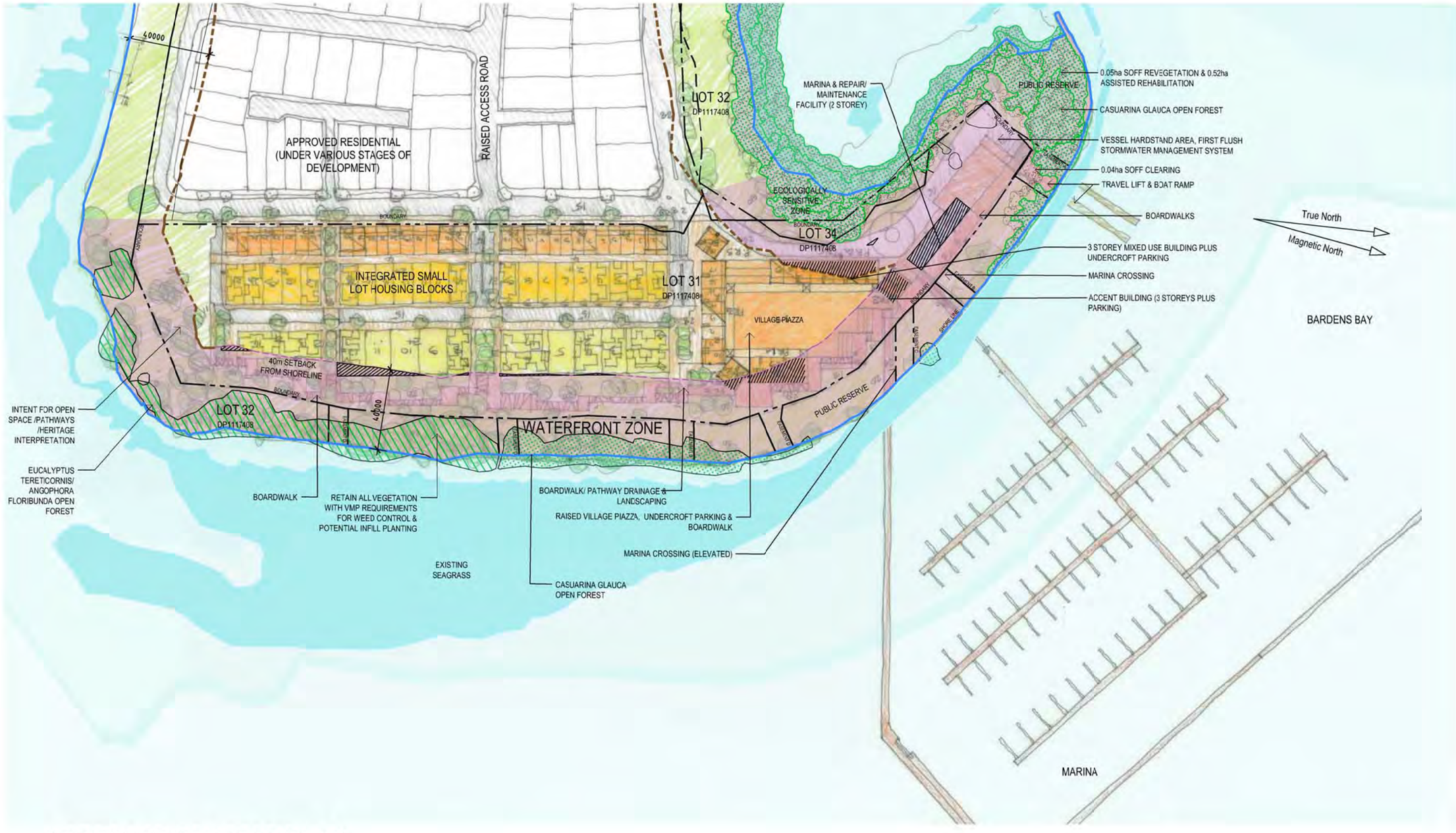

APPROVED CONCEPT PLAN

TRINITY POINT, LAKE MACQUARIE
71 TRINITY POINT DRIVE, MORRISET NSW 2264

A3: 1:2000 @ A3
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MOD 5 PROPOSAL
WATERFRONT LAND UNDER PROVISIONS OF WATERFRONT MANAGEMENT ACT 2000

TRINITY POINT, LAKE MACQUARIE
71 TRINITY POINT DRIVE, MORRISET NSW 2264

FOR MOD 5 DETAILS REFER TO:

- MARINA STAGE 1 DA 1503 /2014
- MIXED USE TOURISM & HOSPITALITY DA 1731 /2014

1:2000 @ A3
A3: 0 10 50

Extracts from Trinity Point Stage 1 Marina EIS (DA 1503/2015) relating to Waterfront Land

(Background Information Only)

Consisting of

- EIS Executive Summary, Sections 7.2-7.5, Sections 8 and 9.
- EIS Extract Appendix D and E (Proposed Plans, Landscape Concepts).

Executive Summary

Introduction & Concept Plan Approval 06_0309

This Environmental Impact Statement has been prepared by ADW Johnson Pty Ltd on behalf of Johnson Property Group Pty Ltd (JPG) to accompany a Development Application to Lake Macquarie City Council for a 94 Berth Marina (staged) with associated building, parking, services, structures and ancillary works including stormwater and landscaping.

The preparation of the Environmental Impact Statement (EIS) has been undertaken in accordance with the following:

- Concept Plan Approval 06_0309;
- Secretary's Environmental Assessment Requirements (Ref: EAR 833) dated 16 June 2014; and
- In consultation with Government Agencies.

The Trinity Point Marina and Mixed Use development Concept Approval (06_0309) was granted by the NSW Minister for Planning on 5 September 2009 and currently includes the following:

- 188 berth marina, associated offices, maintenance and facilities;
- 150 accommodation units comprised of 75 tourist units and 75 residential units;
- Restaurant, café, function centre, shops and office; and
- Parking, landscaping and boardwalk.

The proposed marina will achieve part of the Johnson Property Group Pty Ltd (JPG) vision to create a world class land and water based destination development that forms part of an experience and interaction with Lake Macquarie.

The Site

The subject site is primarily part of Lot 31 DP 1117408 (71 Trinity Point Drive, Morisset Park), but also includes part of Lots 32 & 34 DP 1117408 (Public Reserve) and part of Lake Macquarie (Crown Land Reserve 10121129) (refer **Figure 1**). Ancillary works may extend also into Lot 410 DP 1139690 (depending on the status and timing of public road dedication associated with the adjoining residential estate being progressively developed by JPG).

The site subject to this application is bound by the public reserve and the waters of Lake Macquarie (Bardens Bay) to the east, north and west (unnamed bay), and the remaining part of Lot 31 to the south (which will be subject to future Development Applications under the approved

Concept Plan, as modified). Land to the west of Lot 31 is being progressively developed by JPG under a range of separate development consents. The approved overall residential layout is included on **Figure 1**.

Figure 1 - Site Plan.

The Proposed Development

The proposed development will comprise a 94 Berth Marina (staged) with associated building, parking, services, structures and ancillary works including stormwater and landscaping. Plans of the proposal are included in **Appendix E and F**. Refer summary Figures 2, 3 and 4 below.

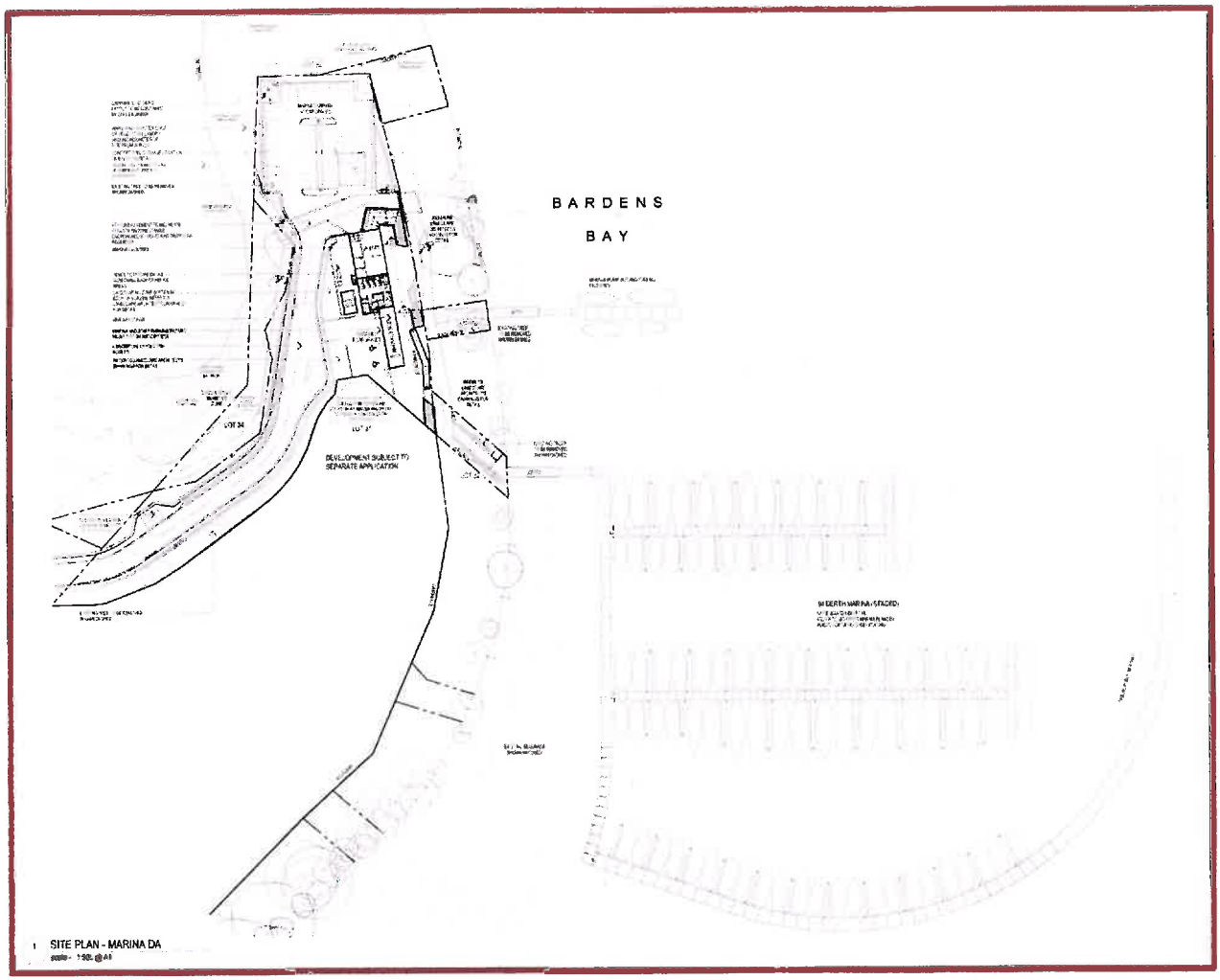


Figure 2 - Overall Site Plan (*refer A3 series of proposal plans in Appendix E and F).*

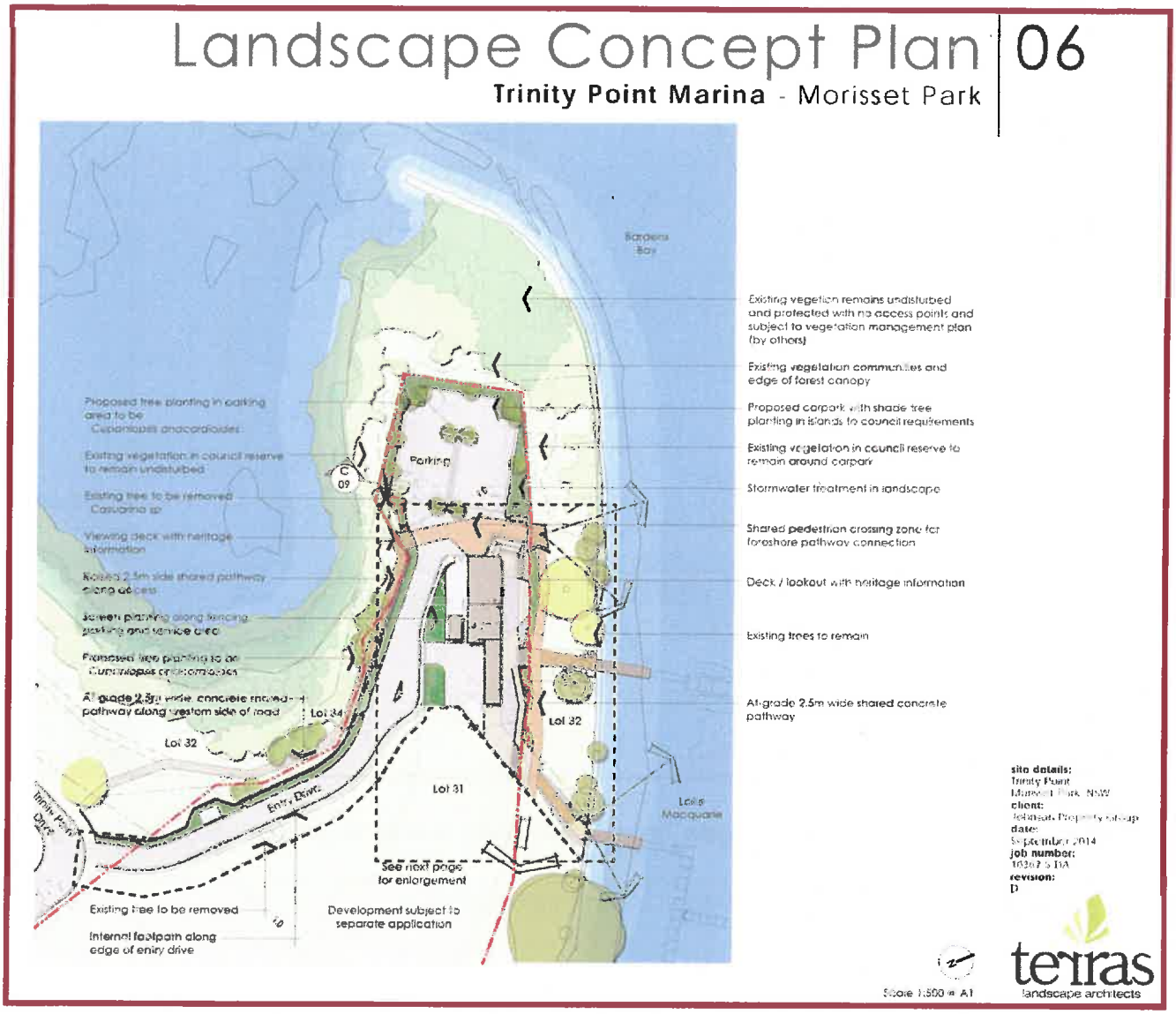


Figure 3 - Overall Site Plan (*refer A3 series of proposal plans in Appendix E and F).*

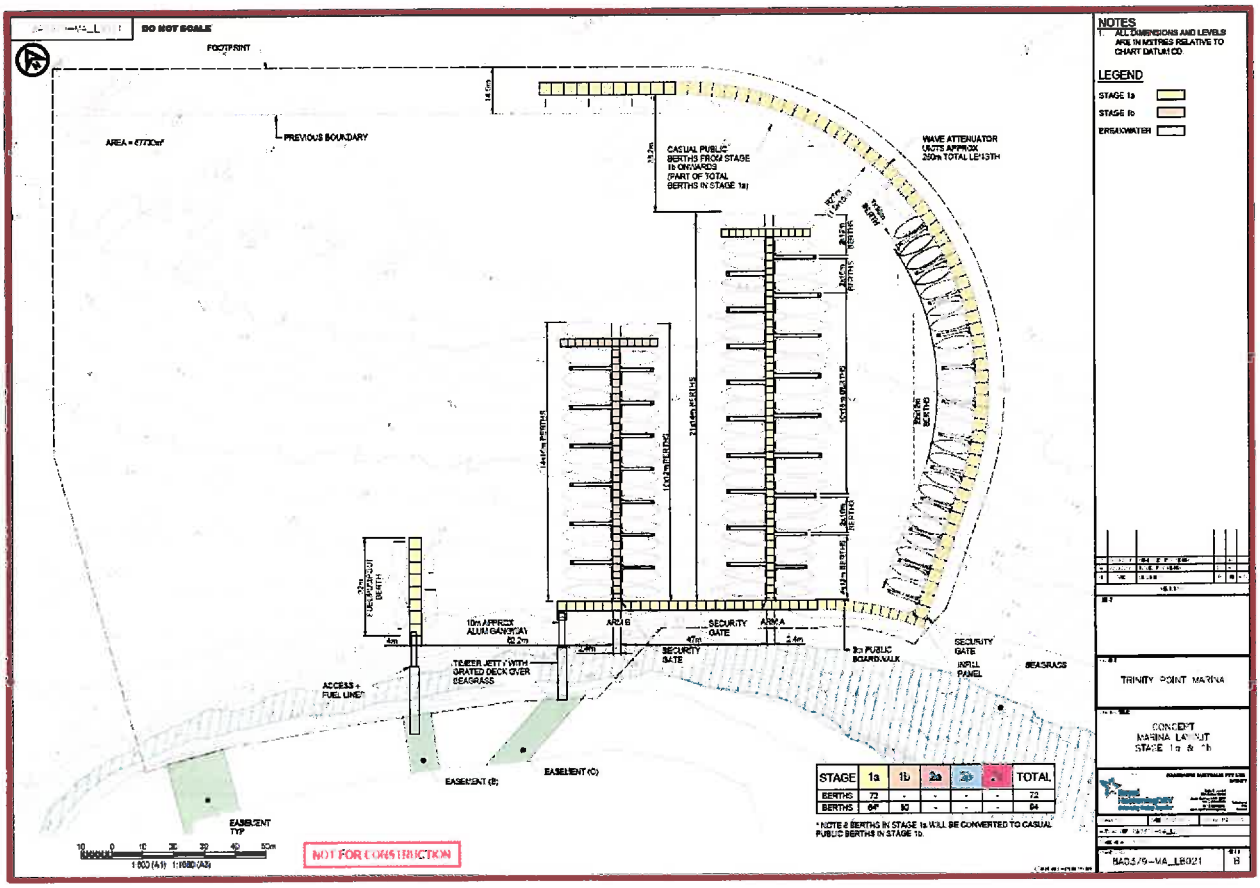


Figure 4 - Concept Marina Staging Plan (*refer A3 series of proposal plans in Appendix E and F).*

The proposed development includes the following key elements:

MARINA – WATER BASED

Proposed floating breakwater and marina structures (floating pontoons) and berths, designed and constructed to Australian Standards (AS 3962-2001 Guidelines for Design of Marinas) with a 25 year design horizon to cater for 94 berths (plus variable casual public berthing), with the option for sub-staging including:

Stage 1a – 72 berths, involving:

- Publicly accessible landward floating pontoon boardwalk (approximately 3m wide x 120m long, sitting approximately 500mm above water level with approximate draught of 600mm below water level).

  This is connected to the land via a hinged aluminium gangway (approximately 2.4m wide x 11m long) and fixed jetty with (approximately 3m wide x 16.5m long) across fringing seagrass (both hinged and fixed structures including 8mm perma composite open grid deck or similar and handrails). The fixed jetty connects to the shore based timber platform

and raised boardwalk (approximately 3m wide, connecting to at grade shared pathway) with the platform, boardwalk and steps sited across Council reserve (within an existing easement (easement C));

- Floating breakwater (secure) (approximately 4m wide x 290m long, consisting of approximately 95, 4m x 3m pontoon units, with a curved leading edge, sitting approximately 600mm above water level with approximate draw of 1.45m below water level). This caters for up to 31 berths on the inside edge of the breakwater (including up to 23 berths within pens created by up to 12 pontoon fingers (typical 1m wide x 10m long), and up to 8 berths parallel to the breakwater);

- Floating internal Arm A (secure) catering for up to 41 berth (approximately 2.4m wide x 119.5m long arm, with tee head (including berthing) and berthing pens created by up to 18 pontoon fingers (variable width and lengths). The floating arm and pontoon fingers sit approximately 500mm above water level. Refer example photo below;

- Separate fuel and sewage pump out floating pontoon wharf (available to public under marina management) (approximately 4m wide x 32m long, sitting approximately 500mm above water level). The wharf will incorporate specifically designed re-fuelling, sewage pump out and slops hopper. Refer example photo below.

  The sewage pump out will include a purpose dockside discharge unit connected back to shore based infrastructure with infrastructure integrated into the wharf, gangway, jetty and boardwalk designs.

  Similarly the fuel dispenser (diesel and premium unleaded) will connect back to shore based infrastructure, with fuel transfer via appropriate double walled pipework integrated into the wharf, gangway, jetty and boardwalk designs.

  This is connected to the land via a hinged aluminium gangway (approximately 2.4m wide x 11m long) and fixed jetty (approximately 3m wide x 16.5m long) across fringing seagrass (both hinged and fixed structures including 8mm perma composite open grid deck or similar and handrails). The fixed jetty connects to a shore based timber raised boardwalk (approximately 3m wide, connecting to at grade shared pathway) with the boardwalk and steps sited across Council reserve (within an existing easement (easement D));

- Provision of services (water, power, lighting, fire hose reels) to berths via service conduits incorporated into jetty, gangway and pontoon design to service pedestals. Service pedestals to include at minimum single phase outlets, circuit breakers, single phase KWH metres, water taps and LED light and fire hose reels on stands with red covers and 9kg extinguishers in red cabinets as required. Refer example photo below;

- Opportunity for occasional berthing of tourist boats on the outside eastern edge of the breakwater, and if additional casual public berthing is desired by authorities as part of Stage 1a only, opportunity for temporary casual public berthing on the internal marina

edge of the landward floating boardwalk; and

- Support piling will consist of steel piles with black HDPE sleeves and white bird caps, and whilst subject to detailed design, may include 55 piles for Stage 1a, consisting of 2 (fuel/sewage wharf), 3 (landward boardwalk), 20 (breakwater), 11 (breakwater internal fingers) and 19 (Arm A internal fingers). These will sit approximately 2.7 - 3.0m above water level.

Stage 1b – additional 22 berths, with casual public berthing added, involving:

- Conversion of parallel berthing from Stage 1a to casual public berthing opportunities (under marina management) along floating breakwater (also with removal of temporary casual public berthing offered under Stage 1a);

- Floating internal Arm B (secure) catering for up to 30 berths (being 8 berths relocated from Stage 1a, plus an additional 22 berths), approximately 2.4m wide x 84.5m long arm, with tee head (including berthing) and berthing pens created by up to 13 pontoon fingers (variable width and lengths). The floating arm and pontoon fingers sit approximately 500mm above water level. Refer example photo below;

- Provision of services (water, power, lighting, fire hose reels) to berths via service conduits incorporated into jetty, gangway and pontoon design to service pedestals. Service pedestals to include at minimum single phase outlets, circuit breakers, single phase KWH metres, water taps and LED light, fire hose reels on stands with red covers and 9kg extinguishers in red cabinets as required. Refer example photo below; and

- Support piling will consist of steel piles with black HDPE sleeves and white bird caps, and whilst subject to detailed design, may include 11 piles for Stage 1b, sitting approximately 2.7 - 3.0m above water level.

Flexibility is sought to provide the option of each sub stage being constructed separately or together.

All dimensions and concept design, general arrangements, sections and details are approximate and will be subject to detailed design following receipt of development approval.

Figure 5 - Photos of similar Marina Infrastructure (Marmong Point Marina).

MARINA – LAND BASED

Architecturally designed permanent marina building and operations including:

- Marina office and chandlery (148m^2);
- Ensuite bathroom facilities (5) and separate laundry for marina users (secure);
- General public toilet facilities (male, female and accessible) (under management);
- Marina lounge (123m^2);
- Raised terrace along edge of building facing the foreshore, with stairs and ramp connections to marina connections (described above), public shared pathway and carparking (described below);
- Emergency shed (24m^2); and
- Marina 'Back of House' RL 1.35m AHD (screened and roofed) to include waste bins and

storage, including general waste and recycling bins and covered storage for 1000L waste oil tank, 1000L waste water tank and batteries (with tanks and batteries siting on prefabricated bunding system, with top lip at 1.5m AHD).

