requirements. This issue can be managed at development application stage based on detailed design and given that there is significant site area available.

Traffic Impact Assessment of the Intersection of School Rd/Yamba Rd

Table 3 of the updated TTM Report

1. *The proposed priority intersection treatment will function up to a level of service of E (worst case scenario - right turn lane movement) during the AM & PM peak within the design horizon (**Base 2028**).*
2. *The proposed priority intersection treatment will **fail** during the AM & PM peak within the design horizon (**Development 2028**).*
3. *The proposed roundabout intersection treatment will function to an acceptable level of service both **Base & Development (2028).***

A sensitivity analysis must be undertaken to determine when the priority treatment would fail and determine roundabout treatment construction completion year.

OTHER ISSUES

The Planning Proposal also raises other planning issues which will need to be the subject of rigorous assessment. These were discussed in detail in the previous Council report dated 15 November 2016.

1. Strategic Planning in relation to the location of marine industry uses on the Clarence River.
2. Compliance with legal planning policies, SEPPS S.117 Directions and justification for any areas of non compliance.
3. Loss of RU1 Primary Production land, 21.22ha regionally significant farmland.
4. Aboriginal Cultural Heritage Assessment: likely requirements for a full cultural heritage assessment.
5. Native Title Yaegl Peoples # 1: Consultation/consent requirements over Clarence River waterway.
6. Potential impacts on rural and residential property in the locality in terms of amenity, noise, and change to the existing rural character of the area.
7. Noise and Vibration potential environmental issues.
8. Access, Transport and Traffic- increased demand on local roads by traffic generated by the likely future development.
9. Flooding - Impacts of proposal on properties and farmland up and down stream.

10. Hydrology - location on an acknowledged eroding river bank site.
11. Air, Soil and Water - potential environmental issues.
12. Justification for rezoning.
13. Consultation with Government Agencies

COUNCIL IMPLICATIONS

Budget/Financial
The applicant has paid the required fee for the processing of this Planning Proposal and would be responsible for any additional studies required for the proposal and subsequent levels of processing.

Asset Management
The site currently has a rock armoured bank which was constructed by Council. Implications for this structure may need to be further investigated as it is located on private land. The impact of the development by creation of flood mounds and the creation of the wet dock, on local flooding may affect adjacent properties and hold implications for future maintenance in relation to similar protection works which would be required to be carried out at the owner's responsibility.

Policy or Regulation
The Planning Proposal is assessed with due regard to the requirements of the *Environmental Planning and Assessment Act 1979* including relevant State Environmental Planning Policies and Ministers 117 Directions made under the Act.

Consultation
Community consultation has not occurred yet as the proposal is subject to an approval from State Government for a Gateway Determination. If this is approved, the proposal would proceed to formal public exhibition in accordance with the Director's requirements.

Legal and Risk Management
The Planning Proposal is being assessed with compliance with the *Environmental Planning and Assessment Act 1979* and accompanying guidelines on the preparation of Planning Proposals and Preparation of Draft LEPs.

Prepared by	Deborah Wray, Senior Strategic Planner
Attachment	1. Planning Proposal including updated Noise Assessment and Traffic Reports by TTM 2. Advice from Department Planning and Environment, dated 5 July 2017

Palmers Island Marine Industrial Park

Planning Proposal

April 2017

Rob Donges Planning Consultant

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Document Control Sheet

Document Title:	Palmers Island Marine Industrial Park Proposal
Author:	Rob Donges, BA, MTCP
Date of Issue:	April 2017

Document Distribution

Date	Status	Distribution – Number of Copies		
		Client	Council	Other
26/4/16	Draft	1		
11/5/16	Final	1	1	
26/6/16	Revised	1	1	
28/11/16	Revised	1	1	
23/3/17	Revised	1	1	

Note:
Clarence Valley Council at its meeting on 15 November 2016 considered a report on this proposal and resolved:

"That Council refer the planning proposal REZ2016/0001 to the Gateway, subject entirely to the proponent amending the proposal in such a way the IN4 Working Waterway area is reduced by 40% percent of the current Plan area, and noting that each of the following is to be provided prior to public exhibition:

a) additional clarification of intersection requirements,
b) impacts on the riverbank in the vicinity of the site due to the proposed dry dock construction,
c) site contamination and
d) Aboriginal cultural heritage."

As directed by Council, this Proposal has now been amended to reflect the 40% reduction in the area to be rezoned to IN4 Working Waterfront. This represents a reduction from 17.6 hectares to 10.6 hectares.

The proposed rezoning plan has been amended to reflect the reduction. The Concept Plan has been amended in consultation with the Acoustic Engineers to reflect the reduction and to improve acoustic protection. A revised Acoustic Report reflecting those changes is included. An additional Traffic Report has been prepared to address issues raised by council staff and is included along with the previous report dated 28 September 2016.

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Appendix I – Clause 8, SEPP 71: Assessment

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1. Background

1.1 Introduction

In May 2014 Hopkins Consultants submitted a Rezoning Planning Proposal for a Marine Industrial Precinct on Lot 2 DP 598769 School Road, Palmers Island on behalf of Yamba Welding & Engineering.

The Proposal was considered by Council at its meeting on 15 July 2014, where it was resolved to initiate the "Gateway" process, subject to the Proposal being amended to delete land to be rezoned IN4 within 100 metres of any existing dwelling not located on the subject land, and the provision of additional assessment prior to exhibition in respect of:

a. *Impact on local hydrology, bank stability and aquatic habitat associated with the proposed open canal, and*

b. *Additional traffic assessment that considers business as well as employee traffic generated by the proposal including more detailed assessment of likely intersection requirements at the corner of Yamba Road and School Lane.*

In accordance with the resolution, the Proposal was forwarded to NSW Department of Planning & Environment seeking a Gateway determination. On 18 November 2014, the Department advised Clarence Valley Council, inter alia:

> *"While acknowledging that the proposal has some merit, it is not supported at this time. This is due to insufficient justification that Council's proposal for a 100m setback from the existing dwellings will adequately address the potential acoustic and land use conflict impacts on those properties. There is also insufficient information on the suitability and viability of the proposed mitigation measures.*
>
> *Should Council wish to pursue the rezoning of the land, a thorough investigation of the potential acoustic and land use conflict impacts of the proposed development on nearby residential properties will be required. This will ensure that any future planning proposal on this site adequately manages the impact on nearby dwellings."*

This current Planning Proposal has been prepared in response to both Council's and the Department's advice. It does not reference the previous Proposal and stands independent of that Proposal.

1.2 Summary

The Planning Proposal seeks to amend Clarence Valley Local Environmental Plan 2011 to rezone part of Lot 2 DP 598769 School Road, Palmers Island from RU1 Primary Production to Part IN4 Working Waterfront/Part W3 Working Waterway to permit the development of a Marine Industrial Precinct (Boatbuilding & Associated Services), to be known as the Palmers Island Marine Industrial Park.

The Proposal will result in the following zoning outcome on the site:

IN4 Working Waterfront:	10.6 ha
W3 Working Waterway:	1.1 ha
Retained RU1 Primary Production:	9.5 ha
Total Site Area	21.2 ha

1.3 Property Description

The subject property is defined as Lot 2 DP 598769 School Road, Palmers Island.

1.4 Site & Locality

The property is located on the south bank of the Clarence River, approximately 6km east of the Pacific Highway at Harwood Bridge and 7km west of the township of Yamba. It has frontage to School Road which in turn connects to Yamba Road and thus Yamba and the Highway. It is owned by Yamba Welding & Engineering Pty Ltd (YWE).

Figure 1: Project Location

Figure 2: Location on Palmers Island

The property is largely surrounded by agricultural land under sugar cane cultivation, though additional uses in the locality include:

- A 5 lot rural horticultural precinct immediately to the north fronting the Clarence River
- A rural produce store and sheds array immediately opposite in McConnells Lane
- 2 tourist parks (2kms north-east and 1.5kms south of the subject property respectively)
- 2 aquaculture industries
- Palmers Island Public School (Primary) at School Road/Yamba Road intersection

There are 7 dwellings fronting School Road between Yamba Road and the subject property.

The property has an area of 21.2 ha, including a 1.1 ha portion of the Clarence River which has encroached onto the property as a result of long term erosion of the riverbank. The property is generally flat as detailed by the survey plan contained within Appendix B.

The property has previously been under cane cultivation though not for at least the last 6 years. It contains no natural vegetation of any note or scale.

The property has a frontage of approximately 260 metres to the Clarence River, with a depth of approximately 6 metres plus tide. The existing bank is within the defined boundaries of the property and has been rock armoured by Clarence Valley Council to provide low level protection against wave action.

1.5 Development Context & Concept

Yamba Welding & Engineering (YWE) is a local boat building company started in 1974 and operating out of the Yamba Industrial Estate since 1980. It exclusively constructs aluminium vessels as distinct from those of steel construction. In 2005/06 it undertook major extensions to its previous premises in response to major and sustained demand which still continues.

The current premises with a floor area of 1,250m^2 including offices, are severely constraining additional growth potential. Construction is limited to vessels up to 20 metres in length and the total number of vessels under construction at any one time is restricted. YWE receives constant enquiries for boats larger than 20 metres (or foregoes the opportunity to tender for such vessels) and for more vessels than the current space can accommodate.

The current location in a land-based industrial estate is not ideal, particularly in respect of larger vessels which ultimately exit Yamba by sea and so must be transported by road through town to the local marina.

The broad development concept (see Appendix A) has been prepared to assist with modelling acoustic and other potential impacts. It is only a broad representation of the possible future layout, though the site location towards the southern boundary is fixed. It consists of 5 precincts, being:

i. Commercial Office Space (360m2) site area including:
   - Administrative Office
   - Naval Architect Office
   - 'Smoko' shop for site workforce
   - 12 parking spaces

ii. Light Industry Workshops (1,600m2), site area including:
   - Shipwright
   - Electronics
   - Electrician
   - Fibreglass fabrication
   - 16 carparking spaces

iii. Heavy Industry Precinct, including:
   - YWE Aluminium Fabrication Shed (5,000m2)
   - Paint shed (1,000m2)
   - Painting Preparation Shed (1,000m2)
   - National/International Refit Bays (2,400m2)
   - Boat Storage Shed
   - 94 carparking spaces
   - Waste Collection Area

iv. Waterfront Activities, including:
   - Reinforced concrete launching/recovery basin equipped with 75t and 300t straddle lifts
   - Hard stand and wash down area
   - Mooring facility, wholly located within property

v. Future TAFE Marine Trades site and 5 carparking spaces (2,000m2) site area

A buffer zone of at least 100 metres is generally provided around Lot 1 DP 598769 and the 9.5 hectares contained within this buffer will retain the current RU1 Primary Production zoning.

The only encroachment into the 100m buffer is a small section of the future hardstand area adjacent to the riverfront. Hardstand areas are utilised for vessel storage and are a passive use that needs to be located adjacent to the launching/recovery basin and accessible by straddle lifts. Sufficient hardstand is provided in the initial development and this future area is provided as a precaution.

The remainder of the property, 10.6 hectares, is proposed to be rezoned IN4 Working Waterfront and the terrestrial component of the development will be wholly contained within this area.

This development footprint will be filled to appropriate levels, with all buildings having a minimum floor height above the 1 in 100 year flood level.

The water-based component will be used for mooring facilities.

The Marine Industrial Park will contain no facilities or businesses catering for the public and public access will be limited to clients and associated visitors with 2 visitor car spaces provided.

The future TAFE site will be offered to the State Government at no cost and whether the offer is taken up is a matter for those authorities.

An on-site wastewater management system will be established on the undeveloped land east of the Marine Park.

Access is via a 10m wide road along the northern boundary of the Marine Park development to the Administration Office. Access into the Marine Park operations area is via security gates located at the eastern end of the Park.

YWE Pty Ltd estimates a long term total workforce of 122 for its boatbuilding, refit/maintenance and associated activities.

Planning Proposal

Part 1: Objectives & Intended Outcomes

The objective of this Planning Proposal is to amend Clarence Valley Local Environmental Plan 2011 in respect of Lot 2 DP 598769 School Road, Palmers Island to enable the development of a Marine Industrial Park.

Part 2: Explanation of Provisions

The proposed outcome will be achieved by:

- Rezoning 10.6 hectares of the land component of the subject property to IN4 Working Waterfront.
- Rezoning the 1.1 hectare water component of the subject property to W3 Working Waterways.

The 9.5 hectare balance of the subject property will be retained as RU1 Primary Production.

There is no proposal to amend the existing building height and Lot size provisions affecting the subject property.

The proposed zones would permit the development of a Marine Industrial Park.

Part 3: Justification

Section A: Need for the Planning Proposal

1. Is the Planning Proposal a result of a strategic study or report?

Both Clarence Valley Council and NSW Planning and Environment have produced strategic studies which encourage and support the establishment of marine industries on the Clarence River.

The Marine-Based Industry Policy – Far North Coast and Mid North Coast NSW [NSW Planning & Environment August 2015]

The Policy identifies the Clarence River as one of five Navigable Waterways within the region with established marine industries and/or suitable for the establishment or expansion of such industries.

Appendix A of the Policy lists the "Characteristics, Industries and Special Attributes' all affected waterways, including the Clarence River:

Waterway	Waterway Characteristics			Existing Waterfront Activity	Special Attributes
	Bar / River Type	Navigability	Physical constraints		
Clarence River	• River • Open entrance with twin training break waters	• More Navigable • Very strong tidal currents (1.8 – 2 m/sec peak at ebb tide) • Rock reef inside the river entrance affects depth of draught • River navigable to Grafton however a rock reef is evident upstream of Maclean.	• Low level bridges on tributaries • Overhead and underwater services • Ferry services at Ulmarra, Lawrence	• Yamba boat building in the industrial estate and some activities at the Yamba Marina • Boatbuilding at Harwood slipway • Goodwood Island Wharf used by ships to service the Pacific Islands and Norfolk Island • Wharves at Maclean, Harwood, Illarwil, Ulmarra, Grafton • Slipways at Yamba, Harwood and Iluka.	• Adjacent Reserves: Bundjalung NP, Clarence Estuary NR, Yuraygir NP, Munro Island NR, Susan Island NR • Numerous SEPP14 wetlands • Major importance for migratory and threatened shorebirds • Numerous [1]Aboriginal Heritage Information Management System (AHIMS) records • Approx. 13 ha of [2]Priority Oyster Aquaculture Area (POAA) in Yamba Bay • [3]Estuary General Fishery • [4]Recreational Fishing Haven • [5]Estuary Prawn Trawl Fishery • #^Saltmarsh = 2.901 km^2 • #^Mangroves = 7.653 km^2 • #^Seagrass = 0.826 km^2

YWE is the "Yamba boat building in the industrial estate" reference above. The constraints listed under 'Navigability' and 'Physical Constraints' do not affect the subject property and its access to the ocean, with the exception of tidal currents which are manageable by all competent river users and the rock reef at the river entrance which still allows sufficient draught and manoeuvrability for the size of vessels which will utilise the proposed Marine Industrial Park.

The 'Special Attributes' are in fact constraints on potential marine industry sites along the river, none of which affect the subject property.

The Policy contains criteria for determining where marine-based industry should and should not occur. These criteria are assessed in some detail in Appendix C. In summary, the subject property avoids all the restrictive criteria of Section 2.2 of the Policy and either does, or can through appropriate design, meet all the criteria of Section 2.3.

Of particular relevance is Section 3.2 of the Policy which includes the following:

"Ideally if more than one enterprise is likely to be established, they should be clustered into a precinct rather than scattered along the waterway's edge, with a view to maximising efficiency of infrastructure and minimising environmental impacts."

This issue is discussed below.

Clarence Marine Precinct (Clarence Valley Council 2010)

The Clarence Marine Precinct states:

"The Clarence Marine Precinct presents a market first in that it is not limited to a single geographical site, rather, the precinct is the Clarence River itself."

and

"Recognising this large section of the river as a precinct area provides scope for a wide range of industries to be considered as partners and participants in new development and offers a choice of site for potential investment and future growth collaborations."

The development of the proposed Marine Industrial Park would be the second major marine industrial site on the Clarence River (the other being the Harwood Slipway). The Clarence River Precinct acknowledges that multiple sites may be appropriate for marine industrial development and so supports the dispersed cluster arrangement that would result.

The Clarence Marine Precinct also states:

"The Clarence Marine Precinct already supports the largest concentration of commercial fishing vessels in New South Wales and is renowned for its innovative and award winning boat building industry; however the precinct also boasts a wider range of established marine services encompassing the following sections:

1. *Boat design*
2. *Boat refit, repair and maintenance*
3. *Commercial fishing support activities*
4. *Recreational fishing and boating*
5. *Marine tourism and water sports*
6. *Aquaculture*
7. *Marine services and vessel storage as well as*
8. *Commercial wharf activities via the Port of Yamba, a recognised port of entry to Australia complete with the provision of federal customs service."*

The 'innovative and award winning boat building industry' refers in a large part to Yamba Welding and Engineering's boat building on its current constrained site. The development of the proposed Marine Industrial Park will enable the company to expand its innovative and award winning activities to encompass the construction of larger vessels and to enter into internationally competitive refit, repair and maintenance market, exclusively for aluminium vessels.

The Park will also include industries that support a marine precinct, such as metal fabrication, electrical services and marine fit-out, as envisaged by the Clarence Marine Precinct.

Clarence River Way Master Plan (Clarence Valley Council February 2009)

The Master Plan also expresses strategic intent to:

"Expand regional shipbuilding and repair facilities at Yamba by facilitating investment and promoting the development of a marine industry based cluster."

The proposed Marine Industrial Park core business will be the fabrication of aluminium vessels by YWE. Refit/maintenance services and a range of ancillary industries serving the aluminium vessel market will create the cluster envisaged by the CRWMP.

The established boat building and associated marine-based activities at Harwood Slipway, upstream of the subject property, represents an existing precinct.

In assessing whether co-location, as envisaged by the Marine-Based Industry Policy, is the ideal outcome in this instance, it is important to note the YWE operations are exclusively aluminium-based. All boats fabricated and maintained within the Marine Industrial Park will be aluminium.

The operations at Harwood are predominately steel-based. Steel particles produced by activities such as grinding and cutting are a contaminant to aluminium if they enter welds and joins. YWE has independent Quality Assurance Certification issued by the international Bureau Veritas organisation and part of the certification process requires YWE to ensure that the fabrication process is carried out in a contaminant-free environment. While the risk of contamination if both operations shared the same site may be slight, the continuance of this Quality Assurance Certification is critical for the company when tendering for many boat building contracts, particularly for government departments and authorities. Operating from an independent site where YWE can control all activities and maintain a strict 'aluminium only' regime will remove all risk. Technical advice on this issue is attached at Appendix K.

The operations at Harwood Slipway and those at the proposed Marine Industrial Park are both established businesses which are seeking to expand. Although they utilise some common ancillary services both have the ability to expand independent of each other. For YWE this involves the development of the subject property as a freestanding marine industrial precinct.

The dispersed cluster model and its inherent benefits as outlined in the Clarence Marine Precinct is the preferred model and is not contrary to the state government Policy in circumstances like these where the 'ideal' arrangement is not practical.

2. Is the Planning Proposal the best means of achieving the objectives or intended outcomes?

Yes – the proposal cannot proceed unless that portion of the subject property proposed to be developed for the Marine Industrial Park is rezoned from RU1 – Primary Production to the IN4 – Working Waterfront and W3 Working Waterways. The balance of the property will be retained as RU1 Primary Production.

Section B: Relationship to Strategic Planning Framework

Is the Planning Proposal consistent with the objectives and actions contained within the applicable regional or sub-regional strategy?

Mid North Coast Regional Strategy (NSW Department of Planning, March 2009)

When this proposal was initially submitted to Council and then forwarded to the Gateway, the Clarence Valley was subject to the provisions of the Mid North Coast Regional Strategy [NSW Department of Planning 2009]. Section 6 – Economic Development and Employment Growth, acknowledge that:

"The Region is historically recognised for its boat building industry and provides sheltered, waterside locations for this industry to grow and provide more employment."

It further states: *"In the case of some marine-based industries that depend upon access to navigable waterways, additional opportunities for industry establishment may be provided outside the growth areas. The Department of Planning will work with the Department of Environment and Climate Change and other relevant State Government agencies on suitable locational criteria to assist in guiding any future development opportunities."*

The subject property has been chosen by the applicant for the very reason identified above, that is, the future expansion of YWE is dependent on direct access to a navigable waterway with good access to open waters.

The 'suitable locational criteria' referred to above are contained in the Marine-Based Industry Policy – Far North Coast and Mid North Coast NSW [NSW Planning & Environment 2015] Section 2.2 lists criteria for where marine-based industry should not occur, which can be characterised as areas of high environmental sensitivity. Section 2.3 lists criteria for where it can occur. The proposed site satisfies with both sets of criteria. See Appendix C. In March 2017 the North Coast Regional Plan 2036 was adopted and so now is the relevant document.

North Coast Regional Plan 2036 (NSW Planning & Environment, March 2017)

The North Coast Regional Plan 2036 is the NSW Governments' strategy for guiding land use planning decisions for the North Coast Region.

A consistency check list against the Plans goals and actions is contained in Appendix M. It is considered that the inconsistencies with Actions 1.1, 1.4, 6.1 and 11.1 are justified.

NSW 2021 (NSW State Plan)

The proposal is consistent with the goal of driving economic growth in regional NSW.

Is the Planning Proposal consistent with the local Council's Community Strategic Plan, or other local strategic plans?

The relevant Clarence Valley Council local strategies are:

- Our Community Plan 2015-2024 (CVC, June 2014)
- Clarence Valley Economic Development Strategic Plan (CVC, June 2006)
- Clarence Valley Industrial Lands Strategy (CVC, October 2007)
- Clarence Marine Precinct (CVC, 2010)
- Clarence River Way Master Plan (CVC, February 2009)

Our Community Plan 2015-2024 includes a range of objectives, strategies and actions to address the five themes around which the Plan is constructed – Society, Infrastructure, Economy, Environment and Leadership.

Under Economy, the Plan details Council's role in fostering economic development and diversity. The proposed marine industrial precinct meets this objective by providing land use planning that facilitates employment creation (3.2.1) and supports and encourages existing business and industry to develop and grow (3.2.2).

Under Environment, the Plan details Council's role in maintaining waterways, catchments and flood plains (4.2.1) and conserving natural flora and fauna and their habitats (4.2.3). The Marine Industrial Park will be developed and operated in a manner that achieves these objectives.

The Proposal will meet both the Economy and Environment objectives.

The *Clarence Valley Economic Development Strategic Plan* includes the goal of facilitating the retention and development of existing, and attraction and support of new businesses and industry in the Clarence Valley.

The proposal meets the dual objectives of retaining and developing existing businesses (YWE) and attracting new businesses.

The final two strategic documents listed are addressed in Question 1 above.

Is the Planning Proposal consistent with applicable State Environmental Planning Policies?

Yes. The proposal is consistent with or justifiable as inconsistent with the relevant State Environmental Planning Policies – see Appendix D.

Is the Planning Proposal consistent with applicable Ministerial Directions (S117 directions)?

Yes. The proposal is consistent with or justifiable as inconsistent with the relevant S117 Directions – see Appendix E.

Section C: Environmental, Social & Economic Impacts

Is there any likelihood that critical habitat or threatened species, populations or ecological communities or their habitats, will be adversely affected as a result of the proposal?

Terrestrial Component

The subject property is a former cane farm and critical habitat or threatened species, populations or ecological communities or their habitats are unlikely to be present.

Aquatic Component

The Clarence River is a fisheries habitat and an assessment of that habitat within the aquatic component which will be affected by the proposal will be required at a later stage.

Are there any other likely environmental effects as a result of the Planning Proposal?

Flooding

The subject property has existing levels ranging from 2.2m AHD at the western (river) end to 0.75m AHD at the eastern (School Road) end. See level survey at Appendix B.

In 2014, BMT WBM produced the Palmers Island Marine Precinct Assessment addressing flooding on the subject property.

The report stated that the property is at risk of flooding from the Clarence River for the 100 year ARI event with the peak flood levels varying between 2.48m AHD in the east of the site to 2.63m AHD in the west. Flood velocities are generally low across the site (less than 0.25m/s). It concludes that proposed finished floor levels of 3.25m AHD are sufficient to be above the 1 in 100 year ARI event.

BMT WBM have subsequently provided advice dated 30 March 2016. This includes modelling undertaken for, but not included in, the 2014 report showing the impact of whole site being filled above the 1 in100 year AEP level (for both existing and future

climates). The impact of this worst case scenario is increased inundation of a section of farmland immediately to the south between 0.03m to 0.10m.

The correspondence further states:

"It is considered that a reduction in the fill extents and heights would result in lesser impacts than that shown in this worse case."

It recommends that a more detailed assessment of flood impacts be undertaken later in the current process which will be done.

A copy of the correspondence is at Appendix F.

Bushfire Hazard

The NSW RFS Bushfire Prone Land Map for Palmers Island shows no hazard areas on or within the vicinity of the property.

Water Quality

Aside from acid sulfate soil management, wastewater management will also be addressed in a Management Plan accompanying the Development Application. A site has been identified on the concept plan for a wastewater treatment plant and disposal area.

Riverbank Stability

The 260 metres of riverbank located within the property is currently protected by rock armouring constructed by Clarence Valley Council. This provides low-level protection against wave action and extends for several kilometres either side of the property.

The development will require the excavation of a 20 metre wide basin and a 14 metre wide boat ramp, both of which will disrupt the existing armouring. The provision of sophisticated riverbank works to protect high-value assets within the Marine Park is critical. The design of these protection works will ensure that the new works integrate with existing armouring on adjacent properties to guarantee there is no weakening of the current level of protection or increased maintenance costs. The impact of these works on local hydrology and bank stability will be the subject of a report at a later stage and detailed design to accompany a future Development Application.

It is anticipated that the owner will be responsible for the design, construction and maintenance of all bank protection structures which will eliminate the need for any council responsibility, particularly in respect of maintenance.

Acid Sulfate Soils

The property is subject to Acid Sulfate soils, predominately Class 3 with a small section of Class 2 at the eastern end. That portion of the property to be developed for the Marine Industrial Park will be filled to appropriate levels and disturbances resulting from the construction of buildings and infrastructure will most likely occur within thatfill.

The exception is the construction of the launching/recovery basin and boat ramp both of which will require excavation. A future Development Application will need to be accompanied by an acid sulfate soil assessment identifying the extent of any disturbance proposed and including geotechnical soil sampling and treatment measures to protect water quality.

A preliminary assessment could be undertaken prior to public exhibition of the Proposal, but this could only address the broad principles of possible future treatment options.

Air & Microclimate

The Marine Industrial Park will be required to satisfy the air quality provisions of the relevant environmental agencies. This will be addressed at the Development Application stage and as part of annual licencing requirements.

Visual Impacts

The potential to screen the Marine Park through the use of extensive plantings will be addressed in future Development Applications.

How has the Planning Proposal adequately addressed any social or economic effects?

Social Effects

The proposal has the potential to conflict with surrounding land uses and as a result a number of ameliorative measures have been incorporated into the concept plan or will be subject to future conditions of development consent based on expert reports prepared by suitably qualified consultants.

Separation from Adjoining Residences

With the exception of a small section of future passive hardstand along the riverfront, the Marine Industrial Park will be located at least 100 metres from the nearest existing residence, located on Lot 1 DP 598769 McConnells Lane.

Acoustic Impacts

An Environmental Noise Assessment Report has been prepared by TTM Consulting Pty Ltd and is attached as Appendix G.

The Report recommends a number of measures to be implemented by way of conditions of consent, addressing:

- Building construction standards, including materials and openings, and
- Operation of plant and equipment, including acoustic criteria compliance measuring
- Location of buildings and heavy vehicle travel paths.

The Concept Plan is designed to locate uses with minimal acoustic impact closest to adjoining residences and those with greater impacts further away and screened by other buildings. To the north this is the existing dwelling on Lot 1 DP 578769 (No. 67) McConnells Land and to the south a recently constructed dwelling mound on Lot 111 DP 1211119 (No. 135) School Road.

The Report concludes that with the implementation of the recommendations, noise generated by the development is predicted to comply with the criteria of the NSW Industrial Noise Policy when assessed at the nearest residential receivers.

Access, Transport & Traffic

A Transport and Traffic Assessment has been prepared by TTM Consulting Pty Ltd and is attached at Appendix H.

Traffic analysis is predicated on 127 parking spaces (122 staff, 5 TAFE).

The Marine Industrial Park will operate from 6 am to 6 pm with peak movement between 6 am to 8 am and 4 pm to 6 pm. These peaks do not coincide with the operating hours of the Primary School located at the Yamba Road/School Road intersection.

The Report adopts the following service vehicle movements:

- 2 small rigid vehicles (6.4m) per day and 1 extra per week
- 1 heavy rigid vehicle (12.5m) per week and 1 extra per month
- 1 articulated vehicle (19.0m) per fortnight
- 2 refuse collection vehicles per week.

The rationale behind these movements is based on a maximum fabrication capacity within the YWE shed of five 35m vessels per annum.

A 35m aluminium vessel has an average lightweight of 118 tonnes of which 53 tonnes is alloy. The majority of alloy is cut off-site and delivered “flat packed” requiring 2-3

articulated vehicles. Engines, transmissions and shafts require a further articulated vehicle.

Each 35m vessel therefore requires a maximum of 3-4 articulated vehicles, with an annual maximum of 15-20 trucks if the theoretical maximum fabrication was achieved.

An annual figure of 26 articulated vehicles has been adopted to allow for possible movements associated by the refit/maintenance activities.

All other materials and fitting ranging from electronics to internal panelling are delivered by vehicles from courier vans to heavy rigid trucks.

The Report concludes that the proposed development be approved on transport planning grounds subject to treatment to the Yamba Road/School Road intersection in the form of left and right turn lanes to address current intersection deficiencies not related to the proposed development. This will be addressed in the conditioning of a future Development Application and will require consultation with Roads & Maritime Services for works in Yamba Road.

Economic Effects

A substantial economic benefit is anticipated in both the construction and operational phases.

The proposed 100m x 50m fabrication shed has the floor space capacity for the construction of five 35 metre vessels simultaneously.

A 35 metre aluminium vessel:

- Contains an average 53 tonnes of alloy[1]
- Has an average completed light weight (pre-provisioning) of 118 tonnes[2]
- Requires 19,500 man hours (12 workers on average) over a 12 month build period[3]
- Is valued at $5.2m[4]

Under this modelling scenario, the maximum capacity of the shed is 60 fabrication staff producing vessels with a total value of $26m p.a.

A more likely mix of vessels is:

6.0m – 9.0m	20 vessels annually
9.0m – 25m	4 vessels annually
25m – 35m	1 vessel annually

[1] Glen Davis, Naval Architect
[2] Ibid
[3] Bill Collingburn, YWE
[4] Ibid

This would require a workforce, and result in an output value, approximate to that in the first scenario. No value has been put against the refit/maintenance activities at this stage.

The current YWE operation employs 20 fabrication staff and has an output value of approximately $5m p.a. Relocating to a substantially larger shed will remove inefficiencies such as multiple handling of materials and vessels resulting from the current constrained premises and substantial productivity improvement will result.

The total anticipated full time employment for the Marine Industrial Park as envisaged in the concept plan is as follows:

Activity	Staff Numbers
Heavy Industry Precinct	
Aluminium Vessel Fabrication	50
Painting	10
Paint Preparation	10
Light Industrial Precinct	
Shipwright	4
Electronics	4
Fibreglass Fabrication	4
Electrician	4
Commercial/Office Precinct	
YWE Administration	10
Naval Architect	1
Other	
Shop	1
Refit/Maintenance	24
Total	**122**

Section D: State and Commonwealth Interests

Is there adequate public infrastructure for the planning proposal?

Yes. The subject property fronts onto School Road which is sealed. Water, power and telecommunications are all located immediately adjoining the property and will be extended/upgraded as required at the owner's expense.

What are the views of State and Commonwealth public authorities consulted in accordance with the Gateway determination?

This section is to be completed following consultation with the State and Commonwealth authorities should the Director General determine to proceed with the Planning Proposal and identifies which authorities are to be consultedwith.

Part 4: Mapping

The Planning Proposal seeks to rezone 10.6 hectares of Lot 2 DP 598769 from RU1 – Primary Production to IN4 Working Waterfront and 1.1 hectares to W3 Working Waterway. See Figures 3, 4 and 5 on the next pages.

There will be no amendments to height of buildings or lot size provisions currently affecting the subject property.

The balance of the property 9.5 hectares will be retained as RU1 Primary Production.

Figure 3

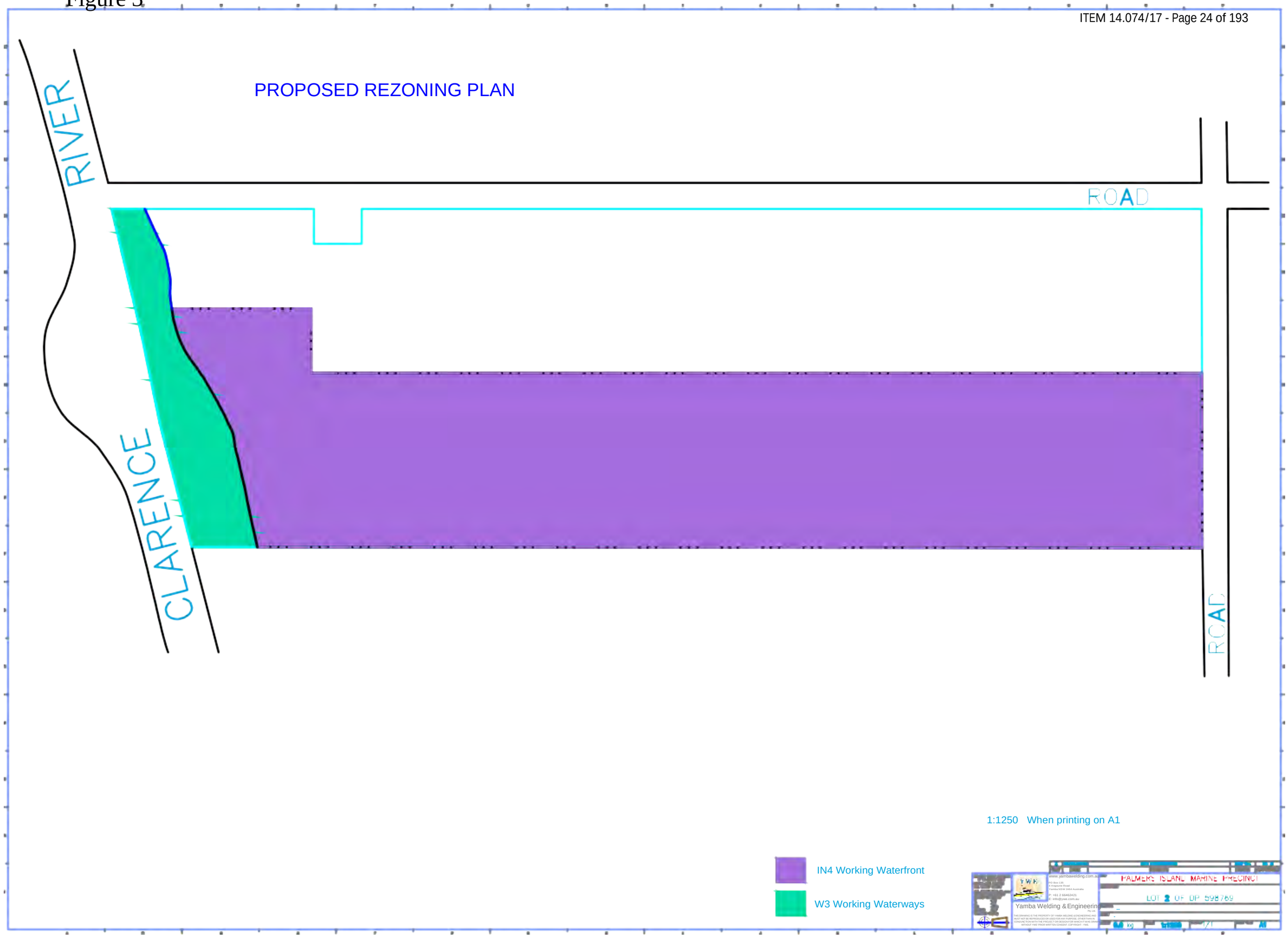

PROPOSED REZONING PLAN
RIVER
ROAD
CLARENCE
ROAD
1:1250 When printing on A1
IN4 Working Waterfront
W3 Working Waterways
PALMERS ISLAND MARINE PRECINCT
LOT 2 OF DP 598769
Yamba Welding & Engineering

Figure 4.

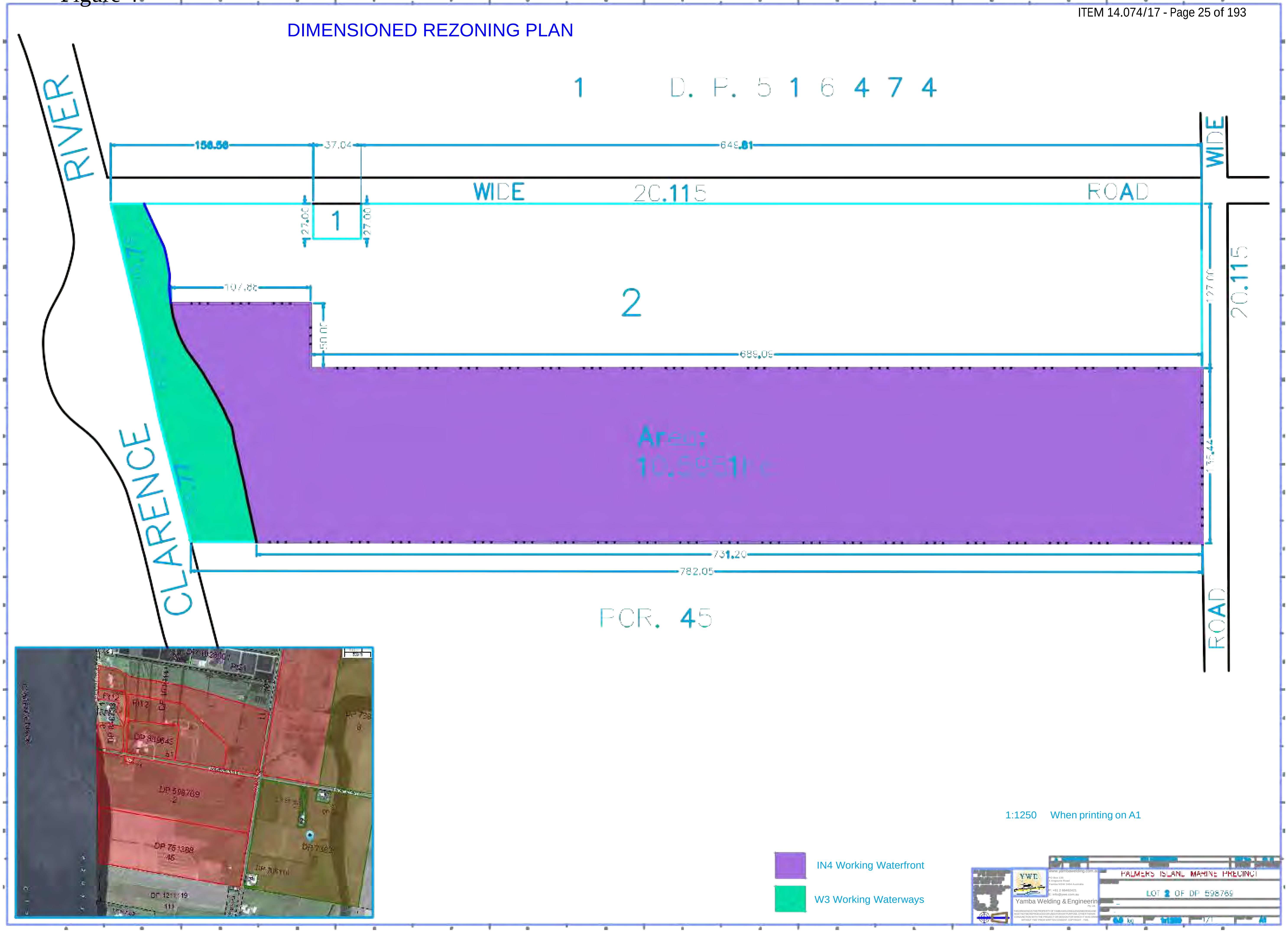

DIMENSIONED REZONING PLAN
1 D. P. 5 1 6 4 7 4
RIVER
CLARENCE
WIDE
20.115
ROAD
158.56
37.04
649.81
27.00
1
2
107.86
50.00
689.09
Area:
731.20
782.05
PCR. 45
1:1250 When printing on A1
IN4 Working Waterfront
W3 Working Waterways
PALMERS ISLAND MARINE PRECINCT
LOT 2 OF DP 598769
Yamba Welding & Engineering
DP 598769
DP 751388

Figure 5: Existing Zone

Part 5: Community Consultation

It is expected that community consultation will be undertaken in accordance with Council's requirements.

The need for Agency consultation will be determined as the proposal proceeds but it is anticipated that consultations will be required the following State agencies:

- Roads & Maritime Services
- Fisheries
- Office of Environment & Heritage
- Office of Water

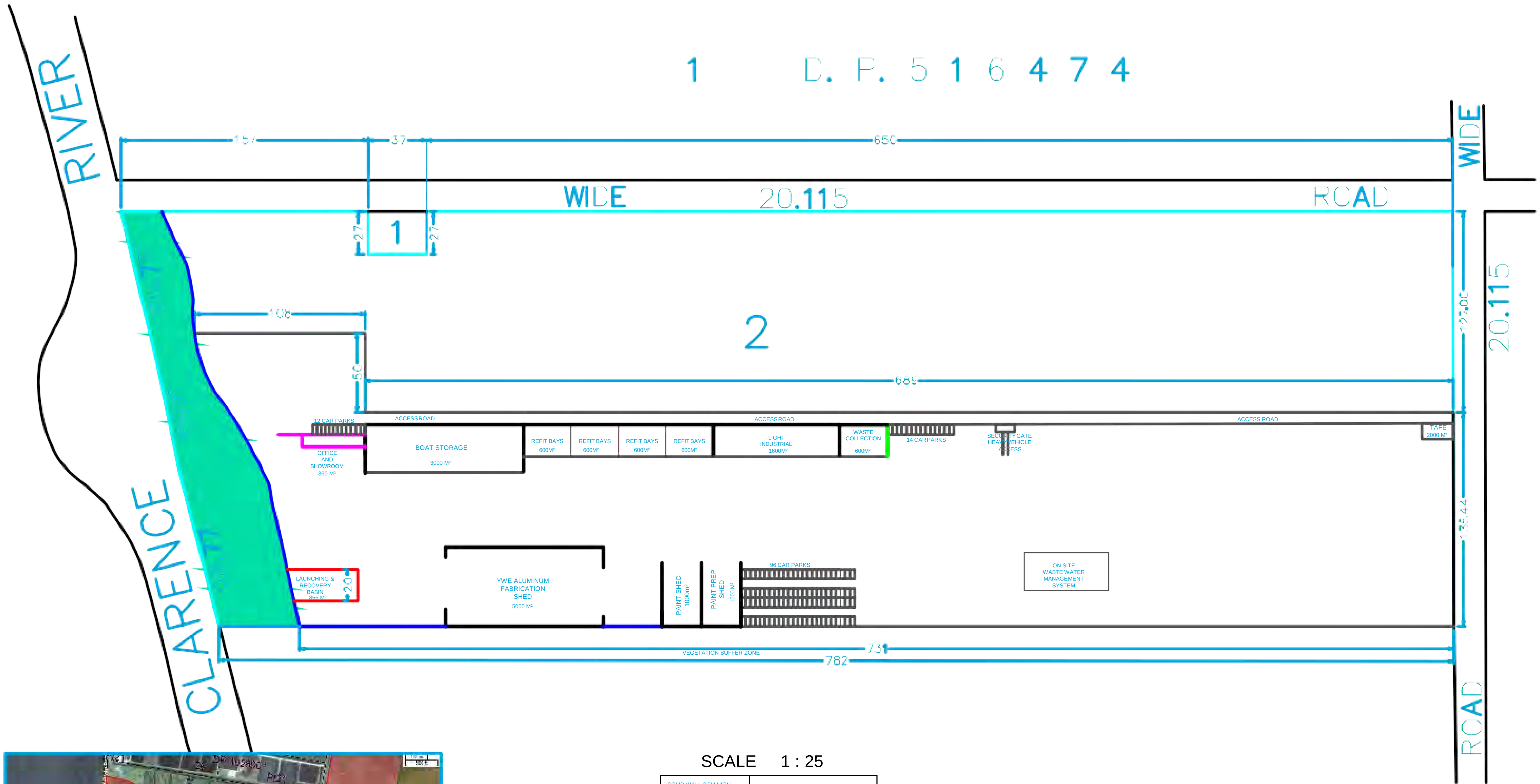
Part 6: Project Timeline

Plan Making Step	Estimated Completion
Council Resolution	TBA
Gateway Determination (Anticipated)	TBA
Government Agency Consultation	TBA
Public Exhibition	TBA
Submissions Assessment	TBA
RPA Assessment of Planning Proposal and Exhibition Outcomes	TBA
Submission of Endorsed LEP to DP&E for finalisation	TBA
Anticipated date RPA will make plan (if delegated)	TBA
Forwarding of LEP Amendment to DP&E for notification (if delegated)	TBA

The table will be completed when the relevant information is available.

