Mooney Mooney & Peat Island Planning Proposal

Maritime Facilities Review

6 September 2016

Government Property NSW

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Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	05.08.2016	D. Bond	J. Taylor	C. Avis	DRAFT for review
B	26.082016	K Aldemir	J. Taylor	C. Avis	Final Report
C	06.09.2016	K Aldemir	J. Taylor	C. Avis	Final Report – Minor Amendments

Information class: Standard

Contents

1 Introduction

Mott MacDonald has been engaged to provide engineering services to support the Planning Proposal to rezone State Government owned land at Mooney Mooney and Peat Island (The Site).

1.1 Project Appreciation

A previous planning proposal was submitted to the Department of Planning and Environment (DPE) for consideration in 2014. As part of the proposal a Marina Assessment was undertaken by NPC. Comments from the review by DPE indicated that further examination of the proposed Marina needed to be explored and addressed in the planning proposal.

This study aims to address previous concerns and incorporate as part of the updated planning proposal.

1.2 Objectives of this Report

This report has been prepared in order to:

- outline the consideration of options for increasing boat storage in the Peat Island and Mooney Mooney area
- detail the opportunities and constraints for the options for consideration with each option
- provide recommended actions to progress the options of additional boat storage to development
- identify and recommend boat storage development options for The Site

1.3 Recommendation for Additional Boating Infrastructure

Transport for NSW published “The Regional Boating Plan for Hawkesbury River, Pittwater and Brisbane Water Region” in 2015. This report references NSW Maritime’s 2010 NSW Boat Ownership and Storage Growth Forecasts to 2026 which forecasts a continuing growth trend in vessel ownership of 2.9% annually across NSW.

The Report used a different regional profile to that being used for the Regional Boating Plan; however, it identified the Hawkesbury/ Broken Bay region (which incorporates Pittwater) as one of the largest areas in the State in terms of boat ownership. The continuing population growth in the region together with high boat ownership of the current population supports the forecasted trend in vessel ownership.

A previous planning proposal was submitted to the Department of Planning and Environment (DPE) for consideration in 2014. Previous investigations undertaken by other consultants revealed a potential need for increased moorings in the region. The Peat Island and Mooney Mooney Planning Proposal Report (Urbis, 2014) stated that there is currently an undersupply of vessel storage in the region and that the Hawkesbury River / Broken Bay area is forecast to experience 1.8% to 4% per annum growth in the number of vessels greater than 6 metres in length seeking berthing arrangements between 2009 and 2026. As such, Mott MacDonald has considered the inclusion of additional boat storage by considering:

- A new Peat Island & Mooney Mooney Marina; and/ or
- Landside dry stack boat storage at Mooney Mooney.

2 The Site

The Site is situated on the north bank of the Hawkesbury River, adjacent to the Pacific Highway and is located within the Central Coast Council LGA. The Site location is shown in Figure 1

The Site covers an area of 38ha and is currently made up of 17 existing lots. The Site is generally bound by the Popran National Park to the north and the Hawkesbury River to the south, east and west. It is currently zoned a mixture of RE1 Public Recreation and SP2 Special Infrastructure.

Figure 1: The Site

Source: Google Earth 2016

3 Proposed Rezoning

The rezoning would provide a mix of community, residential, recreation and employment generating uses, as shown below in Figure 2. The rezoning also allows a marina facility, with supporting landside infrastructure.

This report identifies potential issues associated bathymetry, topography and coastal processes and consideration has been given to each in the concept plan.

Figure 2: Proposed Rezoning

Source: Urbis 2016

4 Reference Documents

Project reference documents considered for development of this report include:

- The Peat Island and Mooney Mooney Rezoning Report, by Urbis, 2014
- Bathymetric Survey by Hydrographic Surveys and Remote Sensing, May 2016
- Ecological Conservation Plan by Travers, May 2016
- Transport for NSW Regional Boating Plan, Hawkesbury River, Pittwater and Brisbane Water Region, February 2015

5 Foreshore Site Information

5.1 Foreshore Site Description

Peat Island and Mooney Mooney are located at the northern bank of the Hawkesbury River, directly west of the Pacific Highway. Peat Island is approximately 400m in length and 100m in width. It is roughly parallel to the Mooney Mooney shoreline and approximately 220m from the shoreline. A causeway provides public access to Peat Island from the mainland and Mooney Mooney.

The Hawkesbury River flows from west to east across The Site. At Peat Island, the river's flow is separated with majority of the flow passing west of Peat Island and some flow passing through the causeway opening on the eastern side of the island.

