

Planning of Major Recreational Boating Facilities at Shell Cove Boat Harbour

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Abstract

Recreational boat ownership in NSW is forecasted to grow at around 3% annually. With limited boat storage and maintenance facilities located south of Sydney, pressure on boating infrastructure is proposed to be relieved in the area with the construction of the Shell Cove Boat Harbour.

The Shell Cove Boat Harbour is one of the most significant recreational boating facilities proposed for the NSW coast, located approximately 100km south of Sydney. The \$150 million plus boat harbour development includes excavation of a harbour basin bound by public promenade and boardwalk, and a trained entrance channel providing direct open ocean access.

The harbour development will support several integrated boating facilities to meet modern day user demands and expectations. These facilities include the following:

- staged 270 berth floating marina for vessels up to 30m in length;
- public jetty and pontoons suitable for berthing charter vessels;
- public drop off/pick up pontoons;
- temporary special event mooring areas;
- vessel maintenance facility supported by a 75 tonne travel lift;
- up to 150 berth dry boat storage facility;
- regional scale twin lane boat ramp and car-trailer parking;
- on-water fuel and sewage pump-out facilities; and,
- heavy duty multi-use jetty.

The design development dates back more than 20 years that has been carried out by Advisian (previously trading as WorleyParsons). Construction of the harbour development commenced in 2013 and is expected to be complete by 2020. The majority of harbour works is being constructed in relatively dry conditions assisted by regular dewatering, with the harbour to be eventually flooded.

Introduction

Shell Cove is a large scale, masterplanned, beachside, urban development that is centred around the Boat harbour and is currently under construction. The Shell Cove Boat harbour Project is being managed under the joint venture (JV) of Frasers Property Australia (previously Australand) and Shellharbour City Council. Advisian (part of the WorleyParsons Group) have been engaged by Frasers Property Australia for the design and documentation of the Project.

The Project involves digging out a harbour landward of the Shellharbour South Beach that is being formalised with varying rock and concrete foreshore edge treatments. The layout of the Boat harbour is shown in Figure 1 and consists of the following:

- Inner Harbour (location for the Marina, Public Jetty and Town Centre);
- Outer Harbour (location of boat launching, dry boat storage and vessel maintenance facilities); and,
- Access Channel (defined by the Breakwater and Groyne).



Figure 1 – Boat Harbour Layout

Inner Harbour Facilities

The Inner Harbour's boating facilities comprise of the Marina and the Public Jetty.

The Shell Cove Marina is to be a higher-end marina to service both power and sailing vessels. It will be the first marina encountered when traveling south of Sydney (approximately 65km south of Port Hacking) with the next marina to south located at Batemans Bay (around 150km away).

The marina will support 270 private and casual floating berths for vessels up to 30 m in length. The marina layout is shown on Figure 2 and comprises of two main walkway arms extending from the Town Centre area. The Marina is to be constructed over 3 stages with around 2 years proposed between stages. However, the staging program will be revised when a better understanding of market is developed following release of the first 115 berths in Stage 1. Demand studies over the years have been carried out that include analysis of boat sales and usage in the area and across the state, as well targeted surveys

and an Expression of Interest. It is seen to be difficult to accurately predict the marina berth demand without being able to bench-mark from other nearby marinas. However, without nearby competing marinas, and being in an area with a strong boating culture coupled with limited permanent mooring opportunities, it is expected the marina berths will be in high demand.

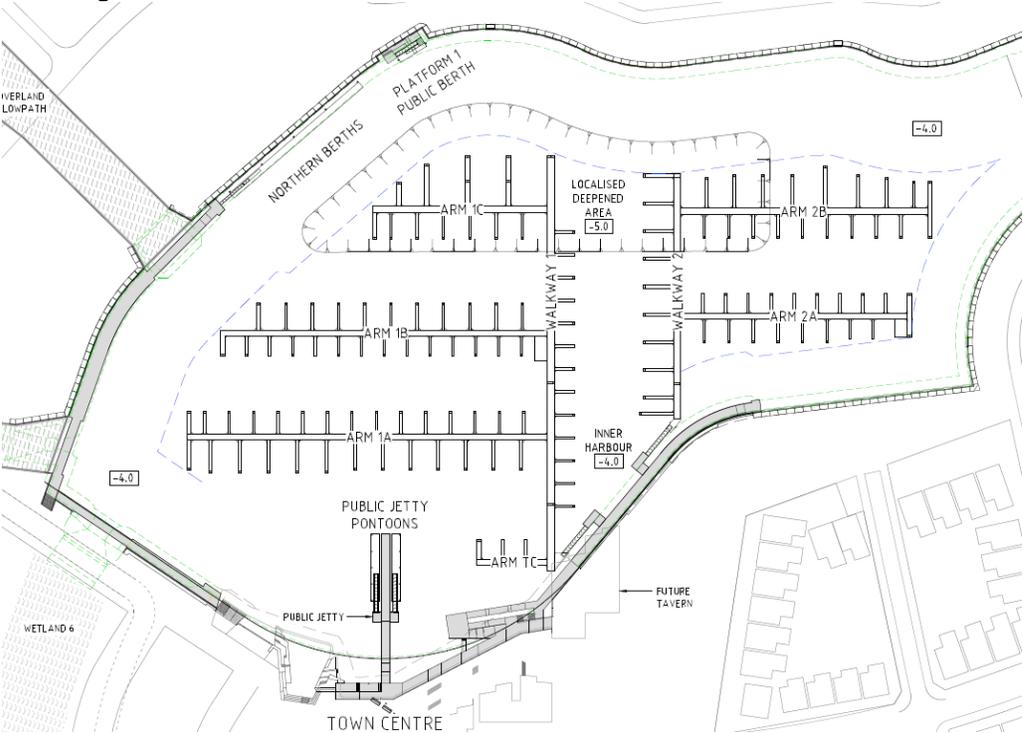


Figure 2 – Marina Layout

The Marina will be constructed by Walcon Marine using their hinged proprietary marina system. The pontoons will be constructed using triple skin polyethylene floatation units bolted to an aluminium frame. Concrete pontoon deck panels are proposed that will support pedestrian traffic only with all berthing, wind and wave loads to be transferred through the aluminium frame. Photographs of the proposed pontoons are provided in Figure 3.