APPENDIX A

Concept Plan



SCALE 1 : 25

SOLID WALL 3.8M HIGH	(blue line)
SOLID WALL 8M HIGH	(black line)
SOLID WALL 4.5M HIGH	(magenta line)
SOLID WALL 3.5M HIGH	(green line)

IN4 Working Waterfront

W3 Working Waterways

PALMERS ISLAND MARINE PRECINCT

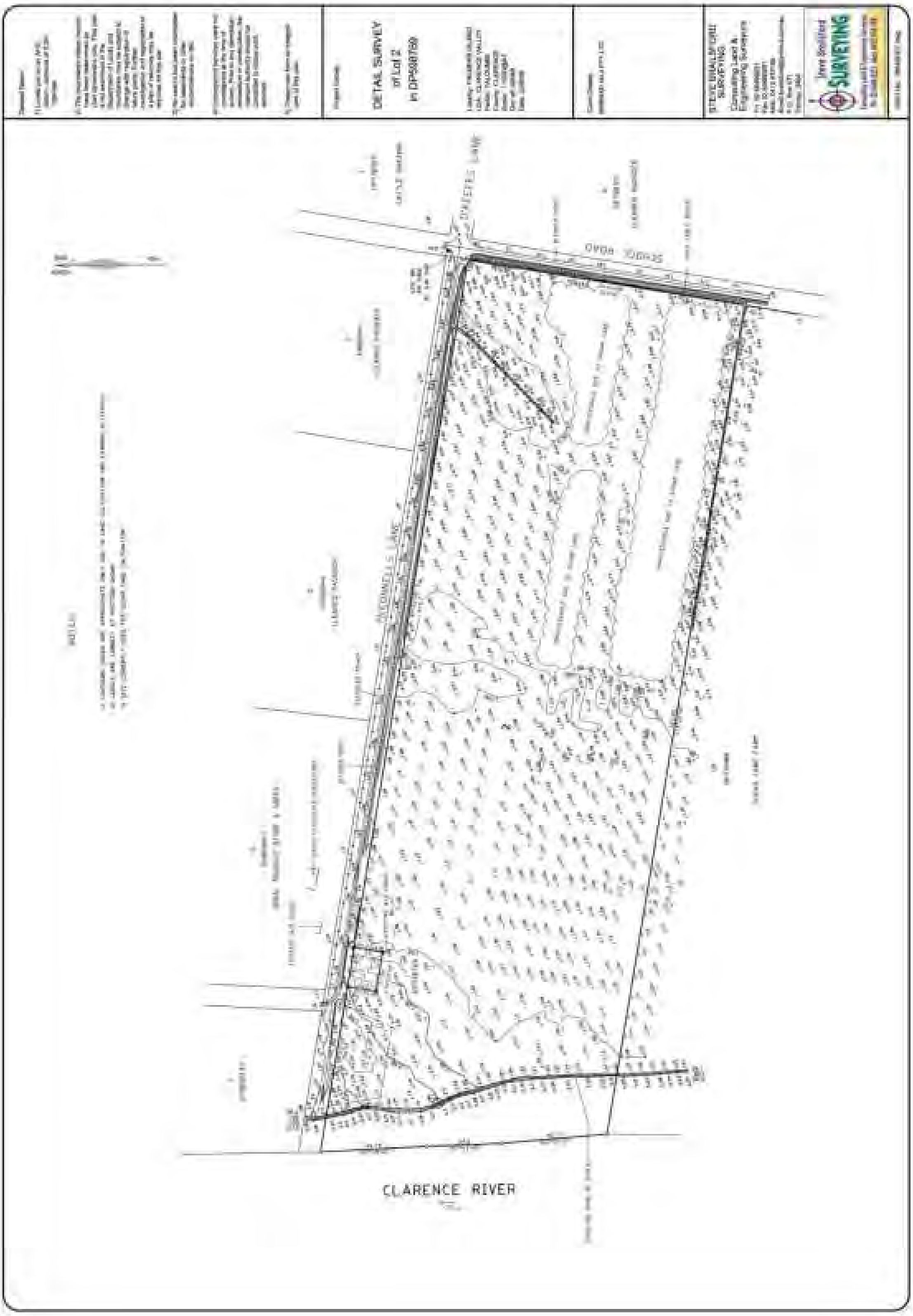
Acoustic Requirements for Compliance

Yamba Welding & Engineering

Appendix B

2008 Survey Detail

Appendix B



Appendix C

Marine-Based Industry Policy – Far North Coast & Mid North Coast NSW Assessment

Marine-Based Industry Policy – Far North Coast & Mid North Coast NSW Assessment

2.2 Where marine-based industry should not occur

- **Reserves (listed in section 30A of the National Parks and Wildlife Act 1974 (NPW Act)) or on Lands acquired for future reservation (NP&W Act Part 11 Lands).**

  Subject property is not affected by current reserves or future reservation.

- **Land accessed from areas of a Marine Park zoned 'Sanctuary' or 'Habitat Protection'**

  No Marine Park in vicinity

- **SEPP 14 and other important wetlands**

  No SEPP 14 or wetlands in vicinity

- **SEPP 26 littoral rainforests and other lowland rainforests**

  No SEPP 26 in vicinity

- **The habitats of threatened species, populations or ecological communities; or critical habitat listed under the Threatened Species Conservation Act 1995 and/or the Fisheries Management Act 1994**

  No critical habitats in vicinity

- **Areas subject to the Commonwealth Environment Protection and Biodiversity Conservation Act 1999, such as habitat for migratory species, Ramsar-listed wetlands, threatened species, etc**

  Area not subject to Commonwealth legislation

- **Seagrass, saltmarsh and mangrove areas**

  No saltmarsh or mangrove areas in vicinity. River along frontage of subject property has a depth of approximately 6m plus tide with velocities up to 2.8m/s so it is unlikely that there would be seagrass beds but this will be confirmed upon inspection by an environmental consultant.

2.3 Where Marine-Based Industry can occur

In order to meet the policy definition and intent, any proposed marine-based industry should meet the following criteria:

1. **The industry is dependent on access to a navigable waterway.**

   The Marine Industrial Park will fabricate vessels ranging from 6 metres to 35 metres in length. The procedure for transporting vessels by road is determined by beam width. A width between 2.6m and 6m requires an escort, and above 6m requires a police escort. Maximum height that can be transported is 5.2m and any vessel above 4.6m requires the electrical authority to lift lines.

   As a result, generally all vessels over 10m in length are transported by water and those less than 10m by trailer.

   All vessels undergoing refit/maintenance will utilise water access.

2. **The maximum draught of the vessel(s) or product(s) proposed to be built allows it/them to pass safely through the waterway and the waterway's entrance to the sea.**

   The maximum draught of a 35m-45m aluminium is between 1.8m and 2.4m. The relevant depths in the Clarence River are:
   - River mouth bar: 5m + tide height
   - In the river, including reef: 4m + tide height
   - Transition from main channel to subject property: 2.8m + tide height
   - Front of property: 6m + tide height

3. **The size or bulk of the vessel(s) or product(s) proposed to be built requires transport by water.**

   Those over 10 metres in length require transportation by water, while all vessels undergoing refit/maintenance will use this method.

Having satisfied the three criteria above, the proposed marine-based industry needs to be assessed against the following site criteria. The criteria can be taken as being met if the issue can be sustainably managed, ameliorated or off-set.

4. **Any new dredging required for site access would not adversely affect estuarine habitats, marine vegetation, fishery resources and water quality.**

   There will be no dredging required as the river at this location has sufficient depth even at low tide for access of vessels up to 45m into the launching/recovery basin. The basin itself is located landward of the riverbank and will be created by excavation. The existing rock armouring will be removed and replaced with an engineered structure in accordance with designs prepared by specialist engineering consultants.

5. **The site is not located where its development would be likely to adversely affect water quality for other users or impact on water quality or tidal regimes for estuaries, wetlands, marine parks, aquatic reserves or other high conservation value habitats.**

   Water quality will not be affected during the construction phase or the subsequent operation of the Park. It is anticipated that development consents for both phases will be conditional to ensure this protection.

   The potential risks to water quality are from:
   - Acid sulfate soils
   - Wastewater disposal
   - Materials stored on site

   Acid sulfate soils will be addressed in a future management plan incorporating a treatment regime to protect water quality.

   Wastewater disposal will be addressed in a future management plan.

   Material will be stored above flood level (or relocatable above this level) and appropriate bunded areas provided as required.

   All of these matters will be subject to conditions of consent.

6. **Development of the site would not have an adverse effect on oyster aquaculture development or Priority Oyster Aquaculture Areas (POAA) and/or commercial and recreational fishing activities.**

   The Park will not affect recreational fishing activities as no habitat critical to fish, such as mangroves, are located within the vicinity of the subject property. The closest Oyster aquaculture is located in Yamba Bay, approximately 7 kms downriver. Water quality will be protected and commercial and recreational fishing activities in the public domain will not be affected.

7. **The site is not located in a high flood risk precinct or high flood area.**

   See 8 in Planning Proposal.

   Being flood affected is possibly a natural characteristic of flat riverfront land.

   The Clarence River has a substantial catchment, the majority of which is located outside the lower Clarence region. As a result, there is 2-3 days' notice of river floods which allows ample time to secure vessels, store materials above flood levels and close down operations. All flood protection actions will be addressed in a Flood Emergency Management Plan.

Water-based access to the site would be practicable given river currents and tidal movements in the locality.

The river is used by commercial vessels accessing the Harwood Slipway and Goodwood Island Wharf, plus commercial fishing boats and recreational boats. Water access to the site is therefore practical.

8. **The site does not contain high-risk acid sulfate soils which could be disturbed, exposed or drained.**

The property is mapped by Council as being predominately Class 3 acid sulfate soils with a small section of Class 2. Under CVC LEP 2011, a future development application for the Marine Industrial Park and specifically the launching/recovery basin and boat ramp would need to identify areas and extent of likely disturbance supported by soil testing. Treatment and water quality protection measures would need to be prepared and approved by Council.

9. **The main industrial complex (excluding the slipway/s), could be set back to avoid bank erosion issues.**

The closest buildings are located approximately 150m from the riverbank and the area in between will be used for hardstand. The property's riverbank will have the existing low-tech rock armouring removed adjacent to the industrial complex (a length of approximately 200 metres) and the construction of engineered-designed protection against bank erosion will be undertaken as part of the process of constructing the launching/recovery basin and boatramp.

10. **Native vegetation (including riparian vegetation and other trees, shrubs, grasses, etc) would not be disturbed.**

There is no natural vegetation located within the area to be developed for the Marine Park.

11. **The proposed development of the site would not conflict with neighbouring land uses (such as residential and recreational/tourism pursuits).**

See Section 4 of the Proposal.

12. **Services and infrastructure could be practicably provided.**

All services, with the exception of a reticulated sewer system, are located within close proximity to the property and will be extended and upgraded as required. Sewer will be treated and disposed of on-site, details of which will be included in a future development application for assessment and approval by Council.

Appendix D

State Environmental Planning Policies Assessment

STATE ENVIRONMENTAL PLANNING POLICIES ASSESSMENT

Name of SEPP	Relevant?	Comment/statement of consistency
The following State Environmental Planning Policies (SEPPs) are current and are applicable to the Clarence Valley LGA and are required to be considered whether applicable or not in a particular circumstance.		
State Environmental Planning Policy No 1 - Development Standards	No	N/A
State Environmental Planning Policy No 14 - Coastal Wetlands	No	N/A
State Environmental Planning Policy No 19 - Bushland in Urban Areas	No	N/A
State Environmental Planning Policy No 21 - Caravan Parks	No	N/A
State Environmental Planning Policy No 26 - Littoral Rainforests	No	N/A
State Environmental Planning Policy No 30 - Intensive Agriculture	No	N/A
State Environmental Planning Policy No 32 - Urban Consolidation (Redevelopment of Urban Land)	No	N/A
State Environmental Planning Policy No 33 - Hazardous and Offensive Development	No	N/A
State Environmental Planning Policy No 36 - Manufactured Home Estates	No	N/A
State Environmental Planning Policy No 44 - Koala Habitat Protection	No	N/A
State Environmental Planning Policy No 47 - Moore Park Showground	No	N/A

Name of SEPP	Relevant?	Comment/statement of consistency
State Environmental Planning Policy No 50 - Canal Estate Development	No	N/A
State Environmental Planning Policy No 52 - Farm Dams and Other Works in Land and Water Management Plan Areas	No	N/A
State Environmental Planning Policy No 55 - Remediation of Land	No	N/A
State Environmental Planning Policy No 62 - Sustainable Aquaculture	No	N/A
State Environmental Planning Policy No 64 - Advertising and Signage	No	N/A
State Environmental Planning Policy No 65 - Design Quality of Residential Flat Development	No	N/A
State Environmental Planning Policy No 70 - Affordable Housing (Revised Schemes)	No	N/A
State Environmental Planning Policy No 71 - Coastal Protection	Yes	The subject property is within the Coastal Protection Zone and is subject to consideration under SEPP 71, particularly Clause 8. See Appendix I.
State Environmental Planning Policy (Affordable Rental Housing) 2009	No	N/A
State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004	No	N/A
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008	No	N/A
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004	No	N/A
State Environmental Planning Policy (Infrastructure) 2007	No	N/A

Name of SEPP	Relevant?	Comment/statement of consistency
State Environmental Planning Policy (Kosciuszko National Park - Alpine Resorts) 2007	No	N/A
State Environmental Planning Policy (Kurnell Peninsula) 1989	No	N/A
State Environmental Planning Policy (State Significant Precincts) 2005	No	N/A
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007	No	N/A
State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007	No	N/A
State Environmental Planning Policy (Penrith Lakes Scheme) 1989	No	N/A
State Environmental Planning Policy (Rural Lands) 2008	Yes	The proposal to rezone rural land requires Clause 7 of the SEPP to be addressed. See Appendix J.
State Environmental Planning Policy (State and Regional Development) 2011	No	N/A
State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011	No	N/A
State Environmental Planning Policy (Sydney Region Growth Centres) 2006	No	N/A
State Environmental Planning Policy (Three Ports) 2013	No	N/A
State Environmental Planning Policy (Urban Renewal) 2010	No	N/A
State Environmental Planning Policy (Western Sydney Employment Area) 2009	No	N/A
State Environmental Planning Policy (Western Sydney Parklands) 2009	No	N/A
State Environmental Planning Policy (Integration & Repeals) 2016	No	N/A

Appendix E

Assessment against S117 Ministerial Directions

Assessment Against S117 Ministerial Directions

Section 117 Direction	Applies?	Comments
1. Employment and Resources		
1.1 Business and Industrial Zones	Yes	Consistent. The proposal will result in substantial increase in direct employment growth for the existing business. Both state government strategies and CVC policies acknowledge that the suitable location for marine-based industry is on sites with frontage to navigable waterways as is the case here.
1.2 Rural Zones	Yes	The proposal is inconsistent but justified. The Direction objective is to protect the agricultural production value of rural land. This Direction prohibits the rezoning of rural land to an urban zone (including industrial) unless justified by a strategy or in accordance with the relevant Regional Strategy prepared by the Department of Planning. The Mid North Coast Regional Strategy, which was the relevant Plan when this Proposal was submitted, states: *"In the case of some marine-based industries that depend upon access to navigable waterways, additional opportunities for industry establishment may be provided outside the growth areas."* Although the recently released North Coast Regional Plan 2036 does not contain such a direct and relevant statement, the Proposal is still consistent with its Direction 6 - Develop successful centres of employment and Action 6.6. The property is mapped as regionally significant farmland under state government mapping but hasn't been in cane cultivation for up to 6 years. The Mid North Coast farmland mapping project final report (2008) states: *"Regionally significant farmland can be considered where there is a need to zone land for marine-based industries that depend on access to navigable waterways."* Both these strategies justify the establishment of the Marine Park at the proposed location.

Section 117 Direction	Applies?	Comments
1.3 Mining, Petroleum Production and Extractive Industries	N/A	
1.4 Oyster Aquaculture		Consistent. The objective is to ensure that Priority Oyster Aquaculture Areas are adequately considered to ensure they will not be adversely affected by the proposal. The closest Priority Oyster Aquaculture Areas are located at Yamba, approximately 7kms downstream. The development application for the Marine Industrial Precinct will need to address the issue of water quality, particularly in respect to the disturbance of acid sulphate soils, and will be assessed and conditioned by CVC and appropriate government authorities.
1.5 Rural Lands	Not specifically	Comments on 1.2 are relevant.
2. Environment and Heritage		
2.1 Environmental Protection Zones	N/A	
2.2 Coastal Protection	Yes	The proposal is consistent with the NSW Coastal Policy and relevant provisions of Coastal Design Guidelines and the NSW Coastal Management Manual. The specifics of the proposal and its compliance will be addressed in detail in the future development application and will include: • Flooding • Riverbank stability • Water quality • On-site waste water management • Acid sulphate soils
2.3 Heritage Conservation	Yes	AHIMs search attached, with no cultural heritage issues identified. All works including those on the river are contained within the boundaries of the property and so are not subject to the recent Native Title determination.
2.4 Recreation Vehicle Areas	N/A	
2.5 Application of E2 and E3 Zones & Environmental Overlays in Far North Coast LEP's	N/A	This direction does not apply to the Clarence Valley Council
3. Housing, Infrastructure and Urban Development		
3.1 Residential Zones	N/A	
3.2 Caravan Parks and Manufactured Home Estates	N/A	

Section 117 Direction	Applies?	Comments
3.3 Home Occupations	N/A	
3.4 Integrated Land Use and Transport	Yes	Inconsistent but justified. The subject property is located approximately 6kms from the nearest urban area (Yamba) in a sparsely populated rural area and so it is anticipated that the majority of travel movements will be by car. As discussed in Direction 1.2 and elsewhere in this planning proposal the relevant Regional Strategy and Council's strategic documents relating to marine-based industries and the Clarence River all acknowledge that these developments may need to be located on navigable waterways and so outside urban areas.
3.5 Development Near Licensed Aerodromes	N/A	
3.6 Shooting Ranges	N/A	

Section 117 Direction	Applies?	Comments
4. Hazard and Risk		
4.1 Acid Sulfate Soils	Yes	Inconsistent but justified. The property is subject to Acid Sulfate soils, predominately Class 3 with a small section of Class 2 at the eastern end. That portion of the property to be developed for the Marine Industrial Park will be filled to appropriate levels and disturbances resulting from the construction of buildings and infrastructure will most likely occur within that fill. The exception is the construction of the launching/recovery basin and boat ramp both of which will require excavation. A future Development Application will need to be accompanied by an acid sulfate soil assessment identifying the extent of any disturbance proposed and including geotechnical soil sampling and treatment measures to protect water quality.
4.2 Mine Subsidence and Unstable Land	N/A	
4.3 Flood Prone Land	Yes	Inconsistent but justified. See 8 in the Planning Proposal. A full flood report modelling the concept plan and incorporating ameliorative measures to reduce or eliminate the impact on the adjoining property will be prepared at a later stage in this process. The 2.9 hectare section of the site upon which the Marine Park will be located will be filled to appropriate heights. All buildings will have a minimum floor level of 3.25 AHD. Hardstand areas, travel routes and the access road may be set at lower levels to reduce the quantity and impact of fill, though this will be determined at a later stage. BMT WBM have mapped the impact of filling the entire site to the 1 in 100 year flood level (for existing and future climates) and shows an impact of up to 0.10m on a section of agricultural land to the south of the property. They state that modelling the actual area to be filled would reduce this impact.

Section 117 Direction	Applies?	Comments
4.4 Planning for Bushfire Protection	N/A	
5. Regional Planning		
5.1 Implementation of Regional Strategies	Yes	The Mid North Coast Regional Strategy identifies the need in some circumstances to locate marine-based industries on navigable waterways.
5.2 Sydney Drinking Water Catchments	N/A	
5.3 Farmland of State and Regional Significance on the NSW Far North Coast	N/A	
5.4 Commercial and Retail Development along the Pacific Highway, North Coast	N/A	Revoked
5.5 Development in the Vicinity of Ellalong, Paxton and Milifield (Cessnock LGA)	N/A	Revoked
5.6 Sydney to Canberra Corrido	N/A	Revoked
5.7 Central Coast	N/A	Revoked
5.8 Second Sydney Airport: Badgerys Creek	N/A	
5.9. North West Rail Link Corridor Strategy	N/A	
5.10 Implementation of Regional Plans	Yes	The applicable Plan is the North Coast Regional Plan 2036 and assessment against the Plan is at Appendix M. It is considered that all identified inconsistencies are justified.
6. Local Plan Making		
6.1 Approval and Referral Requirements	Yes	Complies
6.2 Reserving Land for Public Purposes	N/A	
6.3 Site Specific Provisions	Yes	Proposes to rezone the property to 2 zones currently existing in CV LEP 2011.
7. Metropolitan Planning		
7.1 Implementation of the Metropolitan Plan for Sydney 2036	N/A	
7.2 Implementation of the Greater Macarthur Land Release Investigation	N/A	
7.3 Parramatta Road Corridor Urban Transformation Strategy	N/A	

Appendix F

Flood Information

BMT WBM Pty Ltd
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Our Ref: : L.B22014.001.FIA.docx

30 March 2016

Rob Donges
c/o Yamba Welding and Engineering
PO Box 135
4 Angourie Road
Yamba NSW 2464

Attention: Rod Donges

Dear Rob,

RE: PALMERS ISLAND MARINE PRECINCT – FLOOD IMPACT ASSESSMENT

Further to our proposal to update the flood impact assessment for Palmers Island and subsequent conversations, we provide with this letter, preliminary outputs prepared for, but not included in, the original assessment (prepared by BMT WBM in February 2014). These outputs are based on a fill scenario that would represent a 'worse case' with regards to flood impacts. This case simulates the entire site as being filled above the 1 in 100 year AEP flood level (for both existing and future climates). It is considered that a reduction in fill extents and heights would result in lesser impact than that shown in this 'worse case'.

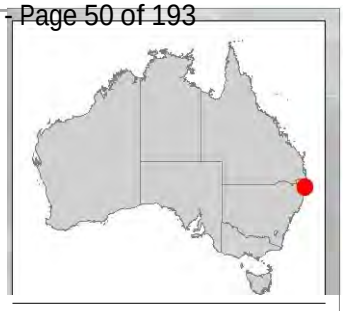
It is recommended that as the planning application progresses, a more detailed assessment of flood impacts are undertaken on the proposed design which would consider a range of flood magnitudes.

I trust that this is adequate for your purposes but don't hesitate to contact me should you require further information or clarification.

Yours Faithfully
BMT WBM

Barry Rodgers

Enc Fig 1 and 2



Clarence River

LEGEND

Subject Site

Peak Level Impact (m)

Was Wet Now Dry
< -0.50
-0.30 **to -0.50**
-0.20 to -0.30
-0.10 to -0.20
-0.05 to **-0.10**
-0.03 to **-0.05**
-0.03 to 0.03
0.03 to 0.05
0.05 to **0.10**
0.10 to 0.20
0.20 to 0.30
0.30 **to 0.50**
> 0.50
Was Dry Now Wet

Title:

100 Year ARI Peak Level Flood Impacts Whole Site Filled

Figure: 1

Rev: A

N

A.

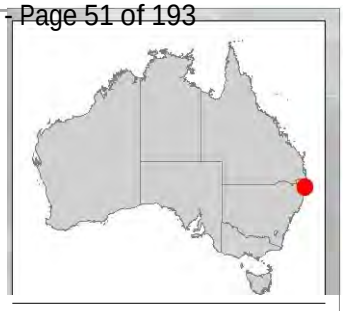
0 400 800m

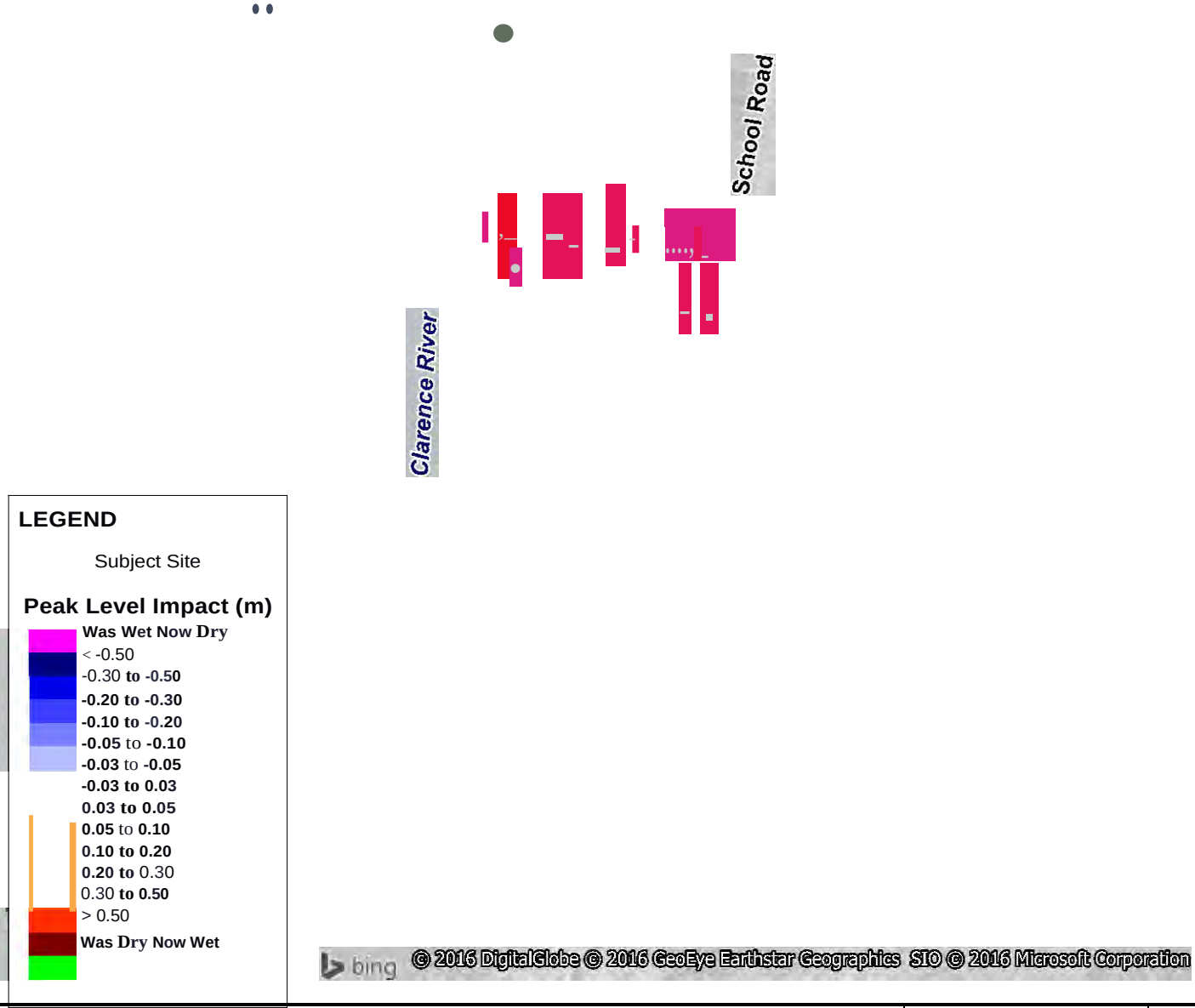
Approx. Scale

BMT WBM

www.bmtwbm.com.au

Filepath : "I:1820369.I.mgh.PalmersIsland_FIAI DRGI FLD_010_160330 Q1OO_Peak_Level_Impacts_Whole_S e.wor"





Title:

100 Year ARI with Climate Change Peak Level Flood Impacts - Whole Site Filled

Figure: 2

Rev: A

N

A.

0 400 800m

Approx. Scale

BMT WBM
www.bmtwbm.com.au

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APPENDIX G

Environmental Noise Assessment Report

Proposed Marine Park
Lot 2 DP598769 School Road, Palmers Island

Environmental Noise Assessment Report

Yamba Welding and Engineering Pty Ltd

Reference: 15GCA0123 R01_6
20 March, 2017

ABN 65 010 868 621

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PO Box 930 Sanctuary Cove QLD 4212
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Rev No.	Author	Reviewed/Approved		Description	Date
		Name	Signature		
A	J Fox			Internal draft	14/10/2015
0	J Fox			Draft report	14/10/2015
1	J Fox	K Hewett		Issue	25/02/2016
2	J Fox	K Hewett MAAS		Issue with updated layout	25/02/2016
3	J Fox	K Dhayam			21/07/2016
4	J Fox AAAS	K Dhayam MAAS			11/08/2016
5	J Fox AAAS	K Dhayam MAAS		RFI response	07/10/2016
6	J Fox AAAS	K Hewett MAAS		Acoustic report	20/03/2017

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1. Executive Summary

Yamba Welding and Engineering is proposing to seek approval for a rezoning application with the purpose of developing a business park at Lot 2 DP598769 School Road, Palmers Island. The development is to be known as Palmers Island Marine Park and will incorporate the relocation of the Yamba Welding and Engineering fabrication business onsite.

TTM was engaged to provide an acoustic assessment as supporting evidence for the preliminary approval. The purpose of the acoustic assessment is to provide an independent assessment of expected noise impact from the development onto the nearest noise sensitive receivers. During the assessment, TTM provided acoustic design advice to develop a revised site plan which provides the best level of internal noise attenuation. Predicative noise calculations were conducted based on this site plan.

These calculations indicate that noise levels from the proposed development are predicted to comply with the criteria. Through smart acoustic design and noise mitigation treatment to marine Travelift machinery, noise generated by the development is predicted to comply with the criteria of the *NSW Industrial Noise Policy* when assessed at the nearest residential receivers.

2. Introduction

2.1. Background

TTM was engaged by Yamba Welding and Engineering Pty Ltd to undertake a preliminary environmental noise assessment for a proposed marine park located at Lot 2 DP598769 School Road, Palmers Island. The preliminary noise assessment is prepared for the purposes of a rezoning application.

The assessment is based on the following:

a. Clarence Valley Council *Planning Proposal Application REZ 2016/0001* (information request) dated 29 June 2016.

b. Further information request from Clarence Valley Council via email correspondence dated 27 July 2016.

c. Development information provided by Yamba Welding and Engineering (YWE).

d. Noise criteria of the *NSW Industrial Noise Policy*[1] (INP).

e. Development plans by Yamba Welding and Engineering (shown in Appendix A).

f. Site inspection, noise measurements, analysis and calculations conducted by TTM.

2.2. Scope

The assessment includes the following:

i. Description of the development site and proposal;

ii. Measurement of the existing ambient noise environment and statement of assessment criteria relating to environmental noise;

iii. Prediction of total noise generated by the development onto the nearby residential properties;

iv. Consideration of the influence of possible weather conditions that may impact predicted noise levels at the receivers in accordance with the *Industrial Noise Policy*;

v. Details of noise mitigation methods to be incorporated to achieve predicted compliance.

[1] NSW Industrial Noise Policy, Environmental Protection Authority 2000.

3. Site Description

3.1. Site Location

The site is described by the following:

- Lot 2 DP598769
- School Road, Palmers Island NSW

The site locality is shown in Figure 1 below.

Figure 1: Site Locality

3.2. Current Conditions Surrounding the Site

The site is bound by McConnell's Lane to the north, School Road to the east, privately owned property to the south and the Clarence River to the west. Residential dwellings are sparsely located to the north, east and south of the subject site. The nearest noise sensitive locations are detailed in Section 8.1.

3.3. Current Acoustic Environment

The acoustic environment is typical of a rural area with noise sources including natural river sounds, commercial and recreational boats, natural land sources such as birds chirping and wind in vegetation, and local road traffic noise. The ambient noise levels used in the assessment are summarised in Section 5.6.

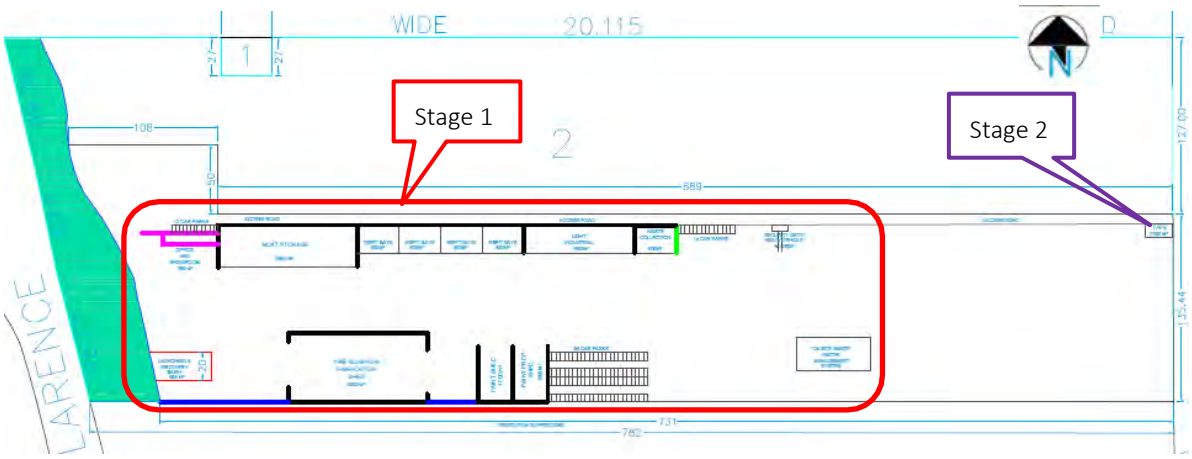
4. Proposed Development

4.1. Development Description

The proposal is to rezone the site for use as a Marine Park comprising two stages. Stage 1 of will incorporate Yamba Welding and Engineering, a light industrial / commercial precinct servicing the marine industry, paint and paint prep shed, and hardstand areas. Stage 2 is currently proposed as a TAFE for marine trade services. Yamba Welding and Engineering is an aluminium fabrication business for the construction of boats and is currently located on Angourie Road at Yamba.

The assessment is based upon the development plan shown in Figure 2 and in Appendix A.

Figure 2: Proposed Development Plan



4.2. Hours of Operation

The proposed hours of operation for Yamba Welding and Engineering are 6am to 6pm, 5 days per week but up to 7 days per week as required. YWE have advised that certain site activities such as, heavy vehicle deliveries, waste collection, and use of the marine Travelift would not commence prior to 7am. The commercial and light industrial precinct is expected to have typical daytime operating hours. General waste will be collected from 1 bin approximately 3 times per week, while aluminium waste will be collected twice per month.

For the purposes of the noise assessment the predicted noise levels are split into two assessment periods; day/evening operation and an early morning (6am to 7am) operating period.

5. Noise Measurements

5.1. Equipment

The following equipment was used to measure existing ambient noise levels:

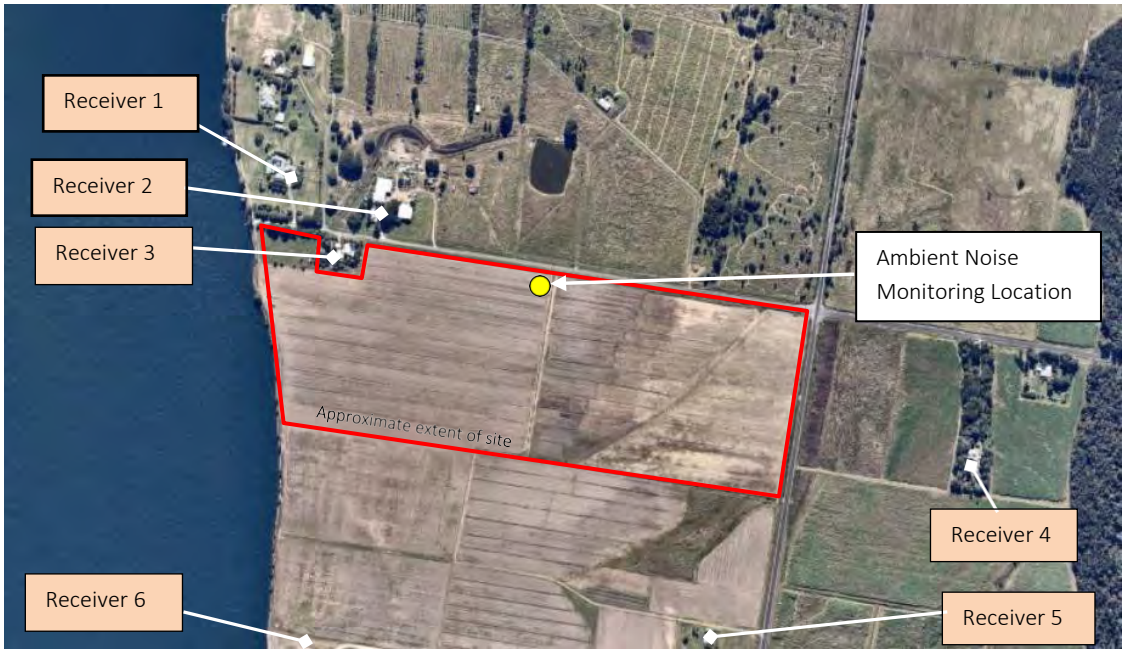
- Bruel and Kjaer 2250 soundlevel meter as an unattended logger (SN#: 3003106).
- RION NA-28 sound level meter (SN# 01060055).
- RION NC-74 Acoustical Calibrator (SN# 35073393).

All equipment was calibrated by a NATA accredited laboratory. The equipment was field calibrated before and after the measurement session. No significant drift from the reference signal was recorded.

5.2. Unattended Ambient Noise Monitoring

Unattended noise monitoring was conducted to establish ambient noise levels between Thursday 07/07/2016 and Saturday 16/07/2016. The noise monitor was located on the northern boundary of the site (refer to Figure 3) in a position considered representative of the minimum ambient noise levels experienced by all surrounding receivers. The microphone was in a free-field location approximately 1.6m above ground level.

Figure 3: Ambient Noise Monitoring Location and Nearest Noise Sensitive Receivers



The environmental noise monitor was set to measure statistical noise levels in 'A'-weighting, 'Fast' response, over 15 minute intervals. Noise measurement was conducted in accordance

with Australian Standard *AS1055:1997*[2] *Acoustics – Description and Measurement of Environmental Noise (AS1055)* and the *NSW INP.*

5.3. Weather Conditions During Noise Monitoring

Weather during the monitoring period was fine with only 1mm of rain on 9th July. Observations from the Yamba weather station are shown in Appendix C. General wind speeds were less than 5m/s (18km/h) during most 15 minute periods on all days in accordance with the requirements of the *INP*. Wind roses from the Yamba weather station are provided in Appendix D. The temperature range during the monitoring period was between 8-22°C (source: Bureau of Meteorology, Yamba 2016).

5.4. Comments on Noise Monitoring Location

The measured ambient noise levels used in the assessment are summarised in Section 5.6. It is noted that ongoing Pacific Highway upgrade works were being undertaken while ambient noise monitoring was being conducted on the subject site. These works were minimum 4km from the site which corresponds to distance attenuation of approximately 72dB. Observations and sound level measurements undertaken during TTM site visits found that noise from the Pacific Highway upgrade works was inaudible onsite and therefore was not influencing the measured ambient noise levels.

As shown in Figure 3, ambient noise monitoring was conducted in proximity to McConnells Lane which is a local road used only for private property access. During TTM site visits there were less than 5 vehicle passes in any 15-minute period. The noise levels from these vehicle passes extrapolated over a 15-minute period indicate that there would be minimal increase to the measured levels presented in Table 1. Further, noise from passing vehicles on McConnells Lane is a feature of the local area and therefore forms part of the ambient noise environment experienced by the nearest sensitive receivers in proximity to the site.

5.5. Noise Source Measurements

Noise levels of transient noise sources used in this assessment were taken from site measurements or similar investigations conducted by TTM. Further detail is shown in Section 8.2. All measurements were conducted in accordance with *AS1055*.

Noise source levels at Yamba Welding and Engineering (YWE) were measured by TTM during a site visit on Thursday 10th December 2015. Noise levels were measured using a RION NA-28 sound level meter in accordance with *AS1055* which was calibrated before and after the measurement session.

[2] AS 1055:1997. Acoustics - Description and measurement of environmental noise - General procedures.

5.6. Results of Measurements

5.6.1. Ambient Noise Levels

Table 1 presents the ambient noise levels determined in accordance with the procedures of the *Industrial Noise Policy*. Note that existing L_{Aeq} noise levels were determined by calculating the logarithmic average of individual $L_{Aeq\ 15minute}$ levels for each day/evening/night assessment period over the measurement period, in accordance with Section 3.2 of the *INP*.

Table 1: Measured Ambient Noise Levels

Time Period	Rating Background Level (RBL), L_{90} dB(A)	Existing Noise Levels, L_{eq} dB(A)
Daytime (7am – 6pm)	30	49
Evening (6pm – 10pm)	31	47
Night time (10pm – 7am)	(28) 30*	38

*in accordance with Section 3.1.2 of the INP (page 24), where the rating background level is found to be less than 30dB(A), then it is set to 30dB(A).

The data presented above was used to determine the assessment criteria for the development. Graphical presentation of the measured ambient noise levels in shown in Appendix B.

6. Noise Criteria

6.1. Noise Emission - Industrial Noise Policy (INP)

Potential noise emissions include commercial and industrial activities, mechanical plant, deliveries and traffic movements on the site. These have been assessed in the same way as the *INP* stipulates.

The assessment procedure has two components:

Control of intrusive noise impacts – The limit criteria for this assessment is as follows: L_{Aeq}, *15 min ≤ Rating Background Level + 5 dB*;

Maintaining noise level amenity for adjacent residential premises. This is achieved by ensuring that the proposed development complies with the noise limit criteria set in Table 2.1 of the *INP*.

The more stringent of these is the Project Specific Noise Level (PSNL) and is the applicable criteria in each time period, day, evening and night.

6.1.1. Intrusive Noise Criteria

The *INP* sets a basic criterion that the $L_{Aeq\ 15\ min}$ associated with industrial activity should not exceed the measured L_{90} Background Level + 5 dB(A). A modifying factor should also be added where appropriate to allow for tonality, impulsiveness, and intermittency or low frequency effects.

6.1.2. Amenity Criteria

The Amenity criteria is intended to limit the absolute noise level from all sources to a level that is consistent with the general environment and land use.

The INP sets out acceptable noise levels for various locations. The relevant section of the INP (Table 2.1 on page 16) is reproduced below. Under the policy the nearest residences would be assessed against the *Rural* criteria, as the locale is dominated by natural sounds, having little or no road traffic.

Table 2: From INP Table 2.1

Type of Receiver	Indicative Noise Amenity Area	Time of Day	Recommended L_{eq}, Noise Level, dB(A)	
			Acceptable	Maximum
Residence	Rural	Day	50	55
		Evening	45	50
		Night	40	45

Table 2.2 of the *INP* sets out the modifications to the acceptable noise levels detailed in Table 2.1 of the *INP* to account for the existing level of industrial noise.

Table 3: From INP Table 2.2

Total existing L_{eq} noise level from industrial sources, dB(A)	Maximum L_{eq} noise level for noise from new sources alone, dB(A)
≥ Acceptable noise level* plus 2	If existing noise level is likely to decrease in future: acceptable noise level minus 10 If existing noise level is unlikely to decrease in future: existing noise level minus 10
Acceptable noise level plus 1	Acceptable noise level minus 8
Acceptable noise level	Acceptable noise level minus 8
Acceptable noise level minus 1	Acceptable noise level minus 6
Acceptable noise level minus 2	Acceptable noise level minus 4
Acceptable noise level minus 3	Acceptable noise level minus 3
Acceptable noise level minus 4	Acceptable noise level minus 2
Acceptable noise level minus 5	Acceptable noise level minus 2
Acceptable noise level minus 6	Acceptable noise level minus 1
< Acceptable noise level minus 6	Acceptable noise level

* ANL = recommended acceptable L_{Aeq} noise level for the specific receiver, area and time of day from Table 2.1.

6.1.3. Modifying Factors

Section 4 of the *INP* refers to correction factors that are applied to noise sources to account for additional annoyance.

These include tonal noise, low-frequency noise, impulsive noise, and intermittent noise. Where two or more modifying factors are present, the maximum adjustment to a noise source level is 10 dB(A).

7. Project Specific Noise Levels

Based on the data presented in Section 5.6, the project specific noise levels for the development are detailed below.

7.1. Intrusive Criteria

The *INP* sets a criterion that the $L_{Aeq\ (15\ min)}$ associated with commercial activity should not exceed the measured RBL + 5 dB(A). Based on the measured data, the intrusive noise limits are presented in Table 4.

Table 4: Intrusive Noise Criteria

Time Period	Ambient Noise Levels from Table 1	Criteria $L_{eq\ (15\ min)}$, dB(A) (RBL + 5)
Day (7am - 6pm)	30	35
Evening (6pm - 10pm)	31	36
Night (10pm - 7am)	28	33

7.2. Amenity Criteria

From *Table 2.1* of the INP, the area fits the description of a 'Rural' receiver type and therefore the corresponding acceptable noise level applies. That is, 50 dB(A) day, 45 dB(A) evening, 40 dB(A) night. The modification procedures detailed in *Table 2.2* of the INP are not applied in this instance as there are no significant existing industrial uses in the vicinity of the site.

Table 5: Amenity Noise Criteria

Time Period	Acceptable Noise Level (ANL)
Day	50
Evening	45
Night	40

7.3. Project Specific Noise Level

Table 6 presents the project specific noise levels (i.e. criteria).

Table 6: Project Specific Noise Levels

Time Period	Intrusiveness Criteria, dB(A)	Amenity Criteria, dB(A)	Project Specific Noise Level, dB(A)
Day (7am - 6pm)	35	50	35
Evening (6pm - 10pm)	36	45	36
Night (10pm - 7am)	35	40	35

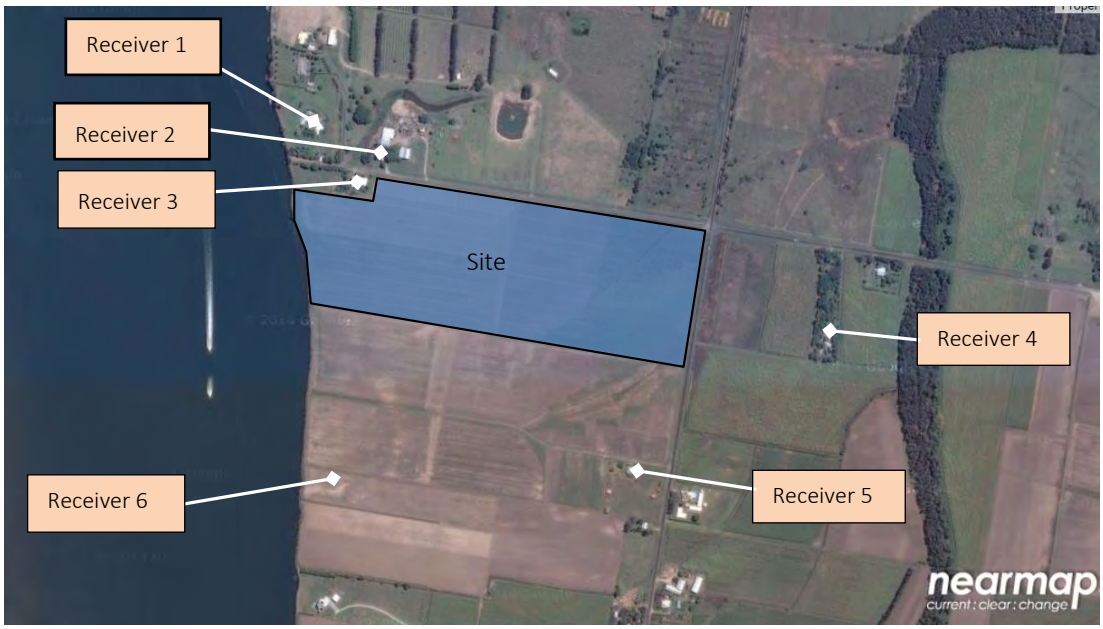
8. Analysis – Development Noise Impacting Offsite Sensitive Receivers

8.1. Noise Sensitive Receivers

The nearest noise sensitive receivers are described below and are identified in Figure 4.

- Receiver 1: Dwelling on Lot 3 DP840733.
- Receiver 2: Dwelling on Lot 51 DP859643.
- Receiver 3: Dwelling on Lot 1 DP598769.
- Receiver 4: Dwelling on Lot 2 DP611270.
- Receiver 5: Dwelling on Lot 45 DP751388.
- Receiver 6: (Future) dwelling on Lot 111 DP1211119.

Figure 4: Noise Sensitive Receivers



If compliance can be achieved at Receivers 1 to 6 then all other receivers are predicted to comply.

8.2. Noise Source Levels

Table 7 presents the potential noise sources and the respective measured noise emission levels. The majority of source noise levels associated with site operations and other commercial activities were determined through noise measurements conducted by TTM. All measurements were conducted in general accordance with *AS1055*.

Noise source levels at Yamba Welding and Engineering (YWE) were measured by TTM on Thursday 10th December 2015. The noise sources measured showed no characteristics that would require a penalty correction applied in accordance with the procedures of the *INP*. Measurements were conducted of the following activities:

- welding and hammering inside the centre of the shed;
- cutting aluminium with a powered hand saw; and
- cutting aluminium with guillotine.

Noise source levels for the marine Travelift are detailed in sound test report by Marine Travelift (presented in Appendix F). A 300-C II and 75BFM II Marine Travelift are proposed at the site. The sound data provided by Marine Travelift for both models were inclusive of Sound Attenuation Package: Level 1. From discussions with the client and with reference to the sound test report (see Appendix F), Test 1: Idle relates to continuous engine noise and Test 2: Full throttle relates to operation of hydraulic pumps used to lift the boats. It is understood that for a worst case 15-minute period, both engine and hydraulic pumps would be operating simultaneously. Marine Travelift have advised through email correspondence that a Level 2 Sound Package and hospital grade muffler is available for additional sound reduction. These treatments can reduce sound levels by a further 6-7% and 3-4% respectively and have been applied in this assessment. The calculated noise source level at 1m from the noisier of the 300-C II and 75BFM II models is 90dB(A), as shown in Appendix F. Recommendations will be made for the site Travelift to comply with this noise level.