The shoreline at Mooney Mooney is covered with mangroves apart from some isolated areas of sandy shoreline and the abutment for the causeway. The shoreline and mangroves are located adjacent to tidal mud plains at both the northern and southern sides of the causeway. Majority of the area proposed for the marina development is currently tidal mud plains. Thus, dredging would be required if a marina were to be installed.

The eastern shoreline of Peat Island appears to be comprised mainly of low lying rock revetment.

5.2 Bathymetry

For the purposes of considering a marina development, the bathymetry of the seabed can be a critical constraint. A hydrographic survey of the area was recommended by Mott MacDonald and was undertaken by Hydrographic Surveys and Remote Sensing in May 2016. The survey shows the bathymetry of the seabed relative to Chart Datum (CD). Zero Chart Datum (CD) is equivalent to zero on the Fort Denison Tide Gauge in Sydney. It covers the extent of area to the north and south of the causeway and extends south of Peat Island along the Mooney Mooney shoreline, up to the boat ramp.

The 0.0m contour shown on the survey represents Lowest Astronomical Tide (LAT), and therefore represents the boundary of the tidal mud plains.

A copy of the hydrographic survey is provided in Appendix A - Surveys.

5.3 Topography

A topographic survey of Peat Island and Mooney Mooney was undertaken by Chase Burke Harvey. The survey levels are shown relative to Australian Height Datum (AHD). A copy is provided in Appendix A.

5.4 Water Levels

5.4.1 Tidal Planes

The tidal plains at Mooney Mooney are assumed to be approximately equivalent to those at Spencer, which houses the nearest NSW Public Works, Manly hydraulics Laboratory (MHL),

tide gauge. Tidal plains are assumed to be as outlined in MHL NSW Tidal Planes Analysis (1999-2010) report, dated October 2012. The levels are summarised in Table 1 below. It is noted that the tidal planes are provided in both Australian Height Datum (AHD) (m) and relative to CD, or Lowest Astronomical Tide (LAT) in Sydney, which is equivalent to zero on the Fort Denison Tide Gauge.

Table 1: Tidal Planes – Mooney Mooney and Peat Island

Description	Relative Level (AHD)	Relative Level (CD)
Mean high water Springs (MHWS)	0.76m	1.69m
Mean High Water Neaps (MHWN)	0.51m	1.44m
Mean Sea Level (MSL)	0.08m	1.01m
Mean Low Water Neaps (MLWN)	-0.34m	0.59m
Mean Low Water Springs (MLWS)	-0.59m	0.34m
Indian Spring Low Water (ISLW)	-0.83m	0.10m

Note: For comparative purposes, the bathymetric survey is provided relative to CD.

5.4.2 Critical Water Levels

Table 2 below outlines the approximate critical water levels, based on flooding of the Hawkesbury catchment.

Table 2: Critical Water Levels

Storm Event	Flood Level (AHD)
1% Annual Exceedance Probability (Existing)	RL 2.0m
1% Annual Exceedance Probability (Design)	RL 1.7m
Probable Maximum Flood (Design)	RL 3.3m

Source: Mott MacDonald Water Cycle Management Review, August 2016

The tide and flood levels provided above do not include allowance for Sea Level Rise (SLR) or Storm Surge, which should be considered over the proposed service life of any infrastructure during the design stage.

6 Vessel Storage Options

6.1 General

The preliminary concept plan of the marina and dry stack storage are provided as part of the planning proposal package. The basis and assumptions for determining the plan arrangements and scale of development proposed for each option are outlined below.

The sizing of both the marina and dry stack storage are indicative only, and final arrangement will be dependent on detailed site specific analysis and investigations including a market study.

6.2 Peat Island and Mooney Mooney Marina

6.2.1 Location

From preliminary analysis of the topographic survey, bathymetric survey and general site observations, it is anticipated that the southern side of the Peat Island Causeway could potentially provide a suitable location for a marina. This primarily considers existing ecological constraints on the foreshore and potential protection provided by the causeway. The concept plan was progressed on that basis. Situating the marina to the south of the causeway provides the potential for the marina to be protected from any flood debris. The causeway could also impact suspended sediment coming from upstream, possibly reducing dredge infilling. This requires further investigation to assess and confirm.

6.2.2 Scale of Development

A maximum marina footprint was developed considering ecological impact, visual impact and appropriateness to adjoining land uses. A minimum off set of 30m was applied between the marina and mangroves as well as the marina and the causeway. A marina constructed within this footprint could accommodate in the order of 110 to 130 vessels ranging from 8m to 25m+. This is based on applying typical vessel size distributions used in recent marina developments within NSW and dimensional criteria provided in AS3962 Guidelines for Design of Marinas. A site specific vessel size distribution study would need to be undertaken to inform any marina design. The marina arm locations shown are indicative only.