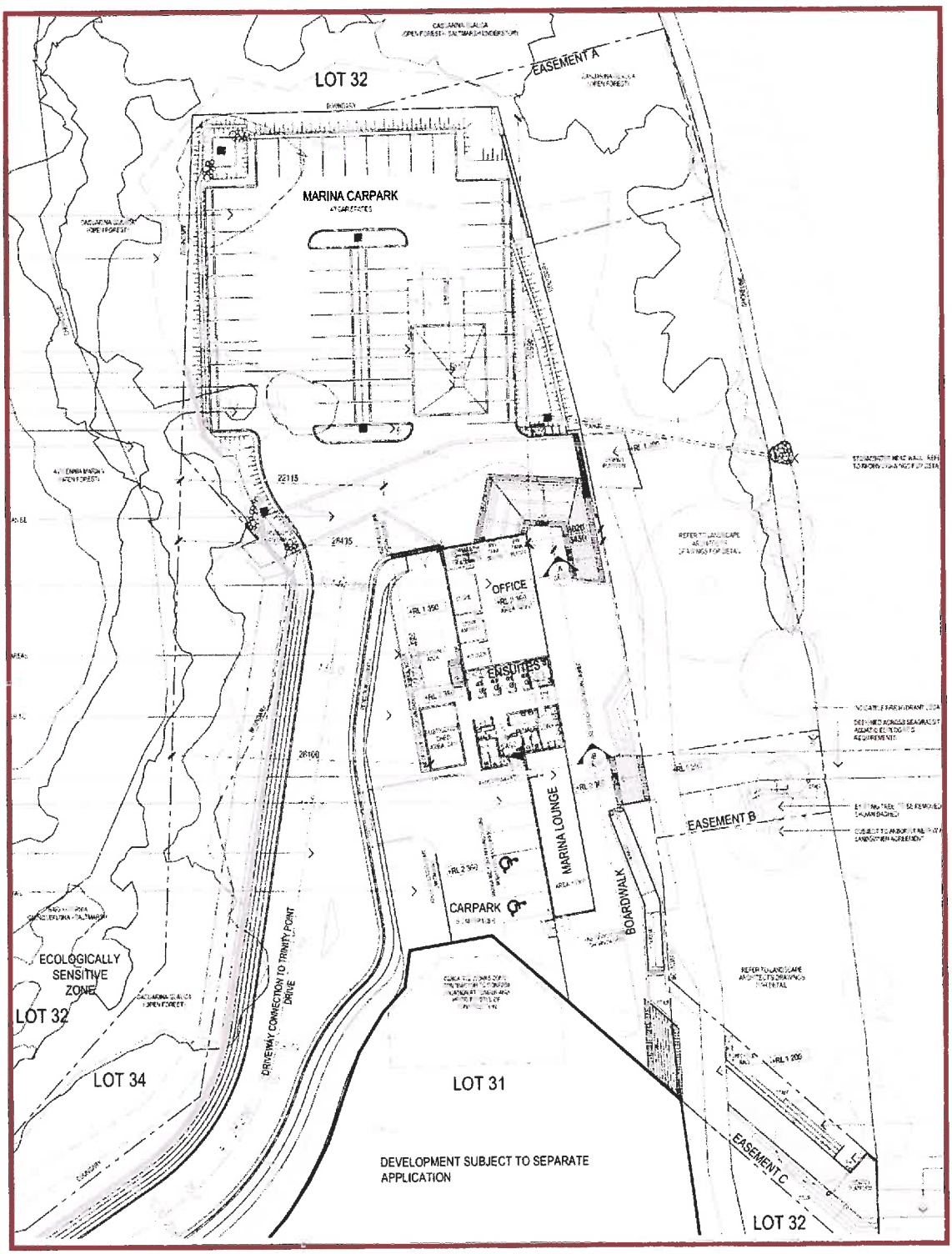


Figure 6 - Site Plan (refer A3 Plan in Appendix E).

The marina building has been designed to sit as an element in the landscape (refer Figure 7). The necessity to raise habitable floor levels to flood planning height (RL 2.36m AHD) creates the opportunity for the building to sit on a podium overlooking the water whilst still presenting as single storey under this proposal. The horizontal emphasis of the roof and simple façade detailing reduces the apparent scale of the building and gives precedence to the existing foreshore landscaping on the site – such that the building is viewed in the landscape setting from both the land and the water.

Along the water side of the building, it presents as a continuous terrace extending the full length of the eastern façade. Thus creates an active waterfront precinct and mediates between the land based activities of the marina, office and lounge to the water based activities. The eastern edge of the terrace is varied in section, with steps and ramps creating a subtle link between the building and the existing foreshore land levels which essentially remain unchanged.

Generous roof overhangs on the eastern and northern facades allow passive solar control to the glazed facades and also create deep shadowing to limit glare when viewed from the water. Recessive external materials and textures further reduce the impact of the building in any distant view. In addition to passive solar control, the proposal includes collection and reuse of roof water and the building will meet all energy requirements of Section J of the BCA.

Figure 7 - Illustrative Perspective of Marina Building (refer A3 Plan in Appendix E).

Proposed Marina Access Driveway, Carparking, Stormwater and Utilities including:

- Two way 6.5m wide access driveway from the corner of Trinity Point Drive around the western perimeter of the site, past the marina building and to the main marina carpark. This driveway will include one way cross fall to partial edge restraint and partial swale and retaining wall ranging in height from approximately 2.9m to 0.5 along most of its length;

- Sealed 47 space marina carpark in northern part of site (refer Figure 8), to include underground fuel storage (refer below) and fuel and waste truck manoeuvring (for design vehicle 12.5m rigid vehicle). The carpark layout is based on one way car circulation and

to AS 2890.1 (user class 1A) and includes landscaping and a feature pavement area to designate a dual use for pedestrian connection between proposed western and eastern shared pathways. The carpark exceeds parking numbers required for a 94 berth marina (0.3 spaces/berth as approved in the Concept Approval) and the excess spaces will cater for future uses on site. The carpark is designed to minimum RL 1.23m AHD;

- Additional sealed 5 space carpark (screened) with access to main driveway to the rear of the marina lounge building, including 2 accessible carparks;

- Stormwater management infrastructure (including water quality management) for site works, carparking and buildings, including roof water collection of rainwater to two tanks (2 x 5KL) for reuse bio-retention basin areas, with biofiltration filter and sub soil drainage around the perimeter of the carpark (refer Figure 8), with underground 300dia pipe across Council Reserve requiring creation of stormwater easement, discharging to lake; and

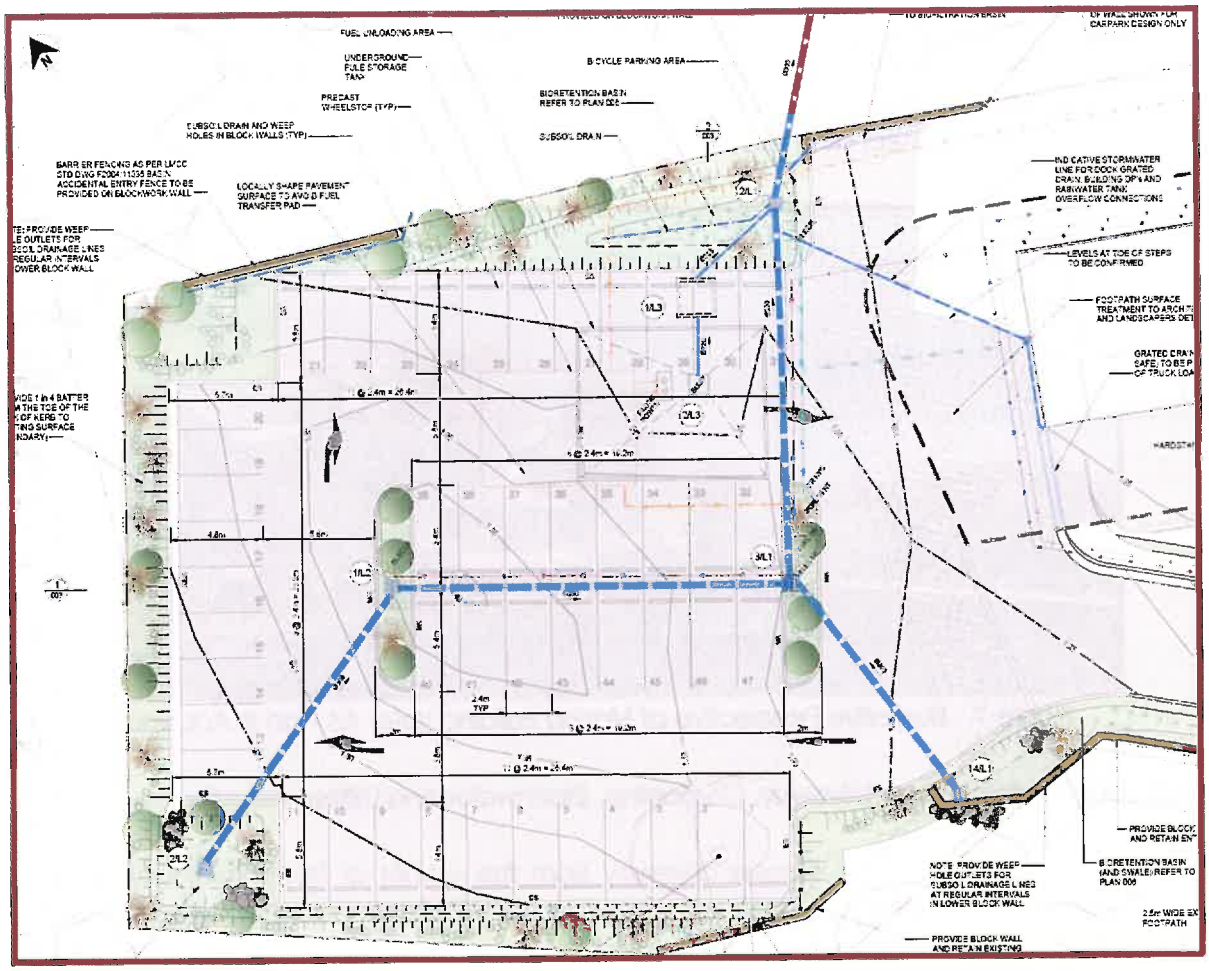


Figure 8 - Concept Stormwater Management (refer A3 Plan in Appendix E).

- Shore based utility infrastructure including:

- Ausgrid electrical kiosk and easements (integrated into western access design, to service marina and future site development), and private electrical switchboards, cabinets and lines;

- Shore based fire hydrants (integrated with boardwalks in easements (B) and (C)), and required private water reticulation to external network;

- Underground fuel storage tanks and dispensing unit for diesel and premium unleaded petrol (PULP) with double walled fibreglass split tank with capacity up to 30000L, with submersible pumps and its own automatic tank gauging and fuel management system and groundwater monitoring wells. Sealed hardstand within the carpark design to drain centrally to a sump at filling location and through an appropriately sized hydrocarbon separator device, providing spill containment; and

- Rising main to connect Dockside Sewage Discharge Unit and separate sewer gravity main connection, both to wastewater infrastructure to be built as part of adjoining residential estate.

Additional Proposed Works in Council Reserve including:

- Lineal public foreshore shared pathway (2.5m wide) on grade for that part of the foreshore which fronts the marina building and between the southern marina connection and the marina carpark, with associated landscaping (refer Figure 9 and 10);

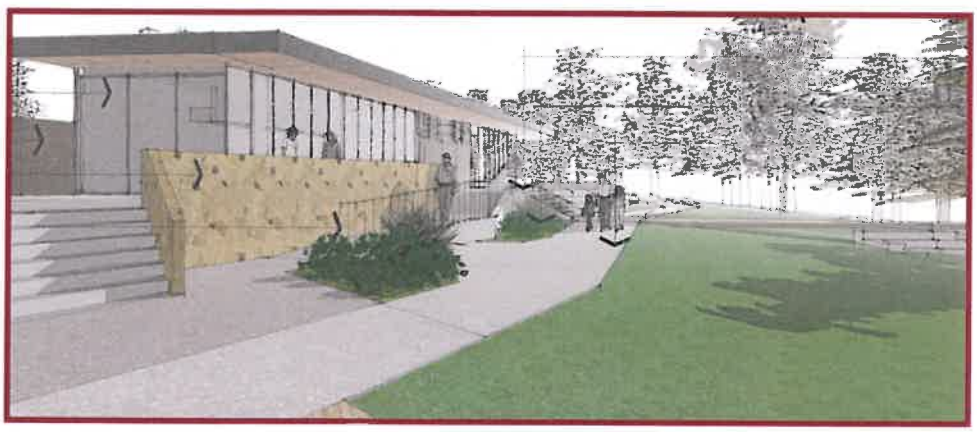


Figure 9 - Illustrative Public Shared Pathway (Eastern) (refer A3 Plan in Appendix F).

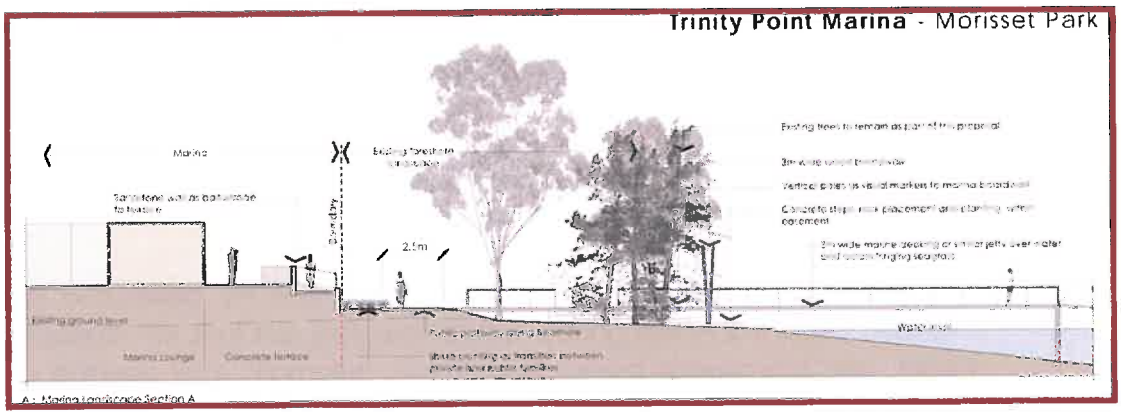


Figure 10 - Illustrative Public Shared Pathway (Eastern) (refer A3 Plan in Appendix F).

- Lineal publicly accessible path (2.5m wide) along part of western boundary (partially in site, partially in Council Reserve), partially on grade and partially raised (refer Figure 11), with associated landscaping. This will connect across and through the carpark with feature pavement to highlight its dual purpose for pedestrian connection and vehicle passing;

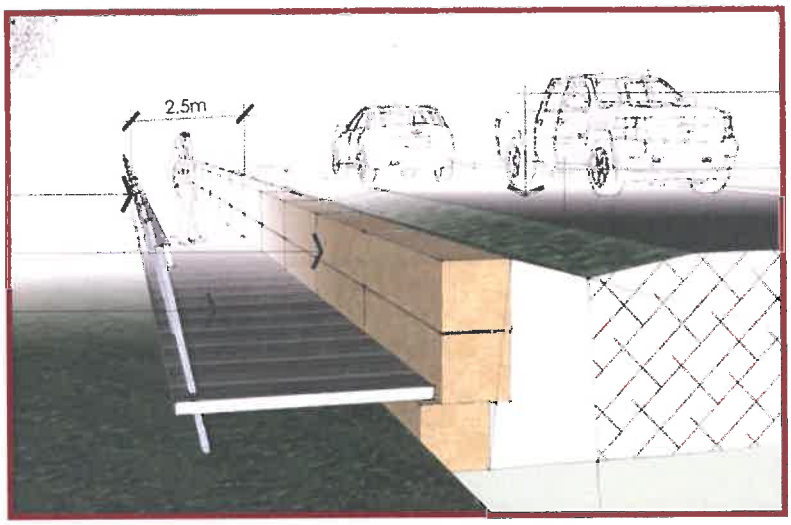


Figure 11 - Illustrative Shared Pathway (Western) (refer A3 Plan in Appendix F).

- Two locations for heritage interpretation, linked into the proposed shared pathway system at western (on site) and eastern (reserve) viewing decks; and

- Vegetation management over part of Reserve as defined within Vegetation Management Plan.

Development Application Process

In accordance with Schedule 3 Clause 23(1)(c) of the Environmental Planning & Assessment Regulation 2000, the proposal constitutes Designated Development. The Secretary's Environmental Assessment Requirements (Ref: EAR 833) were produced on 16 June 2014 for the

preparation of an EIS and this document has been prepared in accordance with these requirements.

Given that the proposal constitutes Designated Development, under Clause 8(b) of Schedule 4A of the Environmental Planning & Assessment Act 1979 the proposal is also classified as 'Regional Development' for determination by the Hunter and Central Coast Joint Regional Planning Panel.

Consultation

In establishing the environmental parameters and scope of this project, consultation was undertaken with key public authorities including the NSW Department of Planning & Environment; NSW Office of Environment and Heritage, NSW Environment Protection Authority; NSW Department of Primary Industries; NSW Roads and Maritime Services; and Lake Macquarie City Council.

In addition to authority consultation, the proponent has also consulted with the Lake Macquarie Estuary & Coastal Management Committee; the Lake Macquarie Aquatic Service Committee; Biraban Local Aboriginal Land Council; Bahtabah Local Aboriginal Land Council and six other Registered Aboriginal Parties, and surrounding landowners and occupiers (via a community consultation open session) and other business and tourism groups (via briefings and/or via the community consultation open session).

Consultation was undertaken in accordance with Secretary's Environmental Assessment Requirements (ref: EAR 833).

Further opportunity for involvement of both government authorities and the community will occur during the public exhibition phase of the assessment.

Key Environmental Investigations

Detailed investigations of the existing environment and the potential impacts of the proposed development have been undertaken. Specialist consultant reports were commissioned where necessary. The following is a summary of the key matters investigated:

- Strategic context and consistency with Part 3A Concept Plan Approval 06_0309;
- Visual Amenity;
- Hydrology (including hydrodynamics), Water Quality Management & Flooding;
- Aquatic and Terrestrial Ecology;
- Land Surface Matters including Geotechnical Assessment, Contamination & Acid Sulphate Soils Management;
- Noise;

- Road Traffic, Access and Carparking;
- Heritage;
- Marine Safety and Navigation;
- Public Access; and
- Waste Management.

Structure of the Environmental Impact Statement

The Environmental Impact Statement is structured in accordance with, and contains the information required by the Secretary's Environmental Assessment Requirements. The EIS contains descriptive and summarised text with appropriate comment, while the appendices provide the detailed specialist assessment reporting.

Sections 1 & 2 – Provides an introduction and background to the proposed development, including an introduction to the Trinity Point Marina and Mixed Use Development Concept Approval (06_0309).

Section 3 – Provides a detailed description of the proposed marina development.

Section 4 – Provides the property description as well a detailed site analysis and overview of the existing environment.

Section 5 – Provides the planning context for the proposed development, including the relevant Commonwealth, State, Regional and local legislation and planning controls.

Section 6 – Details consultation undertaken and how the project team identified the key issues associated with the proposal.

Section 7 – Investigation and assessment of key environmental issues associated with the site and proposed development. This section generally summarises the findings of specialist environmental reporting which is provided within the appendices to the report.

Section 8 – Provides a summary of the approvals and licenses required.

Section 9 – Provides a compilation of the mitigation measures that will be implemented by the proponent. This section demonstrates how the proposal and the environmental safeguards will be implemented and managed in an integrated and feasible manner.

Section 10 – Provides a justification of the proposal.

Section 11 – Conclusion.

- Principle 3 – Building Heights;
- Principle 4 – Public Access and Open Space;
- Principle 5 – Built Form;
- Principle 7 – Building Materials and Colours;
- Principle 8 – Vegetation;
- Principle 9 – Landscape;
- Principle 10 – Roads, Vehicular Access and Parking;
- Principle 11 – Water Management;
- Principle 12 – Flooding;
- Principle 13 – Services and Waste Management;
- Principle 14 – Marina;
- Principle 16 – Acoustics;
- Principle 17 – Sustainability;
- Principle 18 – Indigenous and European Heritage; and
- Principle 19 – Staging, Subdivision and Management.

7.1.4 Statement of Commitments

The Statement of Commitments (SoC) under the Concept Approval largely reinforce commitments contained within the principles and guidelines addressed earlier, as varied by an condition of approval or as sought under modification 2. Based on a review of other commitments, it is not considered that the stage 1 marina application requires the provision of a public art strategy nor a whole of site security management plan. A lighting management plan has not been prepared and is sought to form a condition of approval, with lighting to be consistent with the relevant Australian Standard.

7.2 HYDROLOGY AND WATER QUALITY ISSUES

Section 4.7 provides a summary description of the marine environment which has informed the concept design of the proposed marina, including water depth and existing hydrodynamic processes. It also provides a summary of existing lake water quality and lake sediment quality. The marine environment is now well understood and has been informed by studies and

assessments from 2007 through to 2014, including the re-establishment, calibration and increased definitional accuracy of a 3D hydro-dynamic model. The baseline verification report included in **Appendix H** documents the baseline data and marine environment.

7.2.1 Hydrodynamic Processes

The likely effects of the proposed marina on the existing circulation and transport characteristics of Bardens Bay has been subject to a thorough numerical investigation, including use of a 3D model. This is presented in the Hydrodynamic Model Investigations Report (RHDHV) included in **Appendix I.**

The 3D model has been further calibrated and verified to additional observed data sets to improve confidence in model predictions, resulting in a good match between modelled and observed conditions. It includes six layers (using variable layer thickness modelling system) and uses a flexible triangular mesh of variable resolution from 250m resolution for the overall lake body, through to 100m mesh for the south western lake, 25m mesh for Bardens Bay and down to 12m mesh at the proposed marina site.

As required by Condition C12, the hydrodynamic model investigations relate to the predicted conditions associated with the overall 188 berth concept marina, notwithstanding the current development application is for the first 94 berths only.

The calibrated model has been used to simulate three dimensional lake circulation patterns within southern western Lake Macquarie due to the effects of tide and wind for a range of average conditions, for both existing and design (ie. with 188 berth marina) conditions.

Existing conditions are described within the RHDHV report, and comparison between those and design conditions are also described, with conclusions provided. The comparison between existing and design conditions confirms that:

- By comparison between existing and design conditions, results confirm that tidal currents within Bardens Bay are of negligible magnitude, and that the proposed marina would have negligible effect on tidal currents; and

- Results indicate that E-SW wind directions promote circulation within the Bay and between the Lake and the Bay, and whilst wind directions from the West to NE result in weaker circulation, their persistence means these weaker circulation patterns play a significant overall role in the circulation of the Bay. By comparison between existing and design condition, the proposed marina is expected to have only a minimal impact on the circulation (and hence flushing) of Bardens Bay (with a very localised impact on reducing vertical flow area by reducing wind stress directly below the floating structures for part of the water column).

7.2.2 Water Quality and Sediment Quality

Flushing Analysis and Water Quality

Results of flushing analysis of Bardens Bay (refer Hydrodynamic Model Investigations Report in **Appendix I**) indicate that the proposed marina increases flushing times by less than 1% above that of the existing conditions. This result aligns with the hydrodynamic assessment of the wind driven currents. Although flushing times are marginally increased with the marina, the maximum flushing times (which vary across seasons due to variable wind conditions) of both the current and proposed conditions ranging from 2.2 days (summer) to 4.8 days (autumn) are within generally acceptable flushing limits for maintaining good water quality (typically flushing times less than 7-10 days are generally acceptable).

Therefore, it is considered unlikely that the marina structures (including the floating breakwater) will affect water quality of Bardens Bay as a result of impacts to flushing, with better than acceptable water exchange between Lake Macquarie and Bardens Bay would be maintained.

Particle Tracking Analysis of Pollutants and Spill Management

Particle tracking analysis of pollutants indicates that it is unlikely that pollutants from any potential spill within the marina would spread to the greater Lake environment, subject to industry standard spill prevention practices (and noting the containing effect of the proposed marina design).

Results indicate that in four out of the eight wind directions considered (being winds from north, north east, west and north west), potential spills would be retained within the marina, with any resulting plume readily cleaned and dispersal to the wider lake environment would be minimal.

For other wind directions (being from east, south east, south and south west), undetected spills could disperse to Bardens Bay. In the unlikely event that spills were allowed to leave the marina and remain undetected, they would not reach the shore for 14-24 hours depending on the wind direction (and if it did, it would be deposited in a reasonably compact area). This is worse case scenario in which pollutant management is not employed to contain the spill.

The design and operation of the marina has sought to minimise the chances of a pollution incident (and managed any pollution incident should it occur) through:

- a marina structure and layout that facilitates containment by actively using the marina structures as part of the containment area for half of the possible wind directions and providing a reduced rate of convection and lateral spreading for other wind directions;

- a specially designed fuel and central sewage pump out facilities and wharf that will be operated by marina personnel attendants following a relevant work method statement to avoid spillage into the water;

- a specially designed underground double walled fuel storage system including containment measures and an appropriately sized hydrocarbon separator device, and operated under a fuel management plan that includes monitoring and maintenance;

- provision of spill kits and containment materials at various strategic points around the site with the marina office and spill shed containing appropriate emergency response materials and booms in reasonable proximity to the marina for deployment as required;

- provision of fire fighting equipment at various strategic points;

- professionally managed marina with spill control forming part of a day to day management practice as part of daily dock walk procedures, general security and maintenance of the facilities to ensure working order and appropriately trained staff in emergency response procedures, including for spills on land or water, and fire incidents; and

- education of marina clientele through marina berth contracts, and education and information on responsible boating practices, bilge management, use of sewage pump out and use of waste bins (refer example outline in **Appendix Y**).

The operation of the marina will include a Pollution Incident Response Management Plan.

Particle Tracking Analysis of Seagrass Wrack Movement

Particle tracking analysis has also been undertaken to determine the potential impact of the proposed marina on the transport and fate of sea grass wrack within Lake Macquarie and in and around Bardens Bay (refer **Appendix I**). Seagrass wrack is primarily transported by wind driven currents. Summer conditions were adopted in the simulation due to the higher proportion of easterly winds in this period.

The results show that the proposed marina has an insignificant influence in the overall distribution of particles (seagrass wrack) in the southern area of Lake Macquarie. The results show that particles travel either side of the marina and that there is no significant shadow (ie reduction in particle density) along the western shore of Bardens Bay.

