

Note / Memo

**Haskoning Australia PTY Ltd.
Maritime & Aviation**

To: Paul Busmanis
From: Rick Plain & Gary Blumberg
Date: Friday, 16 March 2018
Copy:
Our reference: M&APA1326N010D03
Classification: Open

Subject: Brunswick Street Boat Ramp Facility - Concept Design Memo

1. Background

The Ballina Shire Council is planning to upgrade seven (7) small craft facilities along the Richmond River and North Creek. The maritime infrastructure proposed at these sites comprises boat ramps, associated carpark facilities and pontoons.

A previous concept design and memorandum was prepared by RHDHV in 2017 for proposed maritime works at the Brunswick Street boat ramp. The concept design involved the renewal of an existing boat ramp at a suitable grade, replacement of an existing concrete finger wharf with a new floating pontoon structure and provision of formalised car and trailer parking along Brunswick Street that also required realignment of the Street.

Council and the Roads and Maritime Services (RMS) reviewed the previous concept designs and provided comment. The comments are summarised below:

- General sentiment is that funding may be better used for other facilities, especially with Fisheries Creek boat ramp nearby.
- Car parking and the designated rigging/de-rigging area is likely to obstruct driveway access and limit driver vision for vehicles entering or exiting private properties along Brunswick Street.
- The design is likely to result in technical difficulties in regards to the road realignment, in particular cost of construction and demolition works and community opposition to the road realignment.
- The ramp receives minimal use and does not currently meet safety requirements. It is mostly used by small runabouts, PWC's and passive craft.

It is apparent that the proximity to local residents combined with limited space for car and trailer parking pose significant constraints for any potential upgrades. Further, the Fisheries Creek boat ramp located at the end of Johnson Drive is approximately 1 km from Brunswick Street by road or 700 m by water (upstream). This facility is the main boat ramp in Ballina and comprises a 3 lane concrete ramp in good condition and multiple pontoons, currently being upgraded, with adequate car and trailer parking.

There is limited incentive or benefit for Council or RMS to retain the boat launching facility at Brunswick Street. In light of recent reviews and discussions, it is understood that Council and RMS' preference would be to provide passive recreation launching facilities at Brunswick Street.

The previous concept design has been refined and is documented herein. The new concept design has regard for Council and RMS' previous comments. This memo should be read in conjunction with the

Basis of Design (BoD) document “M&APA1326R001D01 – Ballina Maritime Works BoD” which sets out all key design parameters for the development and “M&APA1326N100D0.2 – Change of Scope – Brunswick Street and Lennox Head (North Creek)”. The BoD includes a review of all existing site information, environmental conditions, opportunities, constraints and relevant guidelines and standards used to inform the design process.

The concept design and layout of the facility has largely been developed in consideration of the NSW Boat Ramp Facility Guidelines, (referred herein as the “Guidelines”) published by Roads and Maritime Services (RMS) in September 2015, which sets out the general guidance on the design of boat ramp infrastructure facilities for small recreational craft. It may not be required (or sometimes possible) to meet all the specific requirements of the Guidelines due to site or funding constraints. It is important to consider these Guidelines: they have been developed over decades of boat ramp and maritime facilities usage; are consistent with the relevant Australian Standards; have recently been updated to reflect modern day usage and expectations of boat ramp users; and, have been prepared in consultation with key representatives from governmental, non-governmental and recreational user groups.

2. Existing Boating Infrastructure and Site Constraints

When reviewing the proposed concept design drawings, it is important to note the existing condition of the infrastructures and the constraints of the site.

The existing boat ramp located at the river end of Brunswick Street is dilapidated and functionality is reduced. During site inspections, it was observed by RHDHV engineers that undermining at the toe of the ramp has resulted in a large crack forming across the lower portion of the ramp deck, resulting in a separation of the ramp deck. At this point, the ramp drops off considerably with the gradient of the ramp beyond the separation point being far steeper than what is recommended as the preferred gradient in the Guidelines. Council reported that rock had been placed around the toe of the boat ramp to reduce scour.

Concerns were raised by RHDHV engineers regarding potential for a steep drop off at the toe of the ramp as a result of the observed scour and undermining. A warning sign at the top of the ramp identifies this risk. Consequently, there is potential for a trailer wheel to plunge over the end of the ramp resulting in the trailer becoming stuck. However, no such concerns or issues had been relayed to Council or RMS by local ramp users.