The development of a marina will require supporting landside infrastructure including a marina office and a parking area as a minimum. The proposed landside office and parking allowance have been developed in accordance with AS3962. AS3962 recommends 0.3-0.5 spaces per wet berth for parking, and recommends the lower bound value for commercial marinas. The quantity of parking shown on the concept plan represent between 0.3-0.4 spaces per wet berth once allowance for quantity dry storage is also considered.

6.2.3 Opportunities and Constrains

It is noted that opportunities and constraints were summarised and overlain on a general arrangement that plan to inform the iterative design process.

Several opportunities and constraints exist for developing the vessel storage and foreshore access infrastructure at Mooney Mooney and Peat Island as identified by Mott MacDonald in the

Opportunities and Constraints Map developed. The majority of constraints identified are environmental impact hazard that require further assessment.

6.3 Dry Stack Storage at Mooney Mooney

6.3.1 General

The development of a dry stack storage facility has been considered. There is likely to be sufficient demand to build both a marina and dry stack storage. It is also possible to develop a dry stack storage facility independent of the marina.

If a storage warehouse was 3 boats high then a 70m long by 50m wide by 12m high building could store 126 vessels.

Examples of dry stack storage arrangements in Sydney and Akuna Bay in NSW are shown in Figure 3 and Figure 4.

6.3.2 Warehouse and Rocking

Modern dry-stack facilities can store vessels with lengths in excess of 15m (50'). However, it is suggested that the dry-stack be designed to take vessels between 6 and 12m in length. To achieve this, the working or operating aisle of the facility will need to be about 22m wide. With racks up to 12m deep on each side and allowance for the warehouse and perimeter access, the warehouse will need to be up to 50m wide.

Triple-width boat bays suit most requirements with vertical spans generally ranging from 8.5 to 10.0m wide and allowing 3 vessels per span. Triple width racks have proven to give the greatest storage flexibility as compared with double and single width racks. Vertical heights in these racks can be adjusted to fit varying boat profiles but each boat space would average a height of 3.4m.

If the building height was 12m then this would permit boats to be racked "3-high". On the basis that 3 vessels wide are racked within each 10m wide span, then there will be 9 vessels racked per 10m length of each side of the warehouse.

6.4 Holding Berth Requirements

There will need to be some dedicated on-water and readily accessible holding berths for returned boats awaiting lift-out, or launched boats awaiting collection by the owners. It is suggested that provision be made for holding berths for 6 - 8 vessels of up to 8m in length.

6.5 Wash down/Checking/Repair Area

As a support area for dry-stack vessel wash-downs and checking (compulsory before racking), as well as vessels repairs, an apron with an area of approximately 20m x 40m adjoining the dry-stack facility would be advantageous.

6.6 Parking

Within the Australian Standard AS 3962-2001, Guidelines for Design of Marinas, car parking spaces for dry stack berths are recommended to be 0.2 to 0.4 spaces per berth. Assuming the mid range of 0.3 spaces and a 126 vessel dry stack facility then an area to accommodate car parking for 38 vehicles would be required plus some staff and service contractor parking.