Water Quality – Construction and Operation

Baseline water quality conditions have been established for Bardens Bay (refer Section 4.7.3 of this EIS, and **Appendix H**). Water quality conditions are indicative of a typical estuary and water quality conditions reveal a slightly to moderately disturbed environment,

but with conditions generally very low compared to relevant ANZECC trigger values (with majority of samples below relevant LOR values), with copper and zinc concentrations exceeding ANZECC 95% trigger values.

A skeleton Construction Environmental Management Plan (**Appendix W**) has been prepared with a range of management outcomes, including the management of water quality. Management includes soil and water management of land based works, and of land based works/compounds/delivery area that support the water based works (refer also Basis of Design Report **Appendix G**, Stormwater Report **Appendix J**). The construction management includes provision of fencing, banks/diversion drains, sediment fencing and temporary sedimentation basins, along with provision for access and temporary storage and works areas. Acid Sulphate Soil Management has also been identified for the site, and incorporated into the CEMP.

In addition to construction management measures to mitigate impacts on water quality of the receiving environment, the CEMP includes an identified water quality monitoring program during construction that consists of:

- Daily visual inspections from shore and working barges;
- Weekly measurements of physical and chemical parameters using hand held instrumentation (at two locations, within works area and a control location) during period of piling and other water based construction (then fortnight at all other times during the construction period);
- During first 6 weeks of water based construction, fortnightly collection of water samples for laboratory analysis, then monthly for water based construction period if initial results consistent with baseline (at two locations each time, within works area and a control location); and
- Reactive water sampling as required.

A range of Operational Environmental Management Plans will be required to be in place prior to operation of the marina. **Appendix X** provides a chart that illustrates the suite of operational documents that are to be in a place for a professionally managed marina. The range of matters listed above in discussion on spill minimisation and management are equally in place to manage potential operational impacts on water quality.

As part of clientele education, no major cleaning or maintenance works would be permitted within the marina, and clients would be encouraged to:

- make sure boats and engines are in good working order;
- use installed and conveniently located central sewage pump out and slops hopper and not discharging untreated sewage from vessels into waters;
- keep bilges clean by use of industry accepted and supplied oily bilge absorption mats (and dispose of absorbent pads appropriately); and

- collect all rubbish on board and properly dispose of it ashore.

With the provision of well-maintained sewage pump out facilities made available on a user pays basis to the wider boating public, Trinity Point marina will assist in contributing to facilities which assist in reducing impacts on water quality by recreational and other boating.

In addition to water based water quality management, land based water quality management is proposed by the inclusion of a stormwater management solution for the proposed building, access and carparking area. The details of that management, and the modelled performance of that, are included in the Stormwater Report in **Appendix J**, and addressed in Section 7.3 of this EIS.

As required by Condition C13, water quality will be monitored for the first year from commencement of operation. The aim will be to establish a post construction operational baseline, for comparison to pre-existing conditions baseline. A minimum of 10 sampling periods with laboratory analysis and supplementary in situ measurements will be taken over the 12 month period including wet weather sampling when possible (at two locations, one inside the marina footprint and one background location). The details of operational water quality monitoring is included for convenience within the CEMP (refer **Appendix W**).

Sediment Quality – Construction and Operation

Baseline sediment quality conditions have been established for Bardens Bay (refer Section 4.7.4 of this EIS and **Appendix H**). Lake bed sediments at the proposed site are generally not contaminated with all metal and TBT concentrations other than arsenic and cadmium below low trigger values. All cadmium levels in samples from 2012 were below low trigger values, and all arsenic concentrations were well below the high trigger values with relatively consistent levels between 2007 – 2014.

A skeleton Construction Environmental Management Plan (**Appendix W**) has been prepared with a range of management outcomes, including the management of impacts on lake bed sediment. Of most significance, dredging of the lake bed or removal of marine sediment is not required to construct the marina due to appropriate water depths and associated marina design, marina builders have been engaged to provide an efficient and effective piling system that limits the number of piles required (the concept design for the 94 berths is based on approximately 66 piles) and a piling method (drilled/hammer driven) has been identified to minimise bed sediment disturbance. Geofabric and silt curtain can be incorporated into the construction progress if results during construction warrant their use.

In addition to construction management measures to mitigate impacts on lake bed sediments, the CEMP includes an identified sediment quality monitoring program (in addition to the water quality program outlined above including daily inspections) during construction that consists of one sediment sampling collection (at four locations within

marina consistent with locations from baseline sampling) midway during construction, with laboratory analysis.

A range of Operational Environmental Management Plans will be required to be in place prior to operation of the marina. **Appendix X** provides a chart that illustrates the suite of operational documents that are to be in a place for a professionally managed marina. Of most relevance to the consideration of lake bed sediment quality and disturbance is the design of the marina itself relative to bathymetry, and providing boat berthing with suitable depth, and management of on water boat maintenance activities.

As required by Condition C13, two additional sediment quality collections and analysis is proposed for the first year from commencement of operation, at six months and twelve months.

7.3 WATER CYCLE MANAGEMENT & FLOODING

7.3.1 Flooding

As previously outlined in Section 4.5 of the EIS the site is subject to flooding by way of both high permanent inundation hazard (being those parts of the site at or below the lake mean still water level for year 2100, being at or below 1m AHD) and high flood hazard (being those parts of the site at or below the 1:100yr flood level for current year being at or below 1.5m AHD). This constraint does not apply to the whole of the site however is relevant to north eastern end of the site where the Marina is proposed.

Flooding of the site does not prevent development of the site but is a constraint that needs to be managed. In terms of the water based components of the proposed development it is relatively straight forward to account for flooding, it will be the land based components that require greater attention.

Royal HaskoningDHV have been engaged to assess the flooding constraints, address Condition C21 of the Concept Plan approval and assist with a design that responds, a copy of their report is located at **Appendix J**. Since approval of the Concept Plan Council has adopted The Lake Macquarie Waterway Flood Study and Flood Risk Management Plan (WMA Water, 2012). This has been taken into consideration as part of the design process.

Flood planning levels were established for the various types of development proposed based on the flood level information and minimum height requirements provided in Council's flood inundation certificate and the proposed design life. This is summarised in the following table 8.

Table 8 - Flood Planning Levels

Development Type	Design Life	Flood Planning Level	Rationale
Commercial Premises (habitable floor level)	**+30 years**	**2.36m AHD**	• 1% AEP flood level for Year 2050 + 500 mm freeboard. • Consistent with Council guidelines.
Unsealed Electrical Installations	**N/A**	**2.36m AHD**	• 1% AEP flood level for Year 2050 + 500 mm freeboard. • Consistent with Council guidelines.
Car Park (not basement)	**+30 years**	**1.23 m AHD**	• 5% AEP flood level for current conditions. • Car park drainage will continue to function under Year 2050 non-flood conditions.
Marina Piles[1] (pile cap level)	**25 years**	**2.36m AHD**	• 1% AEP flood level for Year 2050 conditions. • 500 mm freeboard for wave action.
Waste Storage[2]	**N/A**	**1.50m AHD**	• 1% AEP flood level for current conditions.

***Note 1**: The Marina boardwalk and berths will be floating structures that are secured by the marina piles.*
***Note 2**: Refers to minimum levels for waste storage in the hardstand area (Refer to **Figure 8A0319-002**). The floor level of the hardstand is 1.35m AHD, so waste will be stored in sealed containers that are elevated at least 150mm above ground level.*

Based on the above table and noting that in accordance with Council's flood inundation certificate land above 1.5m AHD is considered to be low hazard and land below 1.5m AHD is considered to be high hazard only the main car park areas on the lake side of the marina building would be considered to be within the high hazard category. In addition, information provided by Council indicates that during an extreme PMF event, lake flood levels are expected to reach 2.45m AHD for current conditions and 2.81m AHD for projected 2050 condition. This would result in:

- Minor inundation of the Marina Office and Lounge for current climate conditions and inundation depths of up to 0.5m for 2050 conditions; and
- Inundation depths of water 1m within the car park area.

No specific emergency response measures are recommended for the on shore portions of the development given that:

- The flood waters would rise relatively slowly, enabling orderly evacuation of flood prone areas of the site; and
- Emergency access to the site would be afforded via the primary entrance road, which rises away from the flood hazard.

The above outcomes meet Council's design criteria.

7.3.2 Stormwater

Royal HaskoningDHV has also been engaged to address relevant stormwater collection, treatment and disposal including water quality. Stormwater management is dealt with in detail within the same report that addresses flooding and that is provided as **Appendix J**.

The stormwater management plan addresses Condition C19 of the approved Concept Plan as well as Councils relevant DCP 1 and future control document DCP 2104. Other industry guidelines have also been considered including Australian Runoff Quality, Australian Rainfall and Runoff, Managing Urban Stormwater: Soils and Construction (Landcom, 2004) and The Adoption Guidelines for Stormwater Biofiltration Systems.

The context of the site is one of a sensitive receiving environment taking into account the lake and the quality of vegetation within the unnamed bay. Having regard to this, the proposed development has adopted a very conservative approach and so adopts best practice approach and exceeds water quality standards. Proposed stormwater controls include:

- Rainwater Tanks;
- Vegetated Swale;
- Biofiltration Basins; and
- Containment Measures.

Water quality modeling was undertaken to demonstrate the effectiveness of the stormwater strategy and to determine the key design parameters of the proposed controls. The Model for Urban Stormwater Improvement Conceptualisation (MUSIC) was adopted for this purpose. The following table (Table 9) shows the outcome of the model results.

Table 9 - Water Quality Management Modelled Performance

	Developed Conditions			Target Reduction
	Unmitigated	*Mitigated*	*Percentage Reduction*	
Runoff Volume (ML/yr)	3.5	3.0	14%	N/A
TSS (kg/yr)	825	66	92%	85%
TP (kg/yr)	1.6	0.42	73%	65%
TN (kg/yr)	7.6	3.5	54%	50%

Note : all results are mean annual loads

The MUSIC modeling results demonstrate that the pollutant targets of 85% TSS removal, 65% TP removal and 50% TN removal that were the objective will be achieved with predicted removal rates between 4 to 8% above target rates.

Special attention has been paid to the fuel storage and fuel unloading areas part of the overall stormwater management plan.

During the construction phase of the project erosion and sedimentation will be controlled and the report prepared by Royal HaskoningDHV includes a conceptual Erosion and Sediment Control Plan. This includes sedimentation basins, silt fencing, scour protection and rehabilitation as required.

It is proposed to implement a stormwater verification and monitoring program to address Condition C19.7 of the approved Concept Plan and to provide a high level of certainty to the proposed outcomes. This process will ensure that any reduction in predicted targets can be addressed.

In summary the proposed development meets or exceeds required standards for stormwater quality and provides a high degree of certainty using an industry standard model, verification and ongoing monitoring.

7.4 FLORA & FAUNA

7.4.1 Aquatic Ecology

An Aquatic Ecology Impact Assessment has been prepared by Marine Pollution Research Pty Ltd to accompany this EIS and is provided in full in **Appendix K**.

The Aquatic Ecology Impact Assessment has been prepared to update the original aquatic ecology assessment that formed part of the Concept Approval for the site and provide an assessment of the marina proposal against both the Concept Approval 06_0309 (as sought to be modified) and the Secretary's Environmental Assessment Requirements (refer to **Appendix B** of this EIS).

The existing marine ecology environment has been summarised within Section 4.6 of this EIS (with substantially more detailed descriptions included in **Appendix K**).

Provided below is an assessment of the potential aquatic ecological impacts associated with the various construction and operational activities and the mitigation measures that will be implemented.

7.4.1.1 Management of Construction Impacts

Land Based Construction Works

The land based construction works will require the following activities:

- Initial placement of fill to provide elevated pads for the buildings and roads;
- Excavations through the elevated pads for building foundations, fuel tank, stormwater drainage infrastructure and utilities;

- Piles will need to be driven through the pads to support the buildings, and outside the confines of the pads to support the proposed boardwalks;
- Shallow shoreline excavations for placement of boardwalks, a stormwater outlet pipe and an energy dissipater structure. There will also be shallow excavations for utilities and services; and
- Final stabilisation and landscaping works for the external batter slopes of the raised pads and around the margins of the development.

Whilst the land based construction works will not impact any aquatic habitats or species directly there are potential indirect impacts on adjacent aquatic habitats from construction related runoff, mainly stormwater runoff contaminated with excessive sediments that could smother adjacent intertidal habitats, cause excessive turbidity over the shallows limiting light penetration to inshore seagrass beds or altering groundwater flows from the property towards the riparian and intertidal habitats that may rely on the groundwater for part of their existence. Construction related stormwater could also include low PH (acid) waters from disturbed acid sulphate soils, which could directly impact riparian and intertidal vegetation, shore and bethnic (sediment invertebrates).

Construction works will require a temporary construction roadway and compound for the delivery and stockpiling of fill and construction materials for the development, and may include additional excavation and stockpiling of topsoils for later use on the pad batters and for other landscaping purposes. Bulk earthworks for the development have the potential for excessive sediment and turbid water runoff during the construction phase, and excavations have the potential to disturb, activate and mobilise acid sulphate soils.

The risks will be mitigated as follows:

- Implementation of a comprehensive Erosion and Sediment Control Plan (refer to **Appendix E and W** of this EIS); and
- Implementation of a comprehensive Acid Sulphate Soils Management Plan (refer to **Appendix P** of this EIS).

The placement of bulk fill and the required excavations have the potential to alter the existing shallow groundwater flow patterns from the pasture lands towards the inlet and the lake. The development would also alter the rainfall infiltration patterns to the sub soils that maintain groundwater flows towards the inlet and the lake, which has the potential to impact on the riparian and intertidal vegetated habitats. Alterations to groundwater flows will be mitigated as follows:

- Roads and carpark are to be built on raised pads;
- Minimising excavation requirements and depths where possible; and
- Direct losses of rainfall infiltration to capture on hard surfaces will be mitigated by stormwater controls that redirect collected rainwaters back into the sub soils via bioswales to retain groundwater flows to the inlet and the lake (refer to **Appendix J** of the EIS).

Construction works require the use of mechanical plant and there is a risk of oil and fuel spills causing soil and water pollution. The works also include the use of materials that need to be unpacked in-situ and cut to size and there are consequent risks of discarded packing materials and material off cuts being entrained by stormwater runoff onto the shorelines and lake waters. This will be mitigated as follows:

- Implementation of a Waste Management Plan (refer to **Appendix AE** of this EIS); and
- Implementation of best practice work methods as specified within the Construction Environmental Management Plan (refer to **Appendix W** of this EIS).

Water Based Project Construction Works

The water based construction works will require the following activities:

- Road delivery of pre-constructed pontoon units and piles to Lake Macquarie and off-loading into the lake or onto barges for delivery to the site;
- Driving locator piles into offshore sediments to hold the floating pontoon marina structure and associated fingers in place;
- Floating the pontoon units into position and coupling the units together in relation to the pre-placed locator piles;
- Driving of piles to support the two inshore jetties to span the riparian shore, inshore shallows and seagrass bed;
- Provision of ramps to connect the two jetties to the floating marina; and
- Provision of utilities from the shore to the floating marina including water, electricity and fire suppression. The fuel jetty will also require fuel and sewage pump out facilities installed.

Based on the above water based construction works, the following potential impacts have been identified:

- Delivery of piles and pontoons onto the site - The proposal includes an option to deliver the piles and pontoons directly to the site and the use of a crane to swing the pontoon units out over the seagrass beds then place them in the lake waters to be towed to the marina site. Piles would be craned onto a barge to be towed to the marina construction site.

  In terms of potential impacts the crane pad will not be built out beyond the existing foreshore (ie. to the MHWM), and the outer piles will be placed off-shore from the seagrass bed. Accordingly the crane pad construction will temporarily alienate around 1.6m^2 benthic habitat for offshore pile placement. There is a risk of smothering adjacent seagrass beds from silt and sediment escaping from the pad or washed off the pad during wet weather.

  In consideration of the above the following is noted however:

- As the crane pad and piles are a temporary feature, scheduled to be in place for no longer than 20 weeks, it is considered that this temporary loss of bare sediment habitat is not significant; and
- Potential smothering of seagrass from sediments escaping the pad during construction, use and removal can be successfully prevented and mitigated and this is demonstrated by the design provided in **Appendix G** of the EIS. The Erosion and Sediment Control Plan (provided in **Appendix E**) will also ensure that sediments are appropriately managed.

- Pile Driving of Jetty Support Piles and of Marina Locator Piles

  This will require at least four piles for each of the jetties to be placed into the *Zostera* seagrass bed with all remaining piles driven into bare inshore or offshore sediments. The jetty support piles are likely to be 300mm in diameter and placement of these into the seagrass bed will result in the loss of approximately 0.6m^2 of *Zostera* habitat. Allowing for 100mm movement, of the piles during pile driving could result in an additional loss of 1m2 for a total potential loss of 1.6m^2 *Zostera* seagrass habitat. Based on observations of rapid grow back of *Zostera* seagrass around piles, the long term direct loss would be negligible at 0.6m^2 habitat.

  The marina locator piles will be up to 700mm diameter steel piles and will be driven into bare sediment habitat offshore from the seagrass beds. Each pile will displace up to 0.4m^2 of benthic habitat, however as the pile driving activity pushes most sediment aside rather than downwards, the actual loss of benthic biota is minimal as most organisms are pushed aside with the displaced sediments and are able to successfully re-establish after pile driving is completed. Further, there is abundant bare sediment habitat in Bardens Bay so colonisation of displaced sediments would occur rapidly from the adjacent sediments. Accordingly, the overall impact of pile driving on bare sediment benthic habitats is negligible.

- Noise Impacts from Pile Driving Activity

  Impact noise can startle aquatic fauna (fish, marina mammals and turtles) disrupting their normal behaviours and potentially making them more susceptible to predation.

  The proposal will have negligible impact however in terms of noise based on the following:

  - There are few reports of cetaceans in Bardens Bay. Dolphins that do occur are generally seen in the Swansea Channel and the immediate waters around the lakes inner entrance;
  - Green turtle observations are more widespread in Lake Macquarie and are more likely to be observed in larger seagrass beds along the eastern shore of Lake Macquarie closer to the entrance channel; and
  - The piling works are generally being undertaken over bare sediment habitat where the majority of fish are likely to be transient adult or sub adult benthic

foraging, ambush or schooling predators and therefore not susceptible to predation if startled.

- Pile Driving Activities – Potential Indirect Impacts

  Potential indirect impacts include:

  - Excessive disturbance of lake bed sediments can arise from work vessels, barges and floating pontoon segments bottoming out and may lead to direct loss or seagrass habitat or smothering of adjacent seagrass habitats or lead to excessive turbidity, limiting light availability for seagrass growth;
  - Use of anchors, mooring blocks and chains or wires for holding barges in place have the potential to disturb bottom sediments;
  - Fuel or oil spills; and
  - Sediment spills from the temporary crane pad could result in smothering of adjacent seagrass beds from sediments.

  These potential indirect impacts will be mitigated as follows:

  - All contractors will implement the aquatic habitat protection measures detailed with the Aquatic Construction Environmental Management Plan (refer to **Appendix K** of this EIS). This will include that the activities of contractors do not scour, disturb, scalp or smother seagrass beds, scour bare sediment seabed habitat or cause excessive turbidity or cause water pollution from fuel spills.

- Shading of Seagrass Beds

  The orientation of the proposed jetties and ramps to the north east and their height above the seabed will ensure sufficient available residual sunlight through the course of a day to support the seagrasses that would be shaded, and it is considered that losses to shading would be minimal if at all. This risk will further be mitigated through the usage of mesh decking for the jetties to allow additional direct sunlight preparation to the shaded seagrass beds.

- Construction of the floating marina and installation of services

  Potential impacts include risk of fuel and oil spillage associated with construction equipment as well as material packaging.

  This will be mitigated by the use of best work practices as specified in the project CEMP and Aquatic CEMP.

7.4.1.2 Management of Marina Operational Impacts

The reporting notes that there will be numerous positive impacts associated with the proposed marina including the provision of additional hard-substratum wetted surface areas in the form of pile and floating pontoon vertical surfaces; provision of diverse and dense algae based habitat; and the deeper pile surfaces can support encrusting fauna, further enhancing the aquatic complexity at the site.

The reporting notes that associated with the marina operation, there is potential for impact associated with boat use of the marina, in particular:

- Propeller wash induced seabed disturbance;
- Potential for fuel spillage;
- Risk of garbage entering the water;
- Stormwater runoff from the marina carpark; and
- Foreshore Usage.

The reporting confirms that each of the above matters are adequately managed by the design of the proposal and the ongoing stormwater quality (**Appendix J** of the EIS) and operational management measures to be implemented (**Appendix X** of this EIS).

Overall, the Aquatic Impact Assessment confirms that provided that the mitigation measures outlined in the assessment are implemented, in particular the Aquatic Construction Environmental Management Plan and monitoring of the *Zostera* seagrass bed and wrack movement, that the proposed development is acceptable in terms of aquatic ecology considerations.

7.4.2 Terrestrial Ecology

Terrestrial ecological advice for the proposed marina development was prepared by RPS to accompany the EIS and is provided within **Appendix L**.

The existing terrestrial ecology features of the site have been addressed within Section 4.6 of this EIS.

The Secretary's Environmental Requirements (refer to **Appendix B**) do not contain any specific terrestrial ecological assessment requirements.

Terrestrial vegetation community mapping presented in the previous RPS HSO (2008) ecological assessment of the site has been delineated with a differential GPS with sub-meter accuracy to ensure a high level of accuracy and undertaken in 2014. This mapping, which is provided below as Figure 46, was used in the VMP and for all EIS design considerations.

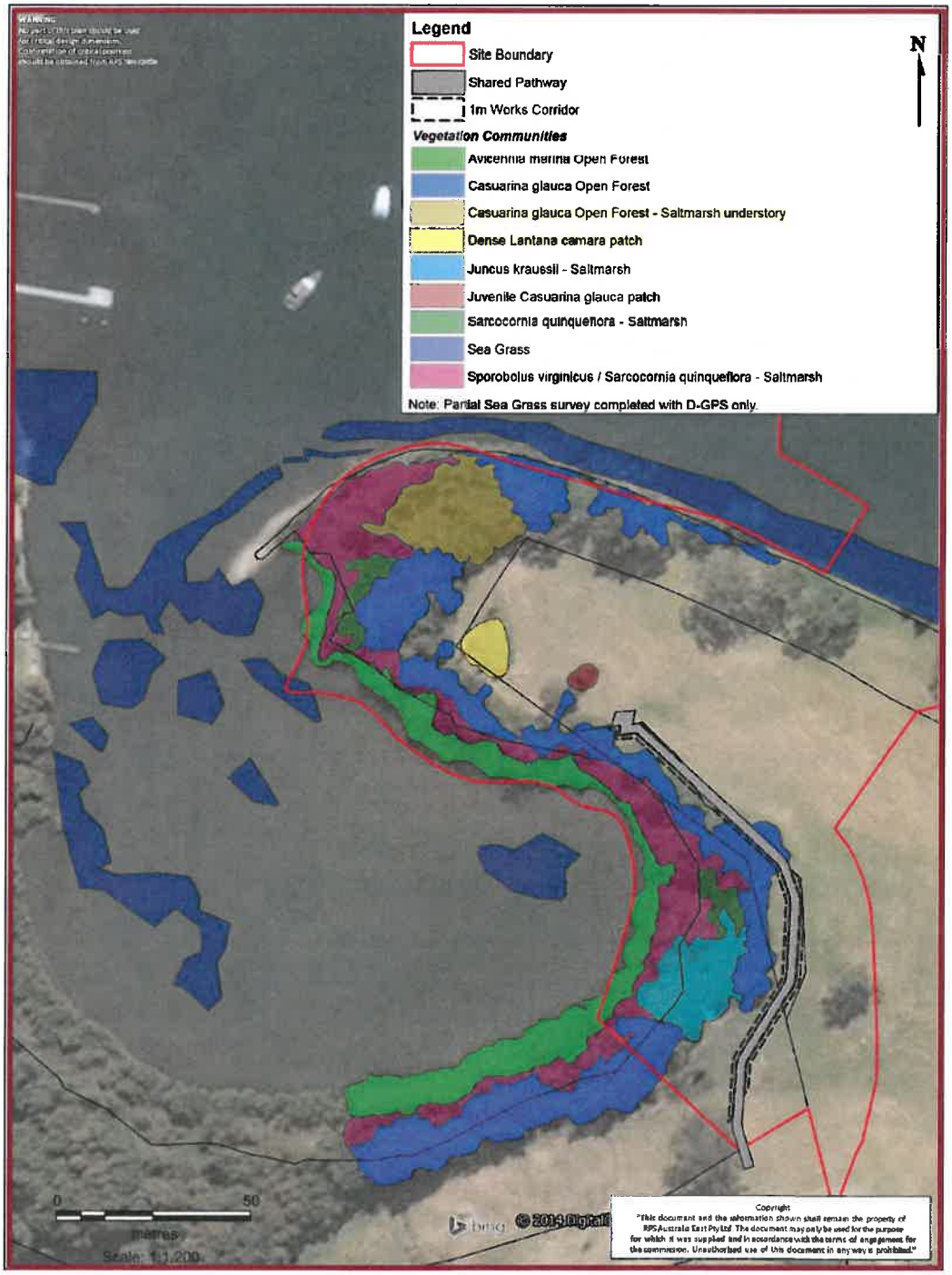


Figure 46 - Vegetation Community Mapping.