Workshop activity noise levels are based on the loudest of numerous noise sources (i.e. rattle guns, wrenches, drills, hoists, compressors, etc.) previously measured by TTM. These noise sources are predicted from the nearest relevant location (i.e. the light industrial precinct or the refit bays).

Table 7: Typical Noise Sources and Average Continuous Noise Levels

Noise Source Description	Noise Level at 1m, $L_{eq,T}$, dB(A)	Measured Duration (s)
Single event car door closure	78*	2
Single event car bypass @ 5km/h	69	6
Single event car engine ignition	72	3
Conversations	75	Long term
Semi-trailer passby	85	20
Semi-trailer idle	79	300
Unloading a delivery vehicle	80	30

Noise Source Description	Noise Level at 1m, $L_{eq,T}$, dB(A)	Measured Duration (s)
Forklift operation	80	30
Waste collection	95*	40
Deliveries – refrigeration vehicle	85#	60
Marine Travelift (with acoustic treatment as specified in Section 9)	82	assumed to be constant
High pressure spray	84	30
Workshop activities	89*	10
YWE – centre of workshop including welding and hammering	85	60
YWE – cutting aluminium with powered hand saw	94	10
YWE – cutting aluminium with guillotine	95	7

Refer to section 8.2.1 below for description of modifying factors used.

8.2.1. Modifying Factors

* Includes 5 dB(A) adjustment to account for the impulsiveness characteristic of noise produced.

Includes 5 dB(A) adjustment to account for the tonal noise characteristic of noise produced.

^ A modifying factor has been applied to this noise source to account for both tonal and intermittent characteristics of noise produced. In accordance with the industrial noise policy, a 5 dB(A) modifying factor is applied to account for tonal characteristic during day and evening periods, and a 10 dB(A) modifying factor will be applied to account for both tonal and intermittent characteristics during the night period.

8.3. Influence of Weather Conditions on Predicted Noise Levels

The influence of site weather conditions on the predicted noise levels was considered in accordance with the Section 5 of the *INP*. In assessing the noise impacts, the criteria are expected to apply under weather conditions that would be expected to occur in the vicinity of the site for a significant period of time. These include conditions of calm wind and temperature inversions.

8.3.1. Temperature Inversions

In accordance with the *INP*, the assessment of noise impacts from temperature inversions is confined to the night noise assessment period (10pm to 7am), as this is when temperature inversions usually occur and disturbance to sleep is possible. Only minimal site activity or indoor work activities are proposed between the hours of 6am to 7am.

An analysis of the temperature inversion screening test using the default values in Appendix C Table C1 of the *INP* is shown below. When the noise increase due to inversions is less than 3dB, no significant additional noise impact is predicted during the inversion conditions.

Table 8: Temperature Inversion Screening Test

Test	Procedure	Result
1. Night time operation	Determine whether the development in question operates at night (2200 to 0700). If the development operates at night, do screening test 2 to determine the potential for impact.	Yes, the development may operate between 6am and 7am
2. Test for maximum possible level of impact	Do a noise prediction assessment, assuming the following meteorological conditions to represent the upper level of impacts: Non-arid areas (average annual rainfall ≥500mm) • Temperature inversion strength: 3°C/100m • Source to receiver drainage wind speed where applicable: 2m/s at 10m height	Drainage wind is not applicable as the site and surrounds is flat. Therefore, by using the default values stated in Table D1 of INP Appendix D the noise level increase due to inversions is 1.5dB for a receiver distance of 750m. This is the furthest receiver distance considered in the assessment. Therefore, based on the requirements of the INP, further analysis of inversion effects is not required as the increase is under 3dB.

8.3.2. Wind Effects

The influence of wind effects was considered in accordance with the procedures described in the *INP*. Wind effects need to be assessed where wind is a feature of the area. Wind is considered to be a feature where source-to-receiver wind speeds of 3 m/s or below occur for 30% of the time or more in any assessment period in any season. Monthly and annual wind roses for Yamba (annual shown in Appendix D) were obtained from the Bureau of Meteorology and reviewed for this occurrence. Based on the wind roses for Yamba, source-to-receiver wind speeds of 3 m/s or below do not occur for greater than 30% of the time and therefore corrections for wind effects is not applicable in accordance with the *INP*.

8.4. Predicted Noise Levels – Day / Evening Period

The calculation assumptions and predicted noise levels for the day and evening period are detailed below. Noise levels were predicted by spreadsheet calculation by applying distance loss from each noise source to the receiver, and calculated shielding reductions from intervening structures was included where applicable. The latest development plan was redesigned to employ the strategy of locating buildings to provide shielding to the nearest receivers, and then incorporating acoustic barriers where required. The acoustic barriers are identified on the development plan and detailed in Section 9 of this report. Sample calculation sheets are provided in Appendix E.

8.4.1. Day/Evening Onsite Activity Noise Assumptions

The following parameters were used for day/evening noise calculations which are based on operational advice provided by Yamba Welding and Engineering.

Table 9: Parameters used for Noise Calculations – Day/Evening Period

Noise Source Description (Type of Event)	Noise Source Location	Daytime / Evening Period (Events per period) or (% of period)
Car door closure	Nearest car park	16 events per 15 minute
Car bypass	Nearest car park	16 trips per peak 15 minute Approximated by TTM Traffic Engineers
Car engine ignition	Nearest car park	16 events per 15 minute
Conversations	Nearest car park / workshop	50% of the time
Semi-trailer passby	Nearest hardstand area / heavy vehicle access location	2 per day (both assumed to occur within the same 15-minute period)
Semi-trailer idle	Nearest hardstand area	70% of the time
Unloading a delivery vehicle	Nearest car park / business	2 events per semi-trailer passby
Forklift operation	YWE and refit bays	80% of the time
Waste collection	Waste storage area	1 collection per 15-minute period (waste collection rates for the development are outlined in Section 4
Refrigeration vehicle	Commercial /light industrial precinct	1 event per week
Marine Travelift	Launch & recovery basin or hardstand	100% of the time
High pressure spray	Paint and paint prep shed	25% of the time
Workshop activities	Inside of light industrial precinct	50% of the time
YWE – welding and hammering / general noise	Inside of YWE	80% of the time
YWE – cutting aluminium with powered hand saw	Inside of YWE	10% of the time
YWE – cutting aluminium with guillotine	Inside of YWE	10% of the time

8.4.2. Day/Evening Noise Levels at Receivers

Table 10 presents the predicted day and evening noise levels at nearby receivers. Predicted noise levels are based on implementation of the recommendations detailed in Section 9.

Table 10: Predicted $L_{Aeq\ (15\ minute)}$ Noise Levels – Day/Evening Periods

Receiver	Noise Source	Predicted External Noise Level at Receiver, L_{eq} dB(A) Free-field	Complies with Criteria (PSNL): (Yes/No) following noise control	
			Day 35 dB(A)	Evening 36 dB(A)
1	Car door closure	16	✓	✓
	Car bypass	12	✓	✓
	Car ignition	12	✓	✓
	Conversations	<10	✓	✓
	Semi-trailer passby	<10	✓	✓
	Semi-trailer idle	11	✓	✓

Receiver	Noise Source	Predicted External Noise Level at Receiver, L_{eq} dB(A) Free-field	Complies with Criteria (PSNL): (Yes/No) following noise control	
			Day 35 dB(A)	Evening 36 dB(A)
	Unloading a delivery vehicle	<10	✓	✓
	Forklift operation	13	✓	✓
	Waste collection	17	✓	✓
	Refrigeration vehicle	<10	✓	✓
	Marine Travelift	33	✓	✓
	High pressure spray	<10	✓	✓
	Workshop activities	16	✓	✓
	YWE – welding and hammering	17	✓	✓
	YWE – cutting aluminium	17	✓	✓
	YWE – cutting with guillotine	18	✓	✓
2	Car door closure	13	✓	✓
	Car bypass	15	✓	✓
	Car ignition	<10	✓	✓
	Conversations	<10	✓	✓
	Semi-trailer passby	19	✓	✓
	Semi-trailer idle	13	✓	✓
	Unloading a delivery vehicle	10	✓	✓
	Forklift operation	14	✓	✓
	Waste collection	15	✓	✓
	Refrigeration vehicle	13	✓	✓
	Marine Travelift	29	✓	✓
	High pressure spray	13	✓	✓
	Workshop activities	20	✓	✓
	YWE – welding and hammering	21	✓	✓
	YWE – cutting aluminium	21	✓	✓
	YWE – cutting with guillotine	22	✓	✓
3	Car door closure	13	✓	✓
	Car bypass	19	✓	✓
	Car ignition	<10	✓	✓
	Conversations	13	✓	✓
	Semi-trailer passby	19	✓	✓
	Semi-trailer idle	16	✓	✓
	Unloading a delivery vehicle	13	✓	✓
	Forklift operation	17	✓	✓
	Waste collection	15	✓	✓
	Refrigeration vehicle	14	✓	✓
	Marine Travelift	34	✓	✓
	High pressure spray	15	✓	✓
	Workshop activities	21	✓	✓
	YWE – welding and hammering	21	✓	✓
	YWE – cutting aluminium	21	✓	✓

Receiver	Noise Source	Predicted External Noise Level at Receiver, L_{eq} dB(A) Free-field	Complies with Criteria (PSNL): (Yes/No) following noise control	
			Day 35 dB(A)	Evening 36 dB(A)
	YWE – cutting with guillotine	22	✓	✓
4	Car door closure	<10	✓	✓
	Car bypass	<10	✓	✓
	Car ignition	<10	✓	✓
	Conversations	15	✓	✓
	Semi-trailer passby	21	✓	✓
	Semi-trailer idle	18	✓	✓
	Unloading a delivery vehicle	15	✓	✓
	Forklift operation	19	✓	✓
	Waste collection	19	✓	✓
	Refrigeration vehicle	22	✓	✓
	Marine Travelift	32	✓	✓
	High pressure spray	<10	✓	✓
	Workshop activities	17	✓	✓
	YWE – welding and hammering	13	✓	✓
	YWE – cutting aluminium	13	✓	✓
	YWE – cutting with guillotine	14	✓	✓
5	Car door closure	12	✓	✓
	Car bypass	<10	✓	✓
	Car ignition	<10	✓	✓
	Conversations	14	✓	✓
	Semi-trailer passby	21	✓	✓
	Semi-trailer idle	18	✓	✓
	Unloading a delivery vehicle	15	✓	✓
	Forklift operation	19	✓	✓
	Waste collection	29	✓	✓
	Refrigeration vehicle	26	✓	✓
	Marine Travelift	26	✓	✓
	High pressure spray	<10	✓	✓
	Workshop activities	27	✓	✓
	YWE – welding and hammering	17	✓	✓
	YWE – cutting aluminium	17	✓	✓
	YWE – cutting with guillotine	18	✓	✓
6	Car door closure	12	✓	✓
	Car bypass	<10	✓	✓
	Car ignition	<10	✓	✓
	Conversations	11	✓	✓
	Semi-trailer passby	<10	✓	✓
	Semi-trailer idle	15	✓	✓
	Unloading a delivery vehicle	12	✓	✓
	Forklift operation	18	✓	✓

Receiver	Noise Source	Predicted External Noise Level at Receiver, L_{eq} dB(A) Free-field	Complies with Criteria (PSNL): (Yes/No) following noise control	
			Day 35 dB(A)	Evening 36 dB(A)
	Waste collection	27	✓	✓
	Refrigeration vehicle	16	✓	✓
	Marine Travelift	31	✓	✓
	High pressure spray	<10	✓	✓
	Workshop activities	23	✓	✓
	YWE – welding and hammering	21	✓	✓
	YWE – cutting aluminium	21	✓	✓
	YWE – cutting with guillotine	22	✓	✓

The summary of daytime and evening noise predictions is as follows:

- Noise levels are predicted to comply with the PSNL in all instances when the noise control recommendations detailed in Section 9 are applied. The noise control recommendations represent the most practical and minimum level of noise reduction measures to meet the project criterion.
- The Travelift will require acoustic treatment to achieve the predicted noise level. Recommendations for acoustic treatment are detailed in Section 9. Further, it will be recommended that the Travelift is used during daytime hours only.

Table 11 below present the total noise levels from all sources occurring simultaneously in a day/evening 15-minute period. It is unlikely that all noise sources would occur during the same 15-minute period and therefore the following predictions represent the worst-case scenario.

Table 11: Predicted Total $L_{Aeq\ (15\ minute)}$ Noise Levels – Day/Evening Periods

Receiver	Noise Source	Predicted Total External Noise Level at Receiver, $L_{eq\ 15min}$ dB(A)	Complies with PSNL: Day/Evening (35/36dB)
1	All sources combined	34	✓
2	All sources combined	32	✓
3	All sources combined	35	✓
4	All sources combined	34	✓
5	All sources combined	34	✓
6	All sources combined	34	✓

Total noise levels are predicted to comply with the PSNL with implementation of the noise control recommendations detailed in Section 9.

8.5. Predicted Noise Levels – Early Morning (6am to 7am) Period

The calculation assumptions and predicted noise levels for the early morning period are detailed below. Noise levels were predicted by spreadsheet calculation by applying distance loss from each noise source to the receiver, and calculated shielding reductions from intervening structures was included where applicable. The acoustic barriers are identified on the development plan and detailed in Section 9 of this report. The sample calculation sheet is provided in Appendix E.

8.5.1. Early Morning Onsite Activity Noise Assumptions

The following parameters were used for the early morning (6am to 7am) period noise calculations which are based on operational advice provided by YWE.

Table 12: Parameters used for Noise Calculations – Early Morning Period

Noise Source Description (Type of Event)	Noise Source Location	Early Morning Time Period (Events / 15 minute) or (% of hour)
Car door closure	Nearest car park	16 events per 15 minute
Car bypass	Nearest car park	16 trips per peak 15 minute Approximated by TTM Traffic Engineers
Car engine ignition	Nearest car park	16 events per 15 minute
Conversations	Nearest car park / workshop	50% of the time
Semi-trailer passby	No events	No events
Semi-trailer idle	No events	No events
Unloading a delivery vehicle	No events	No events
Forklift operation	YWE and refit bays	80% of the time
Waste collection	No events	No events
Refrigeration vehicle	No events	No events
Marine Travelift	No events	No events
High pressure spray	Paint and paint prep shed	25% of the time
Workshop activities	Inside of light industrial precinct	50% of the time
YWE – welding and hammering / general noise	Inside of YWE	80% of the time
YWE – cutting aluminium with powered hand saw	Inside of YWE	10% of the time
YWE – cutting aluminium with guillotine	Inside of YWE	10% of the time

8.5.2. Early Morning Noise Levels at Receivers

Table 13 presents the predicted early morning noise levels at nearby receivers. Table 12 above outlines the noise sources that will not operate during this period and therefore have been excluded. Predicted noise levels are based on implementation of the recommendations detailed in Section 9.

Table 13: Predicted $L_{Aeq\ (15\ minute)}$ Noise Levels – Early Morning Period

Receiver	Noise Source	Predicted External Noise Level at Receiver, L_{eq} dB(A) Free-field	Complies with Criteria: (Yes/No) following noise control
			Early Morning 35 dB(A)
1	Car door closure	16	✓
	Car bypass	12	✓
	Car ignition	12	✓
	Conversation	<10	✓
	Forklift operation	13	✓
	High pressure spray	<10	✓
	Workshop activities	16	✓
	YWE – welding and hammering	17	✓
	YWE – cutting aluminium	17	✓
	YWE – cutting with guillotine	18	✓
2	Car door closure	13	✓
	Car bypass	15	✓
	Car ignition	<10	✓
	Conversation	<10	✓
	Forklift operation	14	✓
	High pressure spray	13	✓
	Workshop activities	20	✓
	YWE – welding and hammering	21	✓
	YWE – cutting aluminium	21	✓
	YWE – cutting with guillotine	22	✓
3	Car door closure	13	✓
	Car bypass	19	✓
	Car ignition	<10	✓
	Conversation	13	✓
	Forklift operation	17	✓
	High pressure wash hose	15	✓
	Workshop activities	21	✓
	YWE – welding and hammering	21	✓
	YWE – cutting aluminium	21	✓
	YWE – cutting with guillotine	22	✓
4	Car door closure	<10	✓
	Car bypass	<10	✓
	Car ignition	<10	✓
	Conversation	15	✓
	Forklift operation	19	✓
	High pressure spray	<10	✓
	Workshop activities	17	✓
	YWE – welding and hammering	13	✓
	YWE – cutting aluminium	13	✓
	YWE – cutting with guillotine	14	✓

Receiver	Noise Source	Predicted External Noise Level at Receiver, L_{eq} dB(A) Free-field	Complies with Criteria: (Yes/No) following noise control
			Early Morning 35 dB(A)
5	Car door closure	12	✓
	Car bypass	<10	✓
	Car ignition	<10	✓
	Conversation	14	✓
	Forklift operation	19	✓
	High pressure spray	<10	✓
	Workshop activities	27	✓
	YWE – welding and hammering	17	✓
	YWE – cutting aluminium	17	✓
	YWE – cutting with guillotine	18	✓
6	Car door closure	12	✓
	Car bypass	<10	✓
	Car ignition	<10	✓
	Conversation	11	✓
	Forklift operation	18	✓
	High pressure spray	<10	✓
	Workshop activities	23	✓
	YWE – welding and hammering	21	✓
	YWE – cutting aluminium	21	✓
	YWE – cutting with guillotine	22	✓

Noise sources, which are expected to occur during the early morning period are predicted to comply with the criteria. The operational details were provided by YWE. Compliance is predicted based on inclusion of the recommendations detailed in Section 9.

Table 14 below present the total noise levels from all sources occurring simultaneously in an early morning 15-minute period. It is unlikely that all noise sources would occur during the same 15-minute period and therefore the following predictions represent the worst-case scenario.

Table 14: Predicted Total $L_{Aeq\ (15\ minute)}$ Noise Levels – Early Morning Period

Receiver	Noise Source	Predicted Total External Noise Level at Receiver, $L_{eq\ 15min}$ dB(A)	Complies with PSNL: Early Morning/Night (35dB)
1	All sources combined	25	✓
2	All sources combined	28	✓
3	All sources combined	29	✓
4	All sources combined	24	✓
5	All sources combined	29	✓
6	All sources combined	28	✓

Total noise levels are predicted to comply with the PSNL with implementation of the noise control recommendations detailed in Section 9.

8.6. Mechanical Plant

As detailed plant selections are not available at this stage, it is not possible to carry out a detailed examination of the ameliorative measures that may be required to achieve the noise targets. Plant should be acoustically treated to achieve the criteria detailed in Section 7 to prevent noise emissions from adversely impacting the surrounding properties. This may include selecting the quietest plant possible, or treating the plant equipment with enclosures, barriers, duct lining and silencers, etc.

A suitably qualified acoustic consultant should conduct a mechanical noise assessment once plant selections are finalised. Noise criteria compliance measurements should then be conducted after the equipment is installed. Such measures should also be conditioned in the Development Approval.

9. Recommendations

Based on the results of the analysis presented in Section 8, the following recommendations should be implemented for predicted compliance with the noise criteria detailed in Section 7.

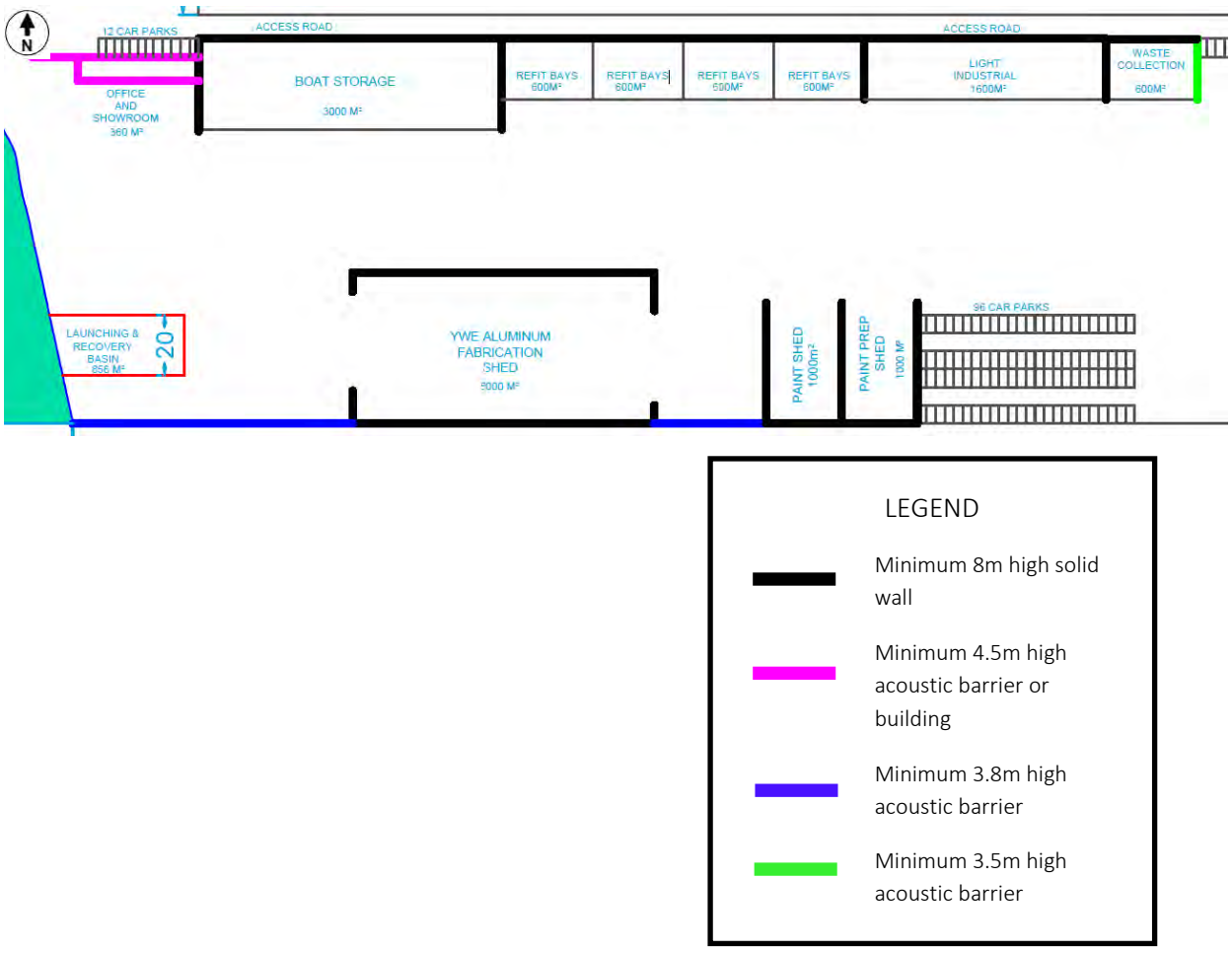
9.1. Acoustic Barriers

Acoustic barriers are required to reduce noise levels and will need to be implemented to achieve predicted compliance. The location and extent of the barriers are identified on the development plan and shown in Figure 5. The barrier details are as follows:

a. Barriers are to achieve the minimum heights specified below and be relative to the finished pad level of the site.

b. The barriers should have a minimum mass (surface density) of 12.5kg/m^2 and be free of gaps and holes. Suitable materials include masonry, compressed fibre cement, lapped timber palings (with 40% overlap), Perspex, glass, earth mound, or any other appropriate material.

Figure 5: Recommended Acoustic Barriers



9.2. Management Strategies

The following management strategies are recommended to be implemented to minimise noise annoyance:

a. Minimise heavy vehicle routes and industrial uses immediately adjacent to nearby residential receivers. Based on the analysis contained in this report, the current layout (shown in Appendix A) is compliant with this strategy.

b. The marine Travelift must only be used between the hours of 7am – 6pm.

c. Waste collection is to occur between the hours of 7am – 6pm.

d. Surface finishes of car parking and hardstand areas must be low-squeal i.e. no polished or painted concrete, etc.

e. Any grates or other protective covers in the car parks and access driveways must be rigidly fixed in position to eliminate clanging, and be maintained.

9.3. Marine Travelift

The marine Travelift will require specific acoustic treatment to achieve the predicted noise level. To achieve compliance at the nearest noise sensitive receivers, the Travelift will need to comply with a noise level of L_{Aeq} 73 dB when measured at 7m. It is recommended that the Travelift is designed and manufactured to achieve this decibel (dB) level and acoustically audited onsite once delivered.

Based on the analysis of this report, the following acoustic treatments are recommended:

a) Marine Travelift model 300-C II or 75BFM II inclusive of sound attenuation packages: Level 1 and Level 2.

b) Addition of the 'hospital grade muffler' as mentioned by Marine Travelift in email correspondence shown in Appendix F.

c) Machine is to be acoustically audited onsite after it is delivered from the manufacturer.

Other Travelift's may be suitable but would need to be reviewed by an acoustic consultant prior to use. Further acoustic treatment or redesign of noise barriers may be required if the design noise level of L_{Aeq} 73 dB measured at 7m cannot be achieved.

9.4. Mechanical Plant

Mechanical plant associated with the development should be designed to achieve compliance with the project specific criteria outlined in Section 7.3 for all plant as a combined noise level.

9.5. Light Industrial Precinct

The following recommendations are made for buildings within the light industrial precinct, including but not limited to manufacturing, repair workshops, vehicle/boat hoists and lifts, cutting, drilling or hammering:

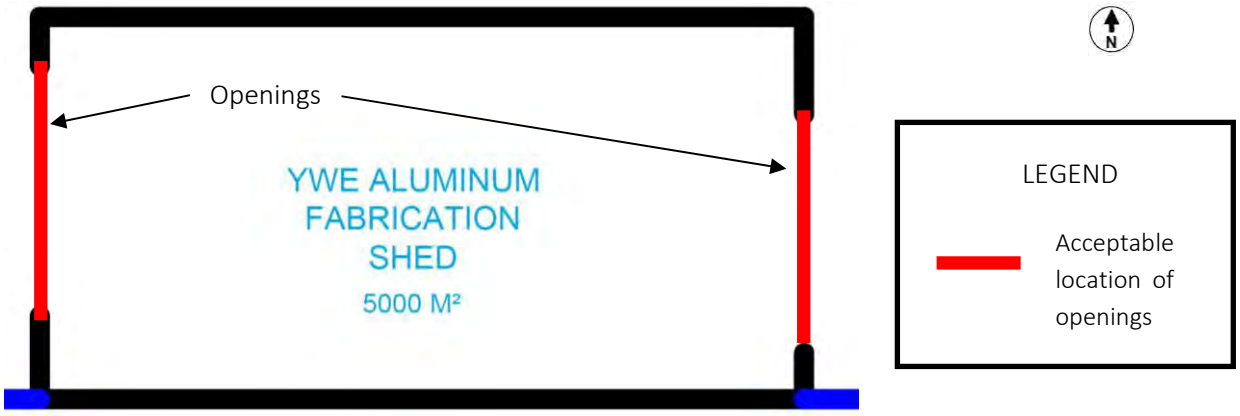
- Operating hours between 6am and 6pm.
- External walls are to be of a solid material with a minimum R_W30 acoustic rating. Sheet metal either side of a stud with insulation or tilt up concrete panel are suitable forms of construction.
- Anticon insulation or equivalent under sheet metals roofs.
- Major openings (i.e. roller doors) should be located along the southern façade and minor openings (windows, access doors, etc.) on the east and west facades. It is proposed that the northern façade of the light industrial precinct will be a solid 8m high wall.

9.6. Yamba Welding and Engineering Operations

The following recommendations are made for Yamba Welding and Engineering operations:

- Operating hours between 6am and 6pm.
- External walls are to achieve a minimum R_W30 acoustic rating. This can be achieved by sheet metal either side of a 64mm steel stud with minimum 10kg/m^3 insulation between, tilt up concrete panel, or any other suitable construction.
- Anticon insulation or equivalent under sheet metals roofs.
- Provide rubber floor matting at the guillotine to soften impact of falling metal.
- Openings located on east and west facades as per Figure 6.

Figure 6: Recommended Location of Façade Openings for the YWE Shed

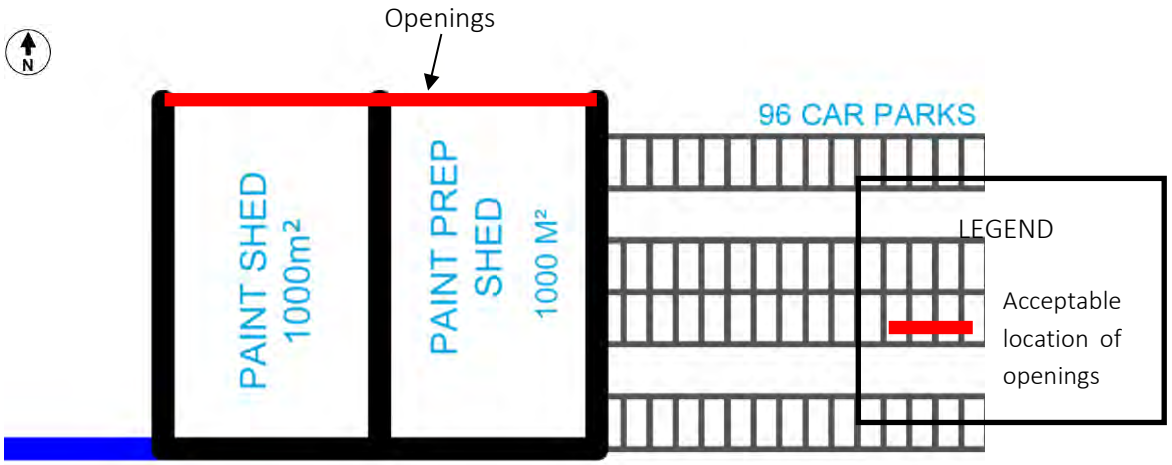


9.7. Paint Shed and Paint Prep Shed

The following recommendations are made for the paint and paint prep shed:

- Operating hours between 6am and 6pm.
- External walls are to be of a solid material with a minimum R_W30 acoustic rating. Sheet metal either side of a stud with insulation or tilt up concrete panel are suitable forms of construction.
- Anticon insulation or equivalent under sheet metals roofs.
- Openings located on the north facade as per Figure 7.

Figure 7: Recommended Location of Façade Openings for the Paint and Paint Prep Shed

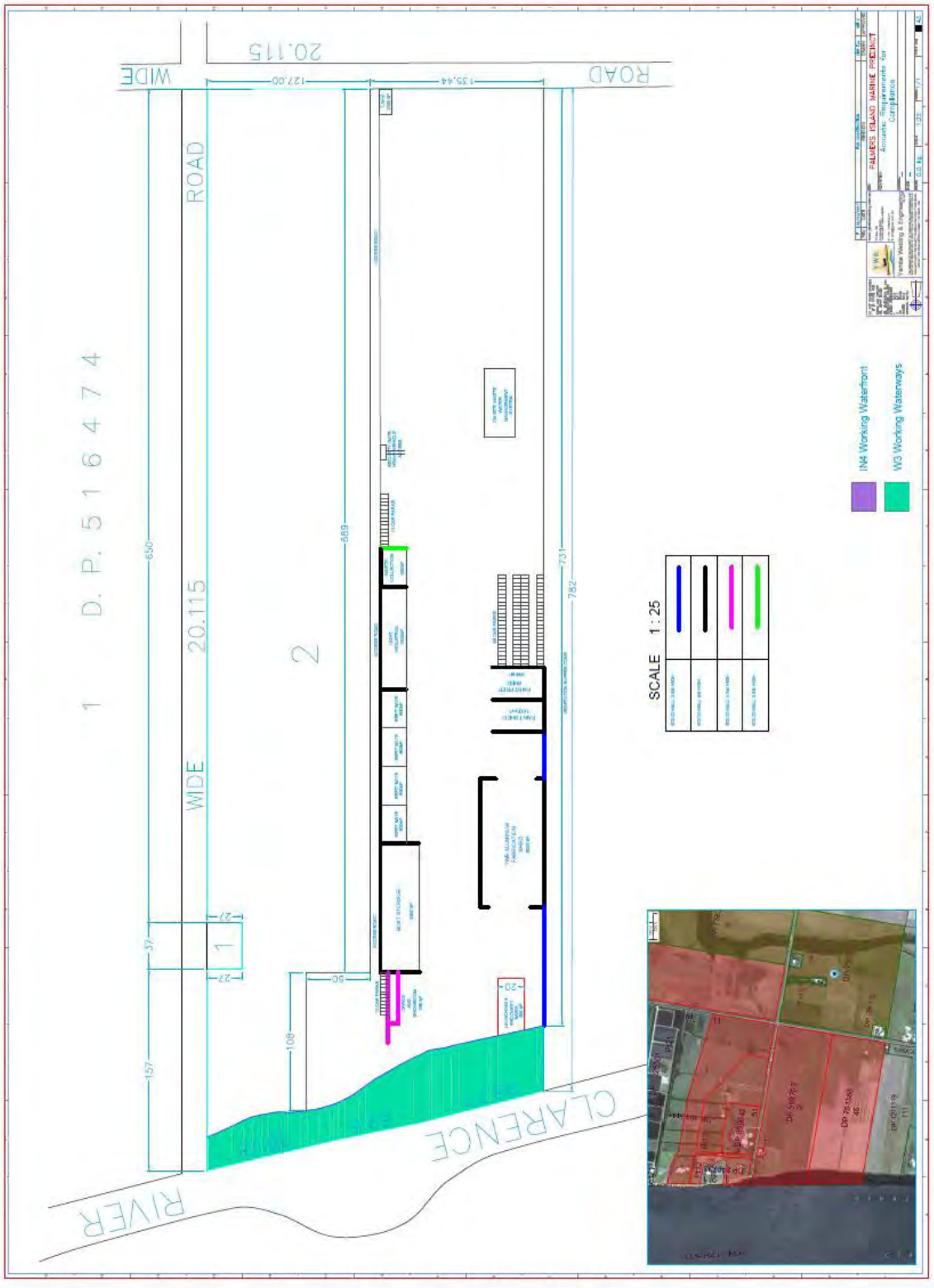


10. Conclusion

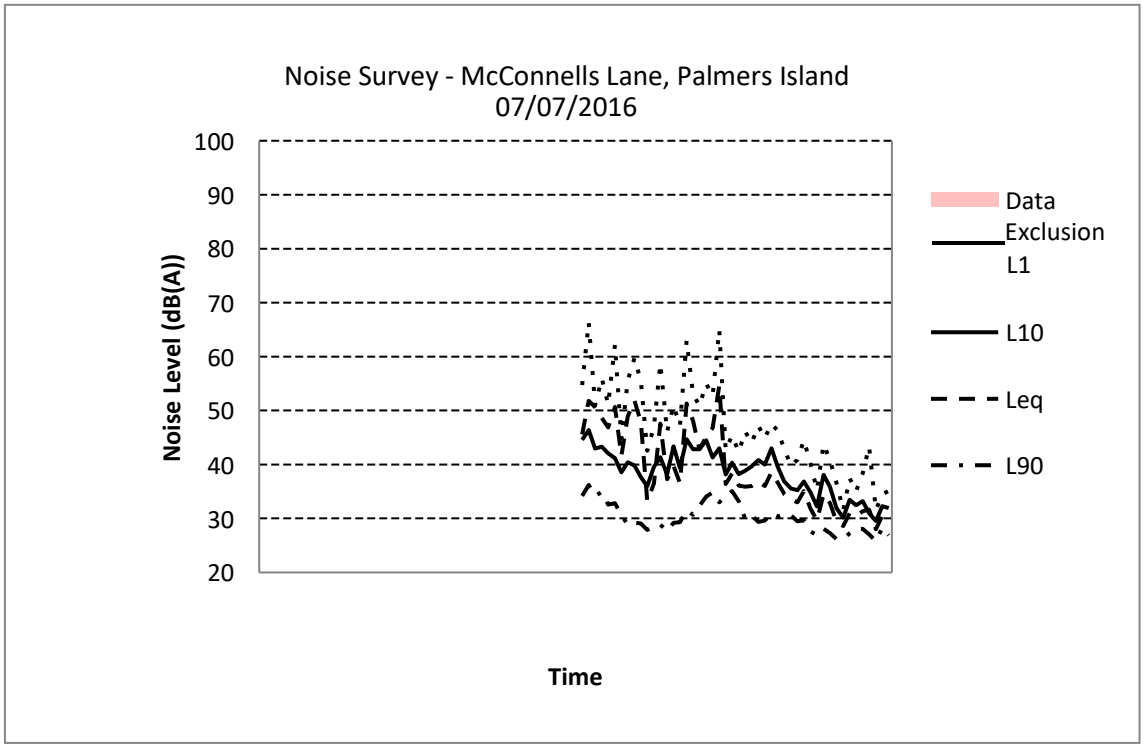
An environmental noise assessment was conducted of the proposed marine park located at Lot 2 DP598769 School Road, Palmers Island. The assessment was prepared for the purposes of a rezoning application.

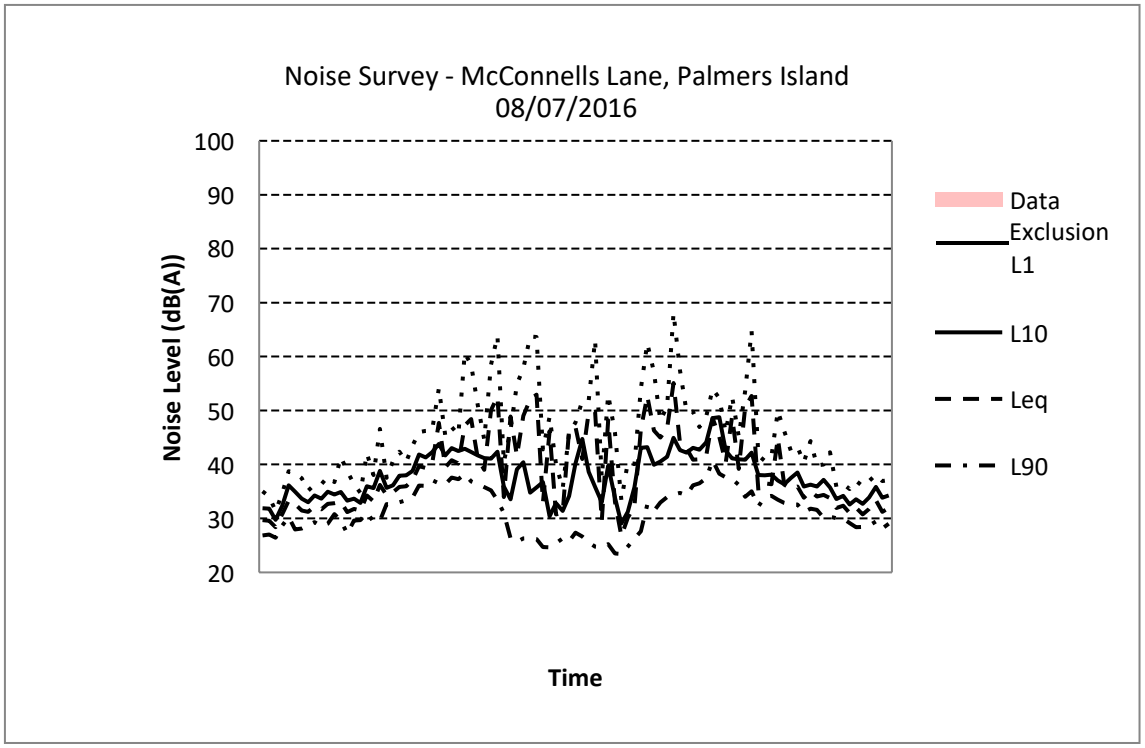
With inclusion of the recommendations detailed in Section 9, the development is predicted to comply with the noise criteria outlined in Section 7.

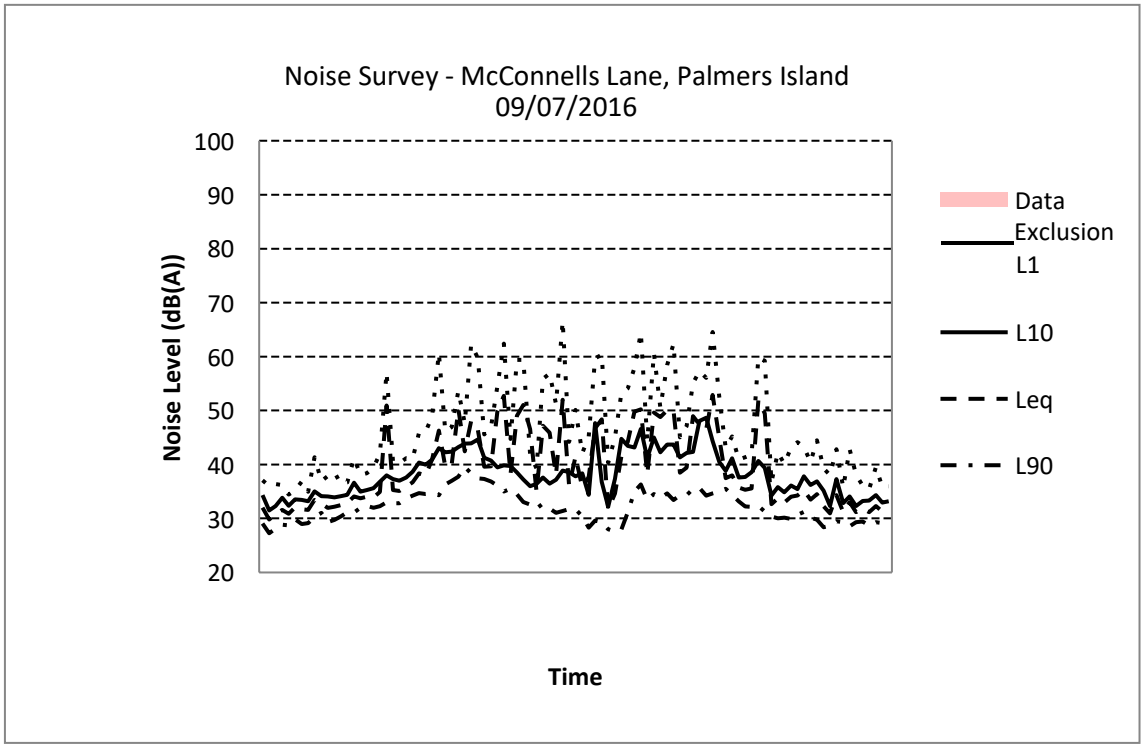
Appendix A Development Plan

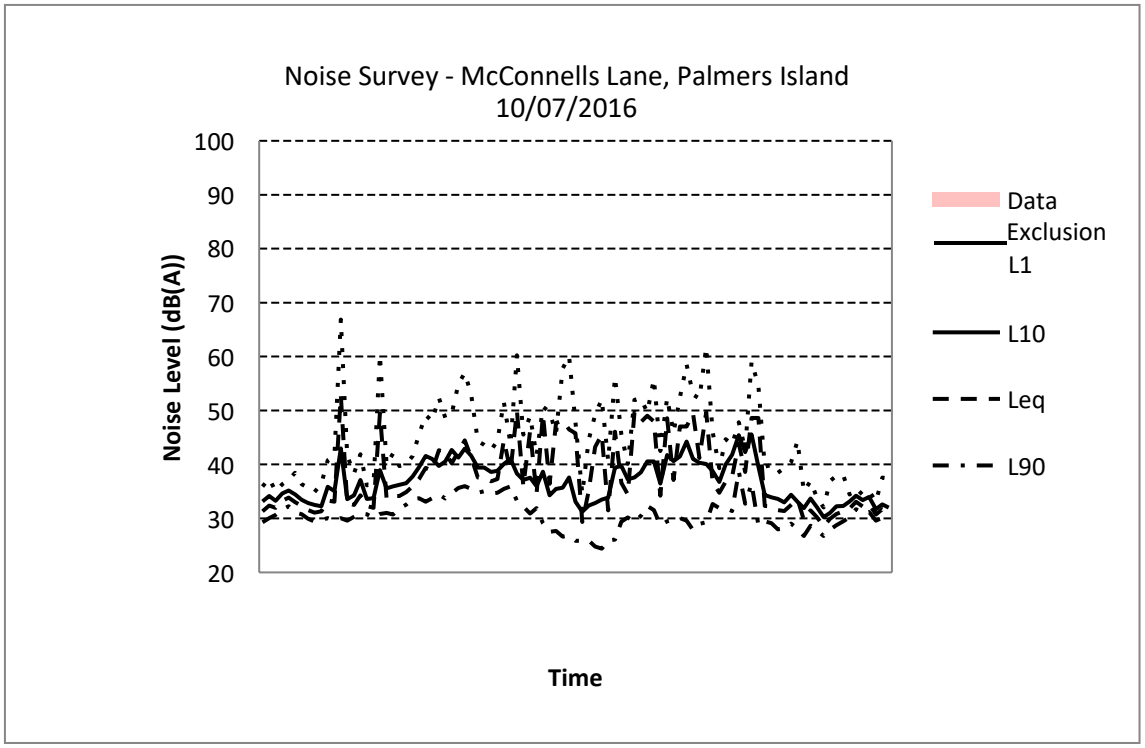

20.115
WIDE
ROAD
ROAD
WIDE
20.115
1 D.P. 516474
2
SCALE 1 : 25
IN4 Working Waterfront
W3 Working Waterways
CLARENCE
RIVER

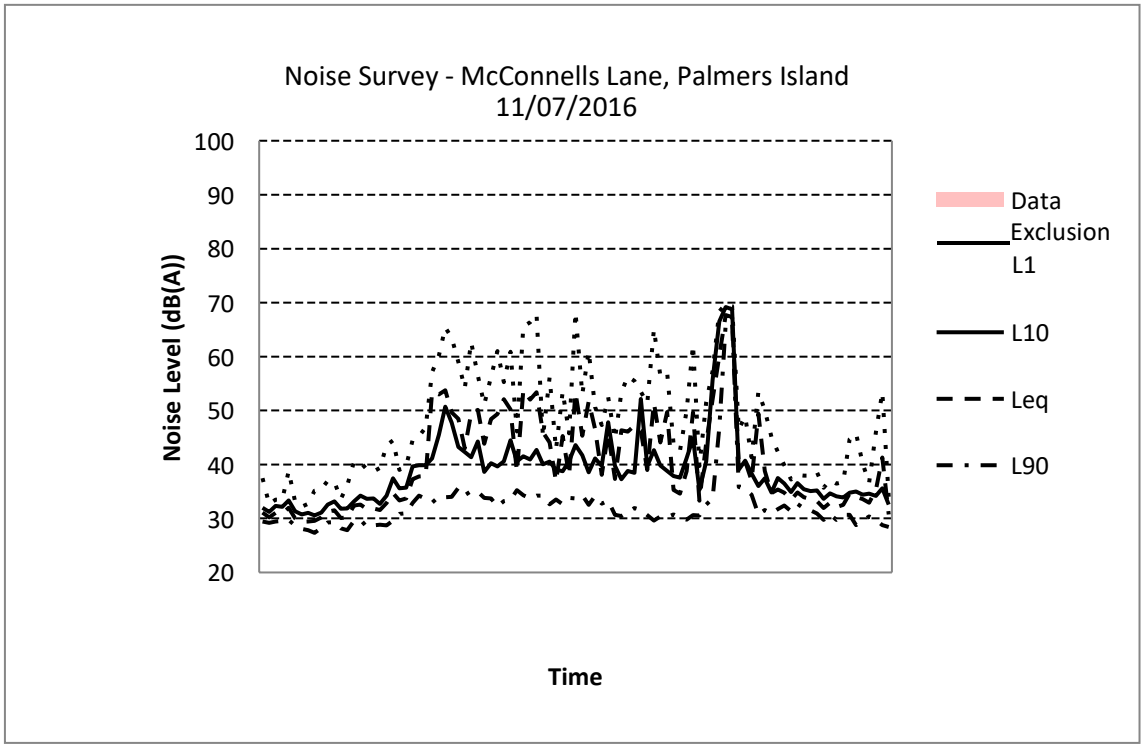
Appendix B Unattended Noise Monitoring Graphs