Figure 3: Typical Dry Stack Storage Warehouse – Rozelle Bay

Figure 4: Typical Dry Stack Storage Warehouse – Akuna Bay

7 Recommendations

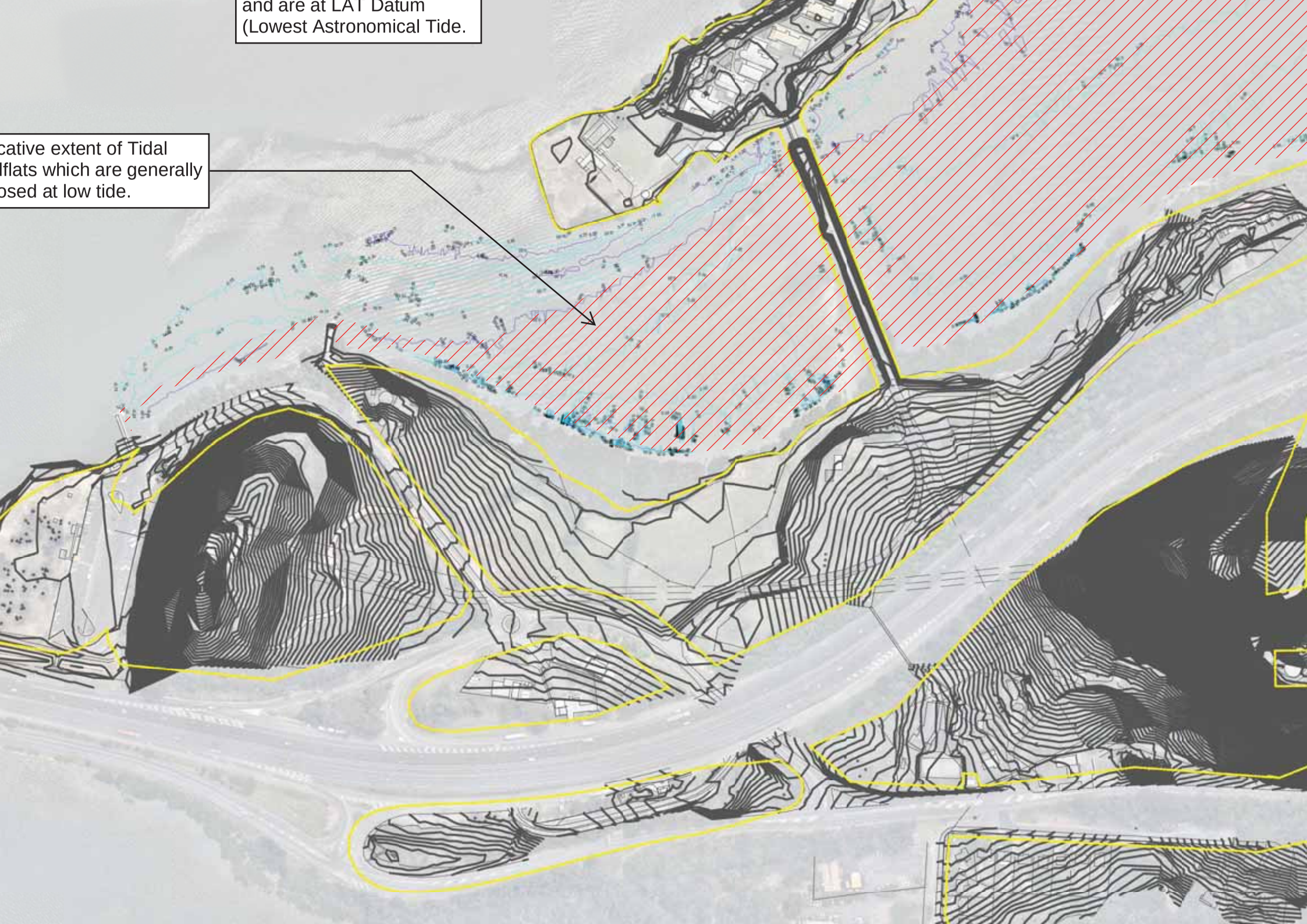
Mott MacDonald's assessment found that Marina facilities are possible at the proposed location. Therefore, the concept plan and rezoning plan within the planning proposal warrants merit.

Prior to construction it is recommended that the feasibility of a marina and dry stack storage is assessed. This would include an assessment of the impacts and effectiveness of dredging in regards to hydrodynamic conditions (especially flushing) and sedimentation in the marina. It is likely that hydraulic modelling would be required with the aim of establishing sedimentation rates in the new marina so that the any future needs for maintenance dredging can be assessed. Consideration should also be given to the environmental approvals process and the fact that any dredging would be undertaken in and area identified as high value mudflats, and also likely to contain acid sulphate soils.

The outcome of this assessment confirms the recommendation to assess the requirement for dredging and the impacts of potential acid sulphate soils and the high value mud flat in the early stages of any project development.

Appendices

A. Surveys


and are at LAT Datum
(Lowest Astronomical Tide.
cative extent of Tidal
lflats which are generally
osed at low tide.

B. Marina Concept Plan


Residential
Residential
Residential
National Park
Public Park
Public Park
RFS / Community Centre
Residential
Residential
Chapel / Community Centre
Residential
Public Car Park
Public Park
Medium Density Residential 1-2 storeys
Medium Density Residential 1-3 storeys
Townhouses
Marina Car Park
Public Car Park
Relocated Ambulance Services
Boat Stacker
Marina
Public Park
Building commodation
Refurbished Existing Buildings
tel / Accommodation
Medium Density Residential 1-3 storeys
Local Neighbourhood Centre
Relocated RMS Highway Services
Residential
Townhouses
Public Park
Expanded Public Carpark with new and upgraded facilities
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