In accordance with Concept Approval 06_0309 (as sought to be modified) this marina development application, which is the first development application following the Concept Approval, is required to have regard for a number of Concept Approval conditions relating to terrestrial ecology. These include:

- C9 – Vegetation Management Plan; and
- C26(9) – Public Access.

Below is a discussion of each of these items. Overall, the terrestrial ecology advice confirms that satisfaction of the above conditions has been achieved by the proposal and the proposed marina is acceptable in terms of terrestrial ecology considerations.

Condition C9 – Vegetation Management Plan

A Vegetation Management Plan (VMP) has been prepared by RPS in accordance with the Lake Macquarie Council VMP Guidelines and is provided within **Appendix M** of this EIS.

The VMP has been designed to enable simple updating on a DA by DA basis as required, to expand either the vegetation management actions within the existing VMA area and / or to expand the area subject to vegetation management for other parts of Lot 32 (not subject to this current DA), as development proposals progress and interact with the Council reserve and existing vegetated lands.

The VMP provides for the vegetation management of a 6,101m^2 area of Council Reserve (referred to as northern VMA, refer Figure 47) as part of the current marina DA, consisting primarily of weed management and a small area (48m^2) of revegetation of Casuarina Open Forest.

Figure 47 - Northern Vegetation Management Area.

The management actions are outlined in Table 10 below:

Table 10 - VMA Management Actions

Vegetation Management Area	Management Area	Vegetation Community (LMCC)
Northern VMA	Weed Management to allow natural regeneration	• *Avicennia marina* Open Forest • *Casuarina glauca* Open Forest • *Juncus kraussii* saltmarsh • *Sarcocornia quinqueflora* saltmarsh • *Sporobolus virginicus / Sarcocornia quinqueflora* saltmarsh
	Revegetation of 46.17m^2 (20.28m^2 to be restored in the works corridor)	• *Casuarina glauca* Open Forest

Ongoing monitoring of the VMA will be undertaken to establish the successes and identify areas for maintenance. This approach will ensure that the implementation of the management actions will result in the protection, enhancement and maintenance of the native plant communities present within the site, ultimately contributing to the ecological values of the overall surrounding vegetation communities.

Condition C26(9) – Public Access

A shared pathway location has been established (refer to the above figure) to primarily avoid all direct and indirect potential impacts to the Coastal Saltmarsh and secondly, to avoid native vegetation wherever possible. The shared pathway will be comprised of both an on grade element (concrete or similar) and raised element (timber boardwalk or similar) in areas of close proximity or within extant native vegetation. The footpath will be 2.5m in width and a further works corridor of up to 1m may be required during construction.

Within the public reserve (Lot 34 only) the design will result in a minor encroachment into the *Casuarina glauca* Open Forest with the remaining area comprising Open Pasture as defined in the previous 2008 RPS HSO report and confirmed by 2014 fieldwork. Total areas of encroachment are presented in table 11:

Table 11 - Shared Pathway Encroachment Areas

Vegetation Type	Public Reserve		Total Area (m^2) Approx
	Footpath (2.5m)	Construction Corridor (1m)	
Casuarina glauca Open Forest	25.89m^2	20.28m^2	46.17m^2
Open Forest	220.3m^2	162.7m^2	383m^2

The *Casurina glauca* Open Forest is commensurate with the Endangered Ecological Community (listed under the TSC Act 1995) known as Swamp Oak Floodplain Forest (SOFF) of the NSW North Coast, Sydney Basin and South East corner Bioregions. The VMP, as noted above, makes provision for the revegetation of an equivalent area of SOFF permanently impacted upon by the proposal. Nevertheless, the proposal will impact a known EEC within the Public Reserve and as such an assessment of significance was undertaken under Section 5A of the EP&A Act (7-Part test). The assessment concluded that the shared pathway proposed will not have a significant impact on the local EEC.

Based on the above consideration of refined vegetation community mapping, vegetation management and provision of public access in accordance with Concept Approval 06_0309 (as sought to be modified) it is considered that the proposal is acceptable in terms of terrestrial ecology considerations.

7.5 LAND SURFACE ISSUES

7.5.1 Geotechnical Assessment

Provided in **Appendix N** of this EIS is a Geotechnical Assessment that was prepared by Douglas Partners as part of the Concept Approval. This reporting remains current.

The geotechnical conditions of the site have been previously outlined within Section 4.8.2 of this EIS. In particular, the conditions of (1) the Marina Area (off shore); and (2) area to contain the Shore Based Marina facilities was described.

The Douglas Partners report identified technical parameters associated with excavations, Site Preparation, Engineered Filling, Pavements, Material Quality and Compaction Requirements and sub grade preparation.

The key limitation identified was in relation to the very soft to soft clay between approximately 1.8m and 3.1m in depth in the vicinity of the proposed carpark and marina

offices. In general, the lower lying areas of the site are underlain by weak alluvial soils, with groundwater present at depths of about 0.5 to 1.0m. Zones of very loose sandy soils, and very soft to soft clayey and silty soils were encountered to depths of up to approximately 5.5m, with conditions below this depth improving, but still including zones of loose sandy soils and/or firm clays to depths of generally about 6 to 8m, but up to approximately 11.5m.

These soils present limitations for the support of the proposed structures (low rise and pavements) because they would settle under loads from buildings, filling or their own self weight. These soils may also be at risk of liquefaction if subjected to a seismic event.

These issues are essentially detailed design and construction matters and will be addressed at the detail design stage of the proposed marina. The following will be undertaken:

- Suitable geotechnical advice for the design of pavements and building foundations will be obtained and incorporated into detailed design; and
- The detailed design of the underground fuel tanks will include an allowance to prevent flotation of the tank when empty.

Overall, it is considered that the proposed marina can proceed in terms of geotechnical considerations.

7.5.2 Acid Sulphate Soils

As described within Section 4.9.1 of this EIS, the site is located within a zone with a high probability of Acid Sulphate Soil. On the LEP 2014 mapping, the site falls within 'Class 2', requiring development consent for any works undertaken below ground surface and an acid sulphate soil management plan to be prepared.

Therefore, all excavations within the subject site to facilitate the marina development have the potential to disturb acid sulphate soils and should be undertaken with specific reference to an Acid Sulphate Soil Management Plan.

Provided in **Appendix P** of this EIS is an Acid Sulphate Soils Management Plan that has been prepared by Douglas Partners. All construction works will be undertaken in accordance with this Acid Sulphate Soils Management Plan and this is noted within the Construction Environmental Management Plan provided within **Appendix W** of this EIS.

7.6 NOISE IMPACT ASSESSMENT

Potential noise from the proposed marina and associated building and ancillary utilities was considered as part of the approved Concept Plan. The original acoustic report prepared by ARUP had assessed a much larger proposal, being for 308 berths and also included a repair and maintenance workshop with associated travel lift. The acoustic report at the time found that the overall development could meet compliance.

8.0 List of Approvals & Licences

Following is a list of approvals which would be required as a result of the proposed marina development, following consent to the development application:

- **NSW Environment Protection Authority**

  The proposed marina would be a 'Scheduled Activity' (Marinas & Boat Repairs) as defined by Schedule 1 of the *Protection of the Environment Operations Act 1997*. An Environmental Protection License is therefore required.

- **NSW Office of Water**

  Approval under Part 5 of the *Water Act 1912* will be required for de-watering (which is a licensed activity) associated with excavations as part of the proposed development.

  Given works are proposed within 40m of the lakes edge, a controlled activity approval under the *Water Management Act 2000* will be required. The need or otherwise for additional approvals under this Act will be identified.

- **NSW Environment & Heritage**

  An Aboriginal Heritage Impact Permit (AHIP) will be required to be obtained under Section 90 of the *National Parks and Wildlife Act 1974*.

- **Hunter Water**

  A Section 50 Certificate will be required.

- **Mine Subsidence Board**

  Approval under the Mine Subsidence Compensation Act 1961 may be required from the Mine Subsidence Board.

9.0 Compilation of Mitigation Measures

The following section provides a summary of the range of construction and operational strategies relating to environmental management and mitigation measures. This section details how the proposal and its environmental safeguards will be implemented and managed in an integrated and feasible manner.

The proposed development will be undertaken generally in accordance with the plans and description of development including in this EIS, subject to the normal detailed design process that will follow.

As outlined within this EIS, a significant effort has been made in the design and development of the proposal to incorporate as part of the design itself impact mitigation and environmental safeguards to improve the environmental performance of the proposed marina, in conjunction with a well informed understanding of the baseline environment. For example, this includes design of the marine structures to limit impact on lake circulation.

Following development consent, and prior to construction and operation, a detailed design process will be undertaken that will provide further input and consideration on detailed matters relating to geotechnical and construction.

The proposed development will be carried out (construction and operation) in accordance with all approvals that will be required by relevant authorities.

- Section 7.17 of this EIS outlines a framework Construction Environmental Management Plan (included in **Appendix W**); and

- Section 7.17 of this EIS outlines a general approach for Operational Environmental Management and **Appendix X** provides a chart of the range of operational documents that will be in place for operation of the marina.

Table x below provides a summary of the type of construction mitigation measures and strategies identified through the EIS process.

Table 13 - Summary Construction Mitigation Measures

Consideration	Strategy
Construction Management Plan	Contractors to incorporate framework Construction Environmental Management Plan (**Appendix W**), as modified by any Conditions of consent or requirements of other licences/permits into Environmental Management System and Site Environmental Management Plan including: • Hours of Operation; • Hours of Operation (piling); • Erosion and Sediment Control (including the installation of and checking of controls); • Water Quality and Sediment Quality Monitoring Program; • Flora and Fauna Management, including access control from terrestrial vegetation areas (to include

	liaise with Council on tree management adjoining works zones and where outside easements) and full inclusion of recommended aquatic ecology construction management (including monitoring of seagrass beds as recommended); • Acid Sulphate Soils (including the acid sulphate soils management plan); • Traffic and Parking Management (with a traffic control plan to be prepared); • Noise and Vibration Management; • Air Quality Management; and • Waste Management.
Cultural Heritage Management Plan	Seek an aboriginal heritage impact permit Contractors to incorporate CHMP into their induction and construction process, including any requirements under any aboriginal heritage impact permit (including identified grader scrapes).
Geotechnical and Groundwater	Seek appropriate licences/approvals Appropriate design and construction of underground fuel storage system and other works relating to geotechnical conditions, groundwater and including any dewatering processes.
Fuel Storage System	Install underground fuel storage system with containment measures.
Landscaping	Implement the landscaping scheme as detailed in approved Landscape Plans.
Materials and Colours	Construct the building in colours and finishes generally as approved and to be sympathetic to the setting.
Lighting	Design and install lighting to comply with Australian Standard AS 4282-1997, control of obtrusive effects of outdoor lighting.

Table 14 below provides a summary of the type of operational mitigation measures and strategies identified through the EIS process.

Table 14 - Summary Operational Mitigation Measures

Consideration	Strategy
Environmental Protection, Spill Management and Response Procedures	Secure and operate in accordance with an Environmental Protection Licence, including required EMP, FMP and Pollution Incident Mgmt Plan and other documents as listed in **Appendix X**. Maintain appropriate material (booms, spill kits) in emergency shed and emergency spill kits at strategic locations;
Oily Bilge Management	Provide industry accepted oily bilge absorption pads to marina clientele and stock in chandlery
Operation of Fuel and Sewage Pump Out Wharf	Maintain the fuel and sewage pump out wharf and provide for operation by attendants to avoid spillage and misuse, and appropriately train staff in spill management procedures;
Fire Fighting	Maintain fire hose reels and infrastructure and

	appropriately train staff in emergency response procedures
Waste Management	Provide waste management as documented in waste management plan
Responsible Boating Practices	Provide readily available responsible boating practices publications to marina clientele and provide responsible boating manual to clientele, educate on practices when moving in and berthing within marina.
Noise Control	Provide an Operational Noise Management Plan which prohibits offensive noise at night including loud music on vessels and educate and manage clientele for compliance, and link behaviour limits into marina berth contract
Vegetation Management Plan	Implement Vegetation Management Plan over Northern VMA area (**Appendix M**), including works, monitoring and reporting
Landscaping	Maintain the installed landscaping scheme
Stormwater Management	Maintain the installed stormwater management system, including performance monitoring for first two years post construction of biofiltration basins
Building	Maintain the building, its materials and colours
Lighting	Maintain the installed lighting
Historical Interpretation	Facilitate installation of interpretation devices in nominated area in future when content is resolved
Environmental Monitoring	Undertake operation water and sediment quality monitoring program, and operational seagrass and inshore sea grass wrack monitoring program.
Recreational Boating Snapshot Analysis	Undertake a second snapshot recreational boating analysis as required by terms of concept approval

Plan of:	PRELIMINARY ACCESS ROAD SITE PLAN	Location:	TRINITY POINT DRIVE MORISSET PARK				
		Council:	LAKE MACQUARIE				

Datum:	AHD	Date:	25th AUGUST 2014	Version:	D (30th OCTOBER 2014)
Origin:	PM 58712	Sheet:	1 of 4	Client:	JOHNSON PROPERTY GROUP
Projection:	MGA ZONE 56	Plan By:	JN	Survey:	
Origin:	DCDB	Project Manager:	LG	AutoCAD:	N:\37429(2)E\Dwg\ENG\37429(2)E_SK_001(C)
North Direction:	GRID	Office:	HUNTER	Our Ref:	37429
Contour Interval:	0.5m	Plan Purpose:	DEVELOPMENT APPLICATION		

adw johnson

BARDENS BAY

MARINA DEVELOPMENT
(REFER TO SQUILLACE DRAWINGS)

CARPARK
(REFER TO ROYAL HASKONING DHV DRAWINGS)

LOT 31
DP 1117408

FUTURE DEVELOPMENT

LOT 34
DP 1117408

LOT 32
DP 1117408

TRANSITION FROM SA KERB TO EDGE RESTRAINT

SL KERB

EDGE RESTRAINT

SA KERB

ELECTRICAL EASEMENT (KIOSK)
(SEE SHEET-004)

2.5m WIDE RAISED WALKWAY

2.5m WIDE PATH

MEAN HIGH WATER LEVEL

UNNAMED BAY

TRINITY POINT DRIVE

LOT 401
DP 1139690

Ver.	Date	Comment
D	30/10/2014	REVISED ISSUE
C	10/09/2014	REVISED ISSUE
B	04/09/2014	REVISED ISSUE
A	25/08/2014	PRELIMINARY ISSUE

Bar Scale 1: 250 (A1), 1:500 (A3)

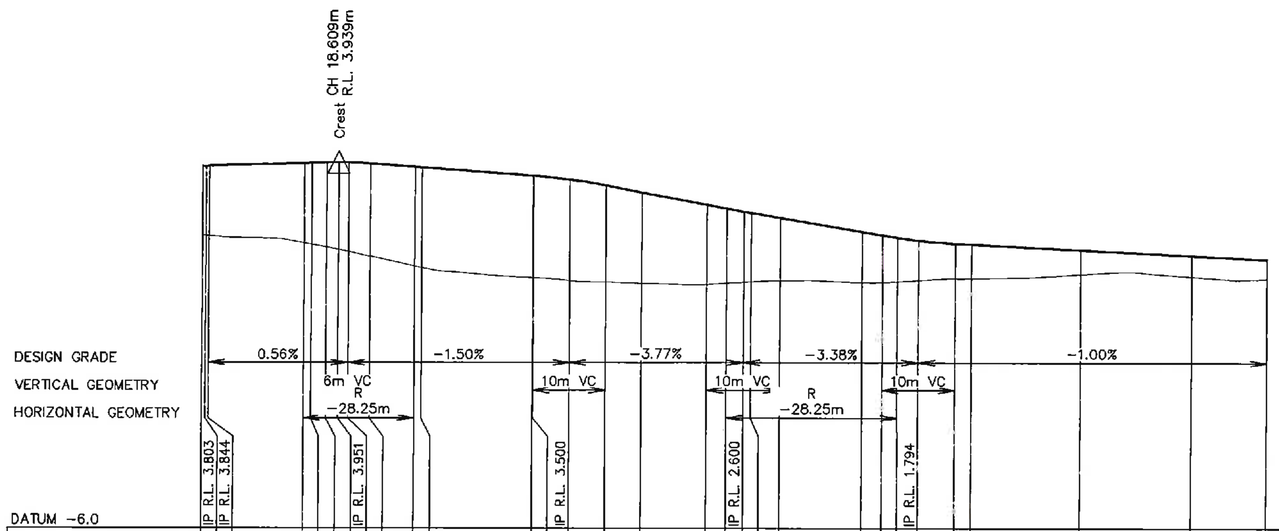
========== RETAINING WALL (REFER TO SHEET 003)

adw johnson pty. ltd. 2 bounty close, tuggerah nsw 2259, po box 3717 tuggerah nsw 2259 ph: (02) 43054300 fax: (02) 43054399 coast@adwjohnson.com.au abn 62 129 445 398

Plotted By: jaysonn Plot Date: 30/10/14 - 10:20 Cad File: N:\37429\37429(2)E\Dwg\ENG\Marina Driveway Concept Design\37429(2)E_SK_001(D).DWG

Plan of:	PRELIMINARY ACCESS ROAD LONGITUDINAL SECTION	Datum:	AHD	Date:	25th AUGUST 2014	Version:	D (30th OCTOBER 2014)
Location:	TRINITY POINT DRIVE MORISSET PARK	Origin:	PM 58712	Sheet:	2 of 4	Client:	JOHNSON PROPERTY GROUP
		Projection:	MGA ZONE 56	Plan By:	JN	Survey:	
		Origin:	DCDB	Project Manager:	LG	AutoCAD:	N:\37429(2)E\Dwg\ENG\37429(2)E_SK_001(C)
		North Direction:	GRID	Office:	HUNTER	Our Ref:	37429
Council:	LAKE MACQUARIE	Contour Interval:	0.5m	Plan Purpose:	DEVELOPMENT APPLICATION		

adw johnson



DESIGN LEVEL	3.84	3.80	3.84	3.92	3.92	3.93	3.94	3.94	3.91	3.82
EXISTING SURFACE	1.95	1.95	1.94	1.76	1.72	1.64	1.58	1.52	1.39	1.12
CUT\FILL	1.89	1.86	1.90	2.16	2.21	2.29	2.36	2.41	2.52	2.69
CHAINAGE	0.000	0.450	0.900	13.920	15.000	16.970	18.610	19.970	22.970	29.060

DESIGN LEVEL	3.80	3.58	3.57	3.47	3.31	3.13	2.79	2.69	2.60	2.57
EXISTING SURFACE	1.08	0.81	0.80	0.73	0.69	0.67	0.63	0.66	0.69	0.70
CUT\FILL	2.72	2.77	2.77	2.75	2.62	2.46	2.16	2.03	1.92	1.87
CHAINAGE	30.000	45.000	45.100	50.100	55.100	60.000	68.960	71.690	73.960	75.000

DESIGN LEVEL	2.43	2.06	1.96	1.90	1.82	1.74	1.72	1.57	1.42	1.32
EXISTING SURFACE	0.73	0.68	0.68	0.70	0.74	0.79	0.79	0.91	0.85	0.79
CUT\FILL	1.70	1.37	1.28	1.20	1.09	0.96	0.93	0.66	0.57	0.53
CHAINAGE	78.960	90.000	92.790	94.840	97.790	102.790	105.000	120.000	135.000	145.280

LONGITUDINAL SECTION MT01
HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:100

Ver.	Date	Comment
D	30/10/2014	REVISED ISSUE
C	10/09/2014	REVISED ISSUE
B	04/09/2014	REVISED ISSUE
A	25/08/2014	PRELIMINARY ISSUE

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Plan of:	PRELIMINARY ACCESS ROAD CROSS SECTIONS	Location:	TRINITY POINT DRIVE MORISSET PARK	Datum:	AHD	Date:	25th AUGUST 2014
				Origin:	PM 58712	Sheet:	3 of 4
				Projection:	MGA ZONE 56	Plan By:	JN
				Origin:	DCDB	Project Manager:	LG
		Council:	LAKE MACQUARIE	North Direction:	GRID	Office:	HUNTER
				Contour Interval:	0.5m	Plan Purpose:	DEVELOPMENT APPLICATION

Version:	D (30th OCTOBER 2014)		
Client:	JOHNSON PROPERTY GROUP		
Survey:			
AutoCAD:	N:\37429(2)E\Dwg\ENG\37429(2)E_SK_001(C)		
Our Ref:	37429		

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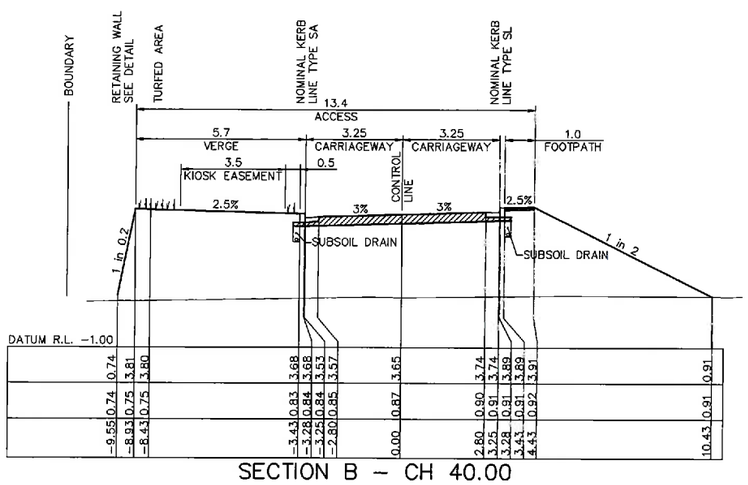

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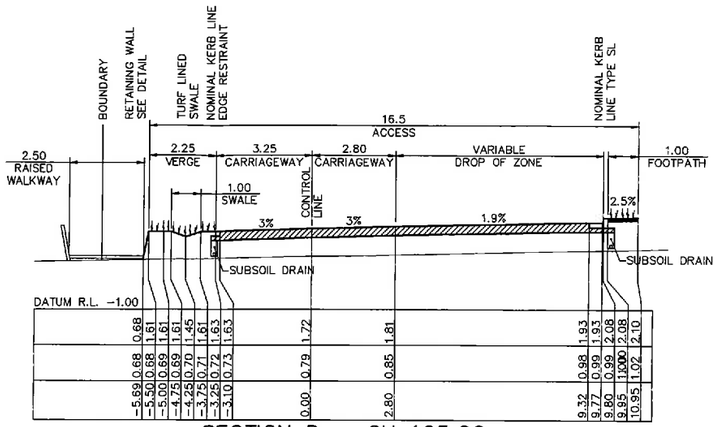

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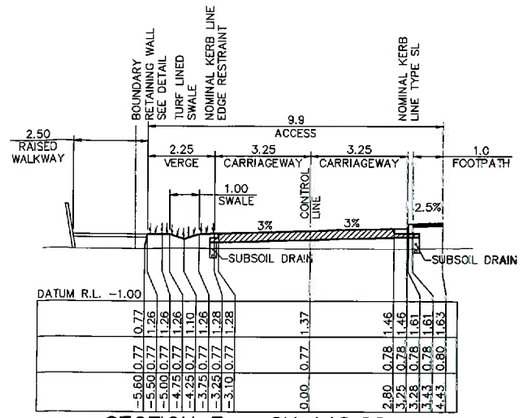
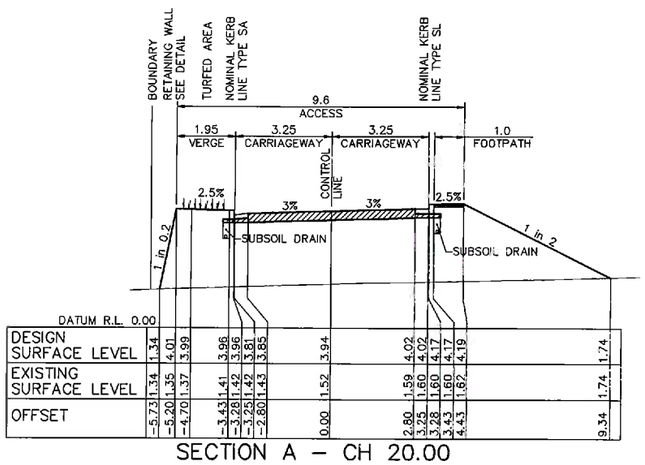
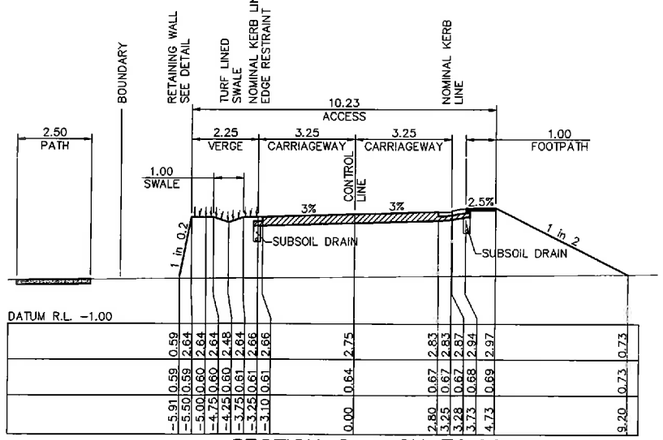


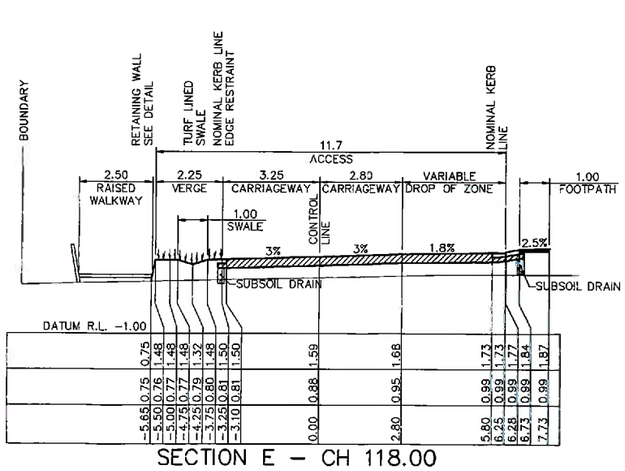
SECTION F – CH 140.00



SECTION A – CH 20.00



SECTION C – CH 70.00



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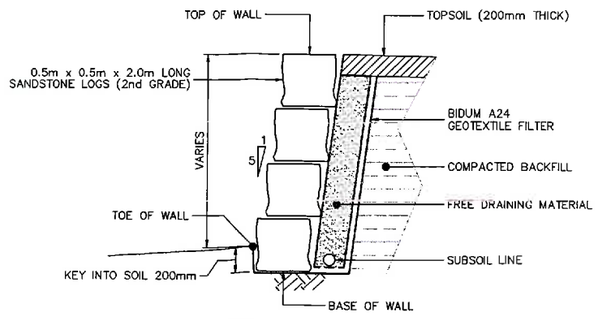

TYPICAL RETAINING WALL DETAIL

N.T.S.