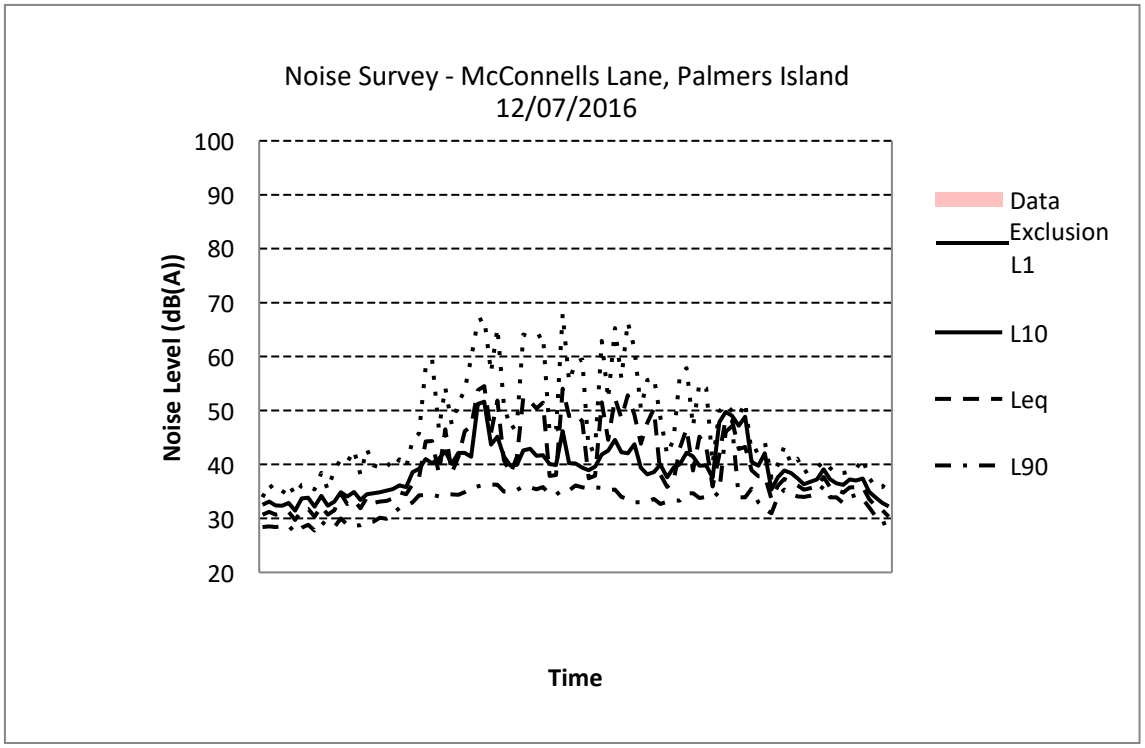

Noise Survey - McConnells Lane, Palmers Island
07/07/2016
Noise Level (dB(A))
100
90
80
70
60
50
40
30
20
Time
Data Exclusion
L1
L10
Leq
L90

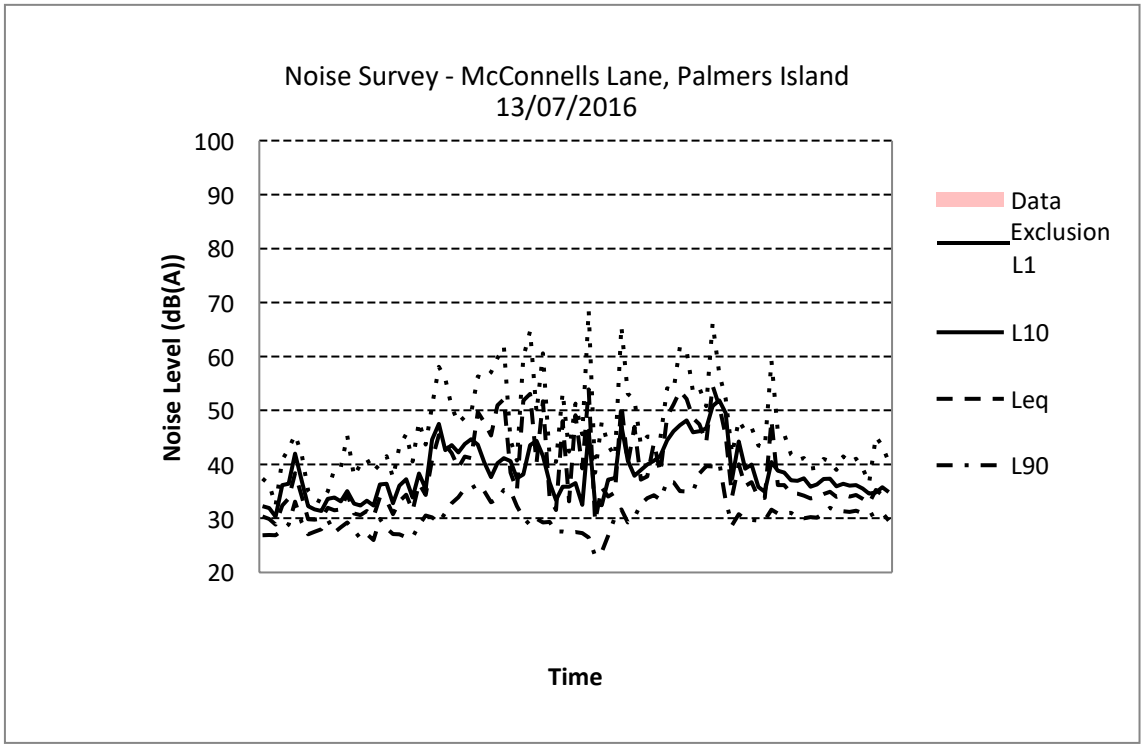

Noise Survey - McConnells Lane, Palmers Island
08/07/2016
Noise Level (dB(A))
100
90
80
70
60
50
40
30
20
Time
Data Exclusion
L1
L10
Leq
L90

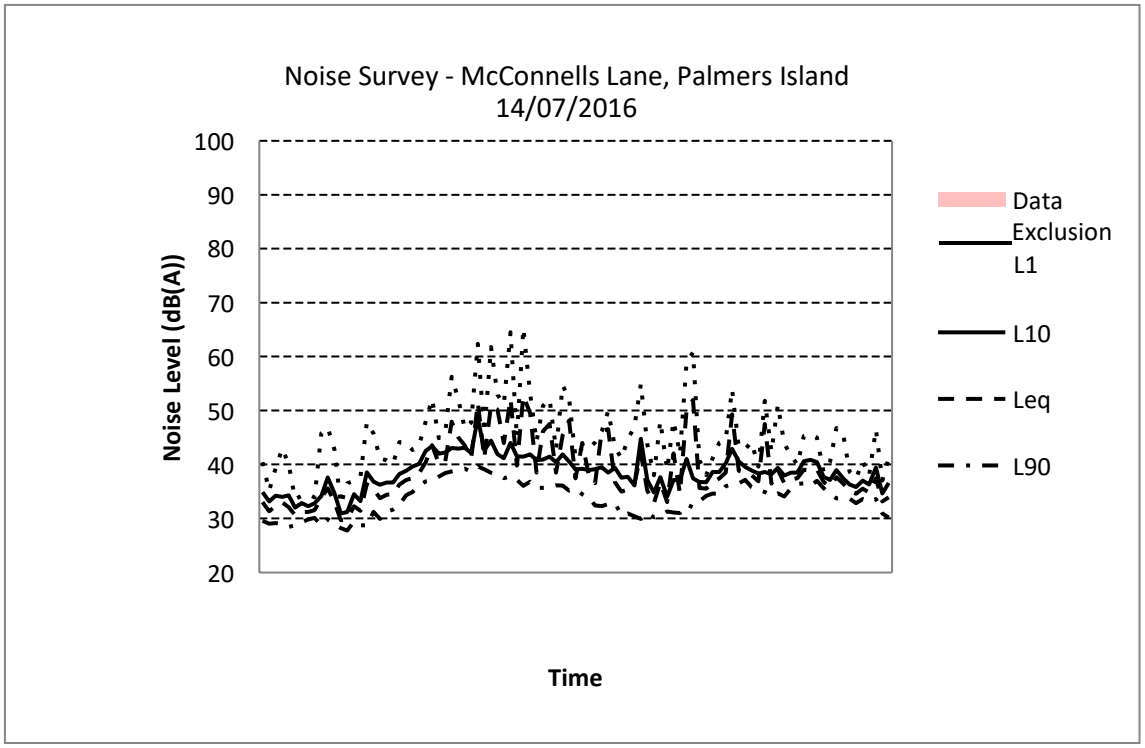

Noise Survey - McConnells Lane, Palmers Island
09/07/2016
Noise Level (dB(A))
100
90
80
70
60
50
40
30
20
Time
Data Exclusion
L1
L10
Leq
L90

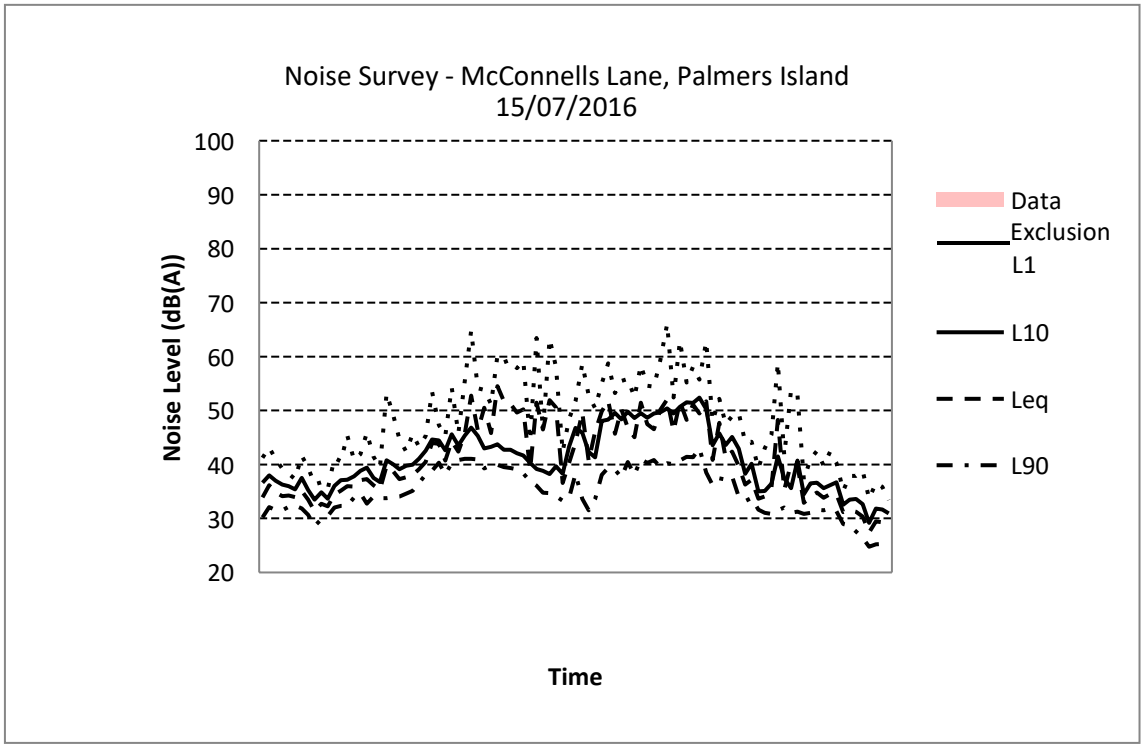

Noise Survey - McConnells Lane, Palmers Island
10/07/2016
Noise Level (dB(A))
100
90
80
70
60
50
40
30
20
Time
Data Exclusion
L1
L10
Leq
L90

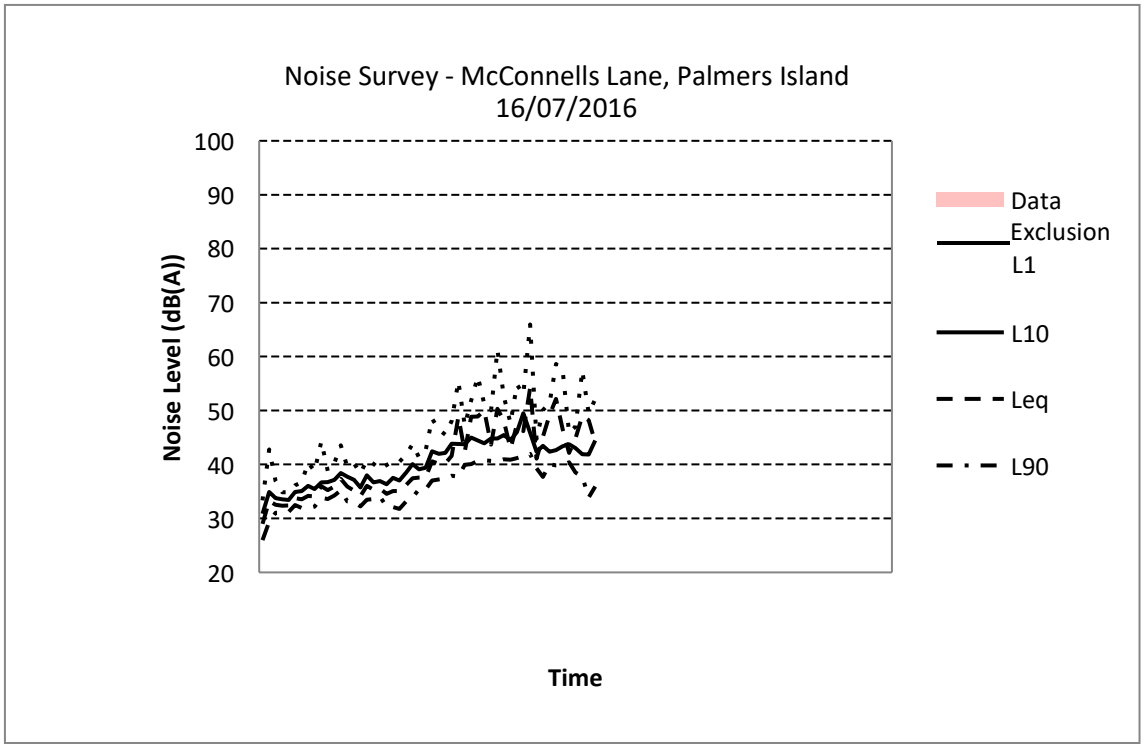

Noise Survey - McConnells Lane, Palmers Island
11/07/2016
Noise Level (dB(A))
100
90
80
70
60
50
40
30
20
Time
Data Exclusion
L1
L10
Leq
L90


Noise Survey - McConnells Lane, Palmers Island
12/07/2016
Noise Level (dB(A))
100
90
80
70
60
50
40
30
20
Time
Data Exclusion
L1
L10
Leq
L90


Noise Survey - McConnells Lane, Palmers Island
13/07/2016
Noise Level (dB(A))
100
90
80
70
60
50
40
30
20
Time
Data Exclusion
L1
L10
Leq
L90


Noise Survey - McConnells Lane, Palmers Island
14/07/2016
Noise Level (dB(A))
100
90
80
70
60
50
40
30
20
Time
Data Exclusion
L1
L10
Leq
L90


Noise Survey - McConnells Lane, Palmers Island
15/07/2016
Noise Level (dB(A))
100
90
80
70
60
50
40
30
20
Time
Data Exclusion
L1
L10
Leq
L90


Noise Survey - McConnells Lane, Palmers Island
16/07/2016
Noise Level (dB(A))
100
90
80
70
60
50
40
30
20
Time
Data Exclusion
L1
L10
Leq
L90

Appendix C Weather observations for Yamba during the ambient noise monitoring period

Yamba, New South Wales
July 2016 Daily Weather Observations

Date	Day	Temps Min °C	Temps Max °C	Rain mm	Evap mm	Sun hours	Max wind gust Dir	Max wind gust Spd km/h	Max wind gust Time local	9 am Temp °C	9 am RH %	9 am Cld 8th	9 am Dir	9 am Spd km/h	9 am MSLP hPa	3 pm Temp °C	3 pm RH %	3 pm Cld 8th	3 pm Dir	3 pm Spd km/h	3 pm MSLP hPa
1	Fr	10.2	21.4	0			W	22	07:20	15.6	62		NW	13	1018.9	20.8	42		NW	9	1015.8
2	Sa	8.2	18.2	0			SE	24	13:18	12.1	56		WSW	11	1025.0	17.5	55		ESE	9	1023.3
3	Su	7.8	19.9	0			WSW	19	01:32	11.7	75		SW	9	1027.3	17.4	62		E	9	1023.3
4	Mo	8.5	20.6	0			NNE	22	16:52	11.4	91		WSW	11	1023.3	19.0	62		NNE	9	1018.8
5	Tu	11.3	18.3	4.2			W	39	21:09	12.9	98		SW	6	1013.9	17.4	98		NNW	9	1009.7
6	We	10.0	18.2	3.0			WNW	44	15:03	12.9	62		NW	13	1012.6	17.8	41		WNW	22	1008.3
7	Th	9.8	22.1	0			WSW	35	09:03	16.3	56		W	15	1012.7	20.2	62		SSE	15	1011.9
8	Fr	13.1	21.2	0			SSE	46	17:07	17.2	65		W	13	1017.6	19.4	66		SE	19	1014.7
9	Sa	9.9	19.5	1.4			SSE	37	15:48	13.7	81		SW	9	1021.3	18.6	62		SSE	22	1019.3
10	Su	10.0	19.4	0			SE	28	13:13	13.9	79		WSW	9	1024.3	18.6	78		SE	20	1021.2
11	Mo	12.7	21.9	0			NW	26	10:20	14.4	98		NW	9	1020.6	20.3	76		N	7	1016.3
12	Tu	14.3	20.5	0			NNW	31	16:56	18.2	82		NNW	13	1016.0	19.8	77		NNW	13	1011.8
13	We	14.7	16.7	0			WSW	20	01:04	15.4	54		Calm		1020.4	15.0	67		NNW	7	1020.1
14	Th	10.3	14.4	0			SW	24	09:07	11.8	51		SW	11	1029.2	13.6	55		SSW	9	1026.9
15	Fr	8.1	18.3	0			SE	35	22:23	10.1	74		WSW	13	1029.4	16.9	63		SSE	19	1026.4
16	Sa	9.7	19.0	0			SE	41	16:24	14.1	80		SW	9	1030.2	17.9	79		SSE	19	1027.5
17	Su	12.9	21.5	4.8			SE	28	00:01	16.2	98		SW	11	1029.0	19.9	71		SE	19	1026.1
18	Mo	14.2	21.1	1.0			SSW	17	00:24	16.0	98		WSW	7	1027.3	20.3	85		ENE	7	1024.0
19	Tu	13.4	24.4	0.2			WNW	17	05:49	17.5	98		NNW	7	1023.4	21.2	80		ENE	9	1020.6
20	We	15.9	23.7	0.2			N	20	14:54	18.1	98		NW	6	1021.6	22.1	83		N	11	1016.8
21	Th	17.7	19.6	2.6			SSE	24	03:06	18.6	98		SSE	9	1018.5	18.9	92		SSE	13	1015.9
22	Fr	16.0	25.9	0.2			NNW	24	23:32	17.4	98		NW	7	1015.3	25.5	61		NNW	11	1009.3
23	Sa	17.3	27.3	0			WNW	48	12:50	21.6	77		NNW	13	1005.6	26.0	28		WNW	30	1004.9
24	Su	12.3	18.3	0			W	24	00:19	14.2	52		WSW	9	1017.0	17.3	54		NE	6	1012.6
25	Mo	10.0	20.8	0			SW	33	01:53	14.8	56		NW	4	1017.7	20.5	36		WNW	15	1014.6
26	Tu	9.1	21.9	0			WNW	17	01:01	13.4	54		W	9	1019.1	19.9	51		NNE	6	1015.1
27	We	12.4	20.2	0			W	22	09:31	13.2	69		W	11	1018.1	20.0	44		NW	9	1014.9
28	Th	10.0	18.9	0			SE	24	12:08	13.7	52		SW	13	1024.6	18.2	51		ESE	11	1022.1
29	Fr	7.4	21.2	0			NNW	22	18:19	12.4	69		WSW	9	1023.6	19.9	59		NE	7	1018.9
30	Sa	8.5	19.5	0			SSE	37	12:53	12.8	65		WSW	11	1021.5	18.9	62		SSE	19	1019.0
31	Su	9.6	23.9	0			NW	28	11:45	14.3	75		W	11	1020.1	23.5	35		NNW	9	1015.7
Statistics for July 2016																					
Mean		11.5	20.6							14.7	74			9	1020.8	19.4	62			12	1017.6
Lowest		7.4	14.4	0						10.1	51		Calm		1005.6	13.6	28		#	6	1004.9
Highest		17.7	27.3	4.8			WNW	48		21.6	98		W	15	1030.2	26.0	98		WNW	30	1027.5
Total				17.6																	

Australian Government
Bureau of Meteorology

Latest Weather Observations for Yamba

Issued at 3:03 pm EST Friday 8 July 2016 (issued every 30 minutes, with the page automatically refreshed every 10 minutes)

Station Details ID: 058012 Name: YAMBA PILOT STATION Lat: -29.43 Lon: 153.36 Height: 27.4 m

Data from the previous 72 hours. | See also: Recent climate at Yamba

Date/Time EST	Temp °C	App Temp °C	Dew Point °C	Rel Hum %	Delta-T °C	Wind					Press QNH hPa	Press MSL hPa	Rain since 9am mm
						Dir	Spd km/h	Gust km/h	Spd kts	Gust kts			
08/03:00pm	19.4	18.7	12.9	66	3.7	SE	19	24	10	13	1014.8	1014.7	0.0
08/02:30pm	19.9	18.0	13.1	65	3.9	SE	15	22	8	12	1014.9	1014.8	0.0
08/02:00pm	20.0	17.7	13.0	64	4.0	SE	17	20	9	11	1014.8	1014.7	0.0
08/01:30pm	20.2	18.5	12.4	61	4.4	SE	13	17	7	9	1014.8	1014.7	0.0
08/01:00pm	19.9	17.9	12.7	63	4.1	ESE	15	19	8	10	1015.4	1015.3	0.0
08/12:30pm	20.6	18.8	11.4	55	5.2	SSE	13	20	7	11	1016.0	1015.8	0.0
08/12:00pm	20.7	19.0	11.1	54	5.3	S	11	17	6	9	1016.4	1016.3	0.0
08/11:30am	20.4	18.8	10.8	54	5.2	SSW	11	17	6	9	1016.7	1016.6	0.0
08/11:00am	19.8	18.7	10.8	56	4.9	SSW	7	11	4	6	1017.3	1017.2	0.0
08/10:30am	18.8	17.4	10.9	60	4.3	SSW	9	15	5	8	1017.7	1017.6	0.0
08/10:00am	18.3	17.3	10.2	57	4.7	W	9	17	5	9	1017.8	1017.7	0.0
08/09:30am	18.4	17.1	11.2	63	3.9	W	9	15	5	8	1017.7	1017.6	0.0
08/09:00am	17.2	14.9	10.6	65	3.5	W	13	17	7	9	1017.7	1017.6	0.0
08/08:30am	15.7	14.4	11.1	74	2.5	W	9	13	5	7	1017.3	1017.2	0.0
08/08:00am	14.1	12.5	10.2	75	2.0	W	9	13	5	7	1017.4	1017.3	0.0
08/07:30am	13.7	12.2	10.5	81	1.7	W	9	13	5	7	1016.9	1016.8	0.0
08/07:00am	13.1	11.5	10.3	85	1.4	W	9	13	5	7	1016.9	1016.8	0.0
08/06:30am	13.2	11.7	10.4	83	1.5	W	9	13	5	7	1016.6	1016.5	0.0
08/06:00am	13.5	11.9	10.1	80	1.8	W	9	13	5	7	1016.4	1016.3	0.0
08/05:30am	14.5	13.2	9.9	74	2.4	SW	7	13	4	7	1015.8	1015.7	0.0
08/05:00am	14.7	13.0	9.9	73	2.5	SW	9	15	5	8	1015.7	1015.6	0.0
08/04:30am	15.0	12.9	9.8	71	2.7	SW	11	17	6	9	1015.8	1015.7	0.0
08/04:00am	14.6	12.9	9.8	73	2.6	SW	9	13	5	7	1016.0	1015.9	0.0
08/03:30am	14.8	13.4	10.2	76	2.3	WSW	7	13	4	7	1016.1	1016.0	0.0
08/03:00am	14.8	13.1	10.6	77	2.1	WSW	9	15	5	8	1016.5	1016.4	0.0
08/02:30am	14.5	13.1	10.9	79	1.9	W	9	11	5	6	1016.1	1016.0	0.0
08/02:00am	14.6	13.2	10.8	78	2.0	WSW	9	13	5	7	1016.3	1016.2	0.0
08/01:30am	14.8	13.5	10.8	76	2.2	SW	6	11	3	6	1016.0	1015.9	0.0
08/01:00am	15.0	13.3	11.2	78	2.0	SW	11	19	6	10	1016.8	1016.7	0.0
08/12:30am	14.9	14.2	12.0	83	1.6	WSW	7	11	4	6	1016.8	1016.7	0.0
08/12:00am	15.1	13.6	11.9	81	1.7	WSW	11	13	6	7	1016.7	1016.6	0.0

Date/Time EST	Temp °C	App Temp °C	Dew Point °C	Rel Hum %	Delta-T °C	Wind					Press QNH hPa	Press MSL hPa	Rain since 9am mm
						Dir	Spd km/h	Gust km/h	Spd kts	Gust kts			
07/11:30pm	15.0	13.8	11.6	80	1.8	WSW	9	13	5	7	1017.0	1016.9	0.0
07/11:00pm	15.2	15.3	11.2	72	2.7	SW	7	11	4	6	1016.6	1016.5	0.0
07/10:30pm	15.8	14.9	11.2	74	2.5	SSW	7	11	4	6	1016.5	1016.4	0.0
07/10:00pm	16.2	15.5	11.4	73	2.6	SW	6	11	3	6	1016.6	1016.5	0.0
07/09:30pm	16.3	15.7	11.7	74	2.5	SSW	6	11	3	6	1016.3	1016.2	0.0
07/09:00pm	16.5	15.4	11.9	74	2.5	SSW	9	15	5	7	1016.1	1016.0	0.0
07/08:30pm	17.3	16.8	12.8	75	2.5	WSW	7	15	4	8	1015.9	1015.8	0.0
07/08:00pm	18.3	16.8	14.2	77	2.4	SSE	15	24	8	13	1015.2	1015.1	0.0
07/07:30pm	18.5	16.7	14.4	77	2.4	SSE	17	26	9	14	1014.8	1014.7	0.0
07/07:00pm	18.6	16.8	14.5	77	2.4	SSE	17	24	9	13	1014.6	1014.5	0.0
07/06:30pm	17.9	17.6	14.4	80	2.0	S	9	17	5	9	1014.4	1014.3	0.0
07/06:00pm	18.4	17.9	14.9	80	2.0	SSE	11	17	6	9	1014.2	1014.1	0.0
07/05:30pm	18.4	17.6	14.7	79	2.1	SSE	11	13	6	7	1013.8	1013.7	0.0
07/05:00pm	18.8	18.5	14.3	75	2.6	SSE	9	13	5	7	1013.2	1013.1	0.0
07/04:30pm	19.2	18.7	13.8	71	3.1	SSE	6	13	3	7	1012.9	1012.8	0.0
07/04:00pm	19.5	18.8	13.3	66	3.7	SSE	11	17	6	9	1012.6	1012.5	0.0
07/03:30pm	20.1	17.9	13.3	65	3.9	SSE	17	20	9	11	1012.2	1012.2	0.0
07/03:00pm	20.2	18.2	12.7	62	4.3	SSE	15	19	8	10	1011.9	1011.9	0.0
07/02:30pm	20.4	17.9	12.4	60	4.5	SE	17	24	9	13	1011.7	1011.7	0.0
07/02:00pm	20.7	18.4	11.9	57	4.9	SE	15	20	8	11	1011.5	1011.5	0.0
07/01:30pm	21.9	18.7	8.4	42	7.1	SSW	15	26	8	14	1011.5	1011.5	0.0
07/01:00pm	21.6	18.7	8.1	42	7.1	SSW	13	24	7	13	1011.7	1011.7	0.0
07/12:30pm	21.3	18.7	8.4	45	6.9	WSW	13	22	7	12	1011.9	1011.9	0.0
07/12:00pm	21.3	18.9	8.6	44	6.7	SW	11	22	6	12	1012.3	1012.3	0.0
07/11:30am	20.5	18.1	8.5	46	6.3	WSW	11	20	6	11	1012.7	1012.6	0.0
07/11:00am	20.2	17.8	8.8	48	6.0	SW	11	20	6	11	1012.9	1012.8	0.0
07/10:30am	16.7	15.4	8.1	60	5.4	W	15	24	8	13	1013.0	1012.9	0.0
07/10:00am	17.9	14.1	7.8	52	5.1	W	17	28	9	14	1013.2	1013.1	0.0

Latest Weather Observations Yamba

Date/Time EST	Temp °C	App Temp °C	Dew Point °C	Rel Hum %	Delta-T °C	Wind					Press QNH hPa	Press MSL hPa	Rain since 9am mm
						Dir	Spd km/h	Gust km/h	Spd kts	Gust kts			
11/04:30pm	19.6	18.5	16.1	80	2.1	N	11	19	6	10	1018.8	1018.7	0.0
11/04:00pm	19.8	20.2	16.3	80	2.1	N	9	17	5	9	1018.6	1018.5	0.0
11/03:30pm	20.1	21.1	16.9	82	1.9	N	7	11	4	6	1018.2	1018.1	0.0
11/03:00pm	20.3	20.9	15.9	75	2.6	N	7	15	4	8	1018.4	1018.3	0.0
11/02:30pm	21.5	22.0	16.5	73	3.0	NNW	9	17	5	9	1018.5	1018.4	0.0
11/02:00pm	21.5	21.1	15.3	68	3.7	NNW	11	20	6	11	1018.7	1018.6	0.0
11/01:30pm	20.5	19.5	14.6	69	3.5	NNW	13	20	7	11	1017.0	1016.9	0.0
11/01:00pm	21.0	20.5	14.9	68	3.6	NNW	11	20	6	11	1017.0	1016.9	0.0
11/12:30pm	20.8	19.6	14.7	69	3.5	NNW	13	20	7	11	1017.9	1017.9	0.0
11/12:00pm	19.8	18.7	14.2	76	3.2	NNW	13	22	7	12	1018.1	1018.1	0.0
11/11:30am	19.3	18.1	14.1	72	3.0	NNW	13	20	7	11	1019.0	1019.0	0.0
11/11:00am	19.7	18.5	14.1	70	3.2	NNW	13	20	7	11	1019.5	1019.5	0.0
11/10:30am	18.6	17.3	14.7	79	2.3	NW	15	22	8	12	1020.2	1020.2	0.0
11/10:00am	17.6	16.8	15.2	86	1.4	NW	13	19	7	10	1020.4	1020.4	0.0
11/09:30am	15.9	15.1	15.1	95	0.5	NW	13	19	7	10	1020.5	1020.5	0.0

This page was created at 23:15 on Wednesday 13 July 2016 (GMT)

Latest Weather Observations Yamba

Date/Time EST	Temp °C	App Temp °C	Dew Point °C	Rel Hum %	Delta-T °C	Wind					Press QNH hPa	Press MSL hPa	Rain since 9am mm
						Dir	Spd km/h	Gust km/h	Spd kts	Gust kts			
13/03:30am	18.6	14.2	2.1	40	6.3	SW	6	9	3	5	1016.0	1015.9	0.0
13/03:00am	17.1	13.6	0.4	40	6.3	WSW	11	19	6	10	1016.0	1015.9	0.0
13/02:30am	17.4	13.5	0.3	39	6.5	WSW	13	20	7	11	1015.8	1015.6	0.0
13/02:00am	17.0	14.1	0.5	39	6.6	W	11	15	6	8	1015.8	1015.7	0.0
13/01:30am	16.2	14.6	2.9	56	7.1	WSW	11	20	6	11	1015.8	1015.7	0.0
13/01:00am	17.7	16.4	10.1	61	4.0	W	7	11	4	6	1015.4	1015.3	0.0
13/12:30am	18.0	18.0	14.3	78	2.1	NW	7	9	4	5	1015.1	1015.0	0.0
13/12:00am	18.0	17.8	14.1	78	2.2	NW	9	15	5	8	1015.1	1015.0	0.0

Date/Time EST	Temp °C	App Temp °C	Dew Point °C	Rel Hum %	Delta-T °C	Wind					Press QNH hPa	Press MSL hPa	Rain since 9am mm
						Dir	Spd km/h	Gust km/h	Spd kts	Gust kts			
12/11:30pm	18.4	18.3	14.9	80	2.0	NW	9	13	5	7	1014.8	1014.7	0.0
12/11:00pm	18.6	18.2	15.3	81	1.9	NW	11	15	6	8	1014.8	1014.7	0.0
12/10:30pm	19.2	17.9	14.9	76	2.5	NNW	15	24	8	13	1014.5	1014.4	0.0
12/10:00pm	19.3	18.4	14.8	75	2.6	NNW	13	20	7	11	1014.3	1014.2	0.0
12/09:30pm	19.4	18.2	15.1	76	2.5	NNW	15	22	8	12	1014.1	1014.0	0.0
12/09:00pm	19.4	18.1	14.9	75	2.6	NNW	16	24	8	13	1013.9	1013.8	0.0
12/08:30pm	19.6	18.0	15.0	75	2.7	NNW	17	26	9	14	1014.2	1014.1	0.0
12/08:00pm	19.2	18.1	15.3	78	2.3	NNW	15	24	8	13	1013.7	1013.6	0.0
12/07:30pm	19.0	18.0	15.7	81	2.0	NNW	15	24	8	13	1013.8	1013.7	0.0
12/07:00pm	19.3	18.3	15.8	79	2.2	NNW	15	24	8	13	1013.4	1013.3	0.0
12/06:30pm	19.3	19.1	15.8	80	2.1	NNW	11	19	6	10	1013.1	1013.0	0.0
12/06:00pm	19.5	19.2	15.4	77	2.4	NNW	11	19	6	10	1012.8	1012.7	0.0
12/05:30pm	19.9	18.4	15.3	75	2.7	NNW	17	24	9	13	1012.7	1012.6	0.0
12/05:00pm	20.3	18.4	15.3	73	3.0	NNW	19	32	10	17	1012.5	1012.4	0.0
12/04:30pm	20.1	18.7	15.5	75	2.7	NNW	17	28	9	15	1012.2	1012.2	0.0
12/04:00pm	20.0	19.4	15.8	76	2.5	NNW	13	22	7	12	1011.9	1011.9	0.0
12/03:30pm	19.9	18.9	15.5	76	2.6	NNW	15	24	8	13	1011.6	1011.6	0.0
12/03:00pm	19.8	19.2	15.7	77	2.4	NNW	13	19	7	10	1011.6	1011.6	0.0
12/02:30pm	19.7	19.0	15.4	76	2.5	NNW	13	19	7	10	1011.7	1011.7	0.0
12/02:00pm	19.8	18.7	15.2	75	2.7	NNW	15	26	8	14	1011.7	1011.7	0.0
12/01:30pm	19.4	18.7	15.5	78	2.3	NNW	13	19	7	10	1011.7	1011.7	0.0
12/01:00pm	19.6	19.6	15.5	77	2.4	NNW	15	20	8	11	1012.2	1012.2	0.0
12/12:30pm	19.7	19.2	16.0	79	2.2	NNW	13	22	7	12	1013.0	1012.9	0.0
12/12:00pm	19.4	19.1	15.8	78	2.3	NNW	11	17	6	9	1013.8	1013.7	0.0
12/11:30am	19.6	20.3	16.1	80	2.1	N	7	13	4	7	1013.9	1013.8	0.0
12/11:00am	19.4	20.1	16.2	82	1.9	NNW	7	13	4	7	1014.8	1014.9	0.0
12/10:30am	19.2	19.5	16.1	82	1.9	NNW	9	15	5	8	1015.0	1014.9	0.0
12/10:00am	19.2	19.5	15.9	81	2.0	NNW	9	13	5	7	1015.6	1015.5	0.0
12/09:30am	18.3	18.0	15.4	83	1.7	NNW	11	17	6	9	1016.1	1015.9	0.0
12/09:00am	18.2	17.4	15.1	82	1.8	NNW	13	19	7	10	1016.1	1016.0	0.0
12/08:30am	17.9	17.3	14.8	81	1.9	NNW	11	19	6	10	1016.3	1016.2	0.0
12/08:00am	17.8	16.8	14.5	81	1.9	NNW	13	20	7	11	1016.1	1016.0	0.0
12/07:30am	17.8	16.9	14.6	80	1.7	NNW	11	20	6	11	1016.2	1016.1	0.0
12/07:00am	17.0	15.8	14.1	83	1.7	NNW	13	20	7	11	1016.2	1016.1	0.0
12/06:30am	17.0	15.9	14.3	84	1.6	NNW	13	26	7	14	1015.8	1015.7	0.0
12/06:00am	17.0	16.0	14.5	85	1.4	NNW	13	20	7	11	1015.8	1015.7	0.0
12/05:30am	17.2	15.9	14.7	85	1.4	NNW	15	24	8	13	1015.4	1015.3	0.0
12/05:00am	17.4	15.7	14.7	84	1.6	NNW	17	24	9	13	1014.9	1014.8	0.0
12/04:30am	17.6	15.9	14.7	83	1.7	NNW	17	24	9	13	1015.0	1014.9	0.0
12/04:00am	17.4	16.1	14.7	84	1.6	NNW	15	20	8	11	1015.2	1015.1	0.0
12/03:30am	17.3	16.4	14.8	85	1.4	NNW	13	19	7	10	1014.9	1014.8	0.0
12/03:00am	17.4	16.4	14.7	84	1.6	NNW	13	20	7	11	1015.3	1015.2	0.0
12/02:30am	17.4	16.1	14.7	84	1.6	NNW	15	22	8	12	1015.3	1015.2	0.0
12/02:00am	17.2	16.3	14.8	86	1.4	NNW	13	22	7	12	1015.6	1015.5	0.0
12/01:30am	17.0	16.4	14.8	86	1.4	NNW	11	17	6	9	1015.9	1015.8	0.0
12/01:00am	17.2	16.6	14.7	85	1.4	NNW	11	15	6	8	1016.2	1016.1	0.0
12/12:30am	17.2	16.7	14.8	86	1.4	NNW	11	15	6	8	1016.0	1015.9	0.0
12/12:00am	17.3	16.4	14.8	85	1.4	NNW	13	20	7	11	1016.1	1016.0	0.0

Date/Time EST	Temp °C	App Temp °C	Dew Point °C	Rel Hum %	Delta-T °C	Wind					Press QNH hPa	Press MSL hPa	Rain since 9am mm
						Dir	Spd km/h	Gust km/h	Spd kts	Gust kts			
11/11:30pm	17.4	16.5	14.9	85	1.4	NW	13	17	7	9	1016.4	1016.3	0.0
11/11:00pm	17.4	16.1	14.9	85	1.4	NNW	15	20	8	11	1016.2	1016.1	0.0
11/10:30pm	17.5	16.7	15.0	85	1.5	NNW	13	17	7	9	1016.4	1016.3	0.0
11/10:00pm	17.3	16.4	14.9	86	1.4	NNW	13	19	7	10	1016.2	1016.1	0.0
11/09:30pm	17.4	17.5	15.6	89	1.1	NW	9	13	5	7	1016.4	1016.3	0.0
11/09:00pm	18.1	17.9	15.0	82	1.8	NNW	13	20	7	11	1016.6	1016.5	0.0
11/08:30pm	18.3	17.7	15.6	84	1.6	NNW	13	20	7	11	1016.5	1016.4	0.0
11/08:00pm	18.6	17.2	15.5	82	1.8	NNW	17	26	9	14	1016.4	1016.3	0.0
11/07:30pm	18.7	17.4	15.9	84	1.7	NNW	17	24	9	13	1016.4	1016.3	0.0
11/07:00pm	18.5	18.1	16.4	88	1.4	NNW	15	26	8	14	1016.3	1016.2	0.0
11/06:30pm	19.0	18.8	16.8	87	1.3	NNW	13	24	7	13	1015.9	1015.8	0.0
11/06:00pm	19.0	18.9	15.9	82	1.8	NNW	11	17	6	9	1016.1	1016.0	0.0
11/05:30pm	19.4	19.5	16.4	83	1.8	N	11	19	6	10	1015.6	1015.5	0.0
11/05:00pm	19.4	18.9	15.9	80	2.1	NNW	13	20	7	11	1015.9	1015.8	0.0

Latest Weather Observations Yamba

Australian Government
Bureau of Meteorology

Latest Weather Observations for Yamba

Issued at 9:03 am EST Thursday 14 July 2016 (issued every 30 minutes, with the page automatically refreshed every 10 minutes)

Station Details: ID: 058012 Name: YAMBA PILOT STATION Lat: -29.43 Lon: 153.36 Height: 27.4 m

Data from the previous 72 hours. | See also:

Date/Time EST	Temp °C	App Temp °C	Dew Point °C	Rel Hum %	Delta-T °C	Wind					Press QNH hPa	Press MSL hPa	Rain since 9am mm
						Dir	Spd km/h	Gust km/h	Spd kts	Gust kts			
14/09:00am	11.8	9.6	2.0	51	4.2	SW	11	20	6	11	1029.2	1029.2	0.0
14/08:30am	11.4	7.6	1.6	51	4.1	SW	11	19	6	10	1029.0	1029.0	0.0
14/08:00am	11.0	7.1	1.3	51	4.0	SW	11	19	6	10	1028.5	1028.5	0.0
14/07:30am	10.6	6.7	1.4	53	3.8	SW	11	19	6	10	1028.1	1028.1	0.0
14/07:00am	10.4	5.9	1.0	52	3.9	SW	9	17	5	9	1027.5	1027.5	0.0
14/06:30am	10.5	7.0	1.3	53	3.8	SW	9	15	5	8	1027.3	1027.3	0.0
14/06:00am	10.6	7.0	0.6	50	4.1	SW	9	13	5	7	1027.3	1027.3	0.0
14/05:30am	10.8	7.6	0.8	50	4.1	SW	7	13	4	7	1027.1	1027.1	0.0
14/05:00am	11.1	7.7	1.6	52	4.0	SW	9	15	5	8	1026.7	1026.7	0.0
14/04:30am	11.0	7.6	1.8	52	4.0	SSW	11	17	6	9	1026.2	1026.2	0.0
14/04:00am	11.2	7.3	1.2	50	4.2	SW	11	15	6	8	1026.3	1026.3	0.0
14/03:30am	10.8	7.7	1.1	51	4.0	SW	7	15	4	8	1026.3	1026.3	0.0
14/03:00am	10.9	7.0	1.4	52	4.0	SW	11	17	6	9	1026.0	1026.0	0.0
14/02:30am	10.7	7.3	1.6	54	3.8	SW	9	15	5	8	1026.0	1026.0	0.0
14/02:00am	10.7	7.5	1.0	51	4.0	SW	7	11	4	6	1025.6	1025.6	0.0
14/01:30am	11.0	7.7	2.3	58	3.7	WSW	9	15	5	8	1025.7	1025.7	0.0
14/01:00am	11.1	7.8	2.7	56	3.6	WSW	9	13	5	7	1025.5	1025.5	0.0
14/12:30am	11.4	8.0	1.9	52	4.0	WSW	9	13	5	7	1024.9	1024.9	0.0
14/12:00am	11.5	8.3	3.0	56	3.7	SW	9	13	5	7	1025.2	1025.2	0.0

Date/Time EST	Temp °C	App Temp °C	Dew Point °C	Rel Hum %	Delta-T °C	Wind					Press QNH hPa	Press MSL hPa	Rain since 9am mm
						Dir	Spd km/h	Gust km/h	Spd kts	Gust kts			
13/11:30pm	11.6	8.6	3.9	59	3.4	WSW	9	17	5	9	1025.2	1025.2	0.0
13/11:00pm	11.9	9.0	4.6	61	3.3	WSW	9	15	5	8	1025.2	1025.2	0.0
13/10:30pm	12.0	9.2	5.2	63	3.1	WSW	9	15	5	8	1024.9	1024.9	0.0
13/10:00pm	11.7	9.2	6.6	71	2.4	WSW	9	15	5	8	1024.8	1024.8	0.0
13/09:30pm	12.1	9.8	7.6	74	2.2	WSW	9	13	5	7	1024.3	1024.3	0.0
13/09:00pm	12.4	10.6	7.9	74	2.2	SW	7	13	4	7	1024.6	1024.6	0.0
13/08:30pm	13.1	11.0	8.4	73	2.3	SW	9	13	5	7	1024.1	1024.1	0.0
13/08:00pm	13.5	11.7	9.4	76	2.1	SSW	9	13	5	7	1024.0	1024.0	0.0
13/07:30pm	14.2	12.0	7.7	65	3.2	SW	9	11	5	6	1023.9	1023.9	0.0
13/07:00pm	14.7	12.2	8.5	68	4.0	SSW	9	13	5	7	1023.5	1023.5	0.0
13/06:30pm	14.6	12.1	8.4	68	4.0	S	9	11	5	6	1023.3	1023.3	0.0
13/06:00pm	14.8	12.8	8.1	66	4.2	SSE	6	7	3	4	1022.5	1022.5	0.0
13/05:30pm	14.6	13.7	8.6	66	4.2	CALM	0	0	0	0	1021.9	1021.9	0.0
13/05:00pm	14.6	13.6	8.4	68	3.9	CALM	0	0	0	0	1021.7	1021.7	0.0
13/04:30pm	14.5	13.8	8.8	69	3.7	CALM	0	0	0	0	1021.4	1021.4	0.0
13/04:00pm	14.8	14.6	9.0	68	2.9	CALM	0	0	0	0	1020.9	1020.9	0.0
13/03:30pm	14.7	13.3	8.9	68	3.0	NNW	6	9	3	5	1020.4	1020.4	0.0
13/03:00pm	15.0	13.4	8.9	67	3.1	NNW	7	9	4	5	1020.1	1020.1	0.0
13/02:30pm	15.2	13.2	8.2	65	4.3	NW	6	9	3	5	1020.1	1020.1	0.0
13/02:00pm	15.4	14.2	8.8	66	5.0	CALM	0	0	0	0	1020.1	1020.1	0.0
13/01:30pm	15.6	14.3	8.3	62	5.3	CALM	0	4	0	2	1019.9	1019.9	0.0
13/01:00pm	16.0	13.2	8.1	62	5.9	S	7	11	4	6	1019.5	1019.5	0.0
13/12:30pm	16.3	13.7	8.0	64	5.7	SSW	7	11	4	6	1019.5	1019.5	0.0
13/12:00pm	16.5	13.9	8.2	64	5.7	WSW	7	9	4	5	1019.6	1019.6	0.0
13/11:30am	16.5	14.6	8.1	60	5.1	W	4	7	2	4	1019.9	1019.9	0.0
13/11:00am	16.3	14.0	8.7	66	5.5	SSW	6	9	3	5	1020.1	1020.1	0.0
13/10:30am	15.9	13.4	8.9	68	5.2	SW	7	11	4	6	1020.3	1020.3	0.0
13/10:00am	15.9	13.6	8.5	66	5.0	SW	7	11	4	6	1020.4	1020.4	0.0
13/09:30am	15.8	14.4	8.7	61	4.8	SSW	2	7	1	4	1020.3	1020.3	0.0
13/09:00am	15.4	14.5	8.2	64	4.4	CALM	0	4	0	2	1020.4	1020.4	0.0
13/08:30am	14.9	12.7	7.7	62	3.6	WSW	9	13	5	7	1020.0	1020.0	0.0
13/08:00am	14.9	13.4	8.4	66	3.3	WNW	6	9	3	5	1019.2	1019.2	0.0
13/07:30am	15.5	12.7	6.3	44	5.8	SW	7	11	4	6	1018.9	1018.9	0.0
13/07:00am	14.9	13.0	4.9	51	4.7	SW	4	7	2	4	1018.7	1018.7	0.0
13/06:30am	15.6	13.0	4.0	46	5.4	WSW	7	11	4	6	1018.0	1018.0	0.0
13/06:00am	15.7	14.8	5.9	52	4.7	CALM	0	0	0	0	1017.6	1017.6	0.0
13/05:30am	15.4	13.2	6.3	51	4.8	NW	6	7	3	4	1017.4	1017.3	0.0
13/05:00am	16.2	13.7	3.6	43	5.8	SW	6	9	3	5	1017.0	1016.9	0.0
13/04:30am	16.3	13.4	4.4	45	5.6	W	9	13	5	7	1016.7	1016.6	0.0
13/04:00am	16.1	13.3	5.1	48	5.2	W	9	13	5	7	1016.4	1016.3	0.0

Latest Weather Observations Yamba

Date/Time EST	Temp °C	App Temp °C	Dew Point °C	Rel Hum %	Delta-T °C	Wind					Press QNH hPa	Press MSL hPa	Rain since 9am mm
						Dir	Spd km/h	Gust km/h	Spd kts	Gust kts			
16/06:00pm	15.4	17.3	14.3	77	2.3	ESE	13	24	7	13	1028.0	1028.0	0.2
16/05:30pm	17.9	15.3	13.8	77	2.3	ESE	20	30	11	16	1027.9	1027.9	0.2
16/05:00pm	17.1	16.8	14.4	84	1.5	SE	9	13	5	7	1027.9	1027.8	0.2
16/04:30pm	17.2	13.6	14.3	83	1.7	SE	28	41	14	22	1027.7	1027.7	0.0
16/04:00pm	18.1	15.8	14.2	76	2.2	SSE	19	26	10	14	1027.5	1027.5	0.0
16/03:30pm	18.0	15.7	14.1	76	2.2	SSE	19	28	10	15	1027.4	1027.4	0.0
16/03:00pm	17.9	15.6	14.2	79	2.1	SSE	19	26	10	14	1027.5	1027.5	0.0
16/02:30pm	17.9	15.6	14.0	78	2.2	SSE	19	30	10	16	1027.7	1027.7	0.0
16/02:00pm	18.4	14.7	12.8	70	3.1	SE	24	35	13	19	1027.8	1027.8	0.0
16/01:30pm	18.1	15.9	14.4	79	2.1	SSE	19	28	10	15	1027.7	1027.7	0.0
16/01:00pm	18.0	15.5	14.1	78	2.2	SSE	20	30	11	16	1028.0	1028.0	0.0
16/12:30pm	18.2	15.8	14.3	78	2.2	SSE	20	32	11	17	1028.0	1028.0	0.0
16/12:00pm	16.4	15.4	13.3	82	1.7	SW	11	19	6	10	1028.4	1028.4	0.0
16/11:30am	16.5	14.6	13.0	80	2.0	SSW	15	22	8	12	1029.1	1029.1	0.0
16/11:00am	15.4	12.5	12.3	82	1.7	S	19	35	10	19	1029.4	1029.4	0.0

This page was created at **10:47 on Tuesday 19 July 2016 (AEST)**

Appendix D Yamba Weather Station Wind Roses

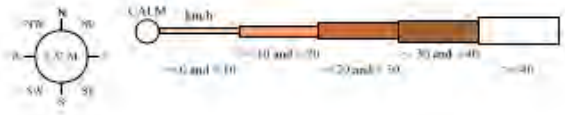
Rose of Wind direction versus Wind speed in km/h (26 Mar 1944 to 30 Sep 2010)

Custom times selected, refer to attached note for details

YAMBA PILOT STATION

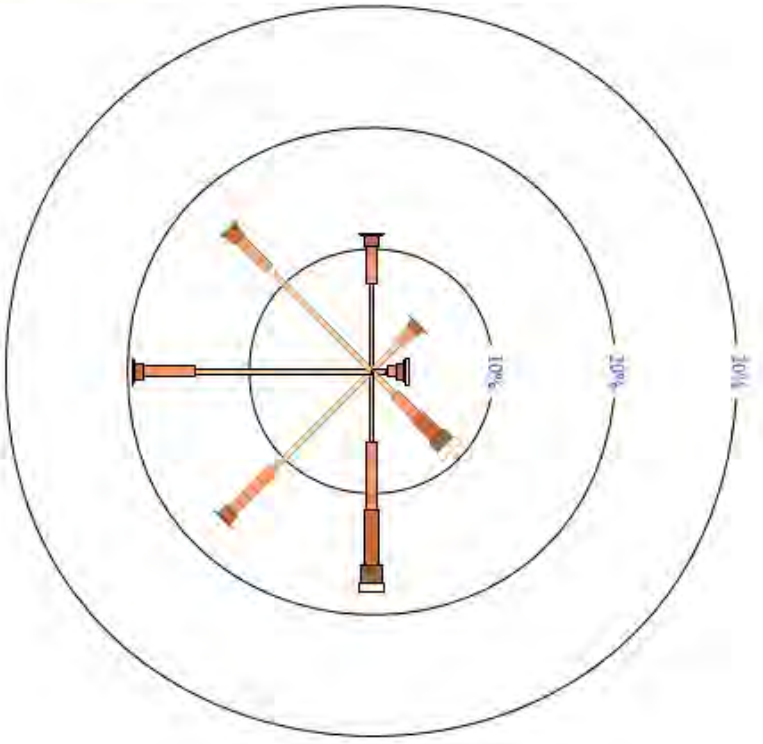
Site No: 058012 • Opened Jan 1877 • Still Open • Latitude: -29.4333° • Longitude: 153.3632° • Elevation 27 m

An asterisk (*) indicates that calm is less than 0.5%.
Other important info about this analysis is available in the accompanying notes.