The boat ramp is located on an outer bend of the Richmond River. Deep seated instability is not uncommon on the outside bends of large coastal rivers in NSW due to hydrodynamic processes that result in stronger currents (both tidal and flood currents) at the outside bends. At this site, this particular process has likely resulted in the migration of the channel further to the north and undermining of the ramp structure. For this reason, any renewal works would need to account for the potential further northerly migration of the channel.

The ramps’ adjacent concrete wharf is also showing signs of structural undermining, with two large cracks running perpendicular to the length of the wharf observed.

There is currently no formal car and trailer parking at this site, with parking opportunities mostly limited to the neighbouring streets. It is also evident that no specified on-street parking arrangements or traffic flow arrangements currently exist. Similarly, the available manoeuvring area at the head of the ramp is tight and no queuing or rigging/derigging areas are defined. Without encroaching on the neighboring Riverview Park, parking and manoeuvring at the facility would continue to be confined to the street.

Two large stormwater outlets are located on the upstream side of the boat ramp and wharf. A third stormwater outlet is located downstream of the ramp. The stormwater assets must be retained and/or relocated to a suitable location.

It is important to note that the site neighbours Riverview Park which provides a number of complementary assets, including:

- a toilet block;
- picnic facilities;
- rubbish receptacles; and,
- a small section of beach at the upstream end, which is reportedly utilized as a vessel holding beach.

When considered in conjunction with the neighboring Park, renewed boating facilities have the potential to provide an all-round high amenity facility for recreational boating.

3. Passive Recreation Launching Facilities

A stepped landing for launching of passive recreation craft is proposed upstream of the existing concrete wharf. The stepped landing would be located downstream of the two large stormwater outlets to ensure there is no impact on stormwater flows. The stepped landing would be approximately 5 m wide catering for manhandling of dinghies or multiple launching and retrieval of narrow passive craft.

The top of the stepped landing would be at approximately 1.5 m AHD, coinciding with the roadside. A small concrete abutment would be installed to provide a smooth transition between the shoreline and the stepped landing. The stepped landing would comprise timber piles, timber or High Density Polyethylene (HDPE) frame and beams and a Fibre Glass Reinforced Plastic (FRP) mesh decking with proven application in coastal and maritime environments. The FRP mesh is non-corrosive, non-slip and UV protected. The design life of the product is adequate and a variety of products are available for numerous applications. Further, the mesh is free draining meaning that silt and marine growth does not readily accumulate on the trafficable surface. Mesh decking also permits light transmission and is favoured by the NSW Department of Primary Industries (Fisheries) for its reduced impact on marine habitat.

The riser height would be 225 mm in accordance with '*AS1657 Fixed platforms, walkways, stairways and ladders – Design, construction and installation*'. The going (length of landing) would be 1000 mm. In total, 14 landings would be provided with the lowest landing at -1.425 m AHD, which is approximately 0.63 m below ISLW. This level is considered adequate for launching of passive recreation craft.

The seaward edge of each landing would incorporate a strip of high visibility material so that the edge of each step is visible.

Piles and a handrail would be provided on the upstream side of the stepped landing. The top of the piles would be at approximately 1.5 m AHD. This level is defined to ensure the piles extend above the water at all tidal levels so that the landing edge is suitably marked and does not pose a navigation risk, but low enough that the piles are not visually obtrusive.

Vertical strip fenders in the form of timber or rubber would be provided on the upstream side of the existing concrete wharf to provide some protection for passive recreation craft when using the landing. Marine growth should be removed from the wharf prior to installing the fenders.

4. Boat Ramp and Concrete Wharf Concept Design

Due to the condition of the existing ramp, limited space available for parking and proximity to nearby regional boat launching facilities at Fisheries Creek, it is agreed that there is minimal benefit in retaining the boat ramp at Brunswick Street. However, despite the dilapidation and reduce functionality of the existing ramp, it remains usable for smaller recreation craft up to say 4 m in length. It is therefore appropriate to undertake minor works to improve the safety and functionality of the boat ramp and retain the boat ramp in its current state of repair with routine maintenance.

The boat ramp would continue to deteriorate over time. When the ramp presents a hazard to users or it becomes unserviceable, it is recommended to remove the boat ramp.

Similarly, the existing concrete finger wharf is undermined and dilapidated. Removal of the wharf was considered as an option, which would allow the stepped landing to be wider than currently proposed. The functionality of the stepped landing would replace the need for the wharf. However, removal of the concrete finger wharf would likely lead to further instability to the adjoining ramp foundations. Therefore, the wharf would be retained in its current location until the boat ramp is removed. At this point in time, the wharf would provide no functional purpose and should be removed.