Ver.	Date	Comment
D	30/10/2014	REVISED ISSUE
C	10/09/2014	REVISED ISSUE
B	04/09/2014	REVISED ISSUE
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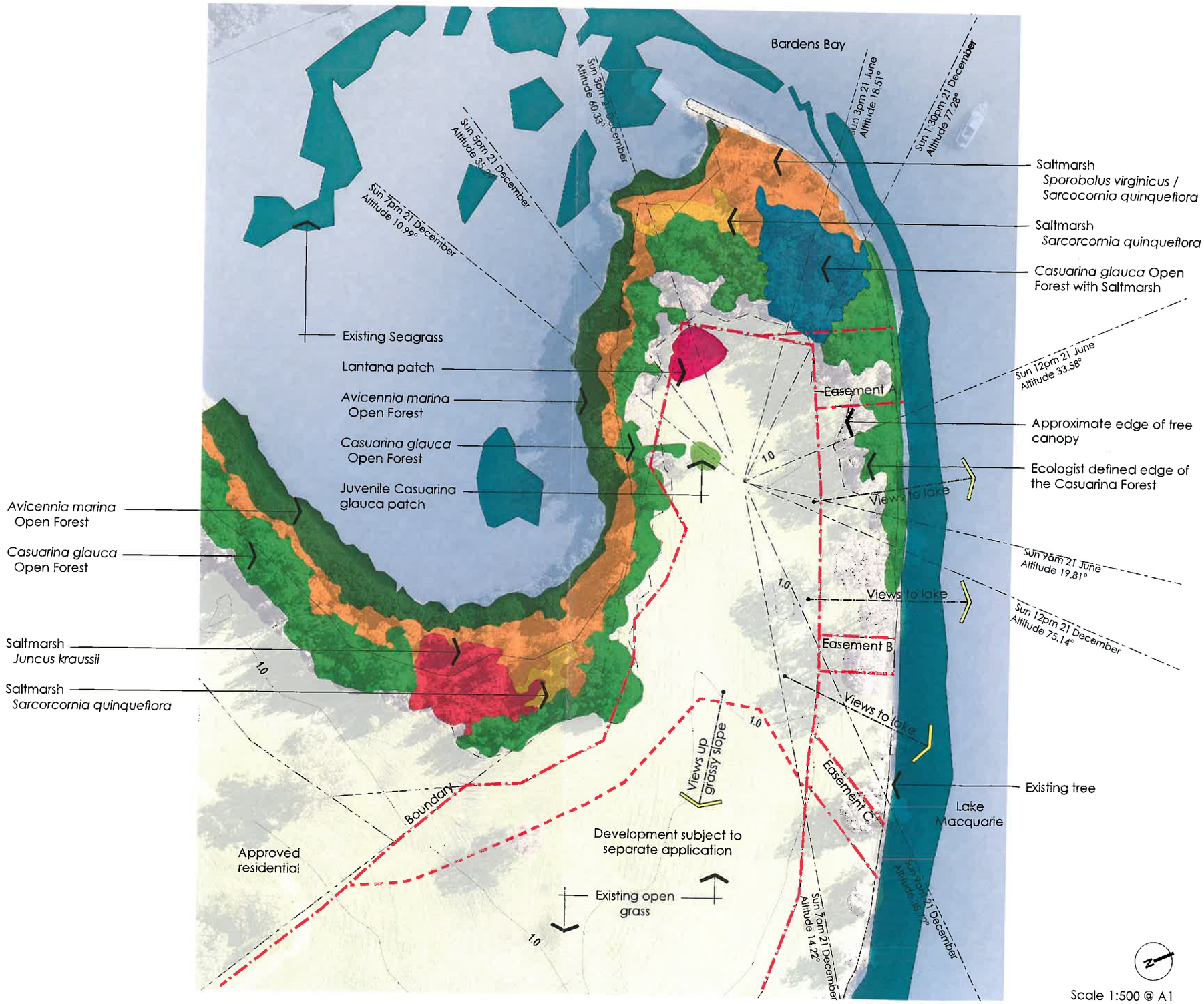
Plotted By: jaysonn Plot Date: 30/10/14 - 10:21 Cad File: N:\37429\37429(2)E\Dwg\ENG\Marina Driveway Concept Design\37429(2)E_SK_001(D).DWG

Site Analysis | 02

Trinity Point Marina - Morisset Park



site details:
Trinity Point
Morisset Park, NSW
client:
Johnson Property Group
date:
September 2014
job number:
10367.5-DA
revision:
D

Scale 1:500 @ A1

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Landscape Design Report | 03

Trinity Point Marina - Morisset Park

Landscape Design Report

General description
The proposed Trinity Point Marina and Mixed Use Development on Lake Macquarie proposes a variety of tourist related facilities and some permanent accommodation at Bluff Point, Bardens Bay - Morisset Park. The project has been approved in concept under Part 3A of the Environmental Planning and assessment Act 1979.

The first stage of development, the subject of this report, includes a marina with a staged portion of the final berthing numbers, and associated marina office, carpark area, boardwalk jetties to the marina, access road and associated infrastructure and utilities. The proposal also includes some works in the Council reserve outside the marina easements, including a western and eastern shared pathway, some minor landscaping, vegetation management and stormwater.

This landscape design report is provided in accordance with Lake Macquarie Development Control Plan 01 - Section 2.7.2 Landscape.

The project is classified as a Category 3 landscape project under the requirements of the DCP -'Medium to large scale proposals and development in areas of ecological value or special projects which have the potential for significant environmental and visual impact.'

Bushfire Asset Protection Zones
The site is predominantly cleared land with the retention of some existing endemic foreshore vegetation and ecological wetland communities in selected areas of the site.

A bushfire risk assessment has been undertaken for the site by Harper Somers O'Sullivan [2007] that informed the Part 3A concept approval and a review of the documentation by RPS in July 2014 concluded that there is no bushfire risk on the site and therefore no Asset Protection Zones are required.

Water Bodies and Wetlands
The site is located on the foreshores of Lake Macquarie. The eastern portion of the site is exposed to the large open lake area whereas the northern tip of the site and the small north western inlet to the southern edge of Bardens Bay provides a unique environmentally sensitive wetland area fringed with EEC Casuarina Forest and Saltmarsh community.

Easements and Restrictions on the Land
There are multiple easements provided on the Council foreshore land to permit construction use and access for marina related facilities.

Existing Noise and Air Quality Sources
The general site area, whilst cleared previously the site was used for various private development types has a low level of surrounding development and a relatively quiet background noise environment.

Heritage Items
A Cultural Heritage Management Plan and Heritage Interpretation Policy has been undertaken for the site by InSite Heritage Pty Ltd. The intention of this policy document has been to satisfy Conditions of Consent issued by the NSW Department of Planning and Infrastructure for the project and to provide guiding policies and principles for the incorporation of interpretation of the cultural and heritage values of the site by means of the presentation of information in the public areas of the project. There are European and Aboriginal cultural heritage considerations.

The concept plans indicate locations for the incorporation of these public interpretive locations and suggest ways that the interpretive materials may be integrated into the site as well as key general themes.

The site
The site is located in Morisset Park on the western shore of Lake Macquarie, south of the Swansea Channel. The site is part of a larger parcel of land that was a formerly occupied by a church institution which developed the site for the institutional and residential buildings. These buildings have been demolished leaving a grassy, sloping site.

The subject site is immediately surrounded on the west, north and east by the waters of Bardens Bay. South of the site is the peninsula that connects the site to the mainland.

Generally, the topography within the site is flat, with the highest point being just over 1m above sea level. This high point is centrally located within the site and the ground slopes down to the lake from there. The larger site of the peninsula slopes from the highest point at the southern end of the landmass toward the north.

The soils
The soil landscape is characterised by broad poorly drained deltaic floodplains and allubial flats of Quarternary sediments. Slope gradients <3%; local relief <10m. Soils are deep (>200cm) Yellow Podzolic Soils, Brown Podzolic Soils, Soloths with some Humus Podzols around lake edges.

The topography of the area is generally characterised by low ridges, monor pormontories and low scale shoreline features developed on soft sandstone and shaly sedimentary rocks of the Triassic Narrabeen and Upper Permian Newcastle Coal Measures geology. Flat alluvial and depositional landscape and flood plains are associated with creeks and bays. Wide, shallow inter tidal areas, sand and mud flats characterise the waterway margins.

Vegetation
Because of the site's prior uses, the majority of the native vegetation has previously been cleared. What remains is remnant vegetation along the water's edge. The vegetation has been mapped in detail on the Analysis Plan and consists of the following.

1. *Avicennia marina* Open Forest
2. *Casuarina glauca* Open Forest
3. *Juncus kraussii* Saltmarsh
4. *Sarcorcornia quinqueflora* Saltmarsh
5. *Sporobolus virinicus / Sarcorcornia quinqueflora* Saltmarsh
6. Seagrass

These vegetation communities are to be retained as they currently exist for the most part. Exceptions to this are the removal of individual *Casuarina* trees to provide room for an access drive and shared pathway as well as the installation of two jetties that lead to marina facilities (as indicated on the Landscape Concept Plan).

Existing landscape character
The site has few natural features due to its history as a formerly developed site. It has remnant foreshore vegetation that screens views of the lake to the north and west. Along the east shoreline, views to the lake are screened through patches of *Casuarina* trees.

To the west of the site, the larger peninsula abuts a landscape of predominantly detached residential development. Further afield and across Bardens Bay, the shoreline is occupied by residential development.

Visual amenity
Lake Macquaries City Council's 'Scenic Management Guidelines' identifies the site as being an area with 'Significant Natural Landscape Feature (Lake promontories, ... with beaches and wetlands).

It also nominates the site as being located within the Bardens Bay Landscape Setting. This has a scenic quality rating of 'Moderate' and a viewing level of 'Level 3'. Development within this area is to:
- minimise substantial alteration of natural ground levels and the dominance of structures along the foreshore
- screen buildings and structures
- implement rehabilitation planting to achieve a min. 30-50% screening within 5 years

site details:
Trinity Point
Morisset Park, NSW
client:
Johnson Property Group
date:
September 2014
job number:
10367.5-DA
revision:
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Landscape Design Report | 04

Trinity Point Marina - Morisset Park

Proposed development

How the Landscape Proposal Meets Intent and Performance Criteria
The Marina development sits within the development boundaries and respects the Council foreshore land through sensitive integration of the development at the boundary interface.

The design plans meet Councils planning objectives through the consideration of environmental, ecological concerns and public amenity through ongoing design development of the concepts.
The visual and environmentally sensitive site characteristics have been considered and have been recognised in the built form through a number of landscape related elements, these include:

- The extensive use of indigenous and endemic plant material.
- Publically accessible shared pathways and linkages.
- Protection of significant areas of native vegetation.
- Vegetation management of existing EEC and protected vegetation.
- Durable, low key materials including natural stone where possible.
- Low maintenance plant selections.
- Articulated lines to hard built forms to soften visual impact.

Broad Planting Theme
The planting palette is based on endemic native species to harmonise with the local landscape character. The additional benefits are suitability to the windy marine environment, minimisation of maintenance and the creation of a local identity.

The principal planting locations include:

Western boundary interface with foreshore land
The sites western boundary shall contain the access road to the marina carpark and future hotel entry. The access road is elevated with the height change managed through a retaining wall with bio-swale. The proposed retaining wall shall be large sandstone 'logs' to create a sympathetic wall element material consistent with the theme materials for the development and local site. The small area of site between the access road and the foreshore land shall be planted with native grasses and sedges to replace the existing kikuyu. Informal copses of Tuckeroo – *Cupaniopsis anacardioides* with be located along the edge of the road where space permits to further complement the landscape character.

Eastern boundary interface with foreshore land
Low shrub and ground cover plantings suited to salt laden air and strong southerly winds. Located to soften the visual appearance of the interface with the foreshore land and connect the building to the landscape setting.

Suggested species include: *Carex appressa, Lomandra longifolia, Carpobrutus glaucesens, Acmena smithii* 'Mini Pilly', *Correa alba* and *Grevillea* 'Royal Mantle'

Carpark planting
Mass planted areas and rain garden areas with shade tree planting in accordance with LMCC guidelines to provide shade to cars. The suggested tree planting is *Cupaniopsis anacardioides* due to its suitable size, proven durability and endemic characteristic.

Rain garden and bioswale plantings
Located in the swale to capture water to the western side of the access road and bordering the western, northern and eastern edges of the parking area. Proven species of low growing hardy sedges including the tough *Carex appressa* and *Ficinia nodosa*, both suited to the harsh environment and capable of withstanding both wet and dry soil conditions.

Western façade screen planting
The service area to the west of the marina offices is proposed to be screened with tall shrubs to compliment the proposed wood fence. Additional mass planting area is provided in front of the screen fence element. This is a location that is only visible by visitors to the carpark but will benefit from additional landscaping. Planting shall include *Syzygium* 'Resilience', possibly *Trachelospermum* as a climber due to its excellent growth properties and native grasses and ground covers.

Hardworks Paving and Surface Treatments
Pavement materials have been suggested within the architectural palette and within the landscape documents. The intent is to use hard wearing durable surfaces such as oxide coloured concrete or exposed aggregate in subdued colors that complement the overall theme. Areas of timber decking are proposed for the link to the marina pontoon with FRB grating to be used over water and sea grass areas as well as the suggested viewing-interprative deck [FRB Marine Decking" by Perma Composite 8mm x 8mm, colour sand RAL]

The proposed eastern public access foreshore path has been located within the foreshore land to provide a separate shared pathway. This path is to be concrete and has been located on existing grades. The material shall be concrete in grey or low visual impact beige colours.

Retaining Walls
Level changes within the design have been accommodated with several materials and designs to allow level changes to occur. The western access road shall be a vertical sandstone log wall. The eastern boundary interface with the foreshore land includes some small areas of vertical sandstone clad wall, several areas of tiered steps or seating areas to minimise vertical surfaces and create a pedestrian friendly element suitable for sitting. The steps around the marina office for instance have been stylised for visual amenity, to permit views out from the carpark and to allow sitting.

Pedestrian or Cyclist Linkages
A condition of the previous consent was the provision of public access around the site. Following environmental assessment the vegetation around the northern tip of the site has been identified as sensitive and these areas have been protected. Pedestrian access has been provided with a footpath along the eastern edge of the access road. This path leads to the northern carpark.

To further improve public access and provide a more separate and identifiable pathway the development proposes to construct, to Council's approval, a 2.5m wide pathway along the western boundary of the site. This path would be located on both private and Council foreshore land, include an elevated 'eco' style boardwalk in locations to protect existing vegetation. This shared pathway would then cross a large clearly defined zone between the building and the carpark to link to the eastern foreshore land.

The marina building incorporates an eastern terrace area at the elevated level for access however a continuation of a separate 2.5m shared pathway is proposed in the foreshore land to provide a clearly defined and accessible public shared pathway on grade. If approved by Council, and at the developers cost. This will complete a continuous separate pubiic shared pathway around the site and proposed to be continued in the adjoining development and linkages to other parts of Trinity Point in accordance with Council's Plan of Management.

Links to Adjoining Spaces
The marina site is located on a peninsular surrounded on three sides by water. The key linkages are access to the eastern and western foreshore land which has been provided in the design. The proposed separate shared pathways provide an excellent public pathway network suitable for cyclists and pedestrians with the opportunity to extend into the future staged development areas and adjoining site areas as part of a continuous pedestrian network along the foreshore and through the site.

References

Harper Somers O'Sullivan, 2008, *Vegetation Map, Trinity Point*

Lake Macquarie City Council, 2004, *Lake Macquarie Local Environment Plan.*

Lake Macquarie City Council, 2014, *Lake Macquarie Development Control Plan 2014, Part 1,* - Revision 03.

Lake Macquarie City Council, 2013, *Scenic Management Guidelines.*

Lake Macquarie City Council, 2005, *Streambank and Foreshore Planting Guide.*

Murphy, C. L., 1992, *Soil Landscapes of Gosford-Lake Macquarie* 1:100 000 Sheet Report, Department of Conservation and Land Management, Sydney.

Marine Pollution Research Pty Ltd, 2014, *Trinity Point Marina Proposal; Condition of Approval CoA11 Pre-Construction Baseline Aquatic Ecology Monitoring.*

Richard Lamb & Associates, 2008, *Trinity Point Marina and Mixed Use Resort; Visual Impact Assessment.*

RPS Australia East Pty Ltd, 2014, *Trinity Point Revised Vegetation Community Mapping.*

Consultants Declaration:

I Steven Rushworth have prepared the documentation and hold qualifications to meet the requirements of Lake Macquarie City Council for this category of development as outlined in LMCC DCP1 and guidelines relevant for this development.

Category of Proposal:
Category 3

Qualification:
Registered Landscape Architect AILA RLA 1615

site details:
Trinity Point
Morisset Park, NSW
client:
Johnson Property Group
date:
September 2014
job number:
10367.5-DA
revision:
D

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Landscape Design Principles | 05

Trinity Point Marina - Morisset Park

Landscape Design Principles

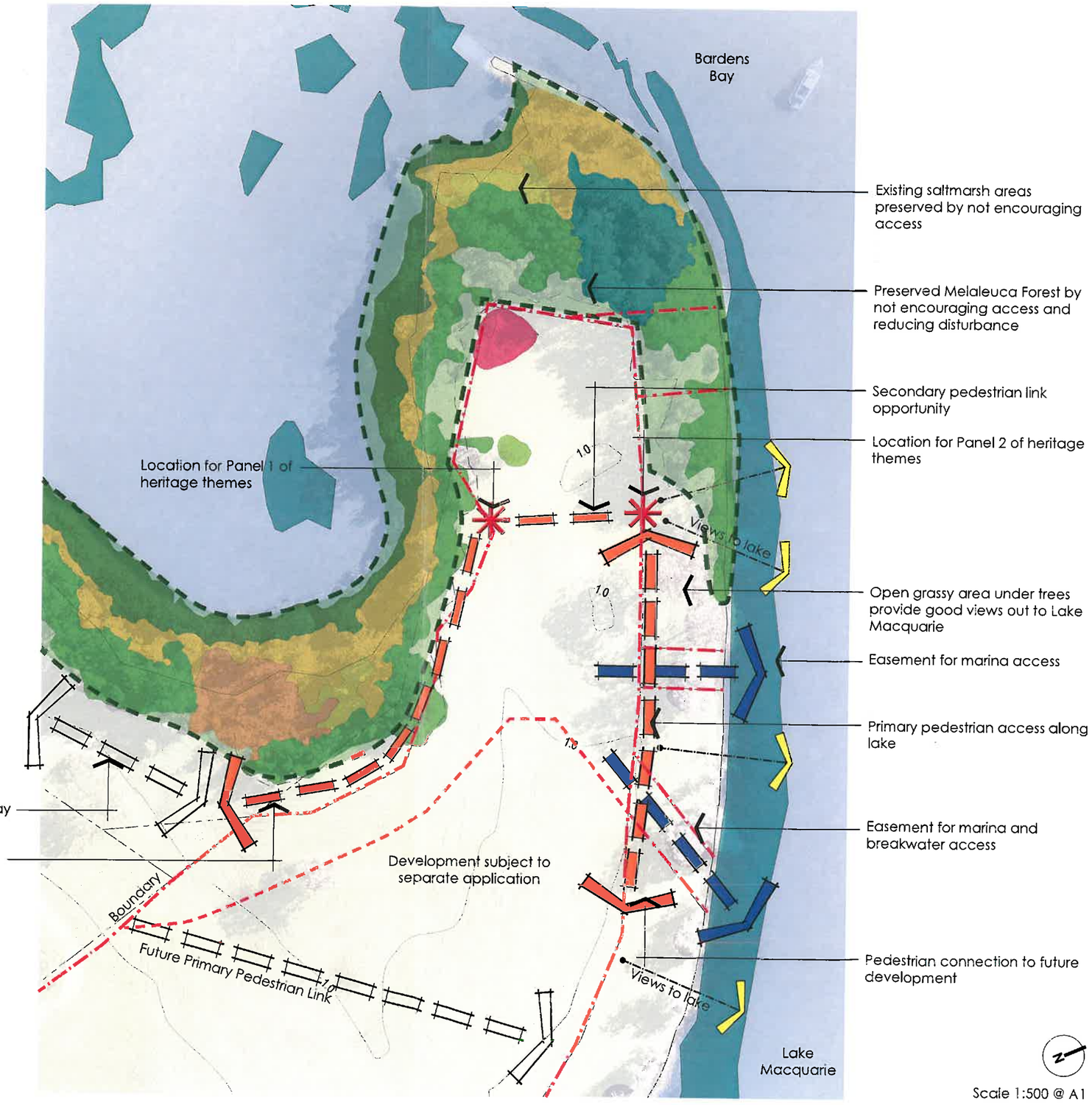
1. Preservation of existing plant communities
2. Provision of public pedestrian access along parts of edge of development and shoreline
3. Access to lake in limited locations to preserve the natural character of the lake edge surrounding the site
4. Inclusion of Aboriginal and Cultural Heritage interpretation into design

Heritage Themes

Listed below are suggested general themes that might be incorporated into the two locations identified on the plan on this page.

Panel 1 (facing west)
- Mangroves and their role in Aboriginal subsistence
- Looking beyond the mangroves and where there is now housing – descriptions of the open site and artefacts salvaged there
- Views to the west and the role of Watagans in Aboriginal culture
- Description of some forest materials used and some Awabakal names of things / places
- The role of neighbouring tribes and the travellers who came to the lake to share poetry and songs.