9 am
19718 Total Observations

Calm *



TCZANNUAL Page 1

Rose of Wind direction versus Wind speed in km/h (26 Mar 1944 to 30 Sep 2010)

Custom times selected, refer to attached note for details

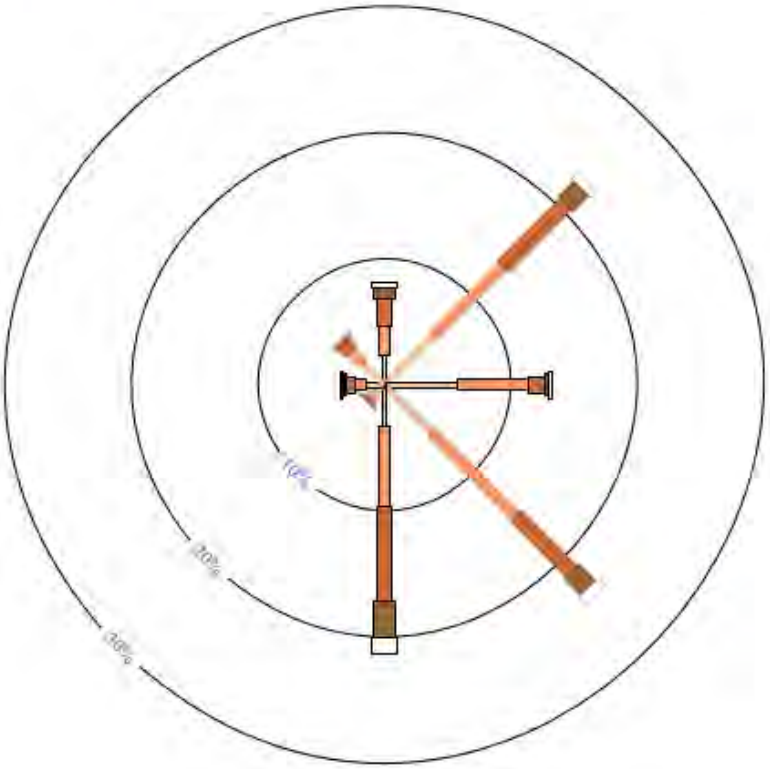
YAMBA PILOT STATION

Site No: 058012 • Opened Jan 1877 • Still Open • Latitude: -29.4335° • Longitude: 153.3632° • Elevation 27 m

An asterisk (*) indicates that calm is less than 0.5%.
Other important info about this analysis is available in the accompanying notes.

3 pm
19702 Total Observations

Calm *



Appendix E Sample Calculations

L_{Aeq} 15 minute – Day Period

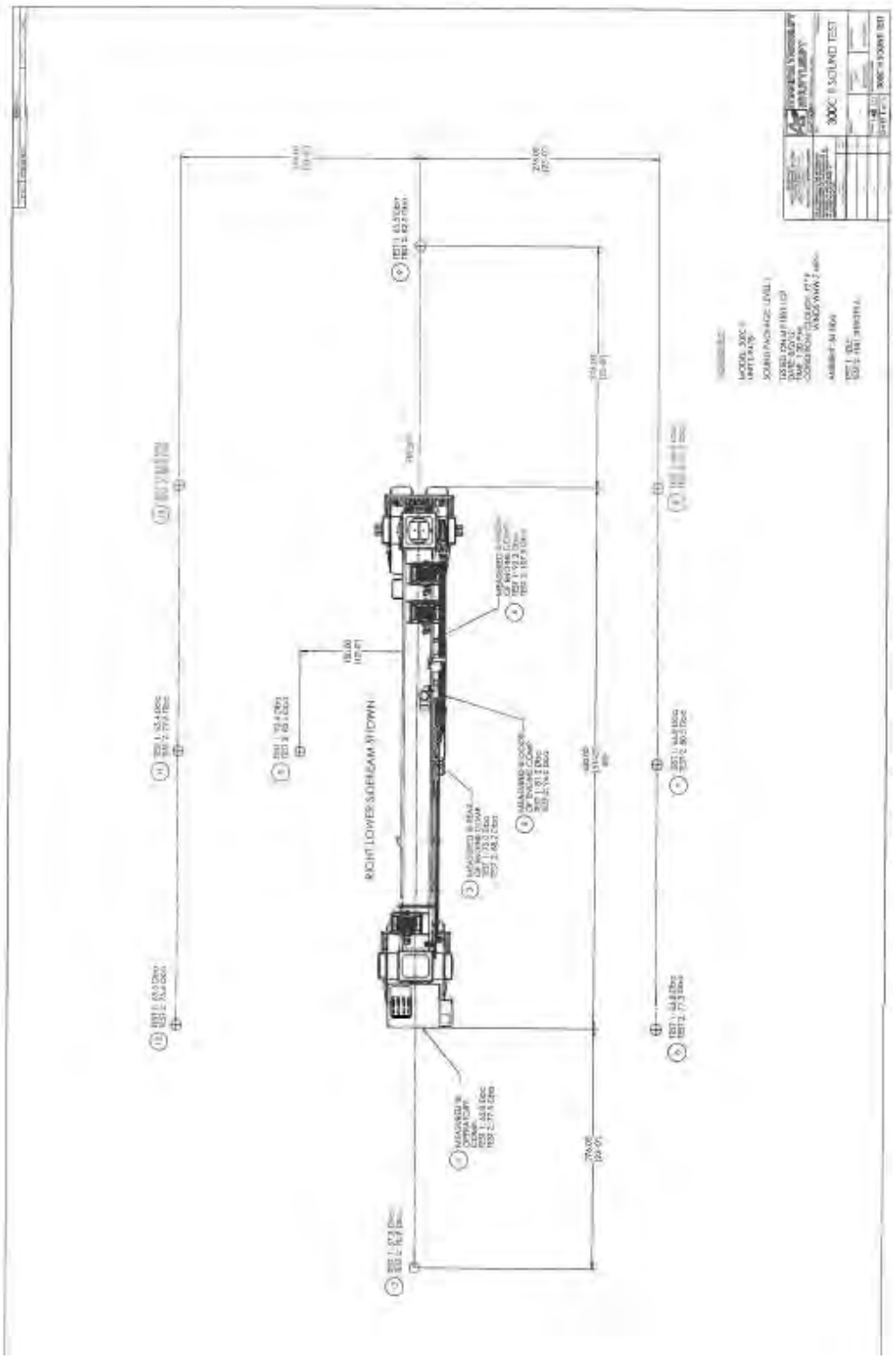
				Distance to the Receivers					
Noise Source	**Duration**	**Leq**	**Leq 15min**	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**
				riverfront	North (far)	North (close)	East	South east	South west
Car door	2	78	51	225	310	310	590	335	350
Car bypass	6	69	47	225	150	100	590	335	350
Car ignition	3	72	47	225	310	310	590	335	350
voice	450	75	72	240	185	120	590	400	325
Semi trailer passby	20	85	68	285	370	360	260	310	360
Semi trailer idle	300	79	74	285	210	150	750	460	360
Unloading a delivery vehicle	120	80	71	285	210	150	750	460	360
Forklift	720	80	79	285	230	170	750	460	325
Waste collection	40	95	81	430	300	290	600	390	460
Deliveries - refrigeration vehicle	60	85	73	430	230	225	630	400	410
Marine Travelift 75BFM	900	90	90	290	220	200	685	400	320
High pressure spray	225	84	78	440	315	260	685	400	320
Workshop activities	10	89	69	430	230	215	630	400	400
YWE - welding etc	720	85	84	335	250	200	750	460	310
YWE - cutting with powered saw	90	94	84	335	250	200	750	460	310
YWE - cutting with guilotine	90	95	85	335	250	200	750	460	310
15 minute period (s)		**900**							
Noise level after Distance loss									
Car door				4	2	2	-4	1	1
Car bypass				0	4	7	-8	-3	-4
Car ignition				0	-3	-3	-8	-3	-4
voice				24	27	30	17	20	22
Semi trailer passby				19	17	17	20	19	17
Semi trailer idle				25	28	31	17	21	23
Unloading a delivery vehicle				22	25	28	14	18	20
Forklift				30	32	34	22	26	29
Waste collection				29	32	32	26	30	28
Deliveries - refrigeration vehicle				21	26	26	17	21	21
Marine Travelift 75BFM				41	44	44	34	38	40
High pressure spray				25	28	30	21	26	28
Workshop activities				17	22	23	13	17	17
YWE - welding etc				34	36	38	27	31	34
YWE - cutting with powered saw				33	36	38	26	31	34
YWE - cutting with guilotine				34	37	39	27	32	35
Shielding									
Car door				0	0	0	0	0	0
Car bypass				0	0	0	0	0	0
Car ignition				0	0	0	0	0	0
voice				16	17	17	0	5	10
Semi trailer passby				16	0	0	0	0	10
Semi trailer idle				16	17	17	0	5	10
Unloading a delivery vehicle				16	17	17	0	5	10
Forklift				16	17	17	0	5	10
Waste collection				11	16	16	5	0	0
Deliveries - refrigeration vehicle				16	18	18	0	0	10
Marine Travelift 75BFM				7	14	10	0	11	8
High pressure spray				16	14	14	11	20	20
Workshop activities				16	18	18	11	6	10
YWE - welding etc				16	14	16	11	12	12
YWE - cutting with powered saw				16	14	16	11	12	12
YWE - cutting with guilotine				16	14	16	11	12	12
Atmospheric Attenuation due to distance, ISO9613									
Car door				0.6	0.9	0.9	1.7	0.9	1.0
Car bypass				0.6	0.4	0.3	1.7	0.9	1.0
Car ignition				0.6	0.9	0.9	1.7	0.9	1.0
voice				0.6	0.5	0.3	1.7	1.0	0.9
Semi trailer passby				0.8	1.0	1.0	1.7	0.8	1.0
Semi trailer idle				0.8	0.6	0.4	2.1	1.3	1.0
Unloading a delivery vehicle				0.8	0.6	0.4	2.1	1.3	1.0
Forklift				0.8	0.6	0.5	2.1	1.3	0.9
Waste collection				1.2	0.8	0.8	1.7	1.0	1.2
Deliveries - refrigeration vehicle				1.2	0.6	0.6	1.7	1.1	1.1
Marine Travelift 75BFM				0.8	0.6	0.6	1.7	1.1	0.9
High pressure spray				1.2	0.9	0.7	1.7	1.1	0.9
Workshop activities				1.2	0.6	0.6	1.7	1.1	1.1
YWE - welding etc				0.9	0.7	0.6	2.1	1.3	0.9
YWE - cutting with powered saw				0.9	0.7	0.6	2.1	1.3	0.9
YWE - cutting with guilotine				0.9	0.7	0.6	2.1	1.3	0.9
SubTotal - Noise Level at Receiver				**R1**	**R2**	**R3**	**R4**	**R5**	**R6**
Car door				4	1	1	-6	0	0
Car bypass				0	3	7	-10	-4	-5
Car ignition				0	-3	-3	-10	-4	-5
voice				8	9	13	15	14	11
Semi trailer passby				3	16	16	18	18	6
Semi trailer idle				8	10	13	15	15	12
Unloading a delivery vehicle				5	7	10	12	12	9
Forklift				13	14	17	19	19	18
Waste collection				17	15	15	19	29	27
Deliveries - refrigeration vehicle				3	7	8	16	20	10
Marine Travelift 75BFM				33	29	34	32	26	31
High pressure spray				8	13	15	9	5	7
Workshop activities				0	4	4	1	10	6
YWE - welding etc				17	21	21	13	17	21
YWE - cutting with powered saw				17	21	21	13	17	21
YWE - cutting with guilotine				18	22	22	14	18	22
Part calculation considering the number of events per 15 min period				4					
Activity	**Events**	**Duration**		**R1**	**R2**	**R3**	**R4**	**R5**	**R6**
Car door	16	2		39	19	19	4	17	15
Car bypass	16	6		15	35	80	2	6	6
Car ignition	16	3		15	7	7	2	6	6
voice	1	450		6	8	20	31	25	12
Semi trailer passby	2	20		4	82	86	141	122	9
Semi trailer idle	2	300		14	21	43	58	59	32
Unloading a delivery vehicle	2	120		7	11	22	29	30	16
Forklift	1	720		21	26	49	88	89	62
Waste collection	1	40		46	33	35	83	734	504
Deliveries - refrigeration vehicle	4	60		9	22	23	144	409	39
Marine Travelift 75BFM	1	900		2164	786	2387	1580	423	1379
High pressure spray	1	225		6	20	31	7	3	5
Workshop activities	45	10		41	104	119	54	484	193
YWE - welding etc	1	720		46	137	138	22	51	123
YWE - cutting with powered saw	1	90		46	136	137	22	51	122
YWE - cutting with guilotine	1	90		58	171	173	28	64	154
RESULT - DAY PERIOD				**R1**	**R2**	**R3**	**R4**	**R5**	**R6**
Car door				16	13	13	6	12	12
Car bypass				12	15	19	2	8	7
Car ignition				12	9	9	2	8	7
voice				8	9	13	15	14	11
Semi trailer passby				6	19	19	21	21	9
Semi trailer idle				11	13	16	18	18	15
Unloading a delivery vehicle				8	10	13	15	15	12
Forklift				13	14	17	19	19	18
Waste collection				17	15	15	19	29	27
Deliveries - refrigeration vehicle				9	13	14	22	26	16
Marine Travelift 75BFM				33	29	34	32	26	31
High pressure spray				8	13	15	9	5	7
Workshop activities				16	20	21	17	27	23
YWE - welding etc				17	21	21	13	17	21
YWE - cutting with powered saw				17	21	21	13	17	21
YWE - cutting with guilotine				18	22	22	14	18	22
TOTAL NOISE				**34**	**32**	**35**	**34**	**34**	**34**

L_{Aeq} 15 minute – Early Morning (6am to 7am) Period

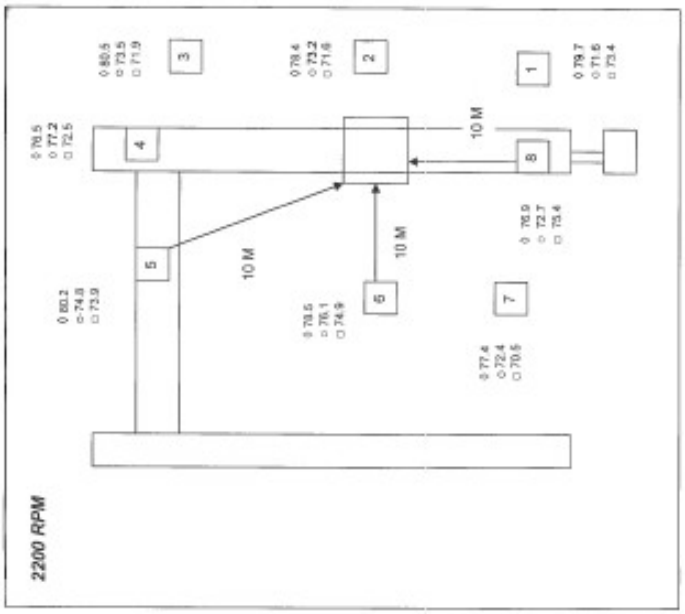
				Distance to the Receivers					
Noise Source	**Duration**	**Leq**	**Leq 15min**	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**
Car door	2	78	51	225	310	310	590	335	350
Car bypass	6	69	47	225	150	100	590	335	350
Car ignition	3	72	47	225	310	310	590	335	350
voice	450	75	72	240	185	120	590	400	325
Forklift	720	80	79	285	230	170	750	460	325
High pressure spray	225	84	78	440	315	260	685	400	320
Workshop activities	10	89	69	430	230	215	630	400	400
YWE - welding etc	720	85	84	335	250	200	750	460	310
YWE - cutting with powered saw	90	94	84	335	250	200	750	460	310
YWE - cutting with guilotine	90	95	85	335	250	200	750	460	310
15 minute period (s)		**900**							
Noise level after Distance loss									
Car door				4	2	2	-4	1	1
Car bypass				0	4	7	-8	-3	-4
Car ignition				0	-3	-3	-8	-3	-4
voice				24	27	30	17	20	22
Forklift				30	32	34	22	26	29
High pressure spray				25	28	30	21	26	28
Workshop activities				17	22	23	13	17	17
YWE - welding etc				34	36	38	27	31	34
YWE - cutting with powered saw				33	36	38	26	31	34
YWE - cutting with guilotine				34	37	39	27	32	35
Shielding									
Car door				0	0	0	0	0	0
Car bypass				0	0	0	0	0	0
Car ignition				0	0	0	0	0	0
voice				16	17	17	0	5	10
Forklift				16	17	17	0	5	10
High pressure spray				16	14	14	11	20	20
Workshop activities				16	18	18	11	6	10
YWE - welding etc				16	14	16	11	12	12
YWE - cutting with powered saw				16	14	16	11	12	12
YWE - cutting with guilotine				16	14	16	11	12	12
Atmospheric Attenuation due to distance, ISO9613									
Car door				0.6	0.9	0.9	1.7	0.9	1.0
Car bypass				0.6	0.4	0.3	1.7	0.9	1.0
Car ignition				0.6	0.9	0.9	1.7	0.9	1.0
voice				0.6	0.5	0.3	1.7	1.0	0.9
Forklift				0.8	0.6	0.5	2.1	1.3	0.9
High pressure spray				1.2	0.9	0.7	1.7	1.1	0.9
Workshop activities				1.2	0.6	0.6	1.7	1.1	1.1
YWE - welding etc				0.9	0.7	0.6	2.1	1.3	0.9
YWE - cutting with powered saw				0.9	0.7	0.6	2.1	1.3	0.9
YWE - cutting with guilotine				0.9	0.7	0.6	2.1	1.3	0.9
SubTotal - Noise Level at Receiver				**R1**	**R2**	**R3**	**R4**	**R5**	**R6**
Car door				4	1	1	-6	0	0
Car bypass				0	3	7	-10	-4	-5
Car ignition				0	-3	-3	-10	-4	-5
voice				8	9	13	15	14	11
Forklift				13	14	17	19	19	18
High pressure spray				8	13	15	9	5	7
Workshop activities				0	4	4	1	10	6
YWE - welding etc				17	21	21	13	17	21
YWE - cutting with powered saw				17	21	21	13	17	21
YWE - cutting with guilotine				18	22	22	14	18	22
CALC	number of events per 15mins			4					
Activity		**Events**	**Duration**	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**
Car door		16		39	19	19	4	17	15
Car bypass		16		15	35	80	2	6	6
Car ignition		16		15	7	7	2	6	6
voice		1		6	8	20	31	25	12
Forklift		1		21	26	49	88	89	62
High pressure spray		1		6	20	31	7	3	5
Workshop activities		45		41	104	119	54	484	193
YWE - welding etc		1		46	137	138	22	51	123
YWE - cutting with powered saw		1		46	136	137	22	51	122
YWE - cutting with guilotine		1		58	171	173	28	64	154
RESULT - NIGHT PERIOD				**R1**	**R2**	**R3**	**R4**	**R5**	**R6**
Car door				16	13	13	6	12	12
Car bypass				12	15	19	2	8	7
Car ignition				12	9	9	2	8	7
voice				8	9	13	15	14	11
Forklift				13	14	17	19	19	18
High pressure spray				8	13	15	9	5	7
Workshop activities				16	20	21	17	27	23
YWE - welding etc				17	21	21	13	17	21
YWE - cutting with powered saw				17	21	21	13	17	21
YWE - cutting with guilotine				18	22	22	14	18	22
TOTAL NOISE				**25**	**28**	**29**	**24**	**29**	**28**

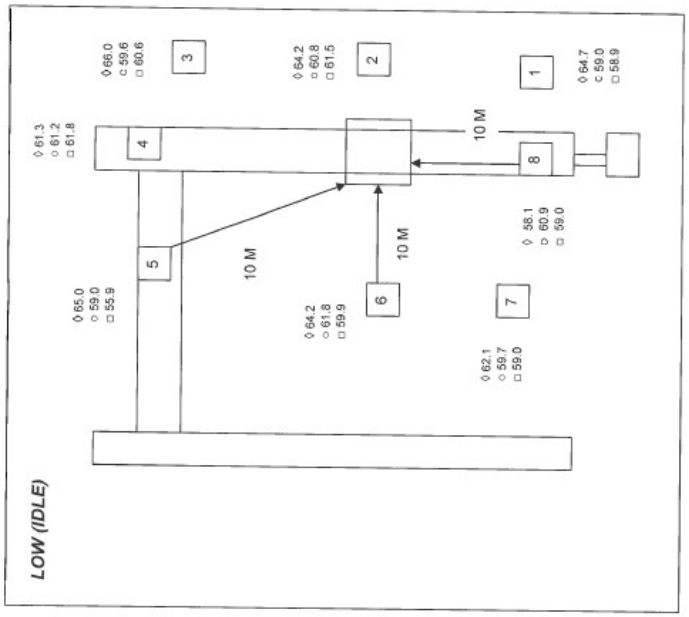
Appendix F Travelift Noise Source Data and Marine Travelift Information

300C II Noise Test:



75BFM II Noise Test:





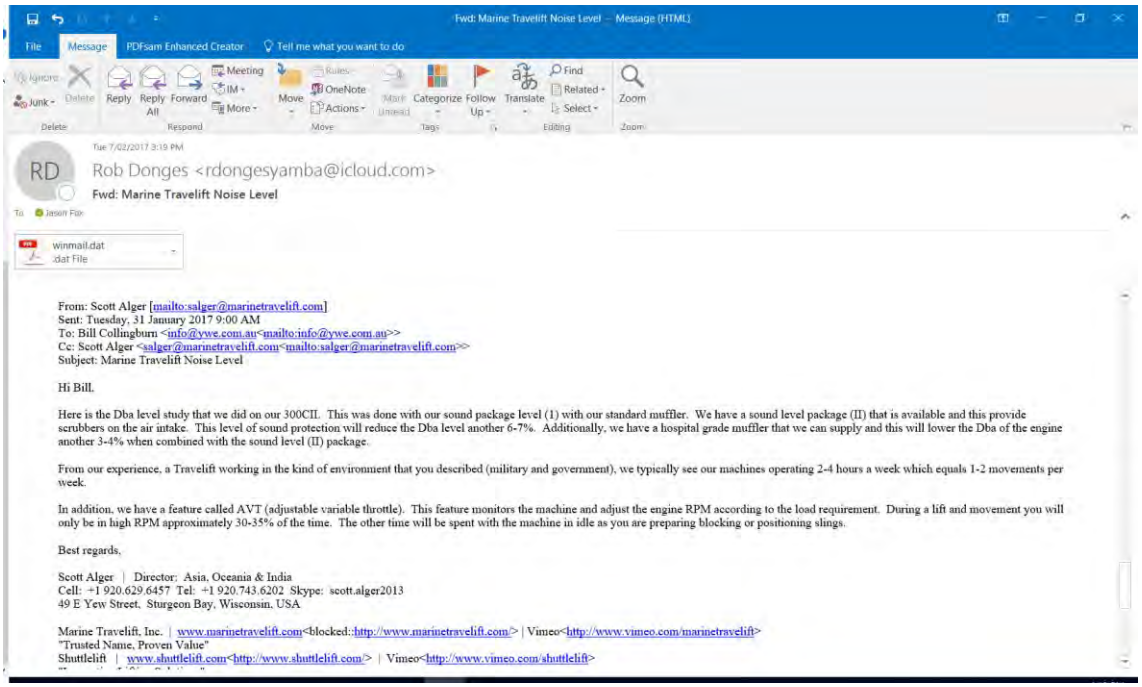
Calculation of source level for report predictions

300C II model:

MARINE TRAVELIFT 300C - information provided by client **Sound Package: Level 1**	Full throttle (meaning hydraulic operation - advised in phone call with Bill Collingwood 29/09/2016) Average of side measurements at 7m					Idle (representative of engine operation - advised in phone call with Bill Collingwood 29/09/2016) Average of measurements at 7m				
	Measurement	dB(A) 7m	dB(A) 1m		Operating	Measurement	dB(A) 7m	dB(A) 1m		Operating
	6	77	94	3E+09		6	64	80	1.1E+08	
	7	81	97	5E+09		7	67	83	2.19E+08	
	8	81	98	7E+09		8	66	82	1.74E+08	
	10	81	98	6E+09		10	67	83	2.19E+08	
	11	80	97	4E+09		11	65	81	1.38E+08	
	12	76	93	2E+09		12	64	80	1.1E+08	
Sound Package 1 noise level		at 1m LOG Average	97		100%		at 1m LOG Avg 6-12	82		100%
Sound Package 2 reduction - 6-7% provides scrubbers on the air intake			91			**Sound Package 2 reduction - 6-7% provides scrubbers on the air intake**		77		
With hospital grade muffler - reduces by another 3-4%			88			**With hospital grade muffler - reduces by another 3-4%**		75		
If both noise sources are operating simultaneously continuously over the period, then it's the sum of both dB							**dB SUM**	**88**		at 1m
								71		at 7m

75BFM II model:

MARINE TRAVELIFT 75BFM information provided by client **No Insulation (assuming Level 1 package)**	Full throttle (meaning hydraulic operation - advised in phone call with Bill Collingwood 29/09/2016) Average of all measurements at 10m					Idle (representative of engine operation - advised in phone call with Bill Collingwood 29/09/2016) Average of all measurements at 10m				
	Measurement	dB(A) 10m	dB(A) 1m		Operating	Measurement	dB(A) 10m	dB(A) 1m		Operating
	1	80	100	9E+09		1	65	85	2.95E+08	
	2	78	98	7E+09		2	64	84	2.63E+08	
	3	81	101	1E+10		3	66	86	3.98E+08	
	4	77	97	4E+09		4	61	81	1.35E+08	
	5	80	100	1E+10		5	65	85	3.16E+08	
	6	79	99	7E+09		6	64	84	2.63E+08	
	7	77	97	5E+09		7	62	82	1.62E+08	
	8	77	97	5E+09		8	58	78	64565423	
Sound Package 1 noise level		at 1m LOG Average	99		100%		at 1m LOG Average	82		100%
Sound Package 2 reduction - 6-7% provides scrubbers on the air intake			93			**Sound Package 2 reduction - 6-7% provides scrubbers on the air intake**		77		
With hospital grade muffler - reduces by another 3-4%			90			**With hospital grade muffler - reduces by another 3-4%**		75		
If both noise sources are operating simultaneously continuously over the period, then it's the sum of both dB							**dB SUM**	**90**		at 1m
								73		at 7m



Fwd: Marine Travelift Noise Level – Message (HTML)

File | Message | PDFsam Enhanced Creator | Tell me what you want to do

Ignore | Junk | Delete | Reply | Reply All | Forward | Meeting | IM | More | Move | Rules | OneNote | Actions | Mark Unread | Categorize | Follow Up | Translate | Find | Related | Select | Zoom

Delete | Respond | Move | Tags | Editing | Zoom

Tue 7/02/2017 3:19 PM

RD

Rob Donges <rdongesyamba@icloud.com>

Fwd: Marine Travelift Noise Level

To Jason Fox

winmail.dat
.dat File

From: Scott Alger [mailto:salger@marinetravelift.com]
Sent: Tuesday, 31 January 2017 9:00 AM
To: Bill Collingburn <info@ywe.com.au<mailto:info@ywe.com.au>>
Cc: Scott Alger <salger@marinetravelift.com<mailto:salger@marinetravelift.com>>
Subject: Marine Travelift Noise Level

Hi Bill,

Here is the Dba level study that we did on our 300CII. This was done with our sound package level (1) with our standard muffler. We have a sound level package (II) that is available and this provide scrubbers on the air intake. This level of sound protection will reduce the Dba level another 6-7%. Additionally, we have a hospital grade muffler that we can supply and this will lower the Dba of the engine another 3-4% when combined with the sound level (II) package.

From our experience, a Travelift working in the kind of environment that you described (military and government), we typically see our machines operating 2-4 hours a week which equals 1-2 movements per week.

In addition, we have a feature called AVT (adjustable variable throttle). This feature monitors the machine and adjust the engine RPM according to the load requirement. During a lift and movement you will only be in high RPM approximately 30-35% of the time. The other time will be spent with the machine in idle as you are preparing blocking or positioning slings.

Best regards,

Scott Alger | Director: Asia, Oceania & India
Cell: +1 920.629.6457 Tel: +1 920.743.6202 Skype: scott.alger2013
49 E Yew Street, Sturgeon Bay, Wisconsin, USA

Marine Travelift, Inc. | www.marinetravelift.com<blocked::http://www.marinetravelift.com/> | Vimeo<http://www.vimeo.com/marinetravelift>
"Trusted Name, Proven Value"
Shuttlelift | www.shuttlelift.com<http://www.shuttlelift.com/> | Vimeo<http://www.vimeo.com/shuttlelift>

APPENDIX H

Transport and Traffic Assessment Report

- Additional Report - 5 April 2017
- Report 28 September 2016

5 April 2017
Our Ref: 16GCT0106
Your Ref:

Attention: Rob Donges

Rob Donges - Planning Consultant
via email

Dear Rob,

RE: Yamba Welding and Engineering - School Road, Palmers Island

With reference to the traffic matters raised in the 15th of November 2016 Summary of the 8th of November 2016 Clarence Valley Council Meeting, regarding the proposed development on Lot 2 DP598769, School Road, Palmers Island, TTM provides the following response.

1. Access

Consistent with Council's commentary, the sight distance of the proposed access will need to be assessed as part of detailed design.

2. Parking

Council have maintained that the previous GFA of 26,500 m^2 requires a minimum parking provision of 265 parking spaces, based on a rate of 1 space per 100 m^2 GFA, despite the development having an estimated peak site occupancy of 133 simultaneous persons.

The GFA of traffic generating site uses has been revised to a total of 13,360m^2, including 11,000m^2 of Industry, 360m^2 of office, and 2,000m^2 of TAFE. The revised parking requirements of the development are summarised in Table 1.

Table 1: Revised Parking Requirements

Use Type	Use	Area	Rate	Requirement
Office	Office	360 m^2	1 space per 30m^2 GFA	12 spaces
Industry	Light industrial	1,600 m^2	1 space per 100m^2	16 spaces
	Fabrication shed	5,000 m^2	1 space per 100m^2	50 spaces
	Refit shed	2,400 m^2	1 space per 100m^2	24 spaces
	Paint shed	1,000 m^2	1 space per 100m^2	10 spaces
	Paint preparation shed	1,000 m^2	1 space per 100m^2	10 spaces
School	TAFE	2,000 m^2	1 space per 2 staff and 1 space per 20 students	5 spaces*
TOTAL		13,360 m^2		127 spaces

**In accordance with the DCP, only 2 spaces would be required for the TAFE use, but 5 have been nominated*

The development is proposing to provide 127 parking spaces in order to comply with the DCP parking rates.

3. Service Vehicle Parking

Council's summary insinuates that TTM previously recommended that a provision of 29 service vehicles be provided in accordance with the DCP. This is incorrect, as TTM recommended that based on the expected servicing that 3 service bays be provided (1 AV and 2 HRV).

Based on the revised GFA of 13,360m^2, of which 11,000m^2 is Industry use, the total required service vehicle provision under the DCP is summarised in Table 2.

Table 2: Revised Service Vehicle Requirements

Use	Area	Rate	Requirement
Industry	11,000 m^2	1 per 800m^2 up to 8000m^2 1 per 1,000m^2 thereafter	13 Service Bays

It is of TTM's understanding that the expected servicing operations have not changed as part of the revised plan, being:

- 2 SRV's per day + 1 Extra SRV per week;
- 1 HRV per week + 1 Extra HRV per month;
- 1 AV per fortnight; and
- 2 RCV per week,

and hence TTM maintain that 3 service bays are adequate for the development. This being noted, the development design provides considerable amounts of hardstand area to allow for heavy vehicles to park where needed. TTM do not consider that providing a multitude of designated formal service bays in a centralised location is practical for the development.

4. Traffic Impact at the Intersection of School Road and Yamba Road

Council conclude that the previously prepared does not adequately demonstrate that the development's impact is mitigated by the recommended turning treatments at the School Road / Yamba Road intersection. Council further states that roundabout treatment is likely to be required to cater to the likely traffic.

TTM have undertaken an additional analysis of the upgrade options of the School Road / Yamba Road intersection to contrast the performance and likely land requirements.

TTM's proposed treatment would introduce an Auxiliary Left (AUL) and Channelised Right (CHR) treatment at the intersection. The concept design provided was based on the Yamba Road / Orion Drive intersection to the east. The recommended treatment would require minimal land acquisition and pavement widening to accommodate it. The proposed design allows for a single left turn vehicle to queue beside a right turning vehicle on School Road as illustrated in Figure 1.

By comparison, a roundabout of sufficient size to cater to AV movements would require approximately a 30m diameter roundabout, comparable to the Yamba Road / Golding Street roundabout. This treatment would require considerably more land and pavement (especially to the south) as illustrated in Figure 2.

Figure 1: Turning from School Road

Figure 2: Roundabout Configuration

TTM have assessed the performance of the treatments during the 2028 design horizon AM and PM peak hours with and without the development traffic.

Although the number of generated trips would be slightly reduced under the revised site plan, for the sake of consistency, TTM have maintained the estimated peak hour trip generation of 63 AM peak hour trips, 62 PM peak hour trips.

TTM have used SIDRA Intersection 7.0 to model and compare the options. The recommended treatment option has been modelled in SIDRA as illustrated in Figure 3. The roundabout option has been modelled in SIDRA as illustrated in Figure 4.

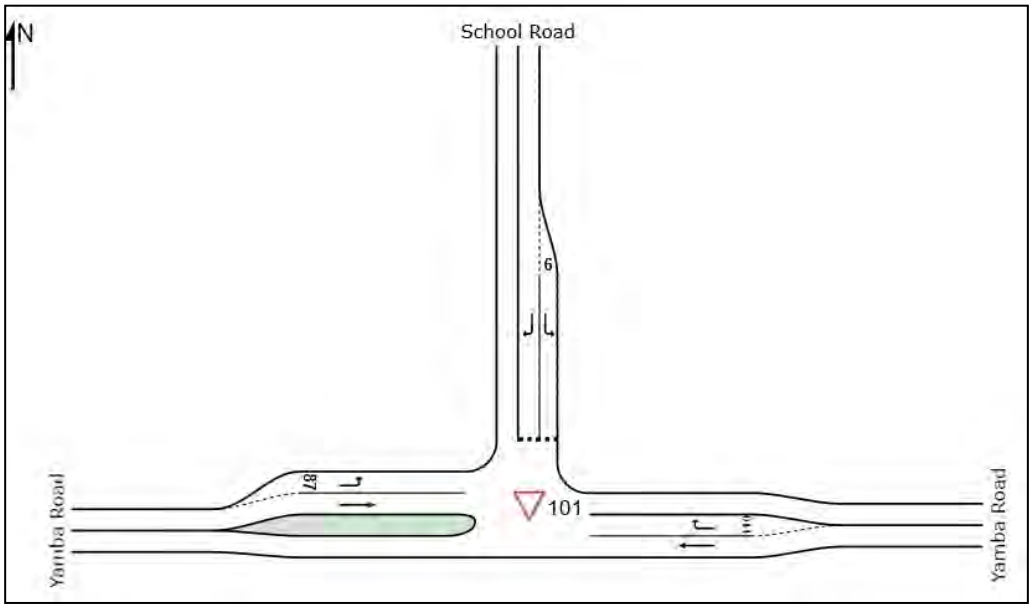


Figure 3: Turning Lane Treatments Option

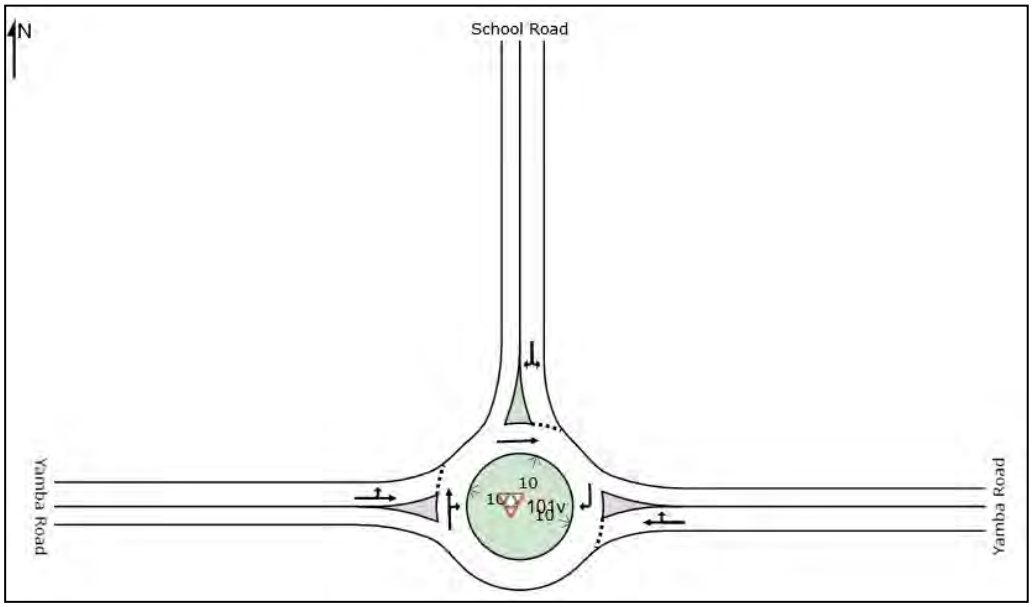


Figure 4: Roundabout Option

A comparison of the 2028 performance is shown in Table 3.

Table 3: Comparison of Treatment Options

Scenario	Treatment	Degree of Saturation	Average Delay	Worst Level of Service	95th Percentile Critical Queue		
					East	North	West
Base 2028 AM Peak	Turn Lanes	0.593	3.5s	E (north)	2.9m	14.3m	0.0m
	Roundabout	0.537	5.6s	B (north)	38.0m	6.6m	35.6m
Development 2028 AM Peak	Turn Lanes	0.709	4.3s	F (north)	4.6m	18.1m	0.0m
	Roundabout	0.585	5.8s	B (north)	41.4m	7.7m	41.1m
Base 2028 PM Peak	Turn Lanes	0.458	2.5s	D (north)	2.6m	12.2m	0.0m
	Roundabout	0.500	5.4	B (north)	33.5m	5.5m	29.4m
Development 2028 PM Peak	Turn Lanes	0.682	4.1s	E (north)	3.1m	19.8m	0.0m
	Roundabout	0.513	5.7s	B (north)	36.3m	9.0m	31.3m

A comparison of the Base and Development cases reiterates that the proposed development is likely to have a minimal impact on the performance of the School Road / Yamba Road intersection. The development itself does not trigger any additional treatment requirements.

Although the turning treatment option maintains an acceptable Degree of Saturation during both the AM and PM peak hours, delays on the north approach, specifically the right turn, resulting in a Level of Service of D to F for the different scenarios.

By contrast, the roundabout option provides additional capacity at the intersection and improves the performance of the north approach, but at the cost of increasing queuing and delays along the more trafficked Yamba Road.

Based on the analysis, a roundabout treatment at the School Road / Yamba Road intersection is likely to be ultimate configuration, but will come at a considerable additional cost then providing auxiliary turning treatments at the intersection.

It is likely that a staged approach, with the intersection initially upgraded with the recommended turning treatments, and upgraded to a roundabout in the future. The turning treatment upgrade can likely be housed within the existing road reserve boundaries, and hence could be constructed with minimal delay to address existing turning treatment warrants for the intersection.

If Council's projection of 5% PA growth is not materialised by the rate of development in the area, the roundabout upgrade may not be necessary within the design horizon of the development.

TTM maintain that the previously recommended turning treatments at the intersection are appropriate to address existing treatment warrants, and should be constructed initially, with a view to upgrade the intersection to an ultimate roundabout configuration when needed in the future.

Any upgrade of the School Road / Yamba Road intersection will benefit not only the proposed development, but also the existing school (by better separating bus turning movements) and improve the safety of through traffic, and hence it would be inappropriate to burden the development with the entire cost of any intersection upgrade.

TTM believe that the above information and recommendations are sufficient to address the traffic items raised in Council's meeting summary, and therefore recommend that the amended development proposal be approved.