To improve the safety and functionality of the boat ramp, it is recommended to:

1. install vertical strip fenders in the form of timber or rubber on the downstream side of the existing concrete wharf to provide some protection for passive recreation craft.
2. undertake an underwater inspection at the toe of the boat ramp and install a wheel stop at the toe of the ramp if the toe of the boat ramp is higher than -1.8 m AHD (1.0 m below ISLW) and there is a drop off at the toe of the ramp that exceeds 300 mm.
3. replace existing warning sign at top of the ramp that states 'Caution deep water off end of ramp'. The sign is faded and clarity could be improved.

The decision regarding when to completely remove the boat ramp should be made when the major horizontal crack in the ramp expands to more than 50 mm or additional cracks form that compromise the safety of the boat ramp users. Expansion of the crack would indicate undercutting of the toe of the boat ramp and seaward movement of the lower section of the slab. It is estimated that the boat ramp would become unserviceable in the next 5 to 10 years.

Remediation works such as stainless steel straps across the ramp surface to prevent sliding of the lower section of the concrete slab could be considered to extend the life of the ramp. However, such works would result in underwater trip hazards and additional expense. Given the condition of the ramp and long term objective to remove the ramp, remediation works are unlikely to be beneficial.

5. Future Works at Boat Ramp

Following removal of the boat ramp and wharf, the seawall at the rear of the boat ramp would need to be reinstated. The works should integrate with the existing seawall on either side of the boat ramp.

Additional space would be available in the alcove following removal of the boat ramp. This space could be utilised for:

1. widening of the stepped landing proposed on the upstream side of the wharf;
2. installation of passive recreational ramp for all-ability access. Any such ramp would need to be designed in accordance with 'AS 1428 – Design for access and mobility' with a maximum slope

of 1:14 (vertical:horizontal). Such a ramp could be aligned perpendicular to the foreshore. However, it would protrude a considerable distance into the waterway. To prevent this, the ramp would need to zig zag back and forth. However, such an arrangement limits the practicality of launching passive recreation craft. An alternative would be to align the ramp parallel to the foreshore. However, there is insufficient space in the alcove for this option. Further, a passive recreation launching ramp alone for all-ability access is often inadequate and a pontoon with a davit is usually required to assist in boarding vessels by passengers with limited mobility. While the need to provide all-ability access is recognised, it is thought that there would be more suitable locations along the river to provide these facilities; or,

3. Installation of a pontoon. The pontoon could be a low freeboard pontoon to accommodate launching passive recreation craft. However, if a stepped landing is installed, the pontoon would provide minimal additional benefit for launching purposes. For reasons given in 2 above, it would not be feasible to provide a ganway to this pontoon which complies with all-ability access.

6. Proposed Carpark and Manoeuvring Areas Concept Design

As part of the current design process, consideration has been made to the operational aspects of the facility, including: general traffic flow, parking arrangements and required manoeuvring areas. When reviewing the proposed concept design drawings for the carpark and manoeuvring areas, it is important to note that the site is considerably constrained by:

- The overall size of land available at the site, whereby parking is currently restricted to the street;
- The overhead power lines which run in an east-west orientation across Brunswick Street;
- Driveways for private residence that restrict opportunities for on street trailer parking; and,
- The limited manoeuvring area at the head of the ramp.

At present, the facility only allows for on street parking and without occupying the neighboring Riverview Park, parking would continue to be constrained to the street. It is worth noting that the Guidelines recommend that urban boat ramp facilities comprising of a single lane ramp and pontoon, should aim to provide 40-50 designated car and trailer parking spaces and 8-10 designated car parking spaces. Renewal of the facility could include the demarcation of specified on-street car and trailer parking bays.

To maximise the car and trailer parking, it was previously proposed to provide 90 degree car and trailer parking spaces along the northern section of Brunswick Street, on the eastern side of the road reserve. However, this would have resulted in realignment of Brunswick Street and manoeuvring of cars and trailers across Brunswick Street, which is not ideal from an operational or safety perspective.

The current proposal is to provide drive through parking bays parallel to Brunswick Street. This arrangement would reduce the requirement to manoeuvring and reverse trailers across Brunswick Street or nearby roads. The drive through parking spaces would be safer as reversing of trailers is not required and would reduce conflict between boat ramp users and the general public. Further, it would not require realignment of Brunswick Street. However, it would only provide four (4) car and trailer parking spaces.