Panel 2 (facing east)
- The lake and its historical role in daily life - fishing and canoes
- There is a story in Threkeld of witnessing a shark attack on the canoe.
- The legend of the monster that lives in the lake near Pulbah.
- The role of cockles in the diet.
- Place names and resources of the lake



Scale 1:500 @ A1

site details:
Trinity Point
Morisset Park, NSW
client:
Johnson Property Group
date:
September 2014
job number:
10367.5-DA
revision:
D

terras landscape architects

Landscape Concept Plan | 06

Trinity Point Marina - Morisset Park

site details:
Trinity Point
Morisset Park, NSW
client:
Johnson Property Group
date:
September 2014
job number:
10367.5-DA
revision:
D

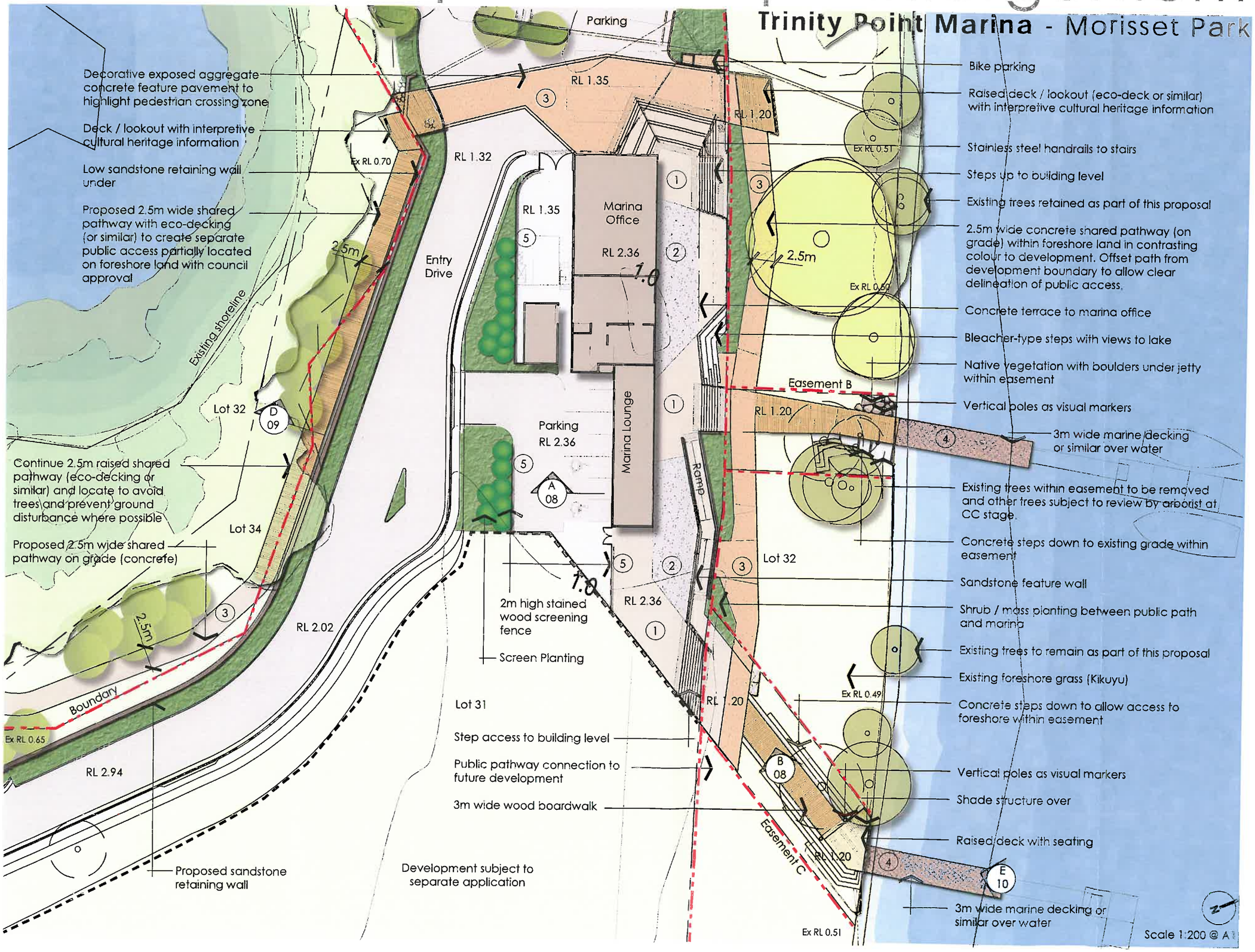
Scale 1:500 @ A1

terras landscape architects

Landscape Concept Enlargement

07

Trinity Point Marina - Morisset Park



Legend

1. Wood decking
2. Grey concrete with light grit blast finish
3. Exposed aggregate concrete
4. Marine decking to allow light through
5. 2m high stained wood screening fence

site details:
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Morisset Park, NSW
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September 2014
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revision:
D

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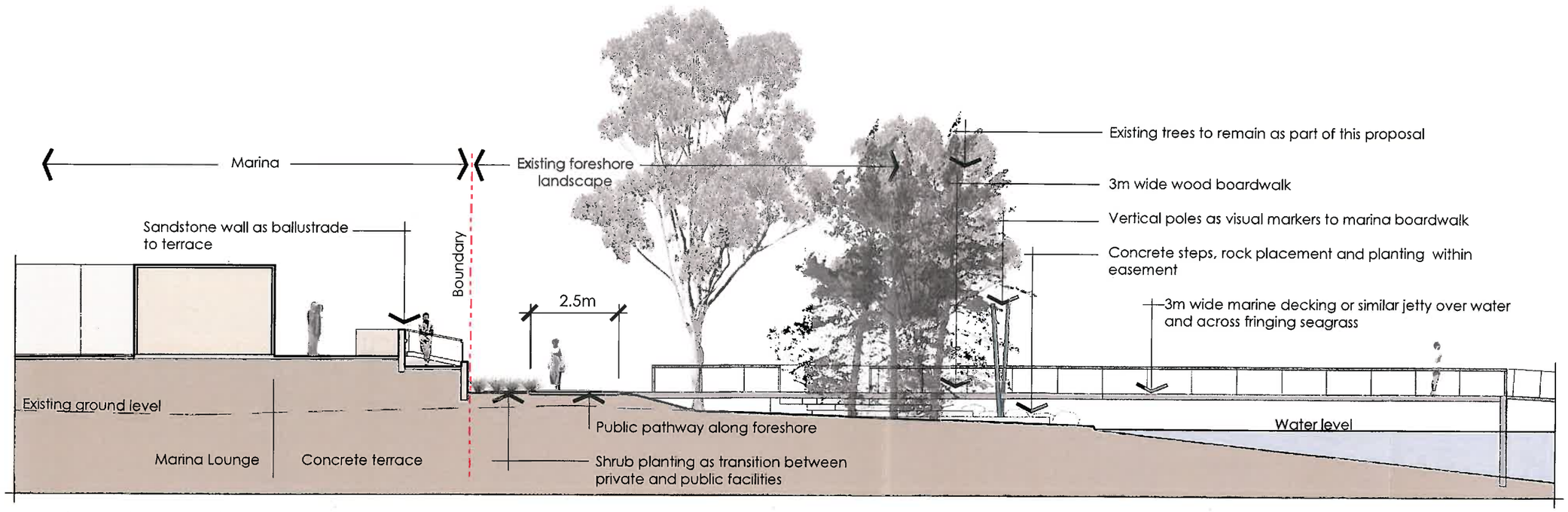
landscape architects

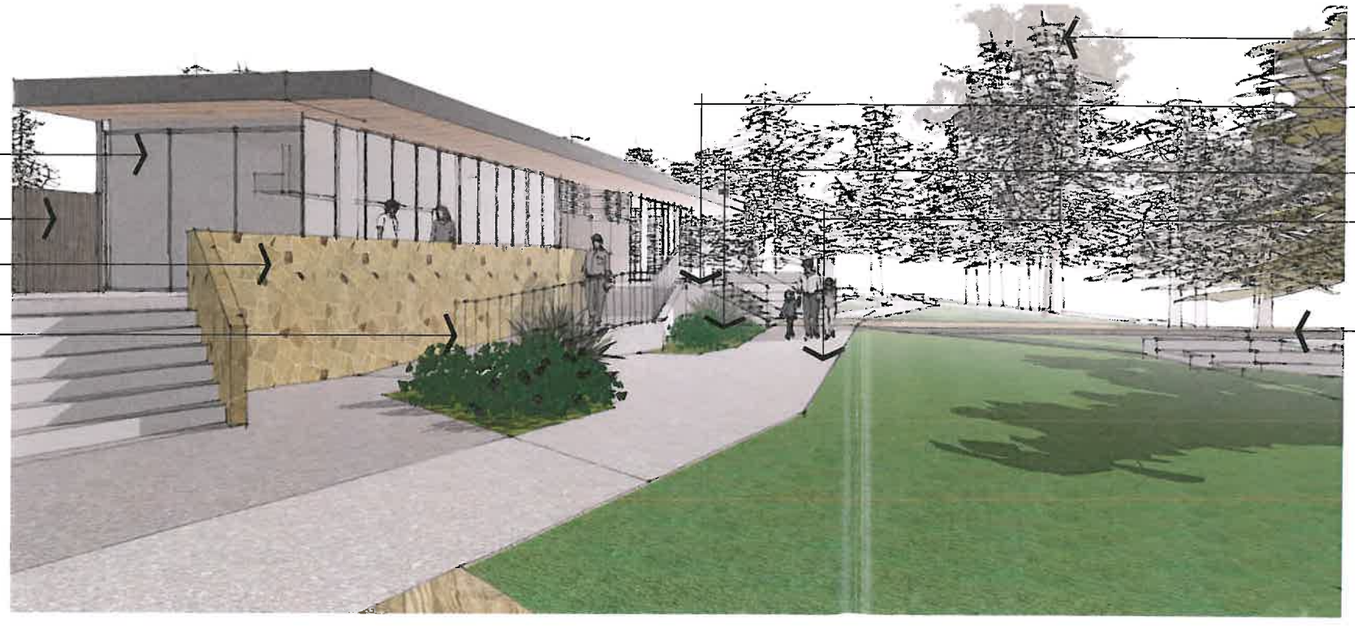
Landscape Sections | 08

Trinity Point Marina - Morisset Park



A : Marina Landscape Section A

Scale 1:75 @ A1



B : Perspective view of proposed landscape treatment

Scale: not to scale

site details:
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Morisset Park, NSW
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date:
September 2014
job number:
10367.5-DA
revision:
D

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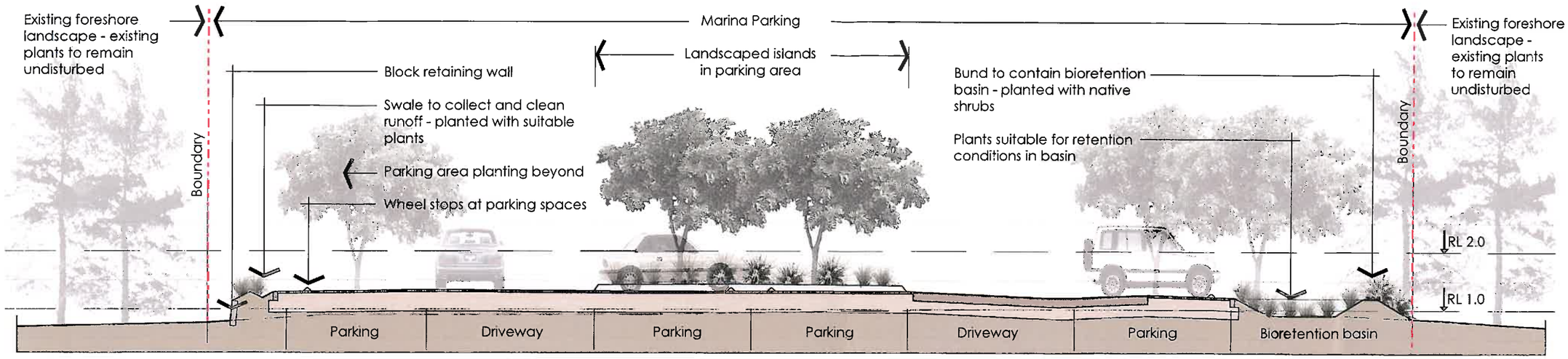
Landscape Sections | 09

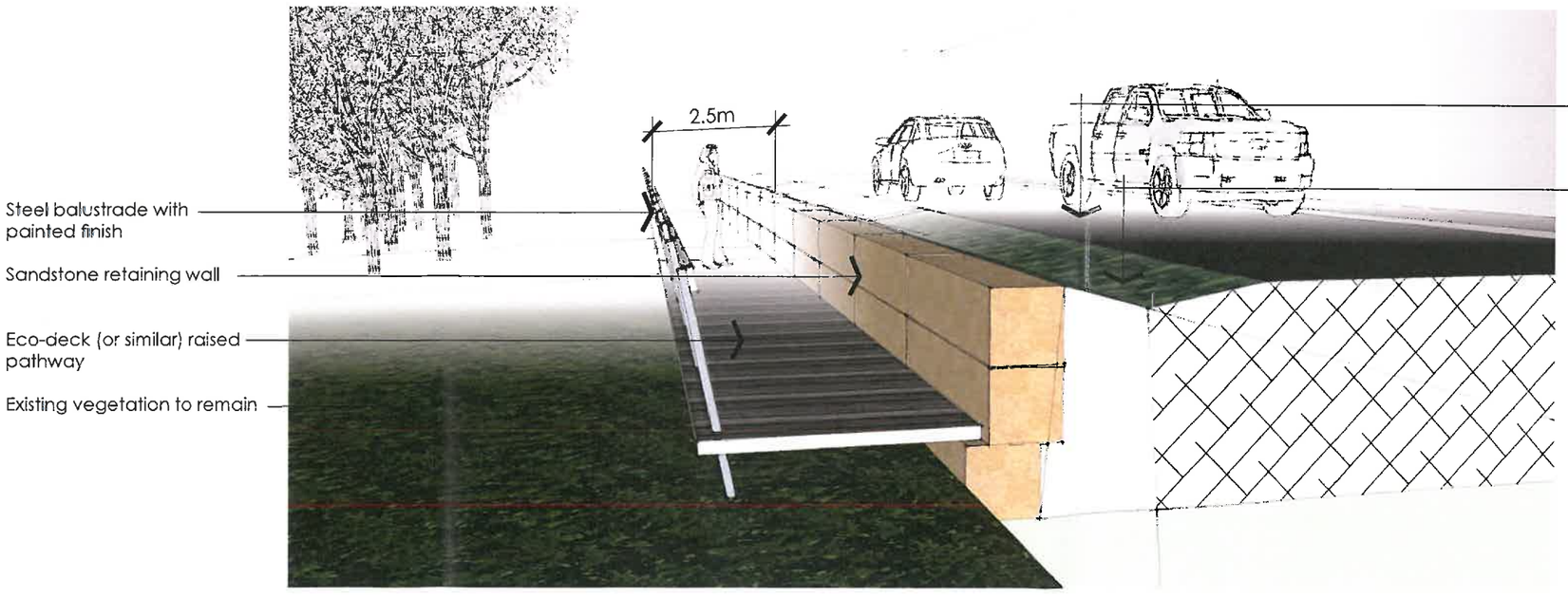
Trinity Point Marina - Morisset Park



C : Parking Area Landscape Section

Vertical scale exagerated

Scale 1:75 (horizontal) @ A1



D : Sectional view of proposed shared pathway along western access where required to manage level change and avoid trees - otherwise on grade concrete shared pathway

Scale: not to scale

site details:
Trinity Point
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September 2014
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revision:
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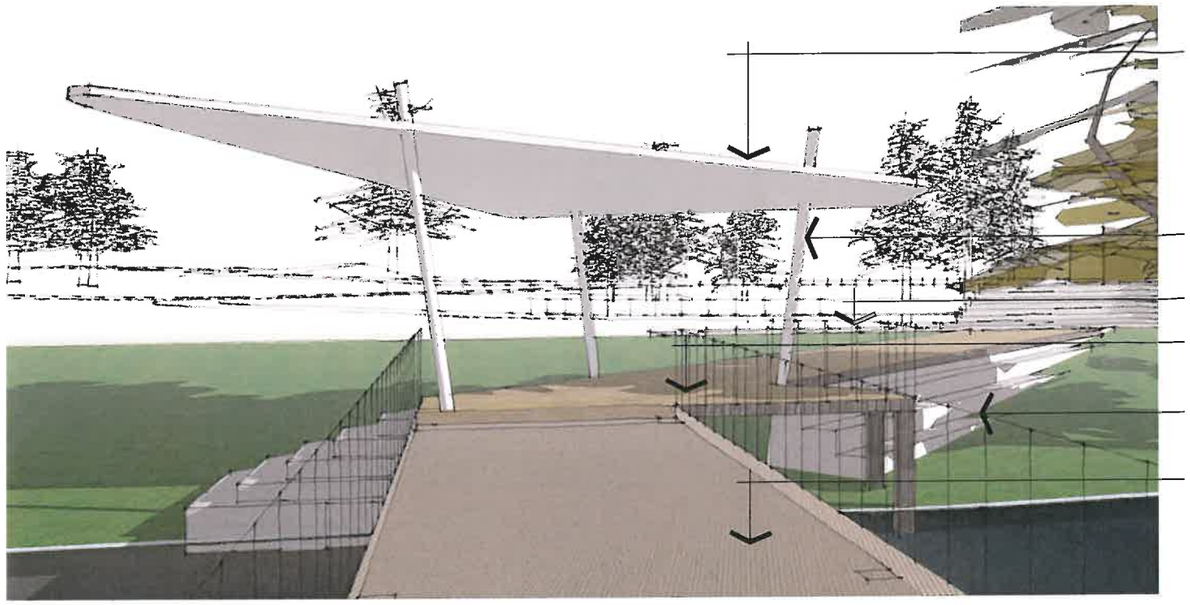
Landscape Materials | 10

Trinity Point Marina - Morisset Park



Angled roof to shade structure. Suggested roof from - indicative only

Angled support posts with painted finish

Stainless steel railing along jetty

Wood boardwalk (3m wide) and deck

Concrete steps along boardwalk for access down to existing levels

3m wide marine decking (or similar) jetty

C : Proposed shade structure at jetty

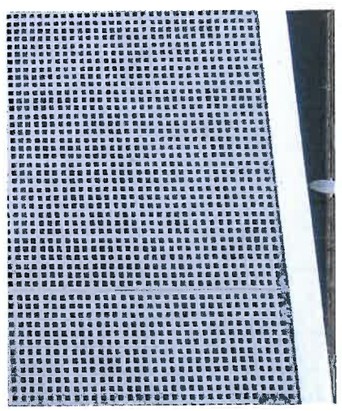
Indicative illustration

Scale: not to scale

Paving

1. Wood decking
2. Grey concrete with light grit blast finish
3. Exposed aggregate concrete

Balustrades to be steel with painted finish



Marine decking to allow light through to waterplants underneath

Walls

Sandstone feature walls

Hardwood screen fence

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Morisset Park, NSW
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Johnson Property Group
date:
September 2014
job number:
10367.5-DA
revision:
D

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landscape architects

8A0379–MA_LB011 **DO NOT SCALE**

FOOTPRINT

AREA = 57730m²

PREVIOUS BOUNDARY

14.9m

30.3m

WAVE ATTENUATOR UNITS APPROX 280m TOTAL LENGTH

R27m (1.5x18m)

1x10m BERTH

2x12m BERTHS

2x16m BERTHS

21x14m BERTHS

10x18m BERTHS

2x16m BERTHS

4x12m BERTHS

22x12m BERTHS

32m FUEL/PUMPOUT BERTH

4m

10m APPROX ALUMINIUM GANGWAY

TIMBER JETTY WITH GRATED DECK OVER SEAGRASS

67.6m

2.4m

ACCESS + FUEL LINES

SECURITY GATE

ARM A

SECURITY GATE

INFILL PANEL

3m PUBLIC BOARDWALK

SEAGRASS

EASEMENT (B)

EASEMENT (C)

EASEMENT TYP

10 0 10 20 30 40 50m

1:500 (A1) 1:1000 (A3)

NOT FOR CONSTRUCTION

STAGE	1a	1b	2a	2b	2c	TOTAL
BERTHS	72	-	-	-	-	72

NOTES

1. ALL DIMENSIONS AND LEVELS ARE IN METRES RELATIVE TO CHART DATUM CD.

LEGEND

STAGE 1a

BREAKWATER

REV	DATE	DESCRIPTION	BY	CHK	APPD
B	04/08.2014	RE-ISSUED FOR REVIEW	SC	AP	
A	25.03.2014	ISSUED FOR REVIEW	SC	AP	

REVISIONS

CLIENT

PROJECT: TRINITY POINT MARINA

DRAWING TITLE: CONCEPT MARINA LAYOUT STAGE 1a

HASKONING AUSTRALIA PTY LTD
SYDNEY
Royal HaskoningDHV
Enhancing Society Together
Suite 8, Level 5
100 Walker Street
North Sydney NSW 2060
+61 2 8854 3000
+61 2 99209940
www.royalhaskoning.com
Telephone
Fax
Internet

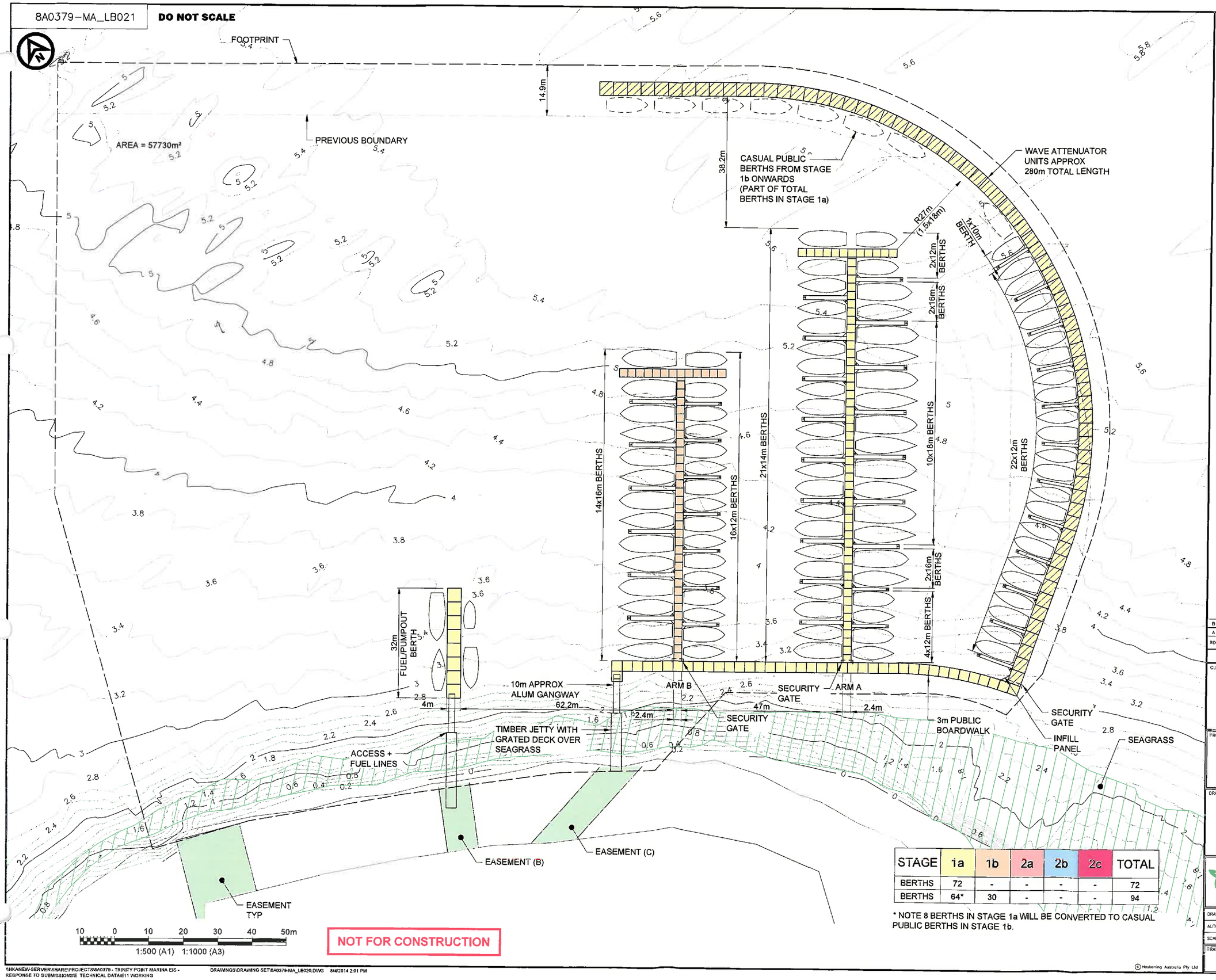
DRAWN SC | DATE 04/08/2014 | JOB No. 8A0379

AUTOCAD REF. 8A0379–MA_LB010

SCALE AT A1 1:500

DRAWING No. 8A0379–MA_LB011 | REVISION B

8A0379–MA_LB021 **DO NOT SCALE**



NOTES

1. ALL DIMENSIONS AND LEVELS ARE IN METRES RELATIVE TO CHART DATUM CD.

LEGEND

STAGE 1a

STAGE 1b

BREAKWATER

STAGE	1a	1b	2a	2b	2c	TOTAL
BERTHS	72	-	-	-	-	72
BERTHS	64*	30	-	-	-	94

* NOTE 8 BERTHS IN STAGE 1a WILL BE CONVERTED TO CASUAL PUBLIC BERTHS IN STAGE 1b.