Yours sincerely,

Chris Wright
Project Consultant
TTM Consulting Pty Ltd

MOVEMENT SUMMARY

Site: 101 [BaseAM2028 School - Turn Treatments]

School Road / Yamba Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Yamba Road											
5	T1	720	3.7	0.384	0.1	LOS A	0.0	0.0	0.00	0.00	59.9
6	R2	51	12.5	0.107	12.1	LOS B	0.4	2.9	0.68	0.87	48.2
Approach		771	4.2	0.384	0.8	NA	0.4	2.9	0.04	0.06	58.6
North: School Road											
7	L2	59	10.7	0.125	11.7	LOS B	0.4	3.2	0.66	0.85	48.9
9	R2	44	0.0	0.593	82.7	LOS F	2.0	14.3	0.97	1.07	19.7
Approach		103	6.1	0.593	42.2	LOS E	2.0	14.3	0.79	0.95	32.6
West: Yamba Road											
10	L2	46	9.1	0.027	5.6	LOS A	0.0	0.0	0.00	0.57	50.6
11	T1	724	6.7	0.394	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		771	6.8	0.394	0.4	NA	0.0	0.0	0.00	0.03	59.2
All Vehicles		1644	5.6	0.593	3.2	NA	2.0	14.3	0.07	0.10	55.4

MOVEMENT SUMMARY

Site: 101v [BaseAM2028 School - Roundabout]

School Road / Yamba Road
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Yamba Road											
5	T1	720	3.7	0.523	5.0	LOS A	5.2	38.0	0.29	0.46	51.5
6	R2	51	12.5	0.523	8.7	LOS A	5.2	38.0	0.29	0.46	53.3
Approach		771	4.2	0.523	5.3	LOS A	5.2	38.0	0.29	0.46	51.7
North: School Road											
7	L2	59	10.7	0.151	9.8	LOS A	0.9	6.6	0.73	0.80	49.3
9	R2	44	0.0	0.151	13.0	LOS B	0.9	6.6	0.73	0.80	46.8
Approach		103	6.1	0.151	11.2	LOS B	0.9	6.6	0.73	0.80	48.4
West: Yamba Road											
10	L2	46	9.1	0.537	5.0	LOS A	4.8	35.6	0.30	0.46	50.2
11	T1	724	6.7	0.537	5.2	LOS A	4.8	35.6	0.30	0.46	51.8
Approach		771	6.8	0.537	5.2	LOS A	4.8	35.6	0.30	0.46	51.7
All Vehicles		1644	5.6	0.537	5.6	LOS A	5.2	38.0	0.32	0.48	51.4

MOVEMENT SUMMARY

Site: 101 [BasePM2028 School - Turn Treatments]

School Road / Yamba Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Yamba Road											
5	T1	674	5.8	0.364	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
6	R2	48	13.0	0.094	11.3	LOS B	0.3	2.6	0.64	0.85	48.7
Approach		722	6.3	0.364	0.8	NA	0.3	2.6	0.04	0.06	58.6
North: School Road											
7	L2	59	7.1	0.112	10.8	LOS B	0.4	2.8	0.62	0.84	49.6
9	R2	28	22.2	0.458	84.8	LOS F	1.5	12.2	0.96	1.04	19.1
Approach		87	12.0	0.458	34.9	LOS D	1.5	12.2	0.73	0.90	35.5
West: Yamba Road											
10	L2	39	0.0	0.021	5.5	LOS A	0.0	0.0	0.00	0.58	51.1
11	T1	700	1.5	0.368	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		739	1.4	0.368	0.3	NA	0.0	0.0	0.00	0.03	59.4
All Vehicles		1548	4.3	0.458	2.5	NA	1.5	12.2	0.06	0.09	56.3

MOVEMENT SUMMARY

Site: 101v [BasePM2028 School - Roundabout]

School Road / Yamba Road
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Yamba Road											
5	T1	674	5.8	0.481	5.0	LOS A	4.5	33.5	0.23	0.45	51.7
6	R2	48	13.0	0.481	8.6	LOS A	4.5	33.5	0.23	0.45	53.5
Approach		722	6.3	0.481	5.2	LOS A	4.5	33.5	0.23	0.45	51.8
North: School Road											
7	L2	59	7.1	0.127	9.1	LOS A	0.7	5.5	0.70	0.77	50.0
9	R2	28	22.2	0.127	13.5	LOS B	0.7	5.5	0.70	0.77	45.6
Approach		87	12.0	0.127	10.6	LOS B	0.7	5.5	0.70	0.77	48.8
West: Yamba Road											
10	L2	39	0.0	0.500	4.9	LOS A	4.1	29.4	0.27	0.45	50.8
11	T1	700	1.5	0.500	5.1	LOS A	4.1	29.4	0.27	0.45	52.2
Approach		739	1.4	0.500	5.1	LOS A	4.1	29.4	0.27	0.45	52.1
All Vehicles		1548	4.3	0.500	5.4	LOS A	4.5	33.5	0.27	0.47	51.7

MOVEMENT SUMMARY

Site: 101 [DevelopmentAM2028 School - Turn Treatments]

School Road / Yamba Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Yamba Road											
5	T1	720	3.7	0.384	0.1	LOS A	0.0	0.0	0.00	0.00	59.9
6	R2	80	9.2	0.170	12.4	LOS B	0.6	4.6	0.70	0.88	48.1
Approach		800	4.2	0.384	1.3	NA	0.6	4.6	0.07	0.09	57.9
North: School Road											
7	L2	65	11.3	0.139	11.8	LOS B	0.5	3.5	0.66	0.86	48.8
9	R2	48	0.0	0.709	105.5	LOS F	2.6	18.1	0.98	1.11	16.7
Approach		114	6.5	0.709	51.7	LOS F	2.6	18.1	0.80	0.96	29.7
West: Yamba Road											
10	L2	74	5.7	0.042	5.6	LOS A	0.0	0.0	0.00	0.57	50.8
11	T1	724	6.7	0.394	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		798	6.6	0.394	0.5	NA	0.0	0.0	0.00	0.05	58.9
All Vehicles		1712	5.5	0.709	4.3	NA	2.6	18.1	0.09	0.13	54.1

MOVEMENT SUMMARY

Site: 101v [DevelopmentAM2028 School - Roundabout]

School Road / Yamba Road
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Yamba Road											
5	T1	720	3.7	0.548	5.1	LOS A	5.7	41.4	0.32	0.46	51.3
6	R2	80	9.2	0.548	8.7	LOS A	5.7	41.4	0.32	0.46	53.3
Approach		800	4.2	0.548	5.5	LOS A	5.7	41.4	0.32	0.46	51.6
North: School Road											
7	L2	65	11.3	0.172	9.9	LOS A	1.0	7.7	0.75	0.81	49.2
9	R2	48	0.0	0.172	13.1	LOS B	1.0	7.7	0.75	0.81	46.8
Approach		114	6.5	0.172	11.3	LOS B	1.0	7.7	0.75	0.81	48.4
West: Yamba Road											
10	L2	74	5.7	0.585	5.3	LOS A	5.6	41.1	0.41	0.48	49.8
11	T1	724	6.7	0.585	5.5	LOS A	5.6	41.1	0.41	0.48	51.2
Approach		798	6.6	0.585	5.5	LOS A	5.6	41.1	0.41	0.48	51.1
All Vehicles		1712	5.5	0.585	5.8	LOS A	5.7	41.4	0.39	0.50	51.1

MOVEMENT SUMMARY

Site: 101 [DevelopmentPM2028 School - Turn Treatments]

School Road / Yamba Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Yamba Road											
5	T1	674	5.8	0.364	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
6	R2	56	13.2	0.110	11.5	LOS B	0.4	3.1	0.65	0.86	48.6
Approach		729	6.3	0.364	0.9	NA	0.4	3.1	0.05	0.07	58.4
North: School Road											
7	L2	96	4.4	0.177	10.8	LOS B	0.6	4.4	0.63	0.84	49.7
9	R2	46	15.9	0.682	102.0	LOS F	2.5	19.8	0.98	1.11	16.9
Approach		142	8.1	0.682	40.5	LOS E	2.5	19.8	0.74	0.93	33.6
West: Yamba Road											
10	L2	45	0.0	0.025	5.5	LOS A	0.0	0.0	0.00	0.58	51.1
11	T1	700	1.5	0.368	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		745	1.4	0.368	0.4	NA	0.0	0.0	0.00	0.03	59.3
All Vehicles		1617	4.2	0.682	4.1	NA	2.5	19.8	0.09	0.13	54.3

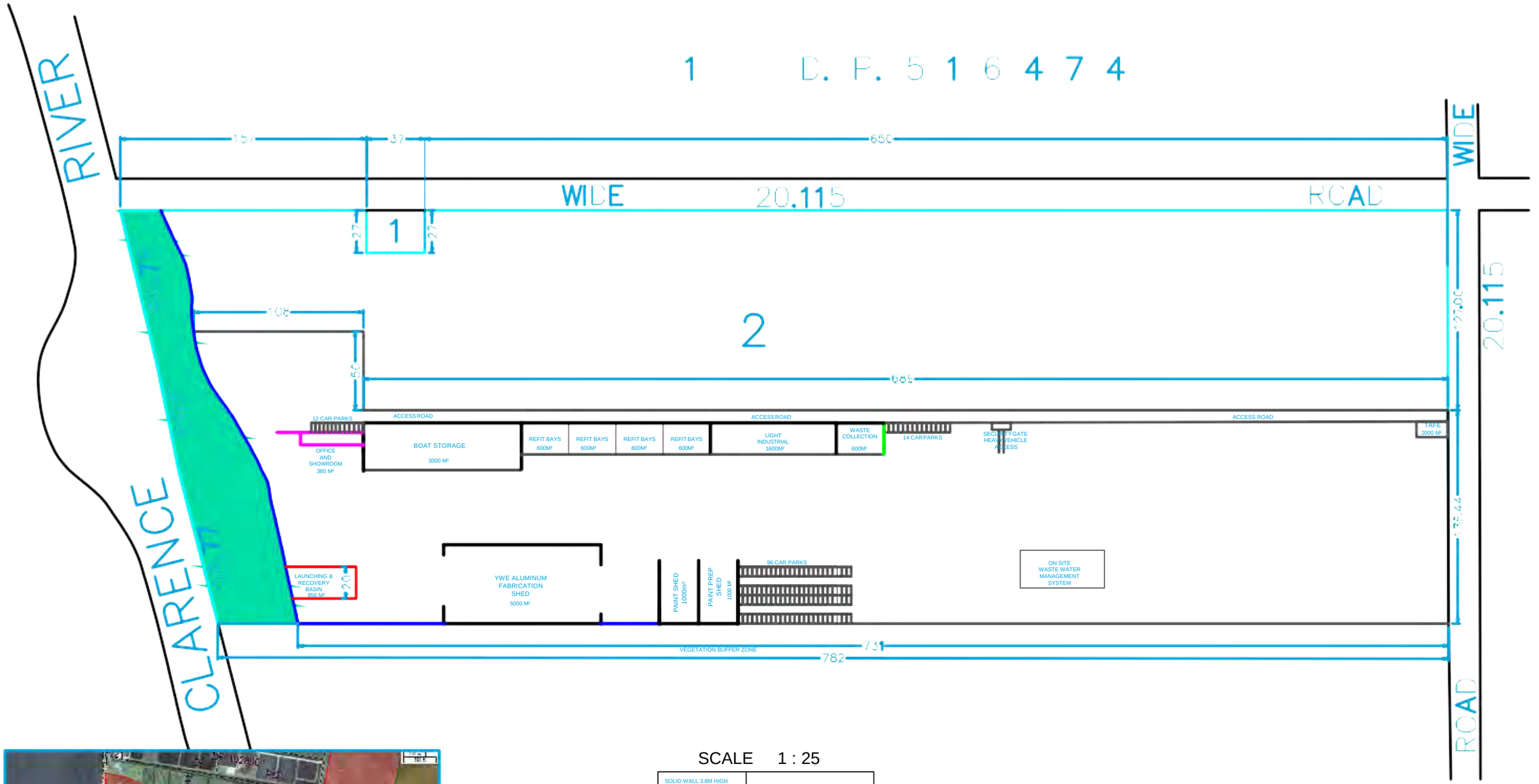
MOVEMENT SUMMARY

Site: 101v [DevelopmentPM2028 School - Roundabout]

School Road / Yamba Road
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Yamba Road											
5	T1	674	5.8	0.509	5.1	LOS A	4.9	36.3	0.31	0.46	51.2
6	R2	56	13.2	0.509	8.7	LOS A	4.9	36.3	0.31	0.46	53.2
Approach		729	6.3	0.509	5.4	LOS A	4.9	36.3	0.31	0.46	51.4
North: School Road											
7	L2	96	4.4	0.203	9.3	LOS A	1.2	9.0	0.73	0.80	50.0
9	R2	46	15.9	0.203	13.5	LOS B	1.2	9.0	0.73	0.80	46.0
Approach		142	8.1	0.203	10.7	LOS B	1.2	9.0	0.73	0.80	48.9
West: Yamba Road											
10	L2	45	0.0	0.513	4.9	LOS A	4.4	31.3	0.30	0.46	50.7
11	T1	700	1.5	0.513	5.1	LOS A	4.4	31.3	0.30	0.46	52.0
Approach		745	1.4	0.513	5.1	LOS A	4.4	31.3	0.30	0.46	51.9
All Vehicles		1617	4.2	0.513	5.7	LOS A	4.9	36.3	0.34	0.49	51.4



SCALE 1 : 25

SOLID WALL 3.8M HIGH	
SOLID WALL 8M HIGH	
SOLID WALL 4.5M HIGH	
SOLID WALL 3.5M HIGH	

IN4 Working Waterfront

W3 Working Waterways

Lot 2 DP598769 School Road, Palmers Island
PALMERS ISLAND NSW 2463
Australia

Reference: 16GCT0106
28 September 2016

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Rev No.	Author	Reviewed/Approved		Description	Date
		Name	Signature		
1	R H van der Merwe	C Wright		First Issue	20/04/2016
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3	C Wright	C Wright		Amended Issue	21/09/2016
4	R H van der Merwe C Wright	C Wright		Amended Issue	28/09/2016
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1. Introduction

1.1. Background

TTM Consulting has been engaged by Yamba Welding and Engineering Pty Ltd to prepare a traffic engineering report investigating a proposed Marine Industrial Park at Palmers Island. It is understood that a Development Application was lodged with Clarence Valley Council (CVC). Clarence Valley Council issued a review of Issue One of this transport and traffic assessment requiring an amendment to the TIA of this report.

Upon discussion with Council, it was decided that a 5% background growth rate needs to be used as Council believe that the Palmers Island area has undergone a significant change in traffic conditions.

1.2. Scope

This report investigates the transport aspects associated with the proposed development. The scope of the transport aspects investigated includes:

- Parking supply required to cater for development demand;
- Parking layout to provide efficient and safe internal manoeuvring;
- Identification of likely traffic volumes and traffic distribution from the future development;
- Identification of likely traffic impact of development on the public road network;
- Access configuration to provide efficient and safe manoeuvring between the site and the public road network;
- Internal road layout to provide efficient and safe internal manoeuvring for service vehicles;
- Suitability of access and internal facilities to provide for pedestrian and cyclist operation;
- Access to suitable level of public transport; and
- Internal road hierarchy to cater for lot access, vehicle design speeds and road user amenity requirements.

To assess the proposed transport arrangements, the development plans have been assessed against the following guidelines and planning documents:

- The Northern Rivers Local Government Development Design and Construction Manual; and
- Australian Standard 2890.

1.3. Site Location

The site is located at School Road Palmers Island NSW 2463, near the intersection of School Road and McConnells Lane, as shown in Figure 1.1. The property description is Lot 2 on DP598769. The site has road frontages to School Road and McConnells Lane, and is currently unoccupied.

Figure 1.1: Site location

1.4. Current Site Use

The site is currently unoccupied with an unformed road access.

2. The Proposed Development

2.1. Development Profile

The proposed Marine Industrial Park development for the site area is not finalised, but is presumed to comprise of:

- Construction of foreshore infrastructure and site earthworks
- Construction of Yamba Welding & Engineering Shed Administration
- Construction of International Marine Servicing & Fitting and Sandblasting
- Construction of Associated Industries

The development plan for the site is included in Appendix A.

2.2. Access

The development plan includes the following access arrangements:

- School Road Access located at the eastern side of the subject site. The characteristics of this access include:
  - AS2890.2 compliant drive way access for entrance of an AV;
  - 21.5m wide at the property boundary;
  - Priority control; and
  - Inbound/outbound, all turns, Left-in/left-out turns permitted

2.3. Parking

The development proposal includes the following parking supply:

- 131 staff spaces, which are located on-grade; and
- 2 visitor/general spaces, which are located on-grade.

Additional parking will be provided on site if staff or TAFE student numbers exceed expectations.

3. Existing Transport Infrastructure

3.1. The Road Network

The majority of roads in the immediate vicinity of the site are administered by Clarence Valley Council, the exceptions being Yamba Road. The hierarchy and characteristics of roads in the immediate vicinity of the site are shown below in Table 3.1.

Table 3.1: Local Road Hierarchy

Road	Speed Limit	Lanes	Classification	Road Authority
Yamba Road	60kph	2 (undivided)	Arterial	CVC/RMS
School Road	60kph	2 (undivided)	Local Road	CVC
River Road	60kph	2 (undivided)	Local Road	CVC
Yamba Street	60kph	2 (undivided)	Local Road	CVC

School Road has a 7m wide carriageway at the site frontage. The intersection of School Road and Yamba Road is a priority controlled intersection, with a stop control.

3.2. Road Planning

TTM have investigated the planning of the future road network in the vicinity of the subject site and it is understood that there are currently no known plans. It is understood that no land dedication is required in the vicinity of the site. Council and RMS have not specified any other works in the vicinity of the site which will impact upon or be impacted by the proposed development.

3.3. Public Transport and Pedestrian Facilities

Palmers Island Coach Stop serviced by 'Maclean service' and 'NSW TrainLink' is located approximately 1,600m to the access of the site, with regular services to Yamba – Grafton utilising Yamba Road.

No formal pedestrian footpaths are located on either side of School Road, and no dedicated on-street or off-street cycle lanes are located in the vicinity of the site.

4. Car Parking Arrangements

4.1. Council Parking Supply Requirement

Council parking requirements for this type of development are identified in Table 4.1.

Table 4.1: Parking Supply Requirement

Land Use	Council Requirement	Extent	Requirement
Industrial	1 space per 100m^2	26,500m^2 GFA	265
Total			**265 Spaces**

TTM consider that Council's parking rate overestimates the likely parking demand of the site. TTM believe that it is unreasonable to calculate the parking demand of this development based on GFA only. The projects expected to be undertaken by the development involve large scale boats, requiring considerable amounts of GFA with low employee density. It is therefore considered more appropriate to calculate parking demand on expected staff numbers.

4.2. Estimated Practical Parking Demands

Due to the unique nature of the development, it is of TTM's professional opinion that the parking requirement for the proposed development is more appropriately calculated based on estimated peak simultaneous staff attendance, as shown below in Table 4.2.

Table 4.2: Practical Parking Supply Demand

Facility	Extent	Parking Demand
Industrial	116 staff	116
TAFE - Enrolees - Visitor	15 enrolees 2 visitors	15 2
Total		**133 Spaces**

The practical parking requirement is based on the estimated peak of 133 simultaneous persons at the development. The parking demand calculation assumes all persons drive a car to the development, even though some carpooling is likely to occur. Hence, the calculated parking demand is a conservative figure. The development is proposing to construct the 133 required spaces as necessary.

It is noted that additional parking can be constructed and accommodated on the site if the staff and/or TAFE students exceed the levels above. Any future expansions of the site that would increase the site considerably beyond the levels above would be subject to a subsequent development application, with additional parking requirements to be assessed at that time.

A minimum of 3 PWD spaces should be provided on-site in convenient locations close to building entrances.

4.3. Car Park Layout

Table 4.3 identifies the characteristics of the proposed parking area with respect to the Council and Australian Standard requirements. The development has not detailed proposed parking layouts and hence TTM recommend that the design be consistent with the requirements as set out below in Table 4.3.

Table 4.3: Parking Design Requirements

Design Aspect	Council Requirements	Alternative Requirement (AS2890.1)
Parking space length: – Standard bay – Parallel bay – Motorcycle bay – Tandem bay – Enclosed garage	 5.4m (min) 6.0m (min) 2.5m (min) 10.8m (min) 6.0m (min)	 5.4m (min) 5.9m (min) 2.5m (min) 10.8m (min) 6.0m (min)
Parking space width: – Staff – Residential – Visitor – Parallel bay – Motorcycle bay – Tandem bay – Enclosed garage	 2.4m (min) 2.6m (min) 2.6m (min) 2.4m (min) 1.35m (min) 2.4/2.6m (min) 3.0m opening /3.2m internal (min)	 2.4m (min) 2.4m (min) 2.6m (min) 2.1m (min) 1.2m (min) 2.4/2.6m (min) 3.0m (min)
Garage door width	3m	3m
Aisle Width: Parking aisle Circulation aisle/ramp Access to parallel bays Access to garages	 6.2m (min) 6.5m (min)	 5.8m (min) 5.8m (min)
Parking envelope clearance - Column intrusion	0.2m into bay within 0.6m of front of bay	0.25m into bay within 0.3m & 0.2m into bay within 1.2m of front of bay
Parking envelope clearance - Column adjacent to bay	Located between 0.8m and 1.8m of aisle	Located between 0.75m and 1.75m of aisle
Parking envelope clearance – space adjacent to wall	Space 0.3m clear of wall	Space 0.3m clear of wall
Maximum Gradient: PWD parking Parking bay Parking aisle Ramp	 1:40 (2.5%) 1:15 (6.7%) 1:20 (5.0%) 1:6 (16.7%)	 1:40 (2.5%) 1:20 (5.0%) 1:16 (6.25%) 1:5 (20%)
Maximum Ramp Transitions	1:12.5 (8%)	1:8 (12.5%) summit 1:6.67 (15.0%) sag
Height Clearance General Min. Over PWD bay Absolute Min.	 2.3m 2.5m 2.1m	 2.2m (2.3m PWD) 2.5m NA
Parking Aisle Extension	2m beyond last bay or 8.0m aisle width	1m beyond last bay

5. Existing Traffic Volumes

5.1. Peak Hour

TTM Data conducted an intersection movement survey at the Yamba Road / School Road intersection, from 07:00 to 09:30am Wednesday the 11th and 14:30 to 18:00 pm on Tuesday 10th of September 2013. The peak hours were found to be 08:15 to 09:15 am and 14:45 to 15:45 pm. The results of the surveys are shown below in Figure 5.1 and Figure 5.2.

The survey results indicate that the AM / PM peak hour traffic volumes on School Road adjacent to the subject site are in the order of 91 vph / 80 vph. Heavy vehicle (i.e. non-car) content on School Road was approximately 8.4%.

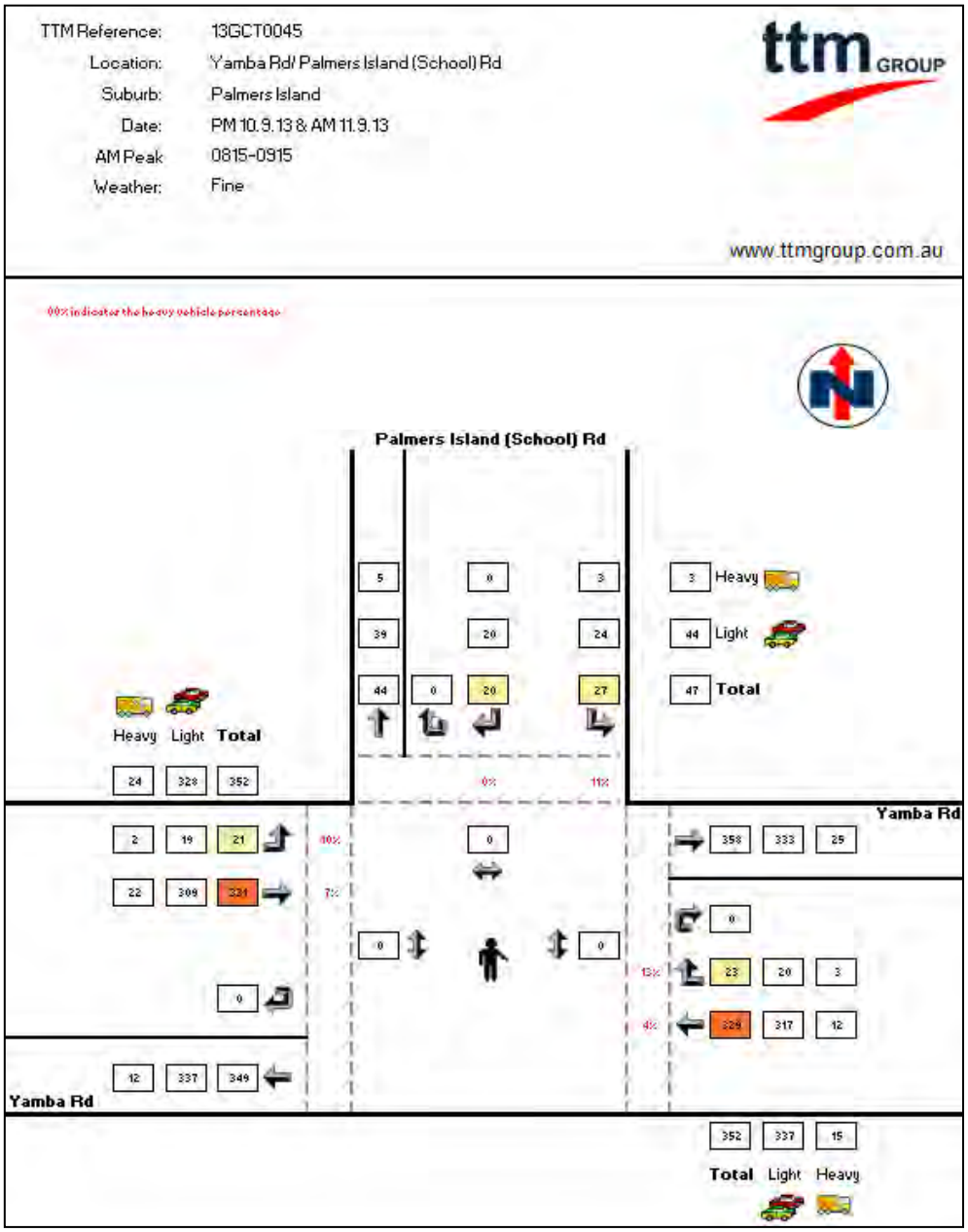


Figure 5.1: AM Survey Results

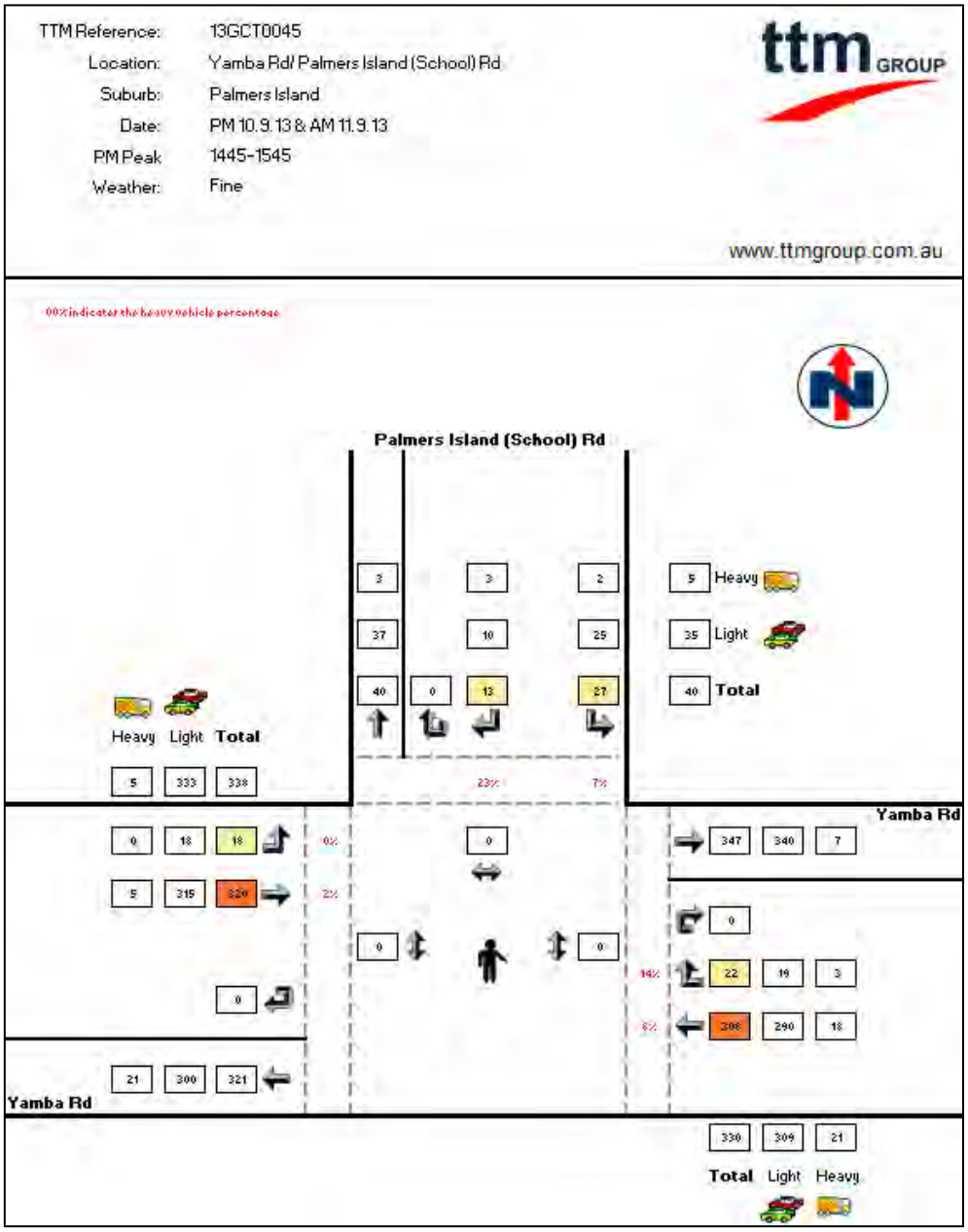


Figure 5.2: PM Survey Results

5.2. Daily Traffic

From the above peak hour data TTM has estimated the daily traffic volume as the average peak hour volume on each route (entering and leaving traffic) multiplied by 10. The two-way daily traffic volumes on the existing roads are therefore as shown below in Table 5.1.

Table 5.1: Existing Daily Traffic Volumes

Road	Segment	Daily Volume
School Road	North of Yamba Road	910 vpd
Yamba Road	East of School Road	7,100 vpd
Yamba Road	West of School Road	7,010 vpd

It is understood that Clarence Valley Council have undertaken traffic counts between Friday the 3rd of June 2016 and Friday the 17th June 2016 which indicate weekday daily traffic volumes of 566 vehicles and weekend daily traffic volumes of 298. Council's data implies that TTM's initial estimate of School Road's daily volume is overly conservative, with the volumes likely being inflated during peak hours due to the existing school.

5.3. River Road Volumes

To the south-west, the housing off of River road produces traffic volume into the network. TTM had no traffic counts of the intersection of Yamba Road and River Road. Thus, the traffic volume has been estimated of the housing to the west by counting the total number of houses and multiplying that figure by generation rates.

The Roads & Maritime Services, in their Technical Direction TDT2013 04a provide updated traffic generation estimates for low density residential dwellings. The 2010 surveys indicate that average weekday trip generation is 7.4 daily trips per dwelling, 0.71 AM peak hour trips per dwelling, and 0.78 PM peak hour trips per dwelling.

Application of these rates were used for the housing off of River Road, while 'ITE Trip Generation 9th Edition' was used to determine the peak hour rates. The estimated traffic volume produced by the housing is displayed in Table 5.2 below.

Table 5.2: Traffic Volume of Housing off River Road

Source	*Dwellings*	*Rates*	*Vehicle Trip Generation Rates*						
			Weekday	*AM Total*	*PM Total*	*AM in*	*AM out*	*PM in*	*PM out*
RMS Technical Direction (With ITE Distribution)	**62 Dwellings**	*Generation Per Dwelling*	*7.4*	*0.71*	*0.78*	*25%*	*75%*	*63%*	*37%*
		Resulting Trips	459 trips	44 trips	48 trips	11 trips	33 trips	30 trips	18 trips

6. Estimated Future Transport Demands

6.1. Development Scenarios

Upon discussion with Council it was agreed that a compound growth rate of 5% would be adopted to reflect background traffic growth. The proposed compound growth over a 15-year period to 2028 represents a more than doubling of surveyed 2013 volumes.

The base 2028 volumes derived are assumed to cater to all additional future development in the area, including expansions to the Palmer's Island School, and the approved caravan park.

TTM has identified three assessment periods for the road network as follows:

- **Current (2013) Traffic Scenario:**

  This scenario includes the 2013 traffic volumes modelled over the existing road network. This analysis has been performed for both the AM and PM Peaks.

- **Opening Year (2018) Traffic Scenario:**

  This analysis incorporates a 5% per annum increase in the background traffic volume for a period of 5 years from the most recent surveys (2013). For the base case scenario, the existing road network has been analysed. While for the development scenario, the development traffic volumes were added to the network.

- **Design Year (2028) Traffic Scenario:**

  This analysis incorporates a 5% per annum increase in the background traffic volume for a period of 10 years past the opening year.

6.2. Estimated Traffic Generation

6.2.1. Existing Traffic

The current use on the site generates 0 vehicles per day.

6.2.2. Proposed Development Traffic Volume

Rates from the ITE's 'Trip Generation 9th Edition Handbook' have been adopted used to estimate the traffic generated by the proposed development during peak hour periods. The estimated generation of the development generated traffic is shown in Table 6.1.

Table 6.1: Traffic Generation

Source	Employees	Rates	*Vehicle Trip Generation Rates*						
			Weekday	***AM Total***	***PM Total***	***AM in***	***AM out***	***PM in***	***PM out***
ITE	**133 Employees**	*Generation Per Employee*	*3.34*	*0.47*	*0.46*	*86%*	*14%*	*20%*	*80%*
		Resulting Trips	***445 trips***	***63 trips***	***62 trips***	***54 trips***	***9 trips***	***12 trips***	***50 trips***

It is estimated that the proposed development will generate 63 AM peak hour trips, 62 PM peak hour trips, and 445 daily trips.

The distribution of development generation traffic is based:

- 86% of development traffic inbound during the AM Peak, with the remaining 14% outbound
- 20% of development traffic inbound during the PM Peak, with the remaining 80% outbound
- The remaining traffic movements are based on corresponding movements in the survey data.

6.3. Opening Day (2018) Base Traffic Demands

Figure 6.1 and Figure 6.2 show the opening day (2018) base traffic demands, based on an application of an annual growth rate of 5% for a period of 5 years (i.e. 5 years past the date of the traffic surveys) to the 2018 traffic survey volumes.

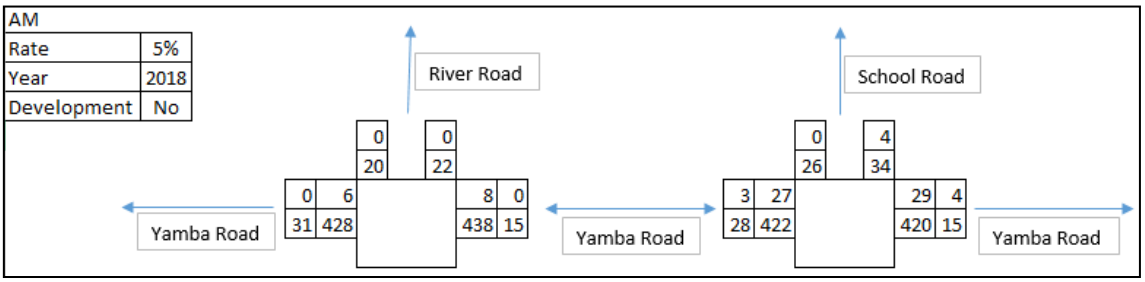


Figure 6.1: Estimated 2018 AM Peak Hour Traffic, Without Development (5%pa growth)

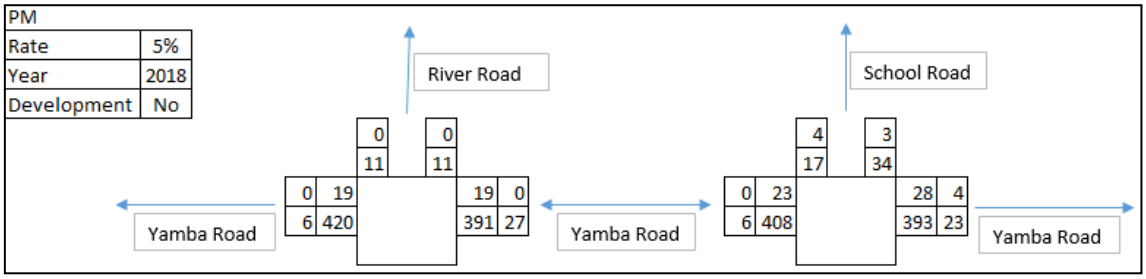


Figure 6.2: Estimated 2018 PM Peak Hour Traffic, Without Development (5%pa growth)

6.4. Opening Day (2018) Project Traffic Demands

The opening day project case scenario is obtained by the addition of the developments traffic generation shown in Table 6.1 to the base traffic volumes shown in Figure 6.1 and Figure 6.2. The expected resulting traffic movements are shown in Figure 6.3 and Figure 6.4.

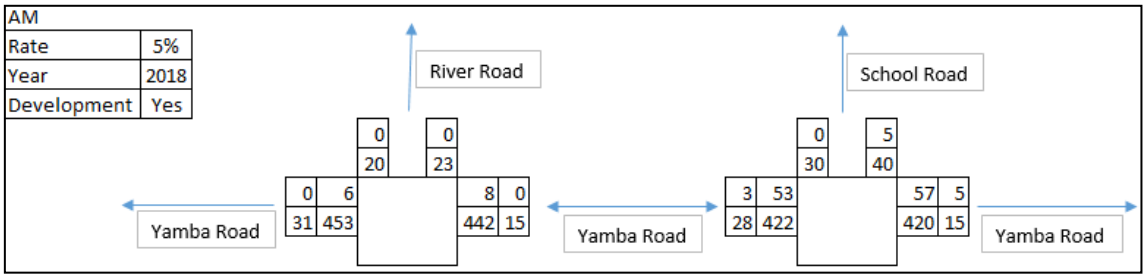


Figure 6.3: Estimated 2018 AM Peak Hour Traffic, With Development (5%pa growth)

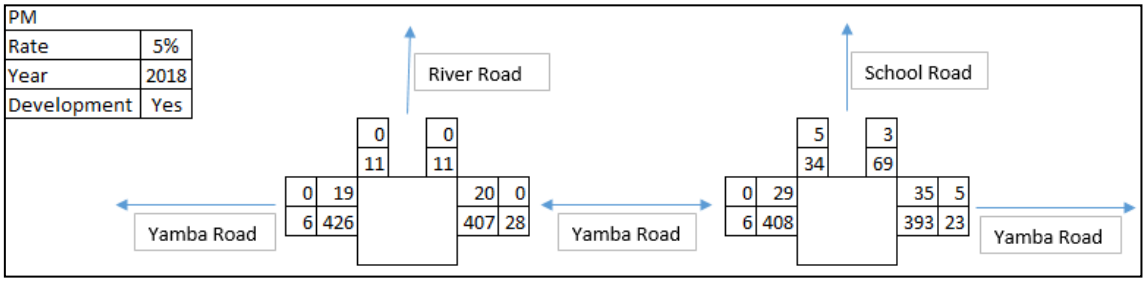


Figure 6.4: Estimated 2018 PM Peak Hour Traffic, With Development (5%pa growth)

6.5. Future (2028) Base Traffic Demands

Figure 6.5 and Figure 6.6 show the future (2028) base traffic demands, based on an application of an annual growth rate of 5% for a period of 15 years (i.e. 10 years past an assumed 2018 completion date of the project) to the 2028 traffic volumes.

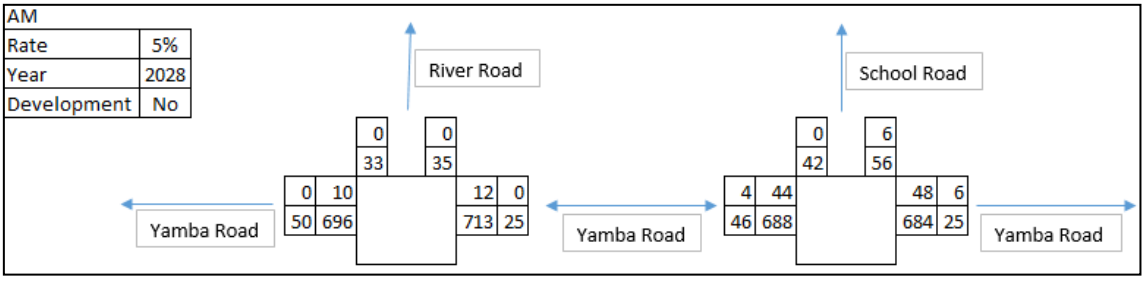


Figure 6.5: Estimated 2028 AM Peak Hour Traffic, Without Development (5%pa growth)

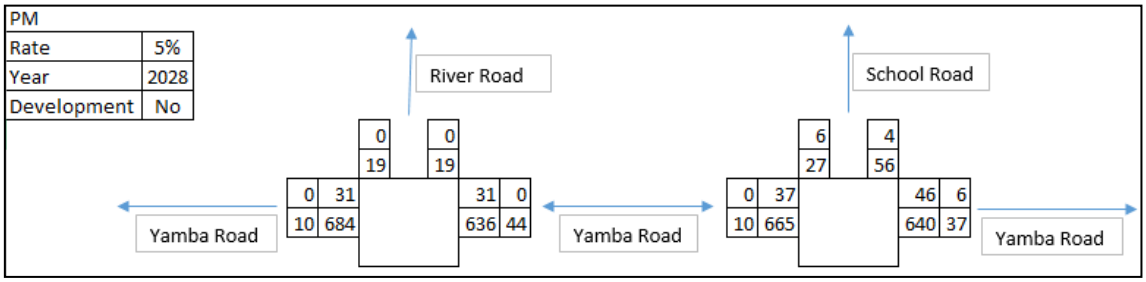


Figure 6.6: Estimated 2028 PM Peak Hour Traffic, Without Development (5%pa growth)

6.6. Future (2028) Project Traffic Demands

The future project case scenario is obtained by the addition of the developments traffic generation shown in Table 6.1 to the base traffic volumes shown in Figure 6.5 and Figure 6.6. These expected traffic movements are shown below.

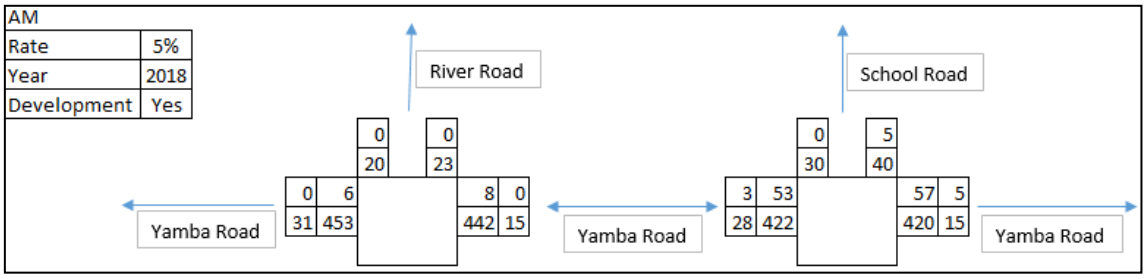


Figure 6.7: Estimated 2028 AM Peak Hour Traffic, With Development (5%pa growth)

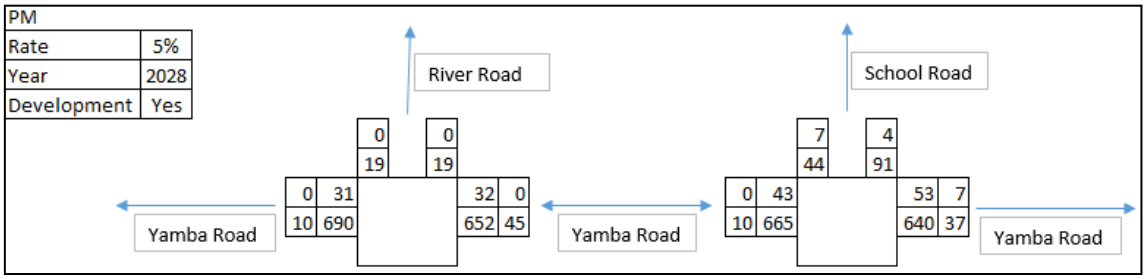


Figure 6.8: Estimated 2028 PM Peak Hour Traffic, With Development (5%pa growth)

7. Road Network Performance

Potential impacts of the proposed development on the Yamba Road intersections have been assessed using a network model in SIDRA Intersection 6.1.

The analysis considered a 10-year design horizon up to the year 2028. RMS (formerly RTA) in their document, *Guide to Traffic Generating Developments,* specifies acceptable degrees of saturations (DOS) and acceptable Levels of Service (LOS) that intersections should operate below. These practical limits are a DOS of 0.8 for giveway and stop sign intersections, and a LOS of D.

7.1. Analysis of Yamba Road/River Road and Yamba Road/School Road Intersections

7.1.1. Analysis Results

The SIDRA network layout identified for these intersections is shown in Figure 7.1.

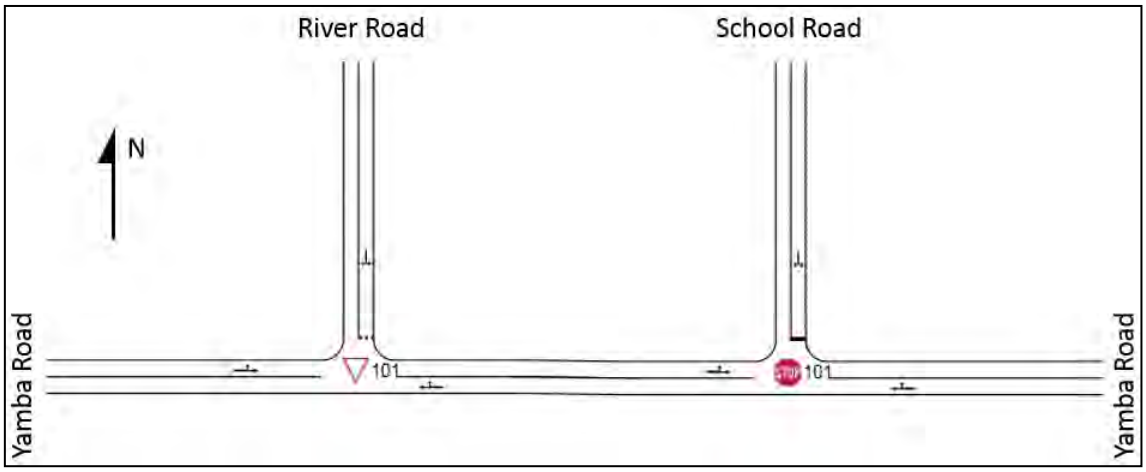


Figure 7.1: Network Layout

Table 7.1 summarises of the outputs for the various traffic cases applied to the intersections. The detailed outputs for this analysis are provided in Appendix B.

Table 7.1: Summary of Sidra Outputs

Network	Intersection (Yamba Road with...)	Degree of Saturation	Average Delay	Level of Service	95th Percentile Critical Queue (m)		
					East	North	West
BaseAM2013	River Road	0.194	0.5	A	0.5	1.0	0.0
	School Road	0.205	1.2	B	2.0	1.9	0.0
BasePM2013	River Road	0.188	0.5	A	1.1	0.5	0.0
	School Road	0.194	1.1	B	1.8	1.7	0.0
BaseAM2018	River Road	0.249	0.6	B	0.7	1.6	0.0
	School Road	0.265	1.4	C	3.1	3.0	0.0
BasePM2018	River Road	0.240	0.6	B	1.7	0.8	0.0
	School Road	0.251	1.3	C	2.9	2.6	0.0
DevelopmentAM2018	River Road	0.259	0.6	B	0.8	1.6	0.0
	School Road	0.295	2.0	C	6.3	3.7	0.0
DevelopmentPM2018	River Road	0.248	0.6	B	1.8	0.8	0.0
	School Road	0.258	2.0	C	3.6	5.0	0.0
BaseAM2028	River Road	0.411	1.1	D	2.7	5.6	0.0
	School Road	0.489	3.3	E	14.0	13.6	0.0
BasePM2028	River Road	0.402	1.1	C	6.6	2.6	0.0
	School Road	0.433	2.7	E	11.7	10.8	0.0
DevelopmentAM2028	River Road	0.414	1.2	D	2.9	6.0	0.0
	School Road	0.584	4.5	F	23.1	17.2	0.0
DevelopmentPM2028	River Road	0.413	1.2	C	7.0	2.7	0.0
	School Road	0.594	4.1	F	13.8	19.6	0.0

The DOS results of Table 7.1 indicate that there is sufficient capacity within the existing intersection to cater for the traffic increase to 2028 both with and without the development. The LOS however results of the Yamba Road / School Road intersection exceed the desirable maximum of LOS D during both 2028 with and without the development scenarios.