The area where the car and trailer parking spaces are proposed is currently a grass verge. The surface would be retained as is. However, if grass die back due to excessive compaction was observed, a grass paver underlay could be installed such as TurfPave[®] XD, SurePave[®] or similar. These products stabilise and support grass by providing a strong surface while remaining free draining. The parking spaces would be delineated with raised pavement markers (cat's eyes) or timber sleepers that are level with the parking spaces.

A shared designated rigging and de-rigging area would be provided on Brunswick Street near the boat ramp. While it is not conventional to have a shared rigging and de-rigging space as some vehicles are required to drive onto the wrong side of the road, it is considered tolerable given the low expected ramp usage and minimal traffic at the end of Brunswick Street, which is a dead-end street. The rigging and derigging lane would be best facilitated through the provision of street signage specifying the extents of the rigging/derigging zone.

The car and trailer parking would be removed when the boat ramp is removed. At this point in time, it could be replaced by 45 to 90 degree rear to kerb car-only parking, which would service the local residents and Riverview Park.

Additional to the car and trailer parking, car-only parking (including disabled access spaces) would be provided near to the ramp and proposed stepped landing structure. These car-only parking spaces would be used by community members visiting the nearby Riverview Park and by users launching passive recreation craft. The parking spaces should be delineated with line marking. Minor realignment of the road and additional asphaltting may be required.

In order to provide the required vehicle manoeuvring area at the head of the ramp, a 10 m turning radius would need to be kept clear at all times. This would be best facilitated through the provision of legally enforceable signage or line markings along the kerb or within turning bay to inform the public of the need to keep this manoeuvring area clear at all times.

It is recommended that the Council together with the relevant stakeholders consider the proposed facility concept design in order to finalise a preferred arrangement for detailed design.

7. Alternate Options Considered

Alternate options were considered during development of the concept layout plan. These include:

1. reclamation of the alcove on either side of the boat ramp. This would result in a boat ramp that was recessed into the seawall, which would provide protection to the boat ramp for currents and reduce undercutting of the toe of the ramp. Conversely, there would be minimal flushing of the ramp and excessive marine growth and sedimentation on the ramp could become an issue over time. This proposed layout would have allowed for approximately five (5) car and trailer parking spaces on the reclaimed land either side of the boat ramp. However, complexity, uncertainty regarding environmental approvals to support reclamation, cost and availability of nearby the boat ramp and pontoon facility at Fishery Creek, in combination, detract from this option.
2. rear to kerb car-only or car and trailer parking indented into Riverview Park. This proposal would have reduced available space in the reserve. In addition, it would have required removal of a mature casuarina tree and relocation of power poles and associated overhead power lines.
3. provision of launching facility and carpark for passive recreation craft at the end of Henry Phillip Drive at the upstream end of Riverview Park. There is currently a set of six (6) concrete steps leading to a sandy beach at the end of Henry Phillip Drive that would be functional for launching passive recreation craft. Further, informal on-street parking is available nearby. There would be minimal benefit in upgrading the head of the road to provide additional facilities for launching of passive recreation craft.

8. Concept Design Construction Cost Estimate

It is recommended that Council together with the relevant stakeholders consider the proposed concept designs and options herein. It is intended that a construction cost estimate would be developed following consultation with Council and agreement of a final concept design.

Attachments

1. Brunswick Street Boat Ramp Renewal, Concept Design Drawings.

DRAFT

LEGEND

- NO PARKING
- NO STOPPING
- CAR & TRAILER PARKING

DATUMS AND TIDAL DATA

| Metres +1.8 | |
|-------------|---------------|
| +1.6 | +1.7 50yr ARI |
| +1.6 | +1.6 20yr ARI |
| +1.4 | |
| +1.2 | |
| +1.0 | +0.93 HHWSS |
| +0.8 | |
| +0.6 | +0.56 MHS |
| +0.4 | +0.45 MHW |
| +0.2 | +0.33 MHW |
| A.H.D | 0.0 +0.02 MSL |
| -0.2 | -0.39 MLWN |
| -0.4 | -0.41 MLW |
| -0.6 | -0.52 MLWS |
| -0.8 | -0.79 ISLW |
| C.D | -1.0 |

ALL LEVELS AUSTRALIAN HEIGHT DATUM (A.H.D)

| REV | DATE | DESCRIPTION | BY | CHK | APPD |
|-----|------------|-------------------------|-----|-----|------|
| B | 15.03.2018 | CONCEPT LAYOUT REVISION | JPC | RP | |
| A | 21.04.2017 | ISSUED FOR REVIEW | BAM | JD | |