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY	CHK	APPD
B	04/08/2014	RE-ISSUED FOR REVIEW	SC	AP	
A	25/03/2014	ISSUED FOR REVIEW	SC	AP	

REVISIONS

CLIENT

PROJECT: TRINITY POINT MARINA

DRAWING TITLE: CONCEPT MARINA LAYOUT STAGE 1a & 1b

HASKONING AUSTRALIA PTY LTD SYDNEY
Royal HaskoningDHV
Enhancing Society Together
Suite 5, Level 5 100 Walker Street North Sydney NSW 2060
+61 2 9854 5000
+61 2 99506363
www.royalhaskoning.com
Telephone Fax Internet

DRAWN SC | DATE 04/08/2014 | JOB No. 8A0379

AUTOCAD REF. 8A0379–MA_LB020

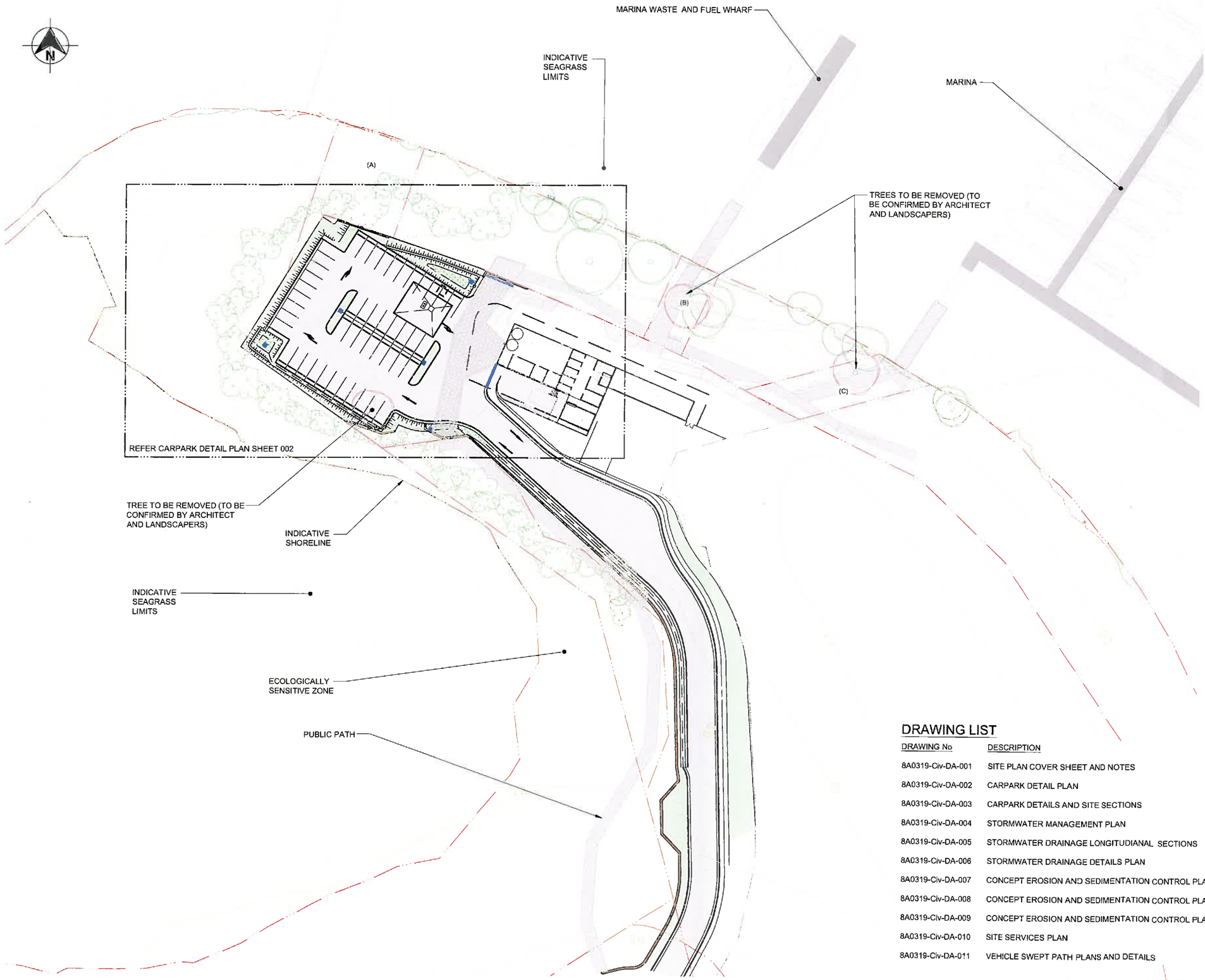
SCALE AT A1 1:500

DRAWING No. 8A0379–MA_LB021 | REVISION B

\\HKANEW-SERVER\SHARE\PROJECTS\8A0379 - TRINITY POINT MARINA EIS - RESPONSE TO SUBMISSIONS\E TECHNICAL DATA\E11 WORKING DRAWINGS\DRAWING SET\8A0379-MA_LB020.DWG 8/4/2014 2:01 PM

DRAWING No.
8A0319-Civ-DA-001

DO NOT SCALE



GENERAL NOTES

1. PAVEMENTS, BEDDING AND SUB-SURFACE CONDITION ASSESMENTS WILL UNDERTAKEN ON SITE BY A SUITABLY QUALIFIED ENGINEER IN CONJUNCTION WITH LMCC. WHERE INDICATED ON THESE PLANS PAVEMENT DETAILING IS CONSIDERED INDICATIVE ONLY.
2. ALL CONSTRUCTION, LANDSCAPING, TRAFFIC MANAGEMENT, QA, EROSION AND SEDIMENT CONTROL AND OHS MANAGEMENT SHALL BE UNDERTAKED AS DIRECTED AND/OR IN ACCORDANCE WITH LMCC STANDARDS.
3. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS AND SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE PROJECT.
4. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH LMCC REQUIREMENTS OR THE RELEVANT AND CURRENT AUSTRALIAN STANDARDS AND WITH CONDITIONS IMPOSED BY REGULATORY AUTHORITIES EXCEPT WHERE VARIED BY THESE DRAWINGS.
5. ALL DIMENSIONS SHOWN MUST BE VERIFIED BY THE CONTRACTOR ON SITE. DRAWINGS SHALL NOT BE SCALED FOR DIMENSIONS.
6. THE CONTRACTOR SHALL ESTABLISH THE LOCATIONS OF ALL EXISTING SERVICES AFFECTED BY THE WORKS AND CONDUCT DIAL-BEFORE-YOU-DIG. THE CONTRACTOR SHALL ADVISE THE SUPERINTENDENT IF THERE ARE ANY UNKNOWN SERVICES THAT CAN POTENTIALLY BE AFFECTED BY THE WORKS.
7. SURVEY BY SURDEVEL 2006 AND PROVIDED BY ADW JOHNSON.
8. VEGETATION REMOVAL TO BE KEPT TO A MINIMUM. SITE ACCESS TRACKS AND CONSTRUCTION PADS SHALL MAKE USE OF EXISTING DE-NUDED AREAS WHERE EVER POSSIBLE.
9. BATTER SLOPES SHOWN ON THESE PLANS INDICATE THE GRADE PERPENDICULAR TO THE SETOUT LINE
10. THE CONTRACTOR SHALL REMOVE AND LAWFULLY DISPOSE OF ALL MISCELLANEOUS WASTE ITEMS OR DEBRIS WHICH MAY OR MAY NOT BE INDICATED ON THESE PLANS BUT ARE IDENTIFIED DURING THE COURSE OF THE WORKS.
11. THE CONTRACTOR SHALL UNDERTAKE PRE AND POST CONSTRUCTION SURVEYS FOR SUBMISSION TO THE SUPERINTENDENT. RECORDS SHALL BE KEPT OF ANY DILAPIDATION TO THE EXISTING STRUCTURES WHICH MAY OCCUR DURING CONSTRUCTION.
12. UNLESS NOTED OTHERWISE AREAS OF THE SITE WHICH ARE IN ANY WAY AFFECTED BY CONSTRUCTION, OR CONSTRUCTION RELATED ACTIVITIES, SHALL BE RESTORED TO THE PRE-CONSTRUCTION CONDITION BY THE CONTRACTOR.
13. ALL DIMENSIONS IN METRES AND LEVELS ARE IN METRES (AHD) UNLESS NOTED OTHERWISE.
14. ALL LANDSCAPING DETAILS (INCLUDING THE REMOVAL OF TREES) ARE INDICATIVE ONLY AND SHALL BE CONFIRMED.
15. BLOCK WALLS HAVE BEEN DEVELOPED IN ORDER TO PROVIDE HORIZONTAL AND VERTICAL GEOMETRY. WALL DETAILS, COLOURS AND TYPE SHALL BE DETERMINED BY OTHERS.

DRAWING LIST

DRAWING No	DESCRIPTION
8A0319-Civ-DA-001	SITE PLAN COVER SHEET AND NOTES
8A0319-Civ-DA-002	CARPARK DETAIL PLAN
8A0319-Civ-DA-003	CARPARK DETAILS AND SITE SECTIONS
8A0319-Civ-DA-004	STORMWATER MANAGEMENT PLAN
8A0319-Civ-DA-005	STORMWATER DRAINAGE LONGITUDIANAL SECTIONS
8A0319-Civ-DA-006	STORMWATER DRAINAGE DETAILS PLAN
8A0319-Civ-DA-007	CONCEPT EROSION AND SEDIMENTATION CONTROL PLAN 1 OF 2
8A0319-Civ-DA-008	CONCEPT EROSION AND SEDIMENTATION CONTROL PLAN 2 OF 2
8A0319-Civ-DA-009	CONCEPT EROSION AND SEDIMENTATION CONTROL PLAN NOTES & DETAILS
8A0319-Civ-DA-010	SITE SERVICES PLAN
8A0319-Civ-DA-011	VEHICLE SWEPT PATH PLANS AND DETAILS

8 0 8 16 24 32 40m

1:400 (A1) 1:800 (A3)

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY	CHK	APPD
B	12.9.14	ISSUED FOR INCLUSION IN REPORT	MC	CK	PH
A	6.9.14	ISSUED FOR DA APPROVAL	MC	BP	BP

REVISIONS

CLIENT

PROJECT:
TRINITY POINT MARINA CARPARK

DRAWING TITLE:
SITE PLAN

HASKONING AUSTRALIA PTY LTD
NEWCASTLE
Royal HaskoningDHV
Enhancing Society Together
Level 1
43 Bolton Street
Newcastle NSW 2300
Australia
+61 2 4926 5500
www.royalhaskoning.com
Telephone
Internet

DRAWN MLC	DATE SEPT 2014	JOB No. 8A0319
AUTOCAD REF. 8A0319-001		
SCALE AT A1 1:400		

DRAWING No. 8A0319-Civ-DA-001 REVISION B

C:\RH0011AD\RHAU-A1-TRINITY.DWG ---

DRAWING No. 8A0319–Civ– DA–002

DO NOT SCALE

BARRIER FENCING AS PER LMCC STD DWG F2004/11035 BASIN ACCIDENTAL ENTRY FENCE TO BE PROVIDED ON BLOCKWORK WALL

JOINS OPPOSITE

GRATED DRAIN (PEDESTRIAN SAFE) TO BE PROVIDED ON LIMIT OF CARPARK FOOTWAY. CONNECT TO BIOFILTRATION BASIN

WALL CONTINUES. LIMITS OF WALL SHOWN FOR CARPARK DESIGN ONLY

FUEL UNLOADING AREA

UNDERGROUND FULE STORAGE TANK

BICYCLE PARKING AREA

PRECAST WHEELSTOP (TYP)

BIORETENTION BASIN REFER TO PLAN 006

SUBSOIL DRAIN AND WEEP HOLES IN BLOCK WALLS (TYP)

SUBSOIL DRAIN

BARRIER FENCING AS PER LMCC STD DWG F2004/11035 BASIN ACCIDENTAL ENTRY FENCE TO BE PROVIDED ON BLOCKWORK WALL

LOCALLY SHAPE PAVEMENT SURFACE TO AVOID FUEL TRANSFER PAD

NOTE: PROVIDE WEEP HOLE OUTLETS FOR SUBSOIL DRAINAGE LINES AT REGULAR INTERVALS IN LOWER BLOCK WALL

PROVIDE 1 in 4 BATTER FROM THE TOE OF THE BACK OF KERB TO EXISTING SURFACE (BOUNDARY)

INDICATIVE STORMWATER LINE FOR DOCK GRATED DRAIN, BUILDING DP's AND RAINWATER TANK OVERFLOW CONNECTIONS

LEVELS AT TOE OF STEPS TO BE CONFIRMED

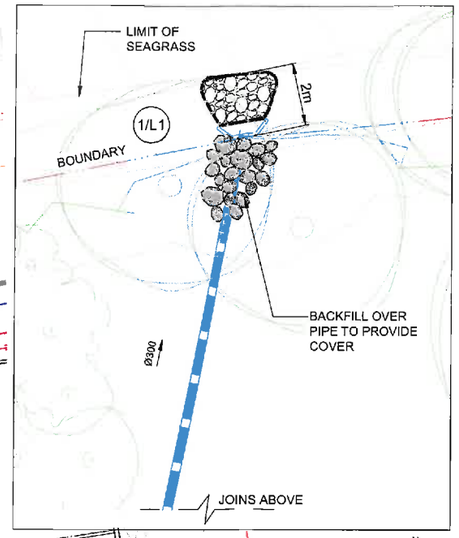
FOOTPATH SURFACE TREATMENT TO ARCHITECT AND LANDSCAPERS DETAILS

GRATED DRAIN (PEDESTRIAN SAFE) TO BE PROVIDED ON LIMIT OF TRUCK LOADING AREA.

MARINA BUILDING ROOF LINE

HARDSTAND AREA

ENTRY / EXIT ROAD TO TRINITY POINT DRIVE DESIGN BY OTHERS



NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY	CHK	APPD
B	12.9.14	ISSUED FOR INCLUSION IN REPORT	MC	CK	PH
A	6.9.14	ISSUED FOR DA APPROVAL	MC	BP	BP

REVISIONS

CLIENT

PROJECT: TRINITY POINT MARINA CARPARK

DRAWING TITLE: CARPARK DETAIL PLAN

HASKONING AUSTRALIA PTY LTD
NEWCASTLE
Royal HaskoningDHV
Enhancing Society Together
Level 1
43 Bolton Street
Newcastle NSW 2300
Australia
+61 2 4908 5500
www.royalhaskoning.com
Telephone
Internet

DRAWN MLC	DATE SEPT 2014	JOB No. 8A0319
AUTOCAD REF. 8A0319–002		
SCALE AT A1 1:100		
DRAWING No. 8A0319–Civ– DA–002		REVISION B

2 0 2 4 6 8 10m

1:100 (A1) 1:200 (A3)

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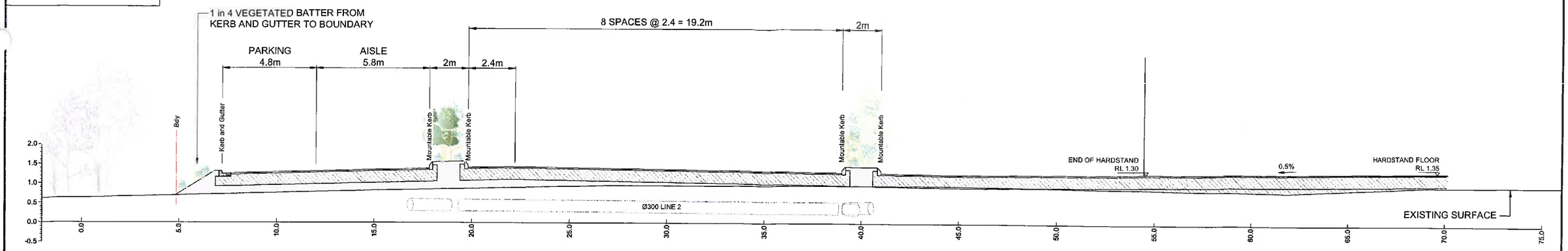
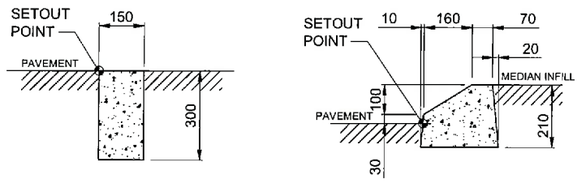
DRAWING No.
8A0319–Civ– DA–003

DO NOT SCALE



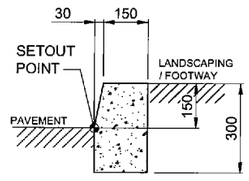
SECTION 1

SECTION 2

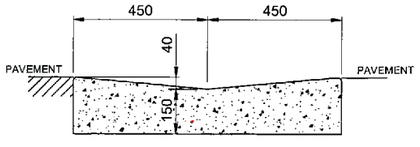


EDGE STRIP (ES)
SCALE 1:10 (A1)

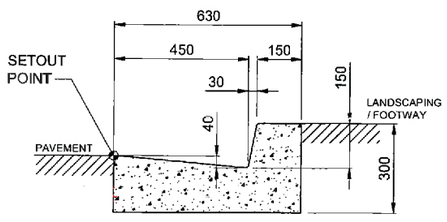
MEDIAN KERB (MK)
SCALE 1:10 (A1)



UPRIGHT KERB ONLY (KO)
SCALE 1:10 (A1)



450mm DISH CROSSING (DC)
SCALE 1:10 (A1)



450mm UPRIGHT KERB AND GUTTER (K&G)
SCALE 1:10 (A1)

200 0 200 400 600 800 1000mm
1:10 (A1) 1:20 (A3)

2000 0 2000 4000 6000 8000 10000mm
HORIZONTAL 1:100 (A1) 1:200 (A3)

1000 0 1000 2000 3000 4000 5000mm
VERTICAL 1:50 (A1) 1:100 (A3)

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY	CHK	APPD
B	12.9.14	ISSUED FOR INCLUSION IN REPORT	MC	CK	PH
A	6.9.14	ISSUED FOR DA APPROVAL	MC	BP	BP

REVISIONS

CLIENT

PROJECT:
TRINITY POINT MARINA CARPARK

DRAWING TITLE:
CARPARK DETAILS AND SITE SECTIONS

HASKONING AUSTRALIA PTY LTD
NEWCASTLE
Royal HaskoningDHV
Enhancing Society Together
Level 1
43 Bolton Street
Newcastle NSW 2300
Australia
+61 2 4926 5000
Telephone
Int+61
www.royalhaskoning.com

DRAWN	DATE	JOB No.
MLC	SEPT 2014	8A0319

AUTOCAD REF. 8A0319–003
SCALE AT A1 AS SHOWN

DRAWING No.	REVISION
8A0319–Civ– DA–003	B

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DRAWING No.
8A0319–Civ– DA–004

DO NOT SCALE

SEAGRASS

SEAGRASS

1/L1

OUTLET TO LAKE MACQUARIE

SHORELINE

SHORELINE

BIOFILTRATION BASIN 1
FILTER AREA 15m²

N

2/L1

1/L3

MARINA LOUNGE AND OFFICE ROOF AREAS DRAIN TO 2x5kL RAINWATER TANKS. HARVESTED RAINWATER TO BE USED FOR TOILET FLUSHING

SC 1
1170m²

2/L3

FUEL UNLOADING AREA.

PURACEPTOR TO PROVIDE WATER QUALITY TREATMENT AND SPILL CONTAINMENT FROM FUEL UNLOADING AREA.

1/L2

3/L1

SC 3
560m²

4/L1

SC 2
2440m²

2/L2

ACCESS ROAD DRAINS TO VEGETATED SWALE

SHORELINE

BIOFILTRATION BASIN 3
FILTER AREA 8m²

BIOFILTRATION BASIN 2
FILTER AREA 8m²

SEAGRASS

LEGEND

- PIPED STORMWATER SYSTEM
- RAINWATER TANKS
- PURACEPTOR
- VEGETATED SWALE
- BIOFILTRATION FILTER
- FUEL UNLOADING AREA

5 0 5 10 15 20 25m

1:250 (A1) 1:500 (A3)

C:\R\F0011AD\RHAU-A1-TRINITY.DWG ----

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY	CHK	APPD
B	12.9.14	ISSUED FOR INCLUSION IN REPORT	MC	CK	PH
A	6.9.14	ISSUED FOR DA APPROVAL	MC	BP	BP

REVISIONS

CLIENT

PROJECT:
TRINITY POINT MARINA CARPARK

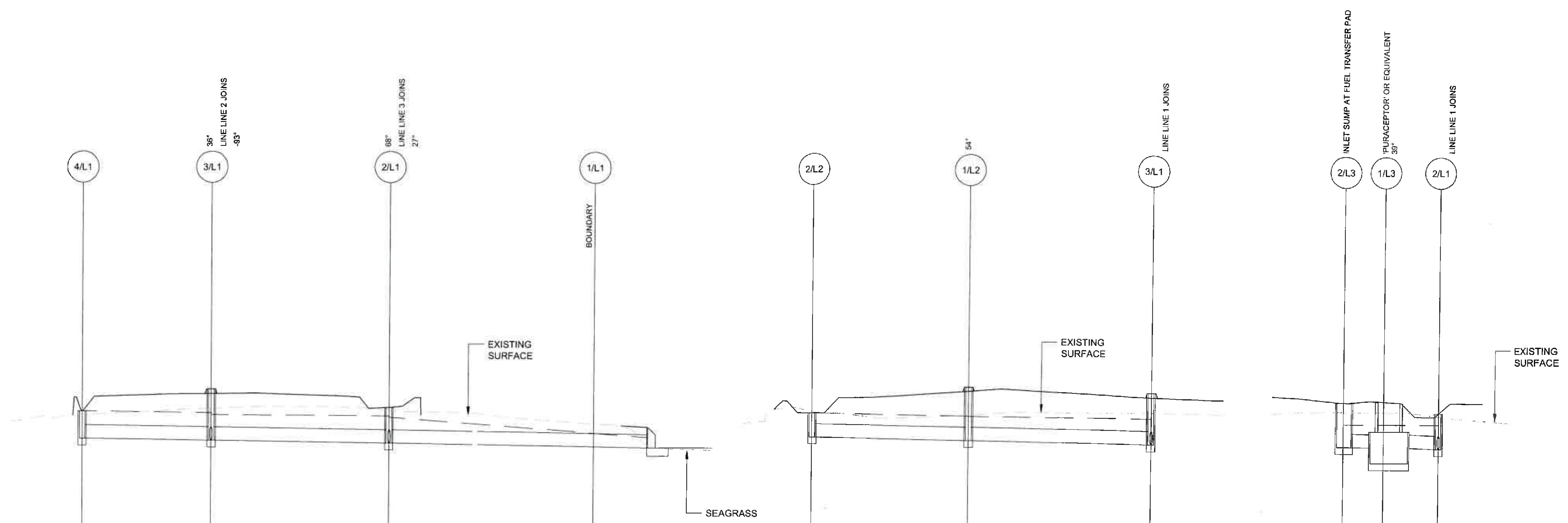
DRAWING TITLE:
STORMWATER MANAGEMENT PLAN

HASKONING AUSTRALIA PTY LTD
NEWCASTLE
Royal HaskoningDHV
Enhancing Society Together
Level 1
43 Bolton Street
Newcastle NSW 2300
Australia
+61 2 4926 0500
www.royalhaskoning.com
Telephone
Internet

DRAWN MLC	DATE SEPT 2014	JOB No. 8A0319
AUTOCAD REF. 8A0319–004		
SCALE AT A1 1:250		
DRAWING No. 8A0319–Civ– DA–004		REVISION B

DRAWING No. 8A0319-Civ- DA-005

DO NOT SCALE



LINE 1

	4/L1		3/L1		2/L1		1/L1
PIPE DIAMETER		300mm		300mm		300mm	
PIPE GRADE		0.3%		0.3%		0.3%	
10Yr ARI PEAK FLOW (L/S)		67		72		105	
Datum R.L.	-6						
10Yr ARI H.G.L	0.88		0.86 / 0.81		0.73 / 0.61		0.35
DEPTH TO INVERT	0.613		1.164 / 1.164		0.799 / 0.799		0.458 / 0.458
INVERT LEVEL	0.287		0.245 / 0.245		0.185 / 0.185		0.100 / 0.100
FINISHED SURFACE LEVEL	0.900		1.409		0.984		0.558
CHAINAGE	0.000		14.441		34.311		57.171

LINE 2

	2/L2		1/L2		3/L1
PIPE DIAMETER		300mm		300mm	
PIPE GRADE		0.3%		0.3%	
100Yr ARI PEAK FLOW (L/S)		23		23	
Datum R.L.	-6				
H.G.L	0.88		0.87 / 0.87		0.86
DEPTH TO INVERT	0.540		1.221 / 1.221		1.164 / 1.164
INVERT LEVEL	0.360		0.305 / 0.305		0.245 / 0.245
FINISHED SURFACE LEVEL	0.900		1.526		1.409
CHAINAGE	0.000		17.420		37.868

LINE 3

	2/L3		1/L3		2/L1
PIPE DIAMETER		225mm		225mm	
PIPE GRADE		0.3%		0.3%	
100Yr ARI PEAK FLOW (L/S)		5		5	
Datum R.L.	-6				
H.G.L	0.73		0.73 / 0.73		0.73
DEPTH TO INVERT	0.980				0.799 / 0.799
INVERT LEVEL	0.220		0.205 / (PIPE)		0.185 / 0.185
FINISHED SURFACE LEVEL	1.200		1.227		0.984
CHAINAGE	0.000		4.510		10.679

1000 0 1000 2000 3000 4000 5000mm
1:50 (A1) 1:100 (A3)

5000 0 5000 10000 15000 20000 25000mm
1:250 (A1) 1:500 (A3)

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REV	DATE	DESCRIPTION	BY	CHK	APPD
B	12.9.14	ISSUED FOR INCLUSION IN REPORT	MC	CK	PH
A	6.9.14	ISSUED FOR DA APPROVAL	MC	BP	BP

REVISIONS

CLIENT:

PROJECT: TRINITY POINT MARINA CARPARK

DRAWING TITLE: STORMWATER DRAINAGE LONGITUDINAL SECTIONS

HASKONING AUSTRALIA PTY LTD
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Level 1, 43 Bolton Street, Newcastle NSW 2300, Australia
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www.royalhaskoning.com Internet

DRAWN MLC	DATE SEPT 2014	JOB No. 8A0319
AUTOCAD REF. 8A0319-005		
SCALE AT A1 VARIES		
DRAWING No. 8A0319-Civ- DA-005	REVISION B	

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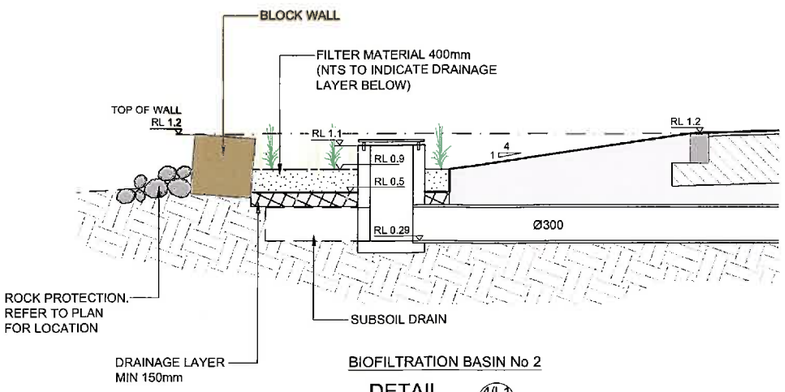
8A0319–Civ– DA–006