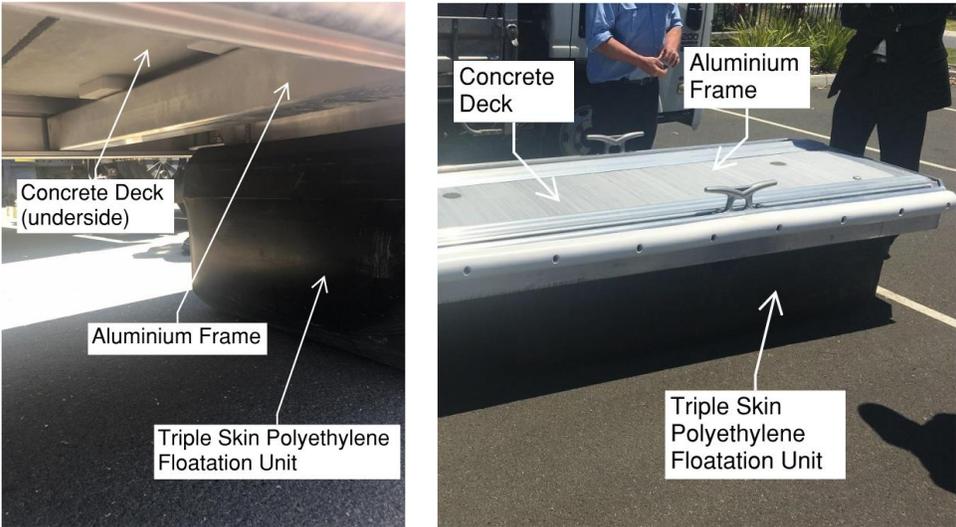


Figure 3 – Pontoon Design

The footprint of the Marina is within the extents of an over-excavated portion of the harbor basin that has been filled up to the design bed level with acid sulfate soils. While this approach has benefited the Project by storing excavated acid sulfate onsite and providing rock and fill for re-use, piling for the Marina has become more challenging. As such, the piles are required to be up to 8m longer to at least reach the over-excavated rock level. The characteristics of the placed acid sulfate material is generally poor strength and variable, and therefore cannot be relied upon to provide pile support. Furthermore, acid sulfate soils can be corrosive to unprotected steel and concrete structures that presents a durability risk. This has been mitigated with the use of HDPE sleeves to be installed to close to the full marina pile length.

The Public Jetty is a 70m long timber structure that extends from the architecturally designed Town Centre as shown in Figure 4. The Public Jetty is to be flanked either side by 32m long and 4m wide pontoons capable of berthing commercial charter vessels such as whale watching tours. Casual berthing would also be supported by the Public Jetty pontoons.



Figure 4 – Public Jetty Computer Generated Image (source: Frasers Property Australia)

Around the outskirts of the Inner Harbour temporary mooring blocks have also been installed that would be used to moor vessels up to 30m for special events such as boat shows.

The Outer Harbour Boating Facilities

The Outer Harbour will support the boat launching ramp, on-water fuel and sewage pump-out services, the vessel maintenance facility and the dry boat storage. All of these components have been carefully considered to promote efficient interaction or separation with each other where required. The Outer Harbour Facilities preliminary layout is provided in Figure 5.

enclosed and supported by a multi-use jetty for launching/retrieving boats with a negative lift forklift.

The biggest challenge of developing the Outer Harbour facilities was managing the interaction between the various user groups of the area. In particular, the harbour edge public promenade is required to cross the path of the boat travel lift machine, the dry boat storage fork lift and the boat ramp vehicle entry and exit routes. These interactions between pedestrians and machines/vehicles are to be managed with gates, signs, staff, and management plans. A further complication to the area is the industrial nature of the Outer Harbour Facilities that will have residents located nearby. Therefore, due to the sensitivities presented, the Outer Harbour facilities are being design to minimise noise, dust and emissions while incorporating architectural design to be aesthetically accommodating to the surrounding residential environment.

Construction

The Shell Cove Boat Harbour Project is five years into a seven year construction program. The most unique component of the boat harbour construction is that it is undertaken in dry conditions using predominately land-based plant and equipment. The boat harbour is separated from the ocean with a sand plug, and requires ongoing dewatering of groundwater and stormwater to stay dry.

The implementation of dewatering has benefited several construction components of the Project such as the excavation, and management of acid sulfate soils, construction of the foreshore, and piling for the marina and boardwalk. However, the reburied acid sulfate soils has also created boggy conditions that prove challenging for larger plant required to track across harbour floor, in particular trucks, excavators, and piling rigs. This issue has been overcome by using a swamp dozer, an amphibious excavator, and constructing temporary access roads where required.

An aerial photograph of the dewatered Boat harbour is provided in Figure 6.



Figure 6 – Aerial Photograph of Construction (source: Frasers Property Australia)

References

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