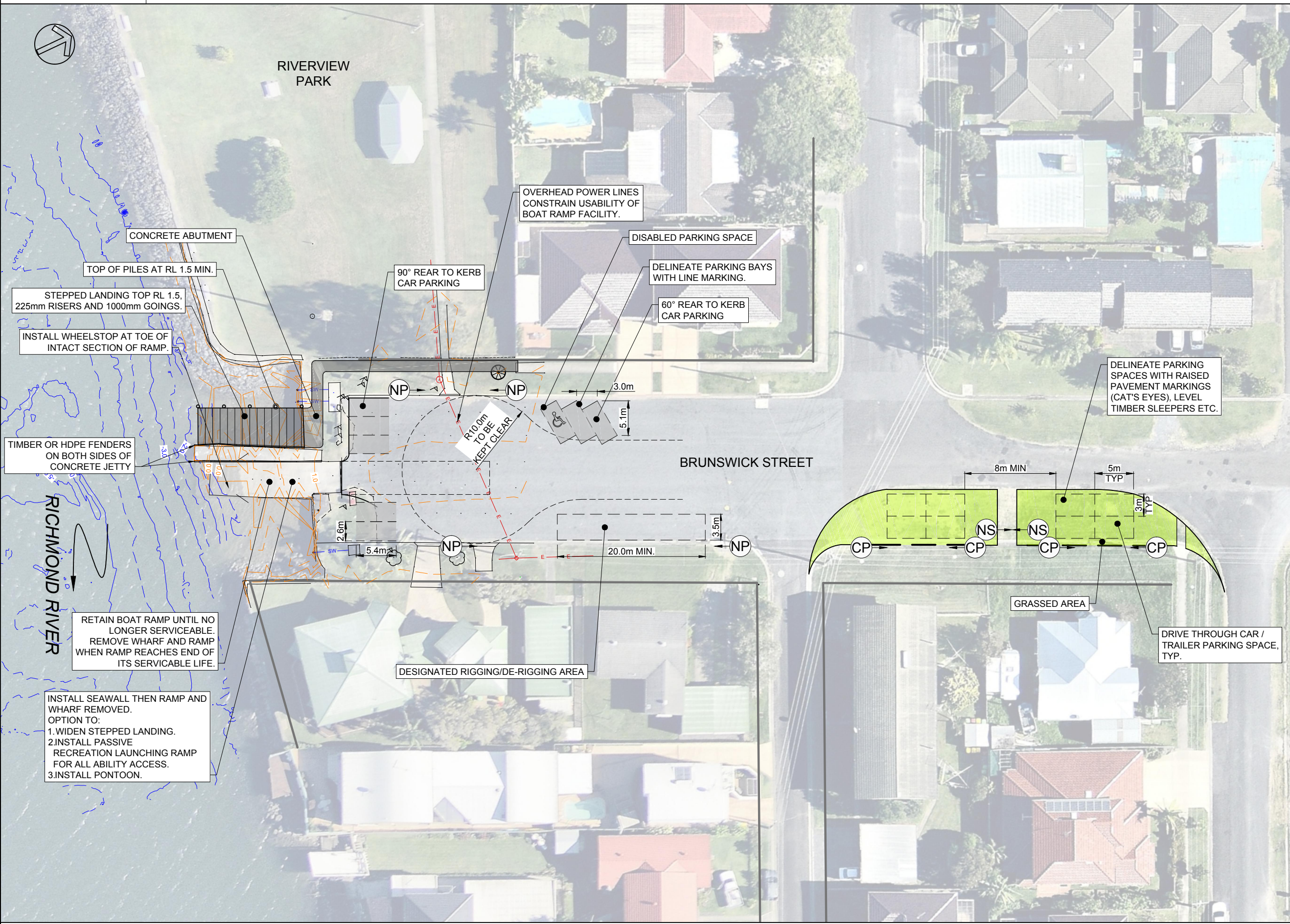


BALLINA BOATRAMP UPGRADE

BRUNSWICK ST PROPOSED PLAN SOUTH



| | | |
|--------------------------------------|-----------------|----------------|
| DRAWN BAM | DATE 15/03/2018 | JOB No. PA1326 |
| AUTOCAD REF. PA1326-MA-DETAIL DESIGN | | |
| SCALE AT A1 AS SHOWN | | |
| DRAWING No. PA1326/CP/3001 | REVISION B | |



AUSTRALIAN HEIGHT DATUM

NOT FOR CONSTRUCTION