7.2. Analysis Conclusions

The analysis has revealed that both the intersections will operate under the acceptable levels of DOS specified in the 'RMS *Guide to Traffic Generating Developments'* up to a design year of 2028. The LOS in the 2028 scenarios for the Yamba Road / School Road intersection, regardless of the development's inclusion, exceeds the acceptable level noted in RMS' *Guide to Traffic Generating Developments* indicating that an upgrade would be required prior to 2028 to address this.

In the Austroads '*Guide to Road Design, Part 4A: Unsignalised and Signalised Intersections'*, turning warrants are provided to assist in determining if a turn treatment should be provided at an intersection. The traffic volumes for the AM (higher volumes) 2018 with no development and future case, 2028, with no development have been overlayed over the warrants in order to determine the necessity of a turn treatment at the Yamba Road / School Road intersection.

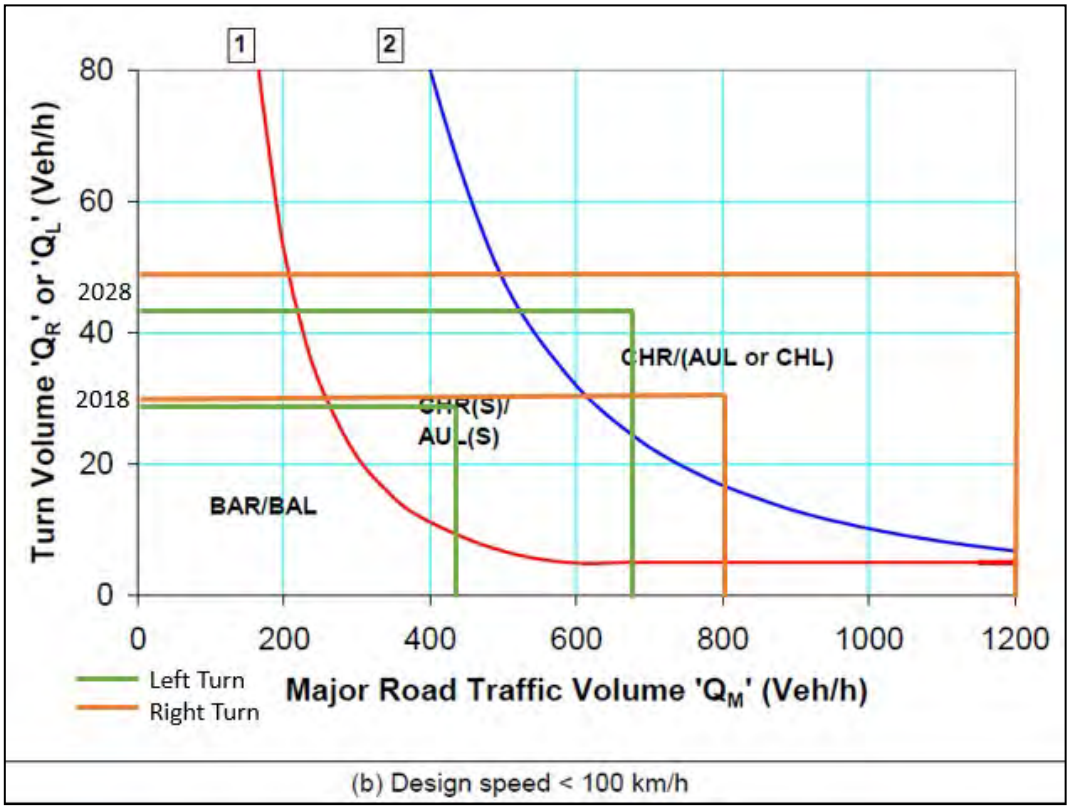


Figure 7.2: Warrants for Turn Treatments without Development

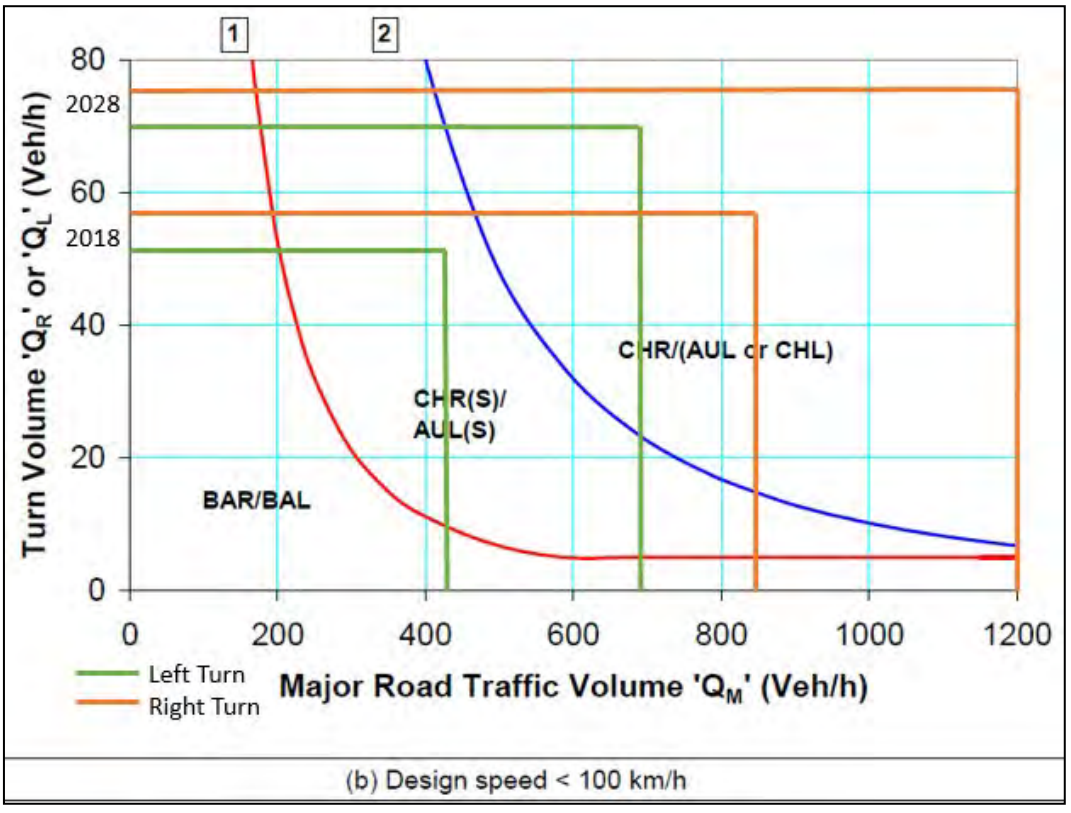


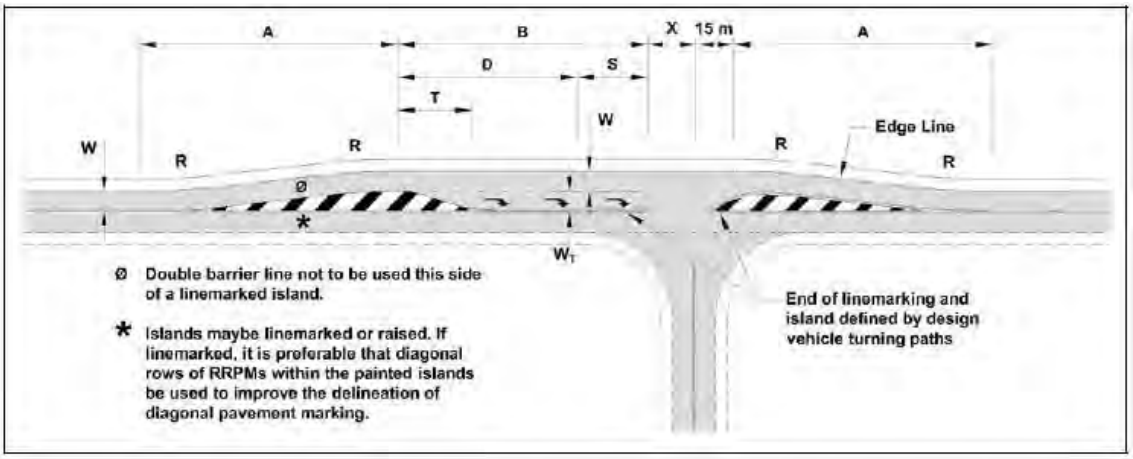
Figure 7.3: Warrants for Turn Treatments for 2028AM with Development

Figure 7.2 and Figure 7.3 indicate that the Yamba Road/School Road intersection warrants a short auxiliary left turn lane (AUL(S), refer to Figure 7.5) and a full length channelised right turn lane (CHR, refer to Figure 7.4) be provided by 2018, and both a full length auxiliary left turn lane (AUL, refer to Figure 7.6) and CHR provided by 2028, regardless of the development.

Currently, the Yamba Road/School Road intersection only features a basic left turn (BAL) and basic right turn (BAR) treatment. Based on 2018 volumes, the treatment warrants for a CHR and a AUL(S) are already met (refer Figure 7.2) and hence, the intersection should be upgraded regardless of the development.

The development does not trigger any higher turn treatment warrants when compared to the base volumes. Any upgrade of the intersection will benefit not only the proposed development, but also the existing school (by better separating bus turning movements) and improve the safety of through traffic. The bus stop opposite the intersection may have to be relocated east or west to accommodate any intersection treatment.

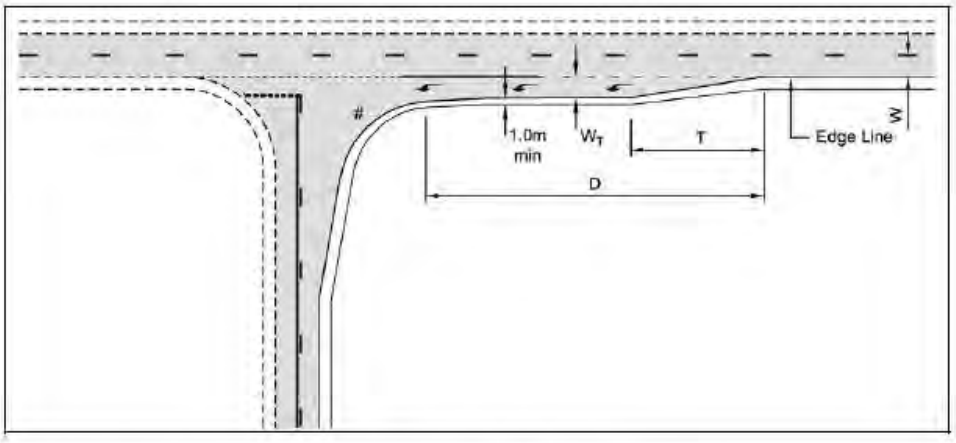
The turn treatment designs for the CHR, AUL(S) and AUL are as follows:



Notes:

1. An alternative to the double white line on the offside edge of the right-turn slot is a 1.0 m painted median. The 1.0 m median is particularly useful when the major road is on a tight horizontal curve and oncoming vehicles track across the centreline. Provision of this median will require the dimension 'A' to be increased.
2. A raised concrete median on the minor road may be used with this treatment to minimise 'corner cutting', particularly for higher turning volumes.
3. The dimensions of the treatment are defined below and values of A, D, R and T are shown in Table 7.2:

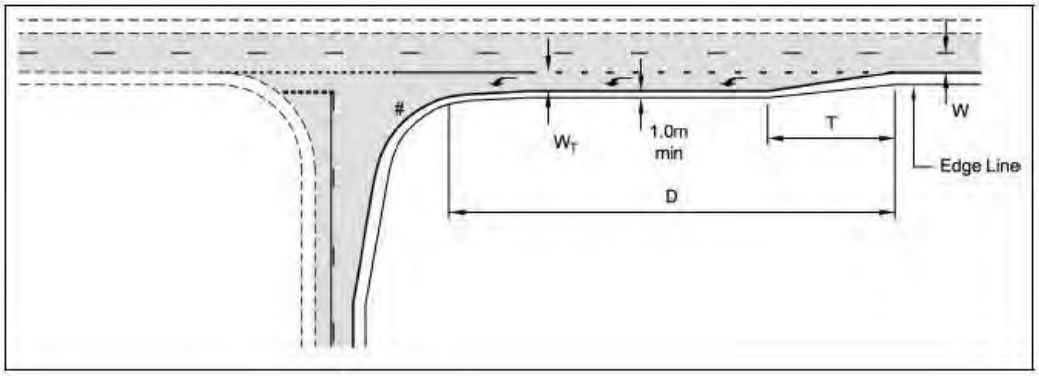
Figure 7.4: Channelised Right Turn (CHR) On A Two-lane Road



Notes:

1. # for setting out details of the left-turn geometry, use vehicle turning path templates and/or Table 8.2.
2. Approaches to left-turn slip lanes can create hazardous situations between cyclists and left-turning motor vehicles. Treatments to reduce the number of potential conflicts at left-turn slip lanes are given in this guide.
3. The dimensions of the treatment are defined as follows. Values of D and T are provided in Table 8.2.

Figure 7.5: Rural AUL(S) Treatment with A Short Left-turn Lane



Notes:

1. # For setting out details of the left-turn geometry, use to vehicle turning path software or templates.
2. Approaches to left-turn slip lanes can create hazardous situations between cyclists and left-turning motor vehicles. Treatments to reduce the number of potential conflicts at left-turn slip lanes are given in this guide.
3. The dimensions of the treatment are defined thus:

Figure 7.6: Auxiliary Left-turn Treatment (AUL) On A Rural Road

8. Site Access Arrangements

Access Driveway

The development has not detailed proposed access layouts and hence TTM recommend that the design be consistent with the requirements as set out below in Table 8.1.

Table 8.1: Typical Driveway Requirements for the School Road Access

Design Aspect	AS2890 Requirements
Distance from a minor intersection	6m
Distance from another driveway	3m
Sight Distance	Ideally 83m for 60kph, or 65m as an absolute minimum
Design Type	Figure 3.2 AS 2890.2 - 2002
Width/ Entry and Exit Widths	10.0m
Minimum Queuing Provisions	5 cars

9. Service Vehicle Arrangements

To assess the required number of service bays for the development, TTM has referred to the Clarence Valley Council requirements for service vehicles. Other service vehicle provisions are generally in accordance with AS2890.2.

9.1. Council Requirements

The proposed development includes Industrial uses. For the development, totalling approximately 26,500m^2, Council requires the following:

Table 9.1: Service Bay Demand

Land Use	Rate	Area	Service Bay Demand
Industrial, Storage and Wholesale	1 per 800m^2 GFA up to 8000m^2	8,000m^2 GFA	10
	1 per 1,000m^2 GFA thereafter	18,500m^2 GFA	18.5
		Total	***29***

9.2. Estimated Service Vehicle Traffic Generation

The Council requirements are very impractical considering the actual delivery requirements by the development for its unique use. The service vehicle requirements have been estimated by TTM based on practical operational requirements of the site. Typically, for a mixed use development, it is appropriate to identify the service vehicle requirements for each individual use and then supply the maximum requirement for any individual use to provide for the full development. This can be achieved through the provision of a managed bay and through the demand share available through the various peak service vehicle requirements for each use. The servicing requirements for the development are as follows:

- 2 SRV's per day + 1 Extra SRV per week;
- 1 HRV per week + 1 Extra HRV per month;
- 1 AV per fortnight; and
- 2 RCV per week.

Therefore, in worst case scenario, the site would need 3 SRV bays, 4 HRV bays and 1 AV bay if all delivery vehicles were to show up at the same time. This is considered highly unlikely. On average, the amount of service vehicles to visit the site per day is 2.67. Therefore, TTM recommends that one AV bay and two HRV bays be provided as a conservative measure. This allows the three largest vehicles to all park if they were, in the very unlikely situation, to arrive simultaneously to the development.

9.3. Proposed Service Vehicle Arrangements and Their Adequacy

The development proposal sought to include three service vehicle bays, suitable to cater for the larger vehicle requirements. The existing site conditions are considered adequate for the proposed development. All internal onsite design complies with 2890.2-2002 Parking Facilities Part 2 Off-street Commercial Design.

The existing Yamba Road/School Road Intersection, with only basic turn treatments provided, is not suitable to cater to the required heavy vehicle movements.

TTM have assumed that the Yamba Road/School Road Intersection will be upgraded in line with the turning warrants previously outline, and hence TTM have undertaking AV swept paths on an assumed upgraded intersection layout (providing CHR and AUL treatments). The AV swept path movements on the upgraded intersection layout are shown in Figure 9.1 and Figure 9.2.

Figure 9.1: AV Swept Path Turns (East)

Figure 9.2: AV Swept Path Turns (West)

10. Active Transport

10.1. Public Transport

Access to public transport from the site is considered poor, due to the presence of only a bus stop 1600m to the south of the site connecting to surrounding suburbs. TTM has produced a graphical diagram outlining the key public transport provisions available for the site. This is shown in Figure 10.1.

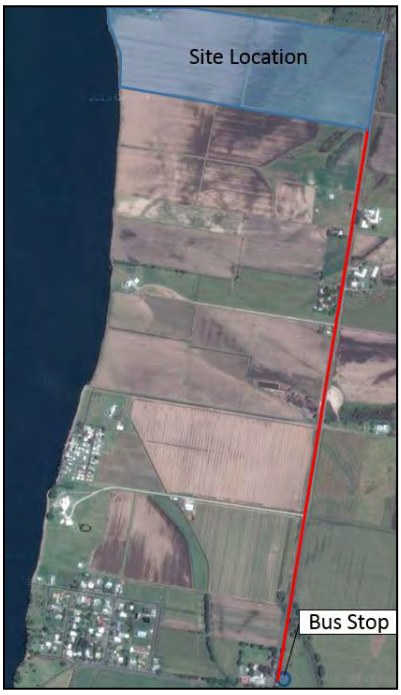


Figure 10.1: Distance to Bus Stop

As can be seen in the above diagram, the site is positioned approximately 1,600m walking distance to the local bus stop servicing bus routes around the Grafton and Yamba area and an occasional service up to Byron Bay. TTM consider the public transportation provisions in the vicinity of the site will fulfil the site's low demand for such facilities as it is unlikely to be utilised. The bus service is also unlikely to run past the development in the foreseeable future as there is very limited housing further north past the development.

10.2. Pedestrian Access

Pedestrian access to the site is considered poor with no pedestrian access points available along the site frontage. The main pedestrian issue with the proposed development will be the lack of footpaths. This will not significantly affect the development as public transport doesn't reach walking distance of the development.

10.3. Cyclist Requirements

The site has access to no cycling facilities, with no dedicated on-street and off-street cycle lanes located nearby.

11. Developer Contributions

11.1. State Controlled Roads

Yamba Road is classified as a Regional Road (gazetted road number 152). Regional Roads perform an intermediate function between the main arterial network of State Roads and council controlled Local Roads. RMS provides financial assistance to councils for the management of their Regional Roads. Any proposed upgrades to Yamba Road therefore will require referral to RMS.

It is noted that some vehicles from the development may utilise the State Controlled Road Pacific Highway to the west of the site. Considering the low traffic demand of the site, the development is unlikely to have any significant impact to the overall state road network. As such no additional contributions to the State Road Network are considered to be warranted.

11.2. Council Roads

Although it is identified that the Yamba Road / School Road intersection will require amelioration in order to improve level of service of the intersection, this requirement occurs regardless of the proposed development's inclusion. Austroad's turning treatment warrants identify that by 2018, AUL and CHR type turn treatments should be provided at the Yamba Road / School Road intersection. The development's contribution to the already warranted upgrade should be limited to the associated 'bring forward' costs of any upgrade.

12. Summary and Conclusions

12.1. Development Access

The access is recommended as a 21.5m wide intersection capable of servicing an AV with compliance under AS2890.2. This will allow the forward gear ingress and egress of the largest required service vehicle of the site. Also, the development access will have to provide a minimum of 5 cars queueing provision.

12.2. Car Parking Arrangements

The proposed parking supply for the site is generally consistent with Clarence Valley Council accepted parking requirements. It is proposed that a reduced parking supply will be provided for the site based on a first principal calculation from total employees; which is considered acceptable given the usage of the site, advice from potential operators of the facility and the operational characteristics of the site. The car park layouts, as a minimum, will comply with AS2890.1 requirements.

12.3. Impact on Surrounding Road Network

The existing intersection of Yamba Road/School Road warrants that turning treatments be provided. The assessment of the proposed development indicates that the development will not have a significant impact on the future road network. As such, the mitigating road works already required on the Yamba Road/School Road intersection ought to be covered by Council.

12.4. Service Vehicle Arrangements

Servicing for this development will be facilitated in a designated loading area accessed off School Road. Service vehicles demands for the various uses of the site will be managed in a way to share the use of the loading areas. The largest design vehicle, a 19m AV, should be able to manoeuvre on site in order to enter and exit in a forward gear.

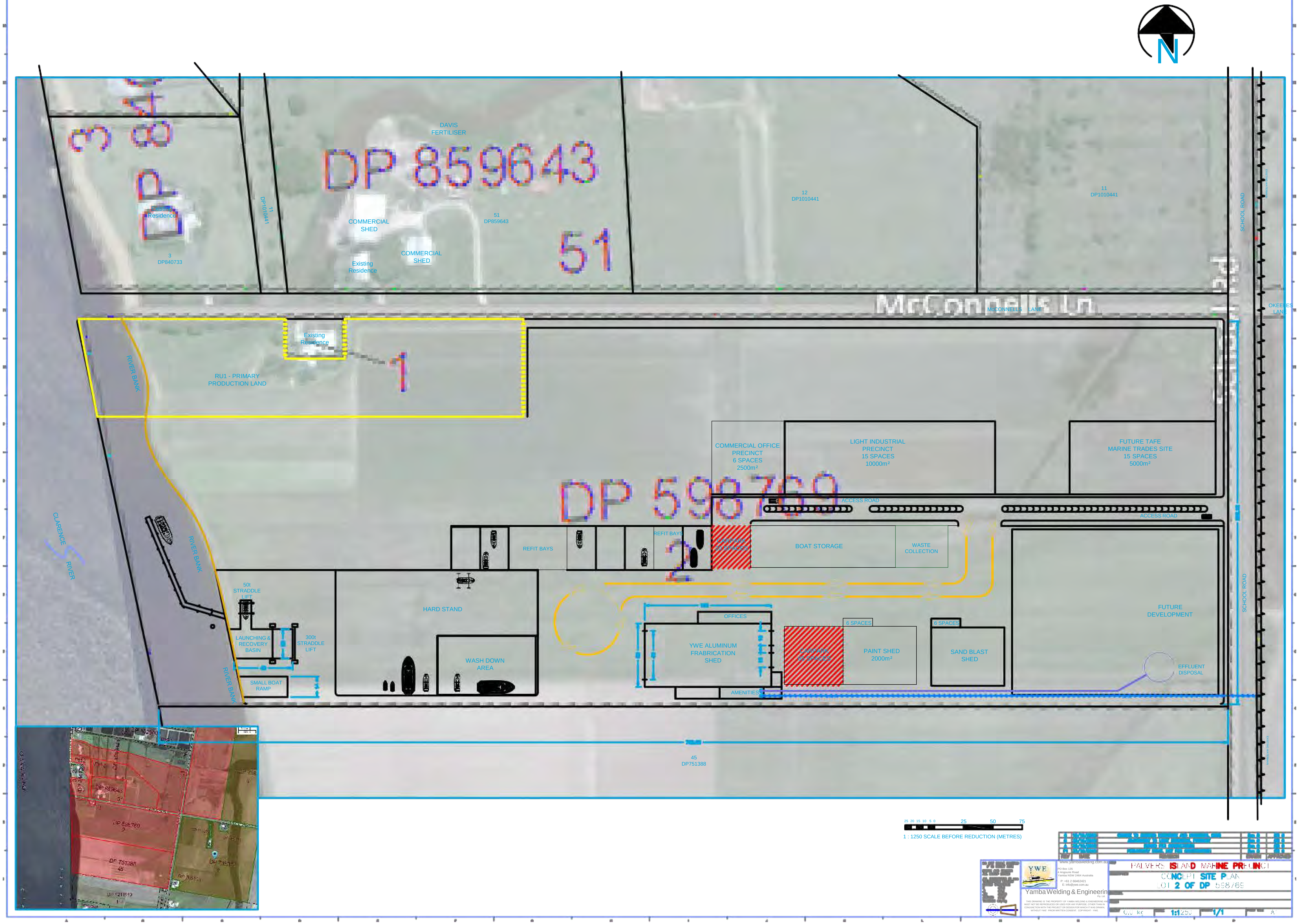
12.5. Public Transport and Bicycle / Pedestrian Facilities

The current public transport infrastructure and proposed site provisions for pedestrian and bicycle facilities is considered adequate for the low usage of the development.

12.6. Conclusion

Based on the assessment contained within this report, TTM recommend that the proposed development be approved on transport planning grounds, subject to the recommendations of this report.

Appendix A Proposed Site Plan


N
DAVIS FERTILISER
DP 859643
51
51 DP859643
COMMERCIAL SHED
COMMERCIAL SHED
Existing Residence
Residence
3 DP840733
11 DP1010441
12 DP1010441
11 DP1010441
SCHOOL ROAD
McConnells Ln
MCCONNELLS LANE
OKEEFES LANE
Existing Residence
1
RU1 - PRIMARY PRODUCTION LAND
RIVER BANK
CLARENCE RIVER
DP 598769
2
COMMERCIAL OFFICE PRECINCT 6 SPACES 2500m²
LIGHT INDUSTRIAL PRECINCT 15 SPACES 10000m²
FUTURE TAFE MARINE TRADES SITE 15 SPACES 5000m²
ACCESS ROAD
REFIT BAYS
BOAT STORAGE
WASTE COLLECTION
50t STRADDLE LIFT
HARD STAND
LAUNCHING & RECOVERY BASIN
300t STRADDLE LIFT
WASH DOWN AREA
SMALL BOAT RAMP
OFFICES
YWE ALUMINUM FRABRICATION SHED
6 SPACES
PAINT SHED 2000m²
SAND BLAST SHED
AMENITIES
FUTURE DEVELOPMENT
EFFLUENT DISPOSAL
45 DP751388
1 : 1250 SCALE BEFORE REDUCTION (METRES)
Yamba Welding & Engineering
PALMERS ISLAND MARINE PRECINCT
CONCEPT SITE PLAN
LOT 2 OF DP 598769
1:1250

Appendix B SIDRA Intersection Movement

MOVEMENT SUMMARY

Site: BaseAM2013 River

Network: BaseAM2013

River Road / Yamba Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	361	3.5	361	3.5	0.194	0.0	LOS A	0.1	0.5	0.02	0.01	59.7
6	R2	6	0.0	6	0.0	0.194	7.1	LOS A	0.1	0.5	0.02	0.01	56.4
Approach		367	3.4	367	3.4	0.194	0.2	NA	0.1	0.5	0.02	0.01	59.7
North: River Road													
7	L2	18	0.0	18	0.0	0.043	6.8	LOS A	0.1	1.0	0.45	0.68	47.7
9	R2	17	0.0	17	0.0	0.043	9.2	LOS A	0.1	1.0	0.45	0.68	51.3
Approach		35	0.0	35	0.0	0.043	7.9	LOS A	0.1	1.0	0.45	0.68	50.0
West: Yamba Road													
10	L2	5	0.0	5	0.0	0.192	5.6	LOS A	0.0	0.0	0.00	0.01	58.2
11	T1	353	7.2	353	7.2	0.192	0.0	LOS A	0.0	0.0	0.00	0.01	59.8
Approach		358	7.1	358	7.1	0.192	0.1	NA	0.0	0.0	0.00	0.01	59.7
All Vehicles		760	5.0	760	5.0	0.194	0.5	NA	0.1	1.0	0.03	0.04	59.0

MOVEMENT SUMMARY

Site: BaseAM2013 School

Network: BaseAM2013

School Road / Yamba Road
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	346	3.6	346	3.6	0.205	0.2	LOS A	0.3	2.0	0.09	0.04	58.6
6	R2	24	13.0	24	13.0	0.205	7.6	LOS A	0.3	2.0	0.09	0.04	56.3
Approach		371	4.3	371	4.3	0.205	0.7	NA	0.3	2.0	0.09	0.04	58.3
North: School Road													
7	L2	28	11.1	28	11.1	0.073	10.3	LOS B	0.3	1.9	0.48	0.94	49.9
9	R2	21	0.0	21	0.0	0.073	12.5	LOS B	0.3	1.9	0.48	0.94	45.3
Approach		49	6.4	49	6.4	0.073	11.2	LOS B	0.3	1.9	0.48	0.94	48.5
West: Yamba Road													
10	L2	22	9.5	22	9.5	0.199	5.7	LOS A	0.0	0.0	0.00	0.04	56.5
11	T1	348	6.6	348	6.6	0.199	0.0	LOS A	0.0	0.0	0.00	0.04	59.5
Approach		371	6.8	371	6.8	0.199	0.3	NA	0.0	0.0	0.00	0.04	59.3
All Vehicles		791	5.6	791	5.6	0.205	1.2	NA	0.3	2.0	0.07	0.09	57.9

MOVEMENT SUMMARY

Site: BasePM2013 River

Network: BasePM2013

River Road / Yamba Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	322	6.9	322	6.9	0.185	0.1	LOS A	0.2	1.1	0.06	0.03	59.3
6	R2	16	0.0	16	0.0	0.185	7.0	LOS A	0.2	1.1	0.06	0.03	56.0
Approach		338	6.5	338	6.5	0.185	0.4	NA	0.2	1.1	0.06	0.03	59.1
North: River Road													
7	L2	9	0.0	9	0.0	0.023	6.7	LOS A	0.1	0.5	0.44	0.65	47.9
9	R2	9	0.0	9	0.0	0.023	8.8	LOS A	0.1	0.5	0.44	0.65	51.4
Approach		19	0.0	19	0.0	0.023	7.7	LOS A	0.1	0.5	0.44	0.65	50.2
West: Yamba Road													
10	L2	16	0.0	16	0.0	0.188	5.6	LOS A	0.0	0.0	0.00	0.03	58.1
11	T1	346	1.5	346	1.5	0.188	0.0	LOS A	0.0	0.0	0.00	0.03	59.5
Approach		362	1.5	362	1.5	0.188	0.3	NA	0.0	0.0	0.00	0.03	59.4
All Vehicles		719	3.8	719	3.8	0.188	0.5	NA	0.2	1.1	0.04	0.04	58.9

MOVEMENT SUMMARY

Site: BasePM2013 School

Network: BasePM2013

School Road / Yamba Road
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	324	5.8	324	5.8	0.194	0.2	LOS A	0.2	1.8	0.08	0.04	58.6
6	R2	23	13.6	23	13.6	0.194	7.4	LOS A	0.2	1.8	0.08	0.04	56.3
Approach		347	6.4	347	6.4	0.194	0.7	NA	0.2	1.8	0.08	0.04	58.3
North: School Road													
7	L2	28	7.4	28	7.4	0.061	9.9	LOS A	0.2	1.7	0.46	0.92	50.1
9	R2	14	23.1	14	23.1	0.061	14.4	LOS B	0.2	1.7	0.46	0.92	45.4
Approach		42	12.5	42	12.5	0.061	11.4	LOS B	0.2	1.7	0.46	0.92	49.1
West: Yamba Road													
10	L2	19	0.0	19	0.0	0.185	5.5	LOS A	0.0	0.0	0.00	0.03	57.2
11	T1	337	1.6	337	1.6	0.185	0.0	LOS A	0.0	0.0	0.00	0.03	59.5
Approach		356	1.5	356	1.5	0.185	0.3	NA	0.0	0.0	0.00	0.03	59.4
All Vehicles		745	4.4	745	4.4	0.194	1.1	NA	0.2	1.8	0.07	0.09	58.0

MOVEMENT SUMMARY

Site: BaseAM2018 River

Network: BaseAM2018

River Road / Yamba Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	461	3.4	461	3.4	0.249	0.1	LOS A	0.1	0.7	0.03	0.01	59.7
6	R2	8	0.0	8	0.0	0.249	7.9	LOS A	0.1	0.7	0.03	0.01	56.4
Approach		469	3.4	469	3.4	0.249	0.2	NA	0.1	0.7	0.03	0.01	59.6
North: River Road													
7	L2	23	0.0	23	0.0	0.067	7.3	LOS A	0.2	1.6	0.52	0.74	46.2
9	R2	21	0.0	21	0.0	0.067	11.2	LOS B	0.2	1.6	0.52	0.74	50.4
Approach		44	0.0	44	0.0	0.067	9.2	LOS A	0.2	1.6	0.52	0.74	48.8
West: Yamba Road													
10	L2	6	0.0	6	0.0	0.245	5.6	LOS A	0.0	0.0	0.00	0.01	58.2
11	T1	451	7.2	451	7.2	0.245	0.0	LOS A	0.0	0.0	0.00	0.01	59.8
Approach		457	7.1	457	7.1	0.245	0.1	NA	0.0	0.0	0.00	0.01	59.7
All Vehicles		971	5.0	971	5.0	0.249	0.6	NA	0.2	1.6	0.04	0.04	58.9

MOVEMENT SUMMARY

Site: BaseAM2018 School

Network: BaseAM2018

School Road / Yamba Road
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	442	3.6	442	3.6	0.265	0.4	LOS A	0.4	3.1	0.11	0.04	58.4
6	R2	31	13.8	31	13.8	0.265	8.6	LOS A	0.4	3.1	0.11	0.04	56.2
Approach		473	4.2	473	4.2	0.265	0.9	NA	0.4	3.1	0.11	0.04	58.1
North: School Road													
7	L2	36	11.8	36	11.8	0.119	11.2	LOS B	0.4	3.0	0.56	0.96	48.8
9	R2	27	0.0	27	0.0	0.119	15.5	LOS C	0.4	3.0	0.56	0.96	43.5
Approach		63	6.7	63	6.7	0.119	13.1	LOS B	0.4	3.0	0.56	0.96	47.2
West: Yamba Road													
10	L2	28	11.1	28	11.1	0.254	5.7	LOS A	0.0	0.0	0.00	0.04	56.4
11	T1	444	6.6	444	6.6	0.254	0.0	LOS A	0.0	0.0	0.00	0.04	59.5
Approach		473	6.9	473	6.9	0.254	0.4	NA	0.0	0.0	0.00	0.04	59.3
All Vehicles		1008	5.6	1008	5.6	0.265	1.4	NA	0.4	3.1	0.09	0.10	57.6

MOVEMENT SUMMARY

Site: BasePM2018 River

Network: BasePM2018

River Road / Yamba Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	412	6.9	412	6.9	0.238	0.2	LOS A	0.2	1.7	0.07	0.03	59.2
6	R2	20	0.0	20	0.0	0.238	7.8	LOS A	0.2	1.7	0.07	0.03	55.9
Approach		432	6.6	432	6.6	0.238	0.5	NA	0.2	1.7	0.07	0.03	59.0
North: River Road													
7	L2	12	0.0	12	0.0	0.034	7.1	LOS A	0.1	0.8	0.51	0.71	46.6
9	R2	12	0.0	12	0.0	0.034	10.5	LOS B	0.1	0.8	0.51	0.71	50.6
Approach		23	0.0	23	0.0	0.034	8.8	LOS A	0.1	0.8	0.51	0.71	49.2
West: Yamba Road													
10	L2	20	0.0	20	0.0	0.240	5.6	LOS A	0.0	0.0	0.00	0.03	58.1
11	T1	442	1.4	442	1.4	0.240	0.0	LOS A	0.0	0.0	0.00	0.03	59.5
Approach		462	1.4	462	1.4	0.240	0.3	NA	0.0	0.0	0.00	0.03	59.4
All Vehicles		917	3.8	917	3.8	0.240	0.6	NA	0.2	1.7	0.05	0.05	58.8

MOVEMENT SUMMARY

Site: BasePM2018 School

Network: BasePM2018

School Road / Yamba Road
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	414	5.9	414	5.9	0.251	0.3	LOS A	0.4	2.9	0.11	0.04	58.5
6	R2	29	14.3	29	14.3	0.251	8.3	LOS A	0.4	2.9	0.11	0.04	56.2
Approach		443	6.4	443	6.4	0.251	0.8	NA	0.4	2.9	0.11	0.04	58.2
North: School Road													
7	L2	36	8.8	36	8.8	0.099	10.7	LOS B	0.3	2.6	0.55	0.95	49.0
9	R2	18	23.5	18	23.5	0.099	18.0	LOS C	0.3	2.6	0.55	0.95	43.7
Approach		54	13.7	54	13.7	0.099	13.2	LOS B	0.3	2.6	0.55	0.95	47.8
West: Yamba Road													
10	L2	24	0.0	24	0.0	0.235	5.5	LOS A	0.0	0.0	0.00	0.03	57.2
11	T1	429	1.5	429	1.5	0.235	0.0	LOS A	0.0	0.0	0.00	0.03	59.5
Approach		454	1.4	454	1.4	0.235	0.3	NA	0.0	0.0	0.00	0.03	59.4
All Vehicles		951	4.4	951	4.4	0.251	1.3	NA	0.4	2.9	0.08	0.09	57.8

MOVEMENT SUMMARY

Site: DevelopmentAM2018 River Network: DevelopmentAM2018

River Road / Yamba Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	465	3.4	465	3.4	0.252	0.1	LOS A	0.1	0.8	0.03	0.01	59.7
6	R2	8	0.0	8	0.0	0.252	8.1	LOS A	0.1	0.8	0.03	0.01	56.4
Approach		474	3.3	474	3.3	0.252	0.2	NA	0.1	0.8	0.03	0.01	59.6
North: River Road													
7	L2	24	0.0	24	0.0	0.071	7.4	LOS A	0.2	1.6	0.54	0.75	46.0
9	R2	21	0.0	21	0.0	0.071	11.6	LOS B	0.2	1.6	0.54	0.75	50.2
Approach		45	0.0	45	0.0	0.071	9.4	LOS A	0.2	1.6	0.54	0.75	48.6
West: Yamba Road													
10	L2	6	0.0	6	0.0	0.259	5.6	LOS A	0.0	0.0	0.00	0.01	58.2
11	T1	477	6.8	477	6.8	0.259	0.0	LOS A	0.0	0.0	0.00	0.01	59.8
Approach		483	6.8	483	6.8	0.259	0.1	NA	0.0	0.0	0.00	0.01	59.7
All Vehicles		1002	4.8	1002	4.8	0.259	0.6	NA	0.2	1.6	0.04	0.04	58.9

MOVEMENT SUMMARY

Site: DevelopmentAM2018 School Network: DevelopmentAM2018

School Road / Yamba Road
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	442	3.6	442	3.6	0.295	0.7	LOS A	0.9	6.3	0.20	0.08	56.9
6	R2	60	8.8	60	8.8	0.295	8.8	LOS A	0.9	6.3	0.20	0.08	55.8
Approach		502	4.2	502	4.2	0.295	1.7	NA	0.9	6.3	0.20	0.08	56.7
North: School Road													
7	L2	42	12.5	42	12.5	0.145	11.2	LOS B	0.5	3.7	0.58	0.97	48.5
9	R2	32	0.0	32	0.0	0.145	16.5	LOS C	0.5	3.7	0.58	0.97	43.1
Approach		74	7.1	74	7.1	0.145	13.5	LOS B	0.5	3.7	0.58	0.97	46.9
West: Yamba Road													
10	L2	56	5.7	56	5.7	0.269	5.6	LOS A	0.0	0.0	0.00	0.07	56.4
11	T1	444	6.6	444	6.6	0.269	0.0	LOS A	0.0	0.0	0.00	0.07	59.1
Approach		500	6.5	500	6.5	0.269	0.6	NA	0.0	0.0	0.00	0.07	58.7
All Vehicles		1076	5.5	1076	5.5	0.295	2.0	NA	0.9	6.3	0.13	0.13	56.7

MOVEMENT SUMMARY

Site: DevelopmentPM2018 River Network: DevelopmentPM2018

River Road / Yamba Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	428	6.9	428	6.9	0.248	0.2	LOS A	0.2	1.8	0.07	0.03	59.2
6	R2	21	0.0	21	0.0	0.248	7.9	LOS A	0.2	1.8	0.07	0.03	55.9
Approach		449	6.6	449	6.6	0.248	0.5	NA	0.2	1.8	0.07	0.03	59.0
North: River Road													
7	L2	12	0.0	12	0.0	0.035	7.2	LOS A	0.1	0.8	0.51	0.72	46.4
9	R2	12	0.0	12	0.0	0.035	10.8	LOS B	0.1	0.8	0.51	0.72	50.5
Approach		23	0.0	23	0.0	0.035	9.0	LOS A	0.1	0.8	0.51	0.72	49.1
West: Yamba Road													
10	L2	20	0.0	20	0.0	0.243	5.6	LOS A	0.0	0.0	0.00	0.03	58.1
11	T1	448	1.4	448	1.4	0.243	0.0	LOS A	0.0	0.0	0.00	0.03	59.5
Approach		468	1.3	468	1.3	0.243	0.3	NA	0.0	0.0	0.00	0.03	59.4
All Vehicles		941	3.8	941	3.8	0.248	0.6	NA	0.2	1.8	0.05	0.04	58.8

MOVEMENT SUMMARY

Site: DevelopmentPM2018 School Network: DevelopmentPM2018

School Road / Yamba Road
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	414	5.9	414	5.9	0.258	0.4	LOS A	0.5	3.6	0.13	0.05	58.1
6	R2	37	14.3	37	14.3	0.258	8.4	LOS A	0.5	3.6	0.13	0.05	56.0
Approach		451	6.5	451	6.5	0.258	1.1	NA	0.5	3.6	0.13	0.05	57.8
North: School Road													
7	L2	73	4.3	73	4.3	0.189	10.6	LOS B	0.7	5.0	0.56	0.96	49.2
9	R2	36	14.7	36	14.7	0.189	17.5	LOS C	0.7	5.0	0.56	0.96	43.8
Approach		108	7.8	108	7.8	0.189	12.8	LOS B	0.7	5.0	0.56	0.96	48.0
West: Yamba Road													
10	L2	31	0.0	31	0.0	0.239	5.5	LOS A	0.0	0.0	0.00	0.04	57.1
11	T1	429	1.5	429	1.5	0.239	0.0	LOS A	0.0	0.0	0.00	0.04	59.4
Approach		460	1.4	460	1.4	0.239	0.4	NA	0.0	0.0	0.00	0.04	59.3
All Vehicles		1019	4.3	1019	4.3	0.258	2.0	NA	0.7	5.0	0.12	0.14	56.8

MOVEMENT SUMMARY

Site: BaseAM2028 River

Network: BaseAM2028

River Road / Yamba Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	751	3.5	751	3.5	0.411	0.3	LOS A	0.4	2.7	0.05	0.01	59.3
6	R2	13	0.0	13	0.0	0.411	12.5	LOS B	0.4	2.7	0.05	0.01	56.0
Approach		763	3.4	763	3.4	0.411	0.5	NA	0.4	2.7	0.05	0.01	59.2
North: River Road													
7	L2	37	0.0	37	0.0	0.247	10.4	LOS B	0.8	5.6	0.80	0.94	38.0
9	R2	35	0.0	35	0.0	0.247	25.7	LOS D	0.8	5.6	0.80	0.94	45.0
Approach		72	0.0	72	0.0	0.247	17.8	LOS C	0.8	5.6	0.80	0.94	42.3
West: Yamba Road													
10	L2	11	0.0	11	0.0	0.399	5.6	LOS A	0.0	0.0	0.00	0.01	58.2
11	T1	733	7.2	733	7.2	0.399	0.1	LOS A	0.0	0.0	0.00	0.01	59.7
Approach		743	7.1	743	7.1	0.399	0.1	NA	0.0	0.0	0.00	0.01	59.7
All Vehicles		1578	5.0	1578	5.0	0.411	1.1	NA	0.8	5.6	0.06	0.05	58.1

MOVEMENT SUMMARY

Site: BaseAM2028 School

Network: BaseAM2028

School Road / Yamba Road
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	720	3.7	720	3.7	0.463	1.6	LOS A	1.9	14.0	0.23	0.05	55.5
6	R2	51	12.5	51	12.5	0.463	14.8	LOS B	1.9	14.0	0.23	0.05	54.9
Approach		771	4.2	771	4.2	0.463	2.5	NA	1.9	14.0	0.23	0.05	55.5
North: School Road													
7	L2	59	10.7	59	10.7	0.489	20.6	LOS C	1.8	13.6	0.87	1.10	39.7
9	R2	44	0.0	44	0.0	0.489	44.3	LOS E	1.8	13.6	0.87	1.10	31.0
Approach		103	6.1	103	6.1	0.489	30.8	LOS D	1.8	13.6	0.87	1.10	36.9
West: Yamba Road													
10	L2	46	9.1	46	9.1	0.414	5.7	LOS A	0.0	0.0	0.00	0.04	56.5
11	T1	724	6.7	724	6.7	0.414	0.0	LOS A	0.0	0.0	0.00	0.04	59.4
Approach		771	6.8	771	6.8	0.414	0.4	NA	0.0	0.0	0.00	0.04	59.2
All Vehicles		1644	5.6	1644	5.6	0.489	3.3	NA	1.9	14.0	0.16	0.11	55.0

MOVEMENT SUMMARY

Site: BasePM2028 River

Network: BasePM2028

River Road / Yamba Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	669	6.9	669	6.9	0.402	0.7	LOS A	0.9	6.6	0.13	0.03	58.2
6	R2	33	0.0	33	0.0	0.402	12.1	LOS B	0.9	6.6	0.13	0.03	55.1
Approach		702	6.6	702	6.6	0.402	1.2	NA	0.9	6.6	0.13	0.03	58.1
North: River Road													
7	L2	20	0.0	20	0.0	0.124	9.1	LOS A	0.4	2.6	0.76	0.90	40.1
9	R2	20	0.0	20	0.0	0.124	21.5	LOS C	0.4	2.6	0.76	0.90	46.5
Approach		40	0.0	40	0.0	0.124	15.3	LOS C	0.4	2.6	0.76	0.90	44.1
West: Yamba Road													
10	L2	33	0.0	33	0.0	0.390	5.6	LOS A	0.0	0.0	0.00	0.03	58.0
11	T1	720	1.5	720	1.5	0.390	0.1	LOS A	0.0	0.0	0.00	0.03	59.4
Approach		753	1.4	753	1.4	0.390	0.3	NA	0.0	0.0	0.00	0.03	59.3
All Vehicles		1495	3.8	1495	3.8	0.402	1.1	NA	0.9	6.6	0.08	0.05	58.0