DO NOT SCALE



BIOFILTRATION BASIN No 2

DETAIL 4/L1 005
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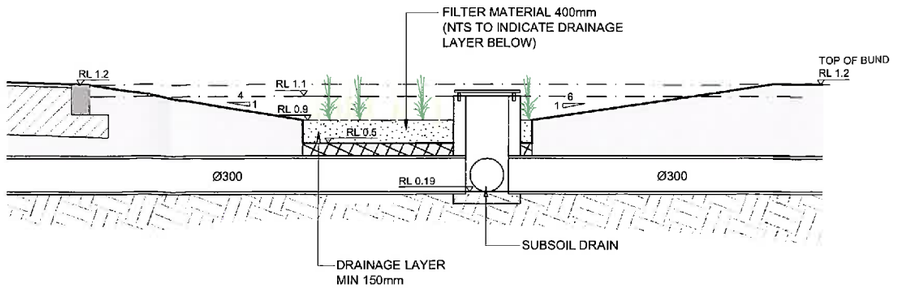

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DETAIL 2/L1 005
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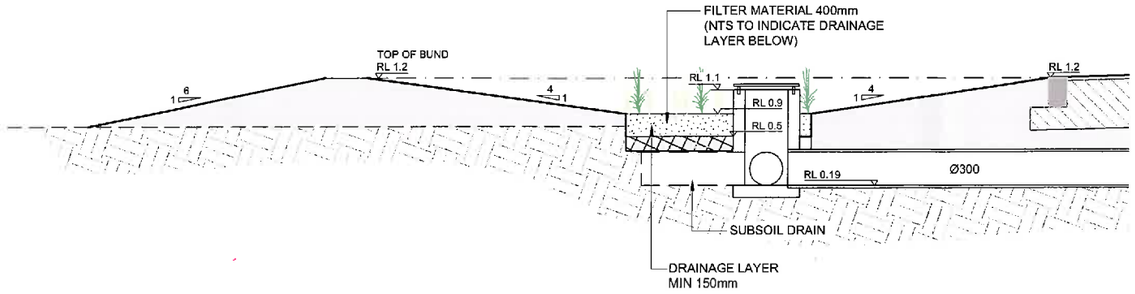

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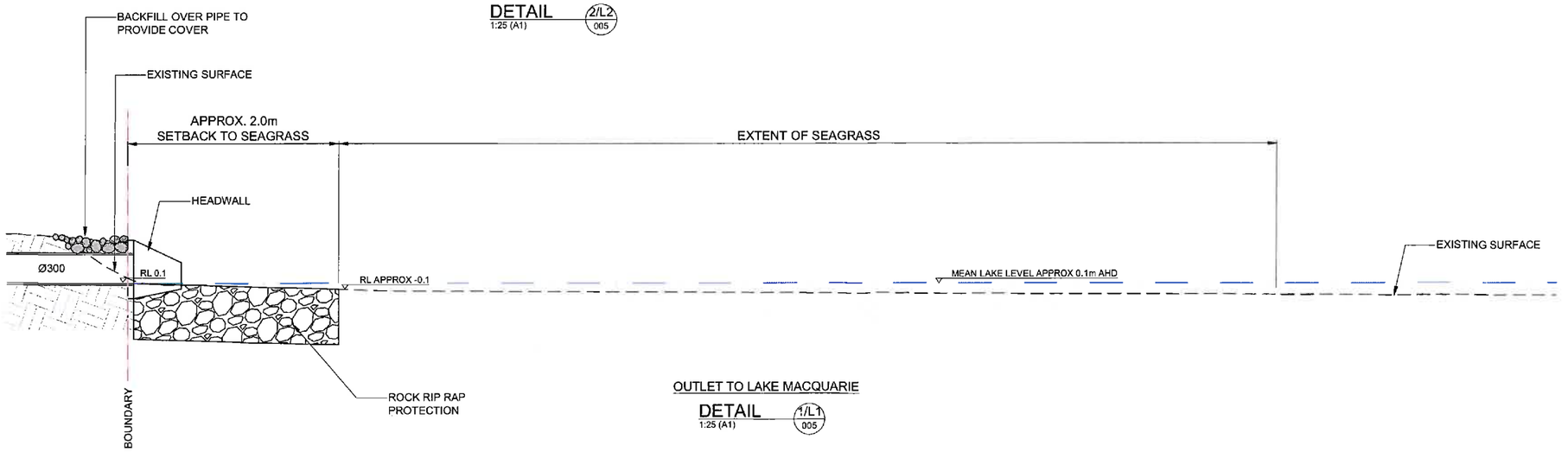
DETAIL 2/L2 005
1:25 (A1)



OUTLET TO LAKE MACQUARIE

DETAIL 1/L1 005
1:25 (A1)

500 0 500 1000 1500 2000 2500mm

VERTICAL 1:25 (A1) 1:50 (A3)

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REVISIONS

CLIENT

PROJECT:
TRINITY POINT MARINA
CARPARK

DRAWING TITLE:
STORMWATER
DRAINAGE DETAILS
PLAN

HASKONING AUSTRALIA PTY LTD
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DRAWN	DETAILS PLAN	DATE SEPT 2014	JOB No. 8A0319
AUTOCAD REF.	8A0319–006		
SCALE AT A1	AS SHOWN		
DRAWING No.	8A0319–Civ– DA–006		REVISION B

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DRAWING No.
8A0319–Civ– DA–007

DO NOT SCALE

N

INDICATIVE PILE LOADING AND BARGE RIG

4 x PILES PLACED ON THE RL -1.6 (CD) SEABED CONTOUR

IDENTIFIED SEAGRASS AREA

INDICATIVE CRANE LANDING AREA BACKFILLED TO PILING LINE ON THE BOUNDARY

PROPOSED LANDING AREA TO BE CONTAINED WITHIN THE EXISTING EASEMENT

ECOLOGICALLY SENSITIVE ZONE

TEMPORARY SEDIMENTATION BASIN

TEMPORARY STORAGE AND LAYDOWN AREA

SITE OFFICES AND FACILITIES

LEVEL SPREADER OVERFLOW FROM BASIN INTO EXISTING (UNDISTURBED) VEGETATION

LEVEL SPREADER OVERFLOW FROM BASIN INTO EXISTING (UNDISTURBED) VEGETATION ON SITE

'CLEAN' WATER DIVERSION DRAIN

NOTE: THIS LOADING AND UNLOADING AREA IS ASSUMED TO BE PREPARED IN A SUITABLE STATE TO ALLOW THE UNOBSTRUCTED MANOUVERING OF HEAVY VEHILCLES

AREAS OUTSIDE THE SITE BOUNDARY ARE CONSIDERED NO-GO ZONES UNLESS NOTED OTHERWISE. NO-GO AREAS SUCH AS ECOLOGICALLY SENSITIVE ZONES AND/OR SEAGRASS'S WHICH FALL WITHIN THE BOUNDARIES WILL TAKE PRECEDENCE.

NO VEGETATION SHALL BE CLEARED OR REMOVED WITHOUT PRIOR APPROVAL FROM THE PRINCIPLE.

TEMPORARY SITE ACCESS TRACK TO BE FORMED ALONG THE FUTURE TRINITY POINT ACCESS ROAD ALIGNMENT.

BARRIER FENCING INDICATE THE NOMINAL LIMITS OF WORK. AREAS OUTSIDE THE BARRIER FENCE CONSIDERED NO-GO ZONES UNLESS NOTED OTHERWISE.

STABILISED SITE ENTRY CROSSING

PLAN
SCALE 1:300

TEMPORARY LANDING AREA FOR CRANE

TEMPORARY PILED RETAINING STRUCTURE WITH GEOFABRIC TO RETAIN SOIL

INDICATIVE 100t CRANE (CAPACITY AND REACH TO BE CONFIRMED)

4 x PILES PLACED ON THE RL -1.6 (CD) SEABED CONTOUR OR DEEPER

EXISTING SEABED

RL 0.0 (CD)

RL -1.6 (CD)

RL -1.06 (CD)

EXISTING SURFACE

GEOFABRIC LAYER PLACED ON EXISTING SURFACE PRIOR TO FILLING

IDENTIFIED SEAGRASS AREA

CONSTRUCTION UNLOADING
1. PRE-FABRICATED PONTOON UNITS (2.4m, 3.0m AND 4.0m Sq)
2. PILES NOMINALLY Ø500 x 18m ONTO BARGE

6 0 10 20 30m
1:300 (A1) 1:600 (A3)

SECTION 1
NTS

LEGEND

NOTE: SEDIMENT AND EROSION DEVICES ARE NOT SHOWN TO SCALE AND HAVE BEEN DRAWN TO INDICATE THE TREATMENT MEASURE ONLY. DO NOT ENTER UNDISTRUBED AREAS TO EFFECT THE MEASURES.

- SAFETY / BARRIER FENCING
- SEDIMENT FENCING
- STRAW BALES (OR EQUIVALENT)
- LEVEL SPREADER
- EARTH BANK / DIVERSION DRAIN
- DIVERSION DRAIN
- TOP OF EXISTING BATTER
- CHECK DAMS (GRAVEL FILTER SOCK / SANDBAGS)
- OVERLAND FLOW
- NO - GO ZONES

LEGEND

- 2.4m x 2.4m PONTOON
- 3.0m x 3.0m PONTOON
- 4.0m x 4.0m PONTOON (LARGEST SIZED OF PONTOONS, AS SHOWN ON PLANS)
- BARGE (LENGTH TO SUIT Ø500 x 18m PILES)

6m (SHOWN)

14m

2.8m

7.5m

INDICATIVE 100t CRANE

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REVISIONS

CLIENT

PROJECT:
TRINITY POINT MARINA CARPARK

DRAWING TITLE:
CONCEPT EROSION AND SEDIMENTATION CONTROL PLAN 1 OF 2

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DRAWN MLC	DATE SEPT 2014	JOB No. 8A0319
AUTOCAD REF. 8A0319–007		
SCALE AT A1 1:300		
DRAWING No. 8A0319–Civ– DA–007		REVISION B

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DRAWING No.
8A0319–Civ– DA–008

DO NOT SCALE

SEAGRASS

PROPOSED BIORETENTION BASIN AREA TO BE UTILISED AS SEDIMENT CONTROL DEVICES WHILST THE AREA OF SEALED PAVEMENT REMAINS DENUDED. BIOFILTER IS TO BE ESTABLISHED ONCE MAJORITY OF CONSTRUCTION IS COMPLETED

ECOLOGICALLY SENSITIVE ZONE

REMOVE HARDSTAND AREA FROM EARLY WORKS PONTOON INSTALLATION AND MAKE GOOD THE SITE PRIOR TO MARINA CONSTRUCTION

TEMPORARY LAY DOWN AREA AND STORAGE

SITE SHEDS AND FACILITES

BARRIER FENCING INDICATE THE NOMINAL LIMITS OF WORK. AREAS OUTSIDE THE BARRIER FENCE CONSIDERED NO-GO ZONES UNLESS NOTED OTHERWISE.

PROPOSED ROADSIDE SWALE TO BE CONSTRCTED IN ADVANCE AND UTILISED AS TEMPORARY DIVERSION DRAIN. PROGRESSIVELEY AJUST THE DRAIN LEVELS TO REMAIN EFFECTIVE THROUGHOUT THE ACCESS ROAD CONSTRUCTION

LANDSCAPING.
NOTE: PLANTING, LANDSCAPING TOPSOIL AND TURFING (AS REQUIRED) SHALL BE INSTALLED AS SOON AS PRACTICAL FOLLOWING EARTHWORKS. (TYPICAL)

UTLIMATE SEALED PAVEMENT AREA (TYPICAL)

INSTALL WINDROWS AND BERMS PROGRESSIVELY ON THE TOP OF EARTHWORKS TO DIRECT FLOWS TO TEMPORARY BASINS

PROPOSED BIORETENTION BASIN AREA TO BE UTILISED AS SEDIMENT CONTROL DEVICES WHILST THE AREA OF SEALED PAVEMENT REMAINS DENUDED. BIOFILTER IS TO BE ESTABLISHED ONCE MAJORITY OF CONSTRUCTION IS COMPLETED

PROPOSED BIORETENTION BASIN AREA TO BE UTILISED AS SEDIMENT CONTROL DEVICES WHILST THE AREA OF SEALED PAVEMENT REMAINS DENUDED. BIOFILTER IS TO BE ESTABLISHED ONCE MAJORITY OF CONSTRUCTION IS COMPLETED

NO VEGETATION SHALL BE CLEARED OR REMOVED WITHOUT PRIOR APPROVAL FROM THE PRINCIPLE.

PUBLIC PATH

AREAS OUTSIDE THE SITE BOUNDARY ARE CONSIDERED NO-GO ZONES UNLESS NOTED OTHERWISE. NO-GO AREAS SUCH AS ECOLOGICALLY SENSITIVE ZONES AND/OR SEAGRASS'S WHICH FALL WITHIN THE BOUNDARIES WILL TAKE PRECEDENCE.

STABILSED SITE ENTRY TO REMAIN UNTIL PAVEMENT IS SEALED

LEGEND

NOTE: SEDIMENT AND EROSION DEVICES ARE NOT SHOWN TO SCALE AND HAVE BEEN DRAWN TO INDICATE THE TREATMENT MEASURE ONLY. DO NOT ENTER UNDISTRUBED AREAS TO EFFECT THE MEASURES.

- SAFETY / BARRIER FENCING
- SEDIMENT FENCING
- STRAW BALES (OR EQUIVALENT)
- LEVEL SPREADER
- EARTH BANK / DIVERSION DRAIN
- DIVERSION DRAIN
- TOP OF EXISTING BATTER
- CHECK DAMS (GRAVEL FILTER SOCK / SANDBAGS)
- OVERLAND FLOW
- NO - GO ZONES
- PIT INLET PROTECTION

5 0 5 10 15 20 25m

1:250 (A1) 1:500 (A3)

NOT FOR CONSTRUCTION

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PROJECT:
TRINITY POINT MARINA CARPARK

DRAWING TITLE:
CONCEPT EROSION AND SEDIMENTATION CONTROL PLAN 2 OF 2

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DRAWN MLC	DATE SEPT 2014	JOB No. 8A0319
AUTOCAD REF. 8A0319–008		
SCALE AT A1 1:250		

DRAWING No. 8A0319–Civ– DA–008

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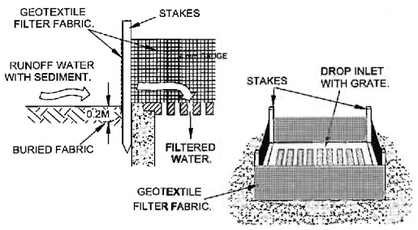
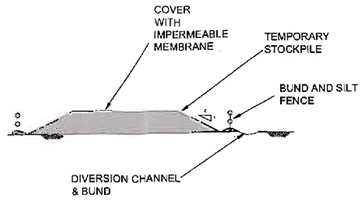
DRAWING No. 8A0319–Civ– DA–009 | DO NOT SCALE

SOIL EROSION AND SEDIMENT CONTROL

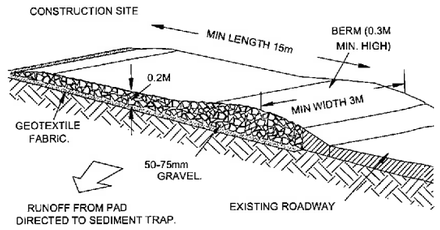
1. THESE PLANS SHALL BE USED AS A GUIDE. ALL EROSION AND SEDIMENT CONTROLS SHALL BE IN ACCORDANCE WITH
   a. LMCC EROSION AND SEDIMENT CONTROL POLICY
   b. THE CONTRACTORS EMP FOR THE WORKS.
   c. THE 'BLUE BOOK' LANDCOM 2004, 4th EDITION.
2. ALL SEDIMENT AND EROSION CONTROLS SHALL BE CHECKED WEEKLY AND IMMEDIATELY AFTER RAINFALL. SEDIMENT BUILD UP TO BE REMOVED AND CONTROLS REPAIRED WHERE NECESSARY.
3. THE CONTRACTOR SHALL CONSTRUCT OR INSTALL SOIL AND SEDIMENT CONTROL MEASURES TO THE SATISFACTION OF THE SUPERINTENDENT PRIOR TO ANY DISTURBANCES TO THE SITE. SOIL AND SEDIMENT CONTROL DEVICES SHALL BE TO THE STANDARD RECOMMENDED BY THE NSW DEPARTMENT OF HOUSINGS 'BLUE BOOK' TITLED "MANAGING URBAN STORMWATER AND CONSTRUCTION – VOLUME 1", 4TH EDITION 2004.
4. THE CONTRACTOR SHALL REGULARLY MAINTAIN ALL SEDIMENT AND EROSION CONTROL DEVICES AND REMOVE ACCUMULATED SEDIMENT FROM SUCH DEVICES BEFORE 50% CAPACITY IS USED. ALL THE ACCUMULATED SEDIMENT SHALL BE RE-SPREAD OR REMOVED IN ACCORDANCE WITH THE SUPERINTENDENTS INSTRUCTIONS. THE DEVICES SHALL BE MAINTAINED BY THE CONTRACTOR UNTIL SUCH TIME AS THE DISTURBED AREAS HAVE BEEN REHABILITATED TO A CONDITION SATISFACTORY TO THE SUPERINTENDENT.
5. THE CONTRACTOR SHALL MAINTAIN ALL RE-VEGETATED AREAS INCLUDING WATERING AND FERTILISING UNTIL SUCH TIME AS THE VEGETATION HAS STABILIZED (MINIMUM TIME IS AT LEAST UNTIL THE END OF THE WORKS, OR AS PER THE LANDSCAPE ARCHITECTS DRAWINGS AND SPECIFICATIONS).
6. THE CONTRACTOR SHALL ENSURE TEMPORARY CONTROLS DO NOT DAMAGE EXISTING STRUCTURES, KERBING, PAVEMENT OR SUBGRADES.
7. VEHICULAR ACCESS TO THE SITE SHALL BE CONTROLLED THROUGH THE ACCESS POINTS IDENTIFIED. VEHICLES NOT REQUIRED IN THE PERFORMANCE OF THE WORKS SHALL BE PARKED OFF SITE AWAY FROM DISTURBED AREAS.
8. ALL EROSION AND SEDIMENT CONTROL MEASURES TO BE INSTALLED PRIOR TO SITE DISTURBANCE TO THE EXTENT THAT THIS CAN BE PRACTICALLY ACHIEVED.
9. PUBLIC ROADS ARE TO BE SWEPT FREE OF DEBRIS RESULTING FROM CONSTRUCTION ACTIVITIES. SWEEPING SHALL BE UNDERTAKEN AT A MINIMUM TWICE MONTHLY.
10. THE CONTRACTOR SHALL TAKE CARE NOT TO DISTURB ANY PORTION OF THE SITE OTHER THAN IN THE IMMEDIATE AREA OF WORKS. NOMINATED UNDISTURBED AREAS SHALL BE BARRICADED PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
11. DRAINAGE INLET PROTECTION TO BE PROVIDED FROM THE COMMENCEMENT OF THE EXCAVATION.
12. ALL SEDIMENT CONTROL STRUCTURES TO BE INSPECTED FOLLOWING EACH RAINFALL EVENT.
13. NO DISTURBED AREA SHALL REMAIN DENUDED FOR A PERIOD LONGER THAN 20 DAYS.
14. THE CONTRACTOR MUST ENSURE THE SUITABILITY AND INTEGRITY OF ALL WORKS AT THE END OF EACH DAYS WORK.
15. ALL REASONABLE AND PRACTICABLE MEASURES MUST BE TAKEN TO ENSURE STORMWATER RUNOFF FROM ACCESS ROADS AND STABILIZED ENTRY/EXIT SYSTEMS, DRAINS TO AN APPROPRIATE SEDIMENT CONTROL DEVICE.
16. SEDIMENT DEPOSITED OFF SITE AS A RESULT OF ON-SITE ACTIVITIES MUST BE COLLECTED AND THE AREA CLEANED/REHABILITATED AS SOON AS REASONABLE AND PRACTICABLE.
17. CONCRETE WASTE AND CHEMICAL PRODUCTS, INCLUDING PETROLEUM AND OIL-BASED PRODUCTS, MUST BE PREVENTED FROM ENTERING ANY INTERNAL OR EXTERNAL WATER BODY, OR ANY EXTERNAL DRAINAGE SYSTEM, EXCLUDING THOSE ON-SITE WATER BODIES SPECIFICALLY DESIGNED TO CONTAIN AND/OR TREAT SUCH MATERIAL. APPROPRIATE MEASURES MUST BE INSTALLED TO TRAP THESE MATERIALS ONSITE.
18. STOCKPILES OF ERODIBLE MATERIAL MUST BE PROVIDED WITH AN APPROPRIATE PROTECTIVE COVER (SYNTHETIC OR ORGANIC) IF THE MATERIALS ARE LIKELY TO BE STOCKPILED FOR MORE THAN 10 DAYS.
19. MEASURES USED MUST BE APPROPRIATE FOR ALL WORKING HOURS, OUT OF HOURS, WEEKENDS, PUBLIC HOLIDAYS, AND DURING ANY OTHER SHUTDOWN PERIODS.
20. ALL MATERIALS REMOVED FROM ESC DEVICES DURING MAINTENANCE, OR DECOMMISSIONING, WHETHER SOLID OR LIQUID, MUST BE DISPOSED OF IN A MANNER THAT DOES NOT CAUSE ANY ONGOING EROSION OR POLLUTION HAZARD.



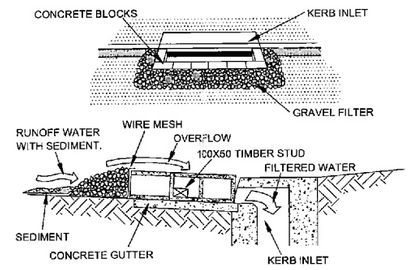
GEOTEXTILE FILTER FABRIC DROP INLET SEDIMENT TRAP.



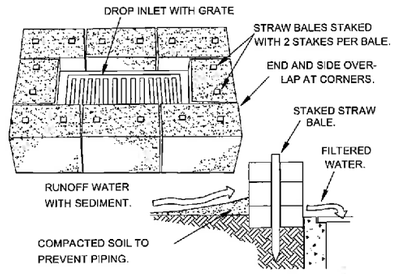
TYPICAL TEMPORARY STOCKPILE



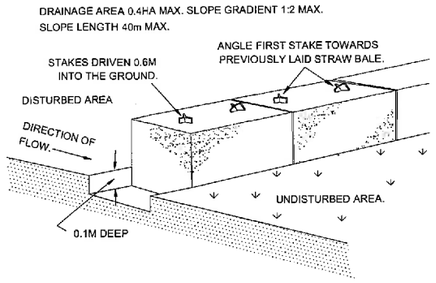
TEMPORARY CONSTRUCTION EXIT



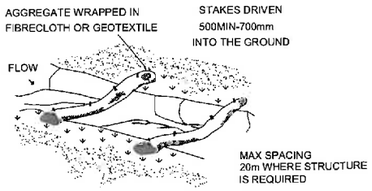
BLOCK & GRAVEL KERB INLET SEDIMENT TRAP.



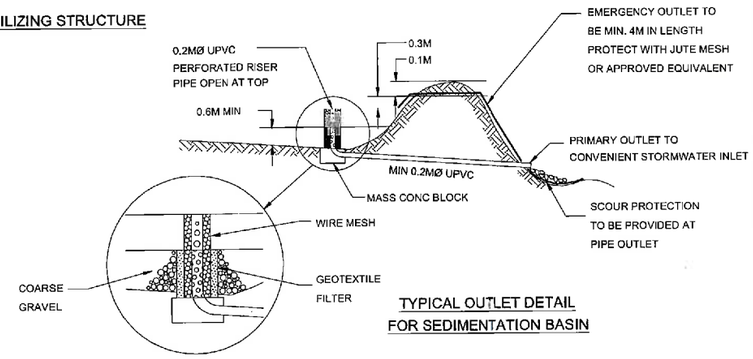
STRAW BALE DROP INLET SEDIMENT TRAP.



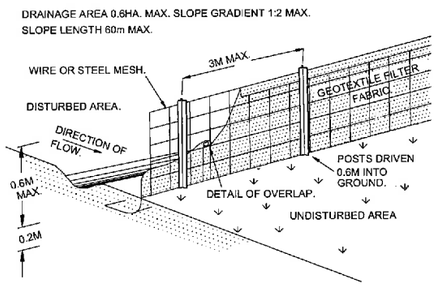
STRAW BALE SEDIMENT FILTER



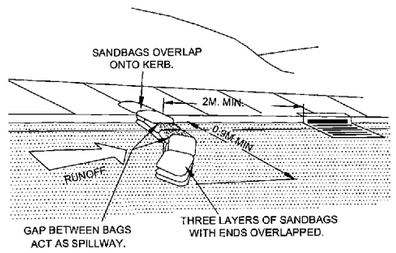
GRADE STABILIZING STRUCTURE



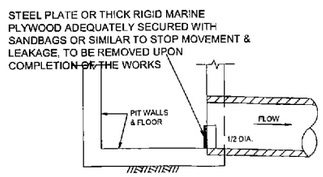
TYPICAL OUTLET DETAIL FOR SEDIMENTATION BASIN



SEDIMENT FENCE