MOVEMENT SUMMARY

Site: BasePM2028 School

Network: BasePM2028

School Road / Yamba Road
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	674	5.8	674	5.8	0.433	1.3	LOS A	1.6	11.7	0.20	0.05	56.2
6	R2	48	13.0	48	13.0	0.433	13.4	LOS B	1.6	11.7	0.20	0.05	55.2
Approach		722	6.3	722	6.3	0.433	2.1	NA	1.6	11.7	0.20	0.05	56.0
North: School Road													
7	L2	59	7.1	59	7.1	0.388	17.2	LOS C	1.4	10.8	0.83	1.07	41.4
9	R2	28	22.2	28	22.2	0.388	48.3	LOS E	1.4	10.8	0.83	1.07	33.0
Approach		87	12.0	87	12.0	0.388	27.3	LOS D	1.4	10.8	0.83	1.07	39.5
West: Yamba Road													
10	L2	39	0.0	39	0.0	0.383	5.6	LOS A	0.0	0.0	0.00	0.03	57.2
11	T1	700	1.5	700	1.5	0.383	0.0	LOS A	0.0	0.0	0.00	0.03	59.5
Approach		739	1.4	739	1.4	0.383	0.3	NA	0.0	0.0	0.00	0.03	59.3
All Vehicles		1548	4.3	1548	4.3	0.433	2.7	NA	1.6	11.7	0.14	0.10	55.9

MOVEMENT SUMMARY

Site: DevelopmentAM2028 River Network: DevelopmentAM2028

River Road / Yamba Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	755	3.5	755	3.5	0.414	0.3	LOS A	0.4	2.9	0.05	0.01	59.3
6	R2	13	0.0	13	0.0	0.414	13.0	LOS B	0.4	2.9	0.05	0.01	56.0
Approach		767	3.4	767	3.4	0.414	0.5	NA	0.4	2.9	0.05	0.01	59.2
North: River Road													
7	L2	38	0.0	38	0.0	0.263	10.9	LOS B	0.9	6.0	0.82	0.95	37.3
9	R2	35	0.0	35	0.0	0.263	27.2	LOS D	0.9	6.0	0.82	0.95	44.5
Approach		73	0.0	73	0.0	0.263	18.7	LOS C	0.9	6.0	0.82	0.95	41.6
West: Yamba Road													
10	L2	11	0.0	11	0.0	0.412	5.6	LOS A	0.0	0.0	0.00	0.01	58.2
11	T1	759	6.9	759	6.9	0.412	0.1	LOS A	0.0	0.0	0.00	0.01	59.7
Approach		769	6.8	769	6.8	0.412	0.1	NA	0.0	0.0	0.00	0.01	59.7
All Vehicles		1609	4.9	1609	4.9	0.414	1.2	NA	0.9	6.0	0.06	0.05	58.0

MOVEMENT SUMMARY

Site: DevelopmentAM2028 School Network: DevelopmentAM2028

School Road / Yamba Road
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	720	3.7	720	3.7	0.513	2.7	LOS A	3.2	23.1	0.35	0.08	53.1
6	R2	80	9.2	80	9.2	0.513	15.6	LOS C	3.2	23.1	0.35	0.08	53.8
Approach		800	4.2	800	4.2	0.513	4.0	NA	3.2	23.1	0.35	0.08	53.3
North: School Road													
7	L2	65	11.3	65	11.3	0.584	24.3	LOS C	2.3	17.2	0.89	1.14	37.6
9	R2	48	0.0	48	0.0	0.584	51.9	LOS F	2.3	17.2	0.89	1.14	28.5
Approach		114	6.5	114	6.5	0.584	36.1	LOS E	2.3	17.2	0.89	1.14	34.6
West: Yamba Road													
10	L2	74	5.7	74	5.7	0.429	5.6	LOS A	0.0	0.0	0.00	0.05	56.5
11	T1	724	6.7	724	6.7	0.429	0.0	LOS A	0.0	0.0	0.00	0.05	59.1
Approach		798	6.6	798	6.6	0.429	0.5	NA	0.0	0.0	0.00	0.05	58.9
All Vehicles		1712	5.5	1712	5.5	0.584	4.5	NA	3.2	23.1	0.22	0.14	53.4

MOVEMENT SUMMARY

Site: DevelopmentPM2028 River Network: DevelopmentPM2028

River Road / Yamba Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	686	6.9	686	6.9	0.413	0.8	LOS A	1.0	7.0	0.13	0.03	58.2
6	R2	34	0.0	34	0.0	0.413	12.3	LOS B	1.0	7.0	0.13	0.03	55.0
Approach		720	6.6	720	6.6	0.413	1.3	NA	1.0	7.0	0.13	0.03	58.0
North: River Road													
7	L2	20	0.0	20	0.0	0.129	9.1	LOS A	0.4	2.7	0.77	0.91	39.7
9	R2	20	0.0	20	0.0	0.129	22.2	LOS C	0.4	2.7	0.77	0.91	46.2
Approach		40	0.0	40	0.0	0.129	15.7	LOS C	0.4	2.7	0.77	0.91	43.8
West: Yamba Road													
10	L2	33	0.0	33	0.0	0.394	5.6	LOS A	0.0	0.0	0.00	0.03	58.0
11	T1	726	1.4	726	1.4	0.394	0.1	LOS A	0.0	0.0	0.00	0.03	59.4
Approach		759	1.4	759	1.4	0.394	0.3	NA	0.0	0.0	0.00	0.03	59.3
All Vehicles		1519	3.8	1519	3.8	0.413	1.2	NA	1.0	7.0	0.08	0.05	57.9

MOVEMENT SUMMARY

Site: DevelopmentPM2028 School Network: DevelopmentPM2028

School Road / Yamba Road
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	674	5.8	674	5.8	0.445	1.6	LOS A	1.9	13.8	0.23	0.06	55.6
6	R2	56	13.2	56	13.2	0.445	13.6	LOS B	1.9	13.8	0.23	0.06	54.9
Approach		729	6.3	729	6.3	0.445	2.5	NA	1.9	13.8	0.23	0.06	55.5
North: School Road													
7	L2	96	4.4	96	4.4	0.594	21.8	LOS C	2.6	19.6	0.86	1.17	39.5
9	R2	46	15.9	46	15.9	0.594	52.0	LOS F	2.6	19.6	0.86	1.17	30.6
Approach		142	8.1	142	8.1	0.594	31.7	LOS D	2.6	19.6	0.86	1.17	37.4
West: Yamba Road													
10	L2	45	0.0	45	0.0	0.387	5.6	LOS A	0.0	0.0	0.00	0.04	57.1
11	T1	700	1.5	700	1.5	0.387	0.0	LOS A	0.0	0.0	0.00	0.04	59.4
Approach		745	1.4	745	1.4	0.387	0.4	NA	0.0	0.0	0.00	0.04	59.3
All Vehicles		1617	4.2	1617	4.2	0.594	4.1	NA	2.6	19.6	0.18	0.14	54.1

MOVEMENT SUMMARY

Site: BaseAM2028 River

Network: BaseAM2028 - Upgraded

River Road / Yamba Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	751	3.5	751	3.5	0.411	0.3	LOS A	0.4	2.7	0.05	0.01	59.3
6	R2	13	0.0	13	0.0	0.411	12.5	LOS B	0.4	2.7	0.05	0.01	56.0
Approach		763	3.4	763	3.4	0.411	0.5	NA	0.4	2.7	0.05	0.01	59.2
North: River Road													
7	L2	37	0.0	37	0.0	0.247	10.4	LOS B	0.8	5.6	0.80	0.94	38.0
9	R2	35	0.0	35	0.0	0.247	25.7	LOS D	0.8	5.6	0.80	0.94	45.0
Approach		72	0.0	72	0.0	0.247	17.8	LOS C	0.8	5.6	0.80	0.94	42.3
West: Yamba Road													
10	L2	11	0.0	11	0.0	0.399	5.6	LOS A	0.0	0.0	0.00	0.01	58.2
11	T1	733	7.2	733	7.2	0.399	0.1	LOS A	0.0	0.0	0.00	0.01	59.7
Approach		743	7.1	743	7.1	0.399	0.1	NA	0.0	0.0	0.00	0.01	59.7
All Vehicles		1578	5.0	1578	5.0	0.411	1.1	NA	0.8	5.6	0.06	0.05	58.1

MOVEMENT SUMMARY

Site: BaseAM2028 School - Upgraded

Network: BaseAM2028 - Upgraded

School Road / Yamba Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	720	3.7	720	3.7	0.378	0.1	LOS A	0.0	0.0	0.00	0.00	59.9
6	R2	51	12.5	51	12.5	0.107	12.1	LOS B	0.4	2.9	0.68	0.87	48.0
Approach		771	4.2	771	4.2	0.378	0.8	NA	0.4	2.9	0.04	0.06	58.1
North: School Road													
7	L2	59	10.7	59	10.7	0.718	36.5	LOS E	3.3	24.2	0.93	1.19	30.4
9	R2	44	0.0	44	0.0	0.718	83.9	LOS F	3.3	24.2	0.93	1.19	21.1
Approach		103	6.1	103	6.1	0.718	56.8	LOS F	3.3	24.2	0.93	1.19	27.1
West: Yamba Road													
10	L2	46	9.1	46	9.1	0.027	5.6	LOS A	0.0	0.0	0.00	0.57	50.6
11	T1	724	6.7	724	6.7	0.388	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		771	6.8	771	6.8	0.388	0.4	NA	0.0	0.0	0.00	0.03	59.2
All Vehicles		1644	5.6	1644	5.6	0.718	4.1	NA	3.3	24.2	0.08	0.12	53.8

MOVEMENT SUMMARY

Site: BasePM2028 River

Network: BasePM2028 - Upgraded

River Road / Yamba Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	669	6.9	669	6.9	0.402	0.7	LOS A	0.9	6.6	0.13	0.03	58.2
6	R2	33	0.0	33	0.0	0.402	12.1	LOS B	0.9	6.6	0.13	0.03	55.1
Approach		702	6.6	702	6.6	0.402	1.2	NA	0.9	6.6	0.13	0.03	58.1
North: River Road													
7	L2	20	0.0	20	0.0	0.124	9.1	LOS A	0.4	2.6	0.76	0.90	40.1
9	R2	20	0.0	20	0.0	0.124	21.5	LOS C	0.4	2.6	0.76	0.90	46.5
Approach		40	0.0	40	0.0	0.124	15.3	LOS C	0.4	2.6	0.76	0.90	44.1
West: Yamba Road													
10	L2	33	0.0	33	0.0	0.390	5.6	LOS A	0.0	0.0	0.00	0.03	58.0
11	T1	720	1.5	720	1.5	0.390	0.1	LOS A	0.0	0.0	0.00	0.03	59.4
Approach		753	1.4	753	1.4	0.390	0.3	NA	0.0	0.0	0.00	0.03	59.3
All Vehicles		1495	3.8	1495	3.8	0.402	1.1	NA	0.9	6.6	0.08	0.05	58.0

MOVEMENT SUMMARY

Site: BasePM2028 School - Upgraded

Network: BasePM2028 - Upgraded

School Road / Yamba Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	674	5.8	674	5.8	0.358	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
6	R2	48	13.0	48	13.0	0.094	11.3	LOS B	0.3	2.6	0.64	0.86	48.5
Approach		722	6.3	722	6.3	0.358	0.8	NA	0.3	2.6	0.04	0.06	58.2
North: School Road													
7	L2	59	7.1	59	7.1	0.570	24.6	LOS C	2.3	17.8	0.90	1.10	34.3
9	R2	28	22.2	28	22.2	0.570	83.1	LOS F	2.3	17.8	0.90	1.10	24.9
Approach		87	12.0	87	12.0	0.570	43.6	LOS E	2.3	17.8	0.90	1.10	32.0
West: Yamba Road													
10	L2	39	0.0	39	0.0	0.021	5.5	LOS A	0.0	0.0	0.00	0.58	51.1
11	T1	700	1.5	700	1.5	0.362	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		739	1.4	739	1.4	0.362	0.3	NA	0.0	0.0	0.00	0.03	59.4
All Vehicles		1548	4.3	1548	4.3	0.570	3.0	NA	2.3	17.8	0.07	0.10	55.3

MOVEMENT SUMMARY

Site: DevelopmentAM2028 River — Network: DevelopmentAM2028 - Upgraded

River Road / Yamba Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	755	3.5	755	3.5	0.414	0.3	LOS A	0.4	2.9	0.05	0.01	59.3
6	R2	13	0.0	13	0.0	0.414	13.0	LOS B	0.4	2.9	0.05	0.01	56.0
Approach		767	3.4	767	3.4	0.414	0.5	NA	0.4	2.9	0.05	0.01	59.2
North: River Road													
7	L2	38	0.0	38	0.0	0.263	10.9	LOS B	0.9	6.0	0.82	0.95	37.3
9	R2	35	0.0	35	0.0	0.263	27.2	LOS D	0.9	6.0	0.82	0.95	44.5
Approach		73	0.0	73	0.0	0.263	18.7	LOS C	0.9	6.0	0.82	0.95	41.6
West: Yamba Road													
10	L2	11	0.0	11	0.0	0.412	5.6	LOS A	0.0	0.0	0.00	0.01	58.2
11	T1	759	6.9	759	6.9	0.412	0.1	LOS A	0.0	0.0	0.00	0.01	59.7
Approach		769	6.8	769	6.8	0.412	0.1	NA	0.0	0.0	0.00	0.01	59.7
All Vehicles		1609	4.9	1609	4.9	0.414	1.2	NA	0.9	6.0	0.06	0.05	58.0

MOVEMENT SUMMARY

Site: DevelopmentAM2028 School - Upgraded — Network: DevelopmentAM2028 - Upgraded

School Road / Yamba Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	720	3.7	720	3.7	0.378	0.1	LOS A	0.0	0.0	0.00	0.00	59.9
6	R2	80	9.2	80	9.2	0.170	12.4	LOS B	0.6	4.6	0.70	0.88	47.9
Approach		800	4.2	800	4.2	0.378	1.3	NA	0.6	4.6	0.07	0.09	57.3
North: School Road													
7	L2	65	11.3	65	11.3	0.849	59.0	LOS F	4.8	35.7	0.95	1.36	25.2
9	R2	48	0.0	48	0.0	0.849	111.9	LOS F	4.8	35.7	0.95	1.36	16.5
Approach		114	6.5	114	6.5	0.849	81.6	LOS F	4.8	35.7	0.95	1.36	22.0
West: Yamba Road													
10	L2	74	5.7	74	5.7	0.042	5.6	LOS A	0.0	0.0	0.00	0.57	50.8
11	T1	724	6.7	724	6.7	0.388	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		798	6.6	798	6.6	0.388	0.5	NA	0.0	0.0	0.00	0.05	58.9
All Vehicles		1712	5.5	1712	5.5	0.849	6.3	NA	4.8	35.7	0.10	0.16	51.2

MOVEMENT SUMMARY

Site: DevelopmentPM2028 River — Network: DevelopmentPM2028 - Upgraded

River Road / Yamba Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	686	6.9	686	6.9	0.413	0.8	LOS A	1.0	7.0	0.13	0.03	58.2
6	R2	34	0.0	34	0.0	0.413	12.3	LOS B	1.0	7.0	0.13	0.03	55.0
Approach		720	6.6	720	6.6	0.413	1.3	NA	1.0	7.0	0.13	0.03	58.0
North: River Road													
7	L2	20	0.0	20	0.0	0.129	9.1	LOS A	0.4	2.7	0.77	0.91	39.7
9	R2	20	0.0	20	0.0	0.129	22.2	LOS C	0.4	2.7	0.77	0.91	46.2
Approach		40	0.0	40	0.0	0.129	15.7	LOS C	0.4	2.7	0.77	0.91	43.8
West: Yamba Road													
10	L2	33	0.0	33	0.0	0.394	5.6	LOS A	0.0	0.0	0.00	0.03	58.0
11	T1	726	1.4	726	1.4	0.394	0.1	LOS A	0.0	0.0	0.00	0.03	59.4
Approach		759	1.4	759	1.4	0.394	0.3	NA	0.0	0.0	0.00	0.03	59.3
All Vehicles		1519	3.8	1519	3.8	0.413	1.2	NA	1.0	7.0	0.08	0.05	57.9

MOVEMENT SUMMARY

Site: DevelopmentPM2028 School - Upgraded — Network: DevelopmentPM2028 - Upgraded

School Road / Yamba Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Yamba Road													
5	T1	674	5.8	674	5.8	0.358	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
6	R2	56	13.2	56	13.2	0.110	11.5	LOS B	0.4	3.1	0.65	0.86	48.4
Approach		729	6.3	729	6.3	0.358	0.9	NA	0.4	3.1	0.05	0.07	58.0
North: School Road													
7	L2	96	4.4	96	4.4	0.859	53.7	LOS F	5.7	42.8	0.93	1.45	27.1
9	R2	46	15.9	46	15.9	0.859	110.5	LOS F	5.7	42.8	0.93	1.45	18.0
Approach		142	8.1	142	8.1	0.859	72.2	LOS F	5.7	42.8	0.93	1.45	24.6
West: Yamba Road													
10	L2	45	0.0	45	0.0	0.025	5.5	LOS A	0.0	0.0	0.00	0.58	51.1
11	T1	700	1.5	700	1.5	0.362	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		745	1.4	745	1.4	0.362	0.4	NA	0.0	0.0	0.00	0.03	59.3
All Vehicles		1617	4.2	1617	4.2	0.859	6.9	NA	5.7	42.8	0.10	0.17	50.5

Appendix I

Clause 8, SEPP 71 Assessment

SEPP 71

Aims	How Proposal satisfies aims
(a) To protect and manage the natural, cultural, recreational and economic attributes of the NSW coast	The proposal will not adversely impact on the natural, cultural, recreational and economic attributes of the NSW coast
(b) To protect and improve existing public access to and along coastal foreshores to the extent that this is compatible with the natural attributes of the coastal foreshore	The subject land fronts the Clarence River and does not adjoin any existing foreshore public access
(c) To ensure that new opportunities for public access to and along coastal foreshores are identified and realised to the extent that this is compatible with the natural attributes of the coastal foreshore	Not applicable in respect of coastal foreshores. Existing access to the riverfront is available via McConnells Lane adjoining the property's northern boundary
(d) To protect and preserve Aboriginal cultural heritage, and Aboriginal places, values, customs, beliefs and traditional knowledge	An AHIMS search has revealed no recorded items of Aboriginal cultural heritage, archaeological or historic significance on the site. A copy of the AHIMS search is provided at Appendix H
(e) To ensure that the visual amenity of the coast is protected	Not applicable in respect of coastal views
(f) To protect and preserve beach environments and beach amenity	Not applicable in respect of beach environments and amenity
(g) To protect and preserve native coastal vegetation	No native coastal vegetation is located on the former cane farm
(h) To protect and preserve the marine environment of NSW	All components of the proposed development which may have the capacity impact on the marine environment will be addressed in detail at the Development Application stage and it is anticipated that any consent will be conditional to ensure that the environment is protected
(i) To protect and preserve rock platforms	N/A
(j) To manage the coastal zone in accordance with the principles of ecologically sustainable development (within the meaning of section 6(2) of the Protection of the Environment Administration Act 1991) and section 6 (2) states that ecologically sustainable development can be achieved through the implementation of the following principles and programs: a. The precautionary principle b. Inter-generational equity c. Conservation of biological diversity and ecological integrity d. Improved valuation, pricing and	The proposal is believed to be consistent with the principles of ecologically sustainable development. As in (h) above, issues such as flood impacts, water quality, filling and riverbank protection shall be addressed in detail at later stages in this planning process. Authorities assessing those details will apply ecologically sustainable development principles in their assessments and conditioning.

Aims	How Proposal satisfies aims
incentive mechanisms e. Polluter pays	
(k) To ensure that the type, bulk, scale and size of development is appropriate for the location and protects and improves the natural scenic quality of the surrounding area	The proposed buildings will be out of scale with other structures in the locality but a substantial portion of the site will not be developed which may allow visual screen through plantings. This can be addressed at the Development Application stage. The proposed rezoning will facilitate future development of the land, and will probably involve the construction of large sheds. The site is not elevated or otherwise highly visible from public places. Consideration of screening and materials would be expected as part of any resultant development application, particularly in relation to adjacent farm dwellings.
(l) To encourage a strategic approach to coastal management	The proposal is a response to planning strategies which recognise that marine-based industries located on riverfront land within coastal zones are a viable and acceptable land use. The proposal does not interfere or conflict with the proper strategic management of the coast

Appendix J

Clause 7, SEPP Rural Lands Assessment

Clause 7 Rural Planning Principles

The Rural Planning Principles are as follows:

(a) The promotion and protection of opportunities for current and potential productive and sustainable economic activities in rural areas.

(b) Recognition of the importance of rural lands and agriculture and the changing nature of agriculture and of trends, demands and issues in agriculture in the area, region or state.

(c) Recognition of the significance of rural land uses to the state and rural communities, including the social and economic benefits of rural land use and development.

(d) In planning for rural lands, to balance the social, economic and environmental interest of the community.

(e) The identification and protection of natural resources, having regard to maintaining biodiversity, the protection of native vegetation, the importance of water resources and avoiding constrained land.

(f) The provision of opportunities for rural lifestyle, settlement and housing that contribute to the social and economic welfare of rural communities.

(g) The consideration of impacts on services and infrastructure and appropriate location when providing for rural housing.

(h) Ensuring consistency with any applicable regional strategy of the Department of Planning or any applicable local strategy endorsed by the Director General.

The subject land is mapped as regionally significant farmland under the Department Planning & Infrastructure mapping. However, it has been acknowledged in both regional and local strategies that marine based industries dependant on access to navigable waters can be considered.

The subject property has an area of 21.22 ha and has previously, though not for at least 6 years, been used for cane cultivation.

It is surrounded in the main by large holdings, often the aggregation of a number of parcels, also utilised for cane cultivation. To the north of a horticultural subdivision which in effect is a rural/residential cluster.

The proposal will not take current cane land out of production and it is unlikely that a lot of this size would be viable as a stand-alone cane cultivation operation.

The proposal is consistent with the relevant regional and local planning strategies which support the development of marine-based industries on properties with water access subject to specific locational criteria.

Appendix K

YWE Pty Ltd Quality Assurance Requirements

Welding Inspection Supervision Services

ABN 19 306 262 994

Proprietor: Anthonie Harvey
5 Clarke Street
WOLUMLA NSW 2550

Mobile 0427 324018
mushywelding@bigpond.com

9 April 2016

TO WHOM IT MAY CONCERN

I have been requested by Yamba Welding & Engineering to provide a professional opinion and comment on the possibility and impact of cross-contamination to the surface finish of aluminium boats under construction prior to being painted.

Both my son and I are contract welding supervisors and welding inspectors who work between Taree and the Queensland boarder in many regional fabrication and welding workshops. I have 35 years welding inspection experience in the preparation and completion of aluminium vessels . I have conducted welding inspections and welder qualification for Yamba Welding & Engineering for the past 20 years. A large proportion of the work performed by Yamba Welding is to construct aluminium vessels under contract to various government departments within Australia. The inspection and acceptance criteria under these contracts is extremely rigorous

Yamba Welding works under a Third Party Quality Assurance program with Bureau Veritas to ISO 9001:2008. Steel, metallic paints, copper, brass, zinc, etc., are contaminates to aluminium fabrication. Under this quality system (Quality Assurance is required by most Government Departments and Defence) there is lo be no fabrication of these items in the vicinity of the aluminium vessels. These contaminatesinterfere with the surface preparation but the most detrimental effect of these contamina tes is in the weld. It causes porosity and degrades the welded structure.

The uncoated aluminium material has a self-healing oxide layer present on all aluminium products. When this oxide layer is removed , which is essential prior to painting, the material becomes highly sensitive to surface contaminations in air borne iron oxide prevalent in the sand blasting of any types of steel. Other contaminants include oil, grease, etc. I have witnessed many aluminium surfaces that have been contaminated prior to painting. The painting would initially appear to be satisfactory but over time a corrosive defect under the paint becomes evident.

Bill Collingburn, the Director of Yamba Welding & Engineering, will not, and has not, used a sand blasting process in the preparation of painting his vessels. Due to his expertise in aluminium boat construction he elects to prepare his boats for painting with orbital sanding. Yamba Welding workshop has no steel fabrications or equipment on its premises for the fear of contaminating the aluminium surface of his vessels under construction. As a welding inspector with expertise in metal construction and finishes, I support the practice of Yamba Welding & Engineering in avoiding contamination to their aluminium vessels caused by sandblasting (especially of steel) within nearby and adjacent locations.

Yours sincerely,

L, ng Supervisor Certification No. 15697

Appendix L

AHIMS Search

Aboriginal Cultural Heritage Due Diligence Assessment

Lot 2 DP59876 School Road, Palmers Island NSW

Introduction

This assessment is in accordance with the "Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (DECCW, 2010)."

The Generic Due Diligence Process

Step 1.

"Will the activity disturb the ground surface or any culturally modified trees"?

Yes.

There are no trees of any significance or longevity located on the site.

The majority of the site of the actual Marine Park will be filled to levels equivalent to between the 1 in 20 year flood level to the 1 in 100 year level. The building and civil construction works will occur within these areas with the exception of the launching/recovery basin discussed below and so the existing ground surface will not be disturbed.

The launching/recovery basin will require the excavation of around 6,000m^3 of material which will disturb approximately 1,000m^2 of ground surface down to a depth of around 6 metres.

Step 2.

Are there any:

a) *Relevant confirmed site records or other associated landscape feature information on AHIMS and/or"*
b) *"are other source of information of which a person is already aware? and/or"*
c) *"landscape features that are likely to indicate presence of Aboriginal objects"?*

Answers:

a) No. The attached AHIMS search indicates no Aboriginal sites recorded in the location nor any Aboriginal places declared.
b) No.
c) No. The site is cleared. Contains no vegetation of any note and has previously been used for cane cultivation.

As a result of the Step 2 assessment, the process proceeds to the following:

"AHIP application not necessary. Proceed with caution. If any Aboriginal objects are found, stop work and notify DECCW. If human remains are found, stop work, secure the site and notify the NSW Police and DECCW".

This advice will be provided to the site supervisor and adhered to.

Rob Donges BA MT&CP

Office of Environment & Heritage
NSW GOVERNMENT

AHIMS Web Services (AWS)
Search Result

Your Ref Number : yamba
Client Service ID : 94357

Leanne Jones
1/109 William Street
Port Macquarie New South Wales 2444
Attention: Leanne Jones
Email: admin@hopcon.com.au

Date: 06 March 2013

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 2, DP:DP598769 with a Buffer of 50 meters, conducted by Leanne Jones on 06 March 2013.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

Appendix M

North Coast Regional Plan 2036 Consistency Checklist

APPENDIX 1: NORTH COAST REGIONAL PLAN 2036 CONSISTENCY CHECKLIST

NORTH COAST REGIONAL PLAN 2036 GOALS, DIRECTIONS & ACTIONS	CONSISTENCY	COMMENTS
Goal 1 - The most stunning environment in NSW **Direction 1 - Deliver environmentally sustainable growth**		
Action 1.1 - Focus future urban development to mapped urban growth areas.	No but Justified	The proposed industrial use is located outside of mapped urban growth areas and so is inconsistent with the Action, but it is consistent with: • The Marine Based Industry Policy – Far North Coast and Mid North Coast NSW (NSW Planning & Environment August 2015) • Clarence Marine Precinct (CVC 2010) • Clarence River Way Master Plan (CVC 2009) All of which encourage the development of marine industrial facilities on the Clarence River. All acknowledge the benefit of locating such facilities on the navigable sections of the river with access to the open sea. The areas identified as "Investigation Area – Employment Land" and "Existing Employment Land" on Figure 20 Urban growth map for the Clarence Valley Local Government Area, are not located on the river and are not suitable for the proposed use. The principle that suitable locations may be located outside of growth areas was recognised in the previous Regional Plan and so is reflected in the 3 strategic documents mentioned above. In the circumstances, achieving regional goals relating economic activity and

NORTH COAST REGIONAL PLAN 2036 GOALS, DIRECTIONS & ACTIONS	CONSISTENCY	COMMENTS
		employment through development on the proposed site which has the critical benefit of navigable river access is considered justified.
Action 1.2 - Review areas identified as 'under investigation' within urban growth areas to identify and map sites of potentially high environmental value.	N/A	
Action 1.3 - Identify residential, commercial or industrial uses in urban growth areas by developing local growth management strategies endorsed by the Department of Planning and Environment.	N/A	The proposed industrial use is located outside of identified urban growth areas – see Action 1.1
Action 1.4 - Prepare land release criteria to assess appropriate locations for future residential, commercial and industrial uses.	No but justified	The North Coast Regional Plan 2036 – Implementation Plan 2017-2019 identifies the Department of Planning & Environment partnered by Council as being responsible for delivering this action within a 0-2year timeframe. As such it is outside the power of the proponent to enable the proposal to be consistent with the Action.
Goal 1 - The most stunning environment in NSW **Direction 2 - Enhance biodiversity, coastal and aquatic habitats, and water catchments**		
Action 2.1 - Focus development to areas of least biodiversity sensitivity in the region and implement the 'avoid, minimise, offset' hierarchy to biodiversity, including areas of high environmental value.	Yes, following further studies	The terrestrial component of the site has been assessed as having no biodiversity sensitivity and so avoids any potential impacts. The aquatic component will require further investigation, which is requested to occur prior to public consultation.
Action 2.2 - Ensure local plans manage marine environments, water catchment areas and groundwater sources to avoid potential development impacts.	Yes, following further studies	The Implementation Plan identifies Council as responsible for delivering this Action on an "on-going" basis through Local Environmental Plans, local planning strategies and other land use planning. This Proposal is the commencement of a process which will culminate in a Local Environmental Plan if it proceeds to that stage.

NORTH COAST REGIONAL PLAN 2036 GOALS, DIRECTIONS & ACTIONS	CONSISTENCY	COMMENTS
Goal 1 - The most stunning environment in NSW **Direction 3 - Manage natural hazards and climate change**		
Action 3.1 - Reduce the risk from natural hazards, including the projected effects of climate change, by identifying, avoiding and managing vulnerable areas and hazards.	Yes	Natural hazards, primarily flooding, affecting the property have been identified and addressed in the Proposal.
Action 3.2 - Review and update floodplain risk, bushfire and coastal management mapping to manage risk, particularly where urban growth is being investigated.	N/A	
Action 3.3 - Incorporate new knowledge on regional climate projections and related cumulative impacts in local plans for new urban development.	N/A	
Goal 1 - The most stunning environment in NSW **Direction 4 - Promote renewable energy opportunities**		
Action 4.1 - Diversify the energy sector by identifying renewable energy resource precincts and infrastructure corridors with access to the electricity network.	N/A	
Action 4.2 - Enable appropriate smaller-scale renewable energy projects using bio-waste, solar, wind, small-scale hydro, geothermal or other innovative storage technologies.	N/A	
Action 4.3 - Promote appropriate smaller and community-scale renewable energy projects.	N/A	
Goal 2 - A thriving, interconnected economy **Direction 5 - Strengthen communities of interest and cross-regional relationships**		
Action 5.1 - Collaborate on regional and intra-regional housing and employment land delivery, and industry development.	N/A	
Action 5.2 - Integrate cross-border land use planning between NSW and South East Queensland, and remove barriers to economic, housing and jobs growth.	N/A	
Action 5.3 - Encourage ongoing cooperation and land use planning between the City of Gold Coast and Tweed Shire Council.	N/A	
Action 5.4 - Prepare a regional economic development strategy that drives economic growth opportunities by identifying key enabling infrastructure and other policy interventions to unlock growth.	N/A	
Goal 2 - A thriving, interconnected economy **Direction 6 - Develop successful centres of employment**		
Action 6.1 - Facilitate economic activity around industry anchors such as health, education and airport facilities by considering new infrastructure	No But Justified	Although not directly identified as an industry anchor, the development of

NORTH COAST REGIONAL PLAN 2036 GOALS, DIRECTIONS & ACTIONS	CONSISTENCY	COMMENTS
needs and introducing planning controls that encourage clusters of related activity.		marine-based industries within the region and specifically on the Clarence River has been identified as a strategic outcome in a number of planning documents. The Proposal is inconsistent with the encouragement of clusters of related industries and this is addressed in Part 2 Section A Q1 of this report as not being an ideal or practical arrangement.
Action 6.2 - Promote knowledge industries by applying flexible planning controls, providing business park development opportunities and identifying opportunities for start-up industries.	N/A	
Action 6.3 - Reinforce centres through local growth management strategies and local environmental plans as primary mixed-use locations for commerce, housing, tourism, social activity and regional services.	N/A	
Action 6.4 - Focus retail and commercial activities in existing centres and develop place–making focused planning strategies for centres.	N/A	
Action 6.5 - Promote and enable an appropriate mix of land uses and prevent the encroachment of sensitive uses on employment land through local planning controls.	Yes	The Proposal includes an assessment of a range of land use conflicts, in particular acoustic and traffic impacts both of which conclude that the level of impact will be either within adopted standards/ guidelines or can be designed to meet those standards/guidelines. See Appendix G – Environmental Noise Assessment Report and Appendix H – Transport and Traffic Assessment Report.
Action 6.6 - Deliver an adequate supply of employment land through local growth management strategies and local environmental plans to support jobs growth.	Yes	Should rezoning occur, an existing employment generating business will be able to relocate and expand on the employment land resulting from that local environment plan.
Action 6.7 - Ensure employment land delivery is maintained through an annual North Coast Housing and Land Monitor.	N/A	
Goal 2 - A thriving, interconnected economy **Direction 7 - Coordinate the growth of regional cities**		
Action 7.1 - Prepare action plans for regional cities that:	N/A	

NORTH COAST REGIONAL PLAN 2036 GOALS, DIRECTIONS & ACTIONS	CONSISTENCY	COMMENTS
▪ ensure planning provisions promote employment growth and greater housing diversity; ▪ promote new job opportunities that complement existing employment nodes around existing education, health and airport precincts; ▪ identify infrastructure constraints and public domain improvements that can make areas more attractive for investment; and ▪ deliver infrastructure and coordinate the most appropriate staging and sequencing of development.		
Goal 2 - A thriving, interconnected economy **Direction 8 - Promote the growth of tourism**		
Action 8.1 - Facilitate appropriate large-scale tourism developments in prime tourism development areas such as Tweed Heads, Tweed Coast, Ballina, Byron Bay, Coffs Harbour and Port Macquarie.	N/A	
Action 8.2 - Facilitate tourism and visitor accommodation and supporting land uses in coastal and rural hinterland locations through local growth management strategies and local environmental plans.	N/A	
Action 8.3 - Prepare destination management plans or other tourism focused strategies that: ▪ identify culturally appropriate Aboriginal tourism opportunities; ▪ encourage tourism development in natural areas that support conservation outcomes; and ▪ strategically plan for a growing international tourism market.	N/A	
Action 8.4 - Promote opportunities to expand visitation to regionally significant nature-based tourism places, such as Ellenborough Falls, Dorrigo National Park, Wollumbin–Mount Warning National Park, Iluka Nature Reserve and Yuraygir Coastal Walk.	N/A	
Action 8.5 - Preserve the region's existing tourist and visitor accommodation by directing permanent residential accommodation away from tourism developments, except where it is ancillary to existing tourism developments or part of an area otherwise identified for urban expansion in an endorsed local growth management strategy.	N/A	
Goal 2 - A thriving, interconnected economy **Direction 9: Strengthen regionally significant transport corridors**		
Action 9.1 - Enhance the competitive value of the region by encouraging business and employment activities that leverage major inter-regional transport connections, such as the Pacific Highway, to South East Queensland and the Hunter.	N/A	

NORTH COAST REGIONAL PLAN 2036 GOALS, DIRECTIONS & ACTIONS	CONSISTENCY	COMMENTS
Action 9.2 - Identify buffer and mitigation measures to minimise the impact of development on regionally significant transport infrastructure including regional and state road network and rail corridors.	N/A	
Action 9.3 - Ensure the effective management of the State and regional road network by: ▪ preventing development directly adjoining the Pacific Highway; ▪ preventing additional direct 'at grade' access to motorway-class sections of the Pacific Highway; ▪ locating highway service centres on the Pacific Highway at Chinderah, Ballina, Maclean, Woolgoolga, Nambucca Heads, Kempsey and Port Macquarie, approved by the Department of Planning and Environment and Roads and Maritime Services; and ▪ identifying strategic sites for major road freight transport facilities.	N/A	The Proposal does not affect any of these outcomes
Goal 2 - A thriving, interconnected economy **Direction 10 - Facilitate air, rail and public transport infrastructure**		
Action 10.1 - Deliver airport precinct plans for Ballina–Byron, Lismore, Coffs Harbour and Port Macquarie that capitalise on opportunities to diversify and maximise the potential of value-adding industries close to airports.	N/A	
Action 10.2 - Consider airport-related employment opportunities and precincts that can capitalise on the expansion proposed around Gold Coast Airport.	N/A	
Action 10.3 - Protect the North Coast Rail Line and high-speed rail corridor to ensure network opportunities are not sterilised by incompatible land uses or land fragmentation.	N/A	
Action 10.4 - Provide public transport where the size of the urban area has the potential to generate sufficient demand.	N/A	
Action 10.5 - Deliver a safe and efficient transport network to serve future release areas.	N/A	
Goal 2 - A thriving, interconnected economy **Direction 11: Protect and enhance productive agricultural lands**		
Action 11.1 - Enable the growth of the agricultural sector by directing urban and rural residential development away from important farmland and identifying locations to support existing and small-lot primary production, such as horticulture in Coffs Harbour.	No But Justified	The subject site, although zoned RU1 Primary Production and having been in the past utilized for cane cultivation, is not by itself a viable agricultural holding. See 1.2 and 1.5 in Appendix E for further assessment.

NORTH COAST REGIONAL PLAN 2036 GOALS, DIRECTIONS & ACTIONS	CONSISTENCY	COMMENTS
Action 11.2 - Deliver a consistent management approach to important farmland across the region by updating the Northern Rivers Farmland Protection Project (2005) and Mid North Coast Farmland Mapping Project (2008).	N/A	
Action 11.3 - Identify and protect intensive agriculture clusters in local plans to avoid land use conflicts, particularly with residential and rural residential expansion.	N/A	No intensive agriculture clusters are in the locality.
Action 11.4 - Encourage niche commercial, tourist and recreation activities that complement and promote a stronger agricultural sector, and build the sector's capacity to adapt to changing circumstances.	N/A	
Action 11.5 - Address sector-specific considerations for agricultural industries through local plans.	N/A	
Goal 2 - A thriving, interconnected economy **Direction 12 - Grow agribusiness across the region**		
Action 12.1 - Promote the expansion of food and fibre production, agrichemicals, farm machinery, wholesale and distribution, freight and logistics, and processing through flexible planning provisions in local growth management strategies and local environmental plans.	N/A	
Action 12.2 - Encourage the co-location of intensive primary industries, such as feedlots and compatible processing activities.	N/A	
Action 12.3 - Examine options for agribusiness to leverage proximity from the Gold Coast and Brisbane West Wellcamp airports.	N/A	
Action 12.4 - Facilitate investment in the agricultural supply chain by protecting assets, including freight and logistics facilities, from land use conflicts arising from the encroachment of incompatible land uses.	N/A	
Goal 2 - A thriving, interconnected economy **Direction 13 - Sustainably manage natural resources**		
Action 13.1 - Enable the development of the region's natural, mineral and forestry resources by directing to suitable locations land uses such as residential development that are sensitive to impacts from noise, dust and light interference.	N/A	
Action 13.2 - Plan for the ongoing productive use of lands with regionally significant construction material resources in locations with established infrastructure and resource accessibility.	N/A	
Goal 3 - Vibrant and engaged communities **Direction 14 - Provide great places to live and work**		

NORTH COAST REGIONAL PLAN 2036 GOALS, DIRECTIONS & ACTIONS	CONSISTENCY	COMMENTS
Action 14.1 - Prepare precinct plans in growth areas, such as Kingscliff, or centres bypassed by the Pacific Highway, such as Woodburn and Grafton, to guide development and establish appropriate land use zoning, development standards and developer contributions.	N/A	
Action 14.2 - Deliver precinct plans that are consistent with the Precinct Plan Guidelines (Appendix C).	N/A	
Goal 3 - Vibrant and engaged communities **Direction 15 - Develop healthy, safe, socially engaged and well-connected communities**		
Action 15.1 - Deliver best-practice guidelines for planning, designing and developing healthy built environments that respond to the ageing demographic and subtropical climate.	N/A	
Action 15.2 - Facilitate more recreational walking and cycling paths and expand inter-regional and intra-regional walking and cycling links, including the NSW Coastline Cycleway.	N/A	
Action 15.3 - Implement actions and invest in boating infrastructure priorities identified in regional boating plans to improve boating safety, boat storage and waterway access.	N/A	
Action 15.4 - Create socially inclusive communities by establishing social infrastructure benchmarks, minimum standards and social impact assessment frameworks within local planning.	N/A	
Action 15.5 - Deliver crime prevention through environmental design outcomes through urban design processes.	N/A	
Goal 3 - Vibrant and engaged communities **Direction 16 - Collaborate and partner with Aboriginal communities**		
Action 16.1 - Develop partnerships with Aboriginal communities to facilitate engagement during the planning process, including the development of engagement protocols.	N/A	
Action 16.2 - Ensure Aboriginal communities are engaged throughout the preparation of local growth management strategies and local environmental plans.	Yes	Local Aboriginal communities will be engaged in the process leading to the local environment plan as required by Council and the State Government,
Goal 3 - Vibrant and engaged communities **Direction 17: Increase the economic self-determination of Aboriginal communities**		
Action 17.1 - Deliver opportunities to increase the economic independence of Aboriginal communities through training, employment and tourism.	N/A	
Action 17.2 - Foster closer cooperation with Local Aboriginal Land Councils to identify the unique potential and assets of the North Coast	N/A	

NORTH COAST REGIONAL PLAN 2036 GOALS, DIRECTIONS & ACTIONS	CONSISTENCY	COMMENTS
communities.		
Action 17.3 - Identify priority sites with economic development potential that Local Aboriginal Land Councils may wish to consider for further investigation.	N/A	
Goal 3 - Vibrant and engaged communities **Direction 18 - Respect and protect the North Coast's Aboriginal heritage**		
Action 18.1 - Ensure Aboriginal objects and places are protected, managed and respected in accordance with legislative requirements and the wishes of local Aboriginal communities.	Yes	A Due Diligence report including an AHIMS search have been undertaken (see Appendix L). It is anticipated that further engagement with the Aboriginal community will be required and that any development consents will be conditioned to provide protection to objects which may be uncovered during development construction phase.
Action 18.2 - Undertake Aboriginal cultural heritage assessments to inform the design of planning and development proposals so that impacts to Aboriginal cultural heritage are minimised and appropriate heritage management mechanisms are identified.	Yes	See 18.1 above
Action 18.3 - Develop local heritage studies in consultation with the local Aboriginal community, and adopt appropriate measures in planning strategies and local plans to protect Aboriginal heritage.	N/A	
Action 18.4 - Prepare maps to identify sites of Aboriginal heritage in 'investigation' areas, where culturally appropriate, to inform planning strategies and local plans to protect Aboriginal heritage.	N/A	
Goal 3 - Vibrant and engaged communities **Direction 19 - Protect historic heritage**		
Action 19.1 - Ensure best-practice guidelines are considered such as the Australia International Council on Monuments and Sites (ICOMOS) Charter for Places of Cultural Significance and the NSW Heritage Manual when assessing heritage significance.	N/A	
Action 19.2 - Prepare, review and update heritage studies in consultation with the wider community to identify and protect historic heritage items, and include appropriate local planning controls.	N/A	
Action 19.3 - Deliver the adaptive or sympathetic use of heritage items and assets.	N/A	
Goal 3 - Vibrant and engaged communities		

NORTH COAST REGIONAL PLAN 2036 GOALS, DIRECTIONS & ACTIONS	CONSISTENCY	COMMENTS
Direction 20 - Maintain the region's distinctive built character		
Action 20.1 - Deliver new high-quality development that protects the distinct character of the North Coast, consistent with the North Coast Urban Design Guidelines (2009)	N/A	
Action 20.2 - Review the North Coast Urban Design Guidelines (2009).	N/A	
Goal 3 - Vibrant and engaged communities **Direction 21 - Coordinate local infrastructure delivery**		
Action 21.1 - Undertake detailed infrastructure service planning to support proposals for new major release areas.	N/A	
Action 21.2 - Maximise the cost-effective and efficient use of infrastructure by directing development towards existing infrastructure or promoting the co-location of new infrastructure.	N/A	
Goal 4 - Great housing choice and lifestyle options **Direction 22 - Deliver greater housing supply**		
Action 22.1 - Deliver an appropriate supply of residential land within local growth management strategies and local plans to meet the region's projected housing needs.	N/A	
Action 22.2 - Facilitate housing and accommodation options for temporary residents by: ▪ preparing planning guidelines for seasonal and itinerant workers accommodation to inform the location and design of future facilities; and ▪ working with councils to consider opportunities to permit such facilities through local environmental plans.	N/A	
Action 22.3 - Monitor the supply of residential land and housing through the North Coast Housing and Land Monitor.	N/A	
Goal 4 - Great housing choice and lifestyle options **Direction 23 - Increase housing diversity and choice**		
Action 23.1 - Encourage housing diversity by delivering 40 per cent of new housing in the form of dual occupancies, apartments, townhouses, villas or dwellings on lots less than 400 square metres, by 2036.	N/A	
Action 23.1 - Develop local growth management strategies to respond to changing housing needs, including household and demographic changes, and support initiatives to increase ageing in place.	N/A	
Goal 4 - Great housing choice and lifestyle options **Direction 24: Deliver well-planned rural residential housing areas**		

NORTH COAST REGIONAL PLAN 2036 GOALS, DIRECTIONS & ACTIONS	CONSISTENCY	COMMENTS
Action 24.1 - Facilitate the delivery of well-planned rural residential housing areas by: ▪ identifying new rural residential areas in a local growth management strategy or rural residential land release strategy endorsed by the Department of Planning and Environment; and ▪ ensure that such proposals are consistent with the Settlement Planning Guidelines: Mid and Far North Coast Regional Strategies (2007) or land release criteria (once finalised).	N/A	
Action 24.2 - Enable sustainable use of the region's sensitive coastal strip by ensuring new rural residential areas are located outside the coastal strip, unless already identified in a local growth management strategy or rural residential land release strategy endorsed by the Department of Planning and Environment.	N/A	
Goal 4 - Great housing choice and lifestyle options **Direction 25 - Deliver more opportunities for affordable housing**		
Action 25.1 - Deliver more opportunities for affordable housing by incorporating policies and tools into local growth management strategies and local planning controls that will enable a greater variety of housing types and incentivize private investment in affordable housing.	N/A	
Action 25.2 - Prepare guidelines for local housing strategies that will provide guidance on planning for local affordable housing needs.	N/A	

NSW GOVERNMENT | Planning & Environment

Mr A Lindsay
Acting General Manager
Clarence Valley Council
Locked Bag 23
GRAFTON NSW 2460

Our ref: 16/15472
Your ref: REZ16/001

Attention: Deborah Wray

Dear Mr Lindsay

Planning Proposal – Palmers Island Marine Industry Park

I am writing in response to Council's letter dated 6 June 2017 requesting a Gateway determination under Section 56 of the Environmental Planning and Assessment Act 1979 in respect to the Planning Proposal to establish the Palmers Island Marine Industry Park on part of Lot 2 DP 598769, School Road, Palmers Island. Reference is also made to discussions on this matter with Department staff.

It is considered appropriate in this instance that Council staff seek the position and a resolution of Council on this matter to determine whether there is continued support for the proposal in its revised design. The revised Planning Proposal includes considerable new information and detail which is significantly different to what Council considered at its meeting in November 2016 in response to Councils resolution to reduce the proposal and undertake reporting on various aspects.

Prior to the Department accepting and proceeding with an assessment of the proposal, it is important to determine whether Council supports the revised information.

Should you have any further enquiries about this matter please contact Jon Stone in our Northern Region on telephone number (02) 6701 9688.

Yours sincerely

5 JULY 2017.

Jeremy Gray
Director Regions, Northern
Planning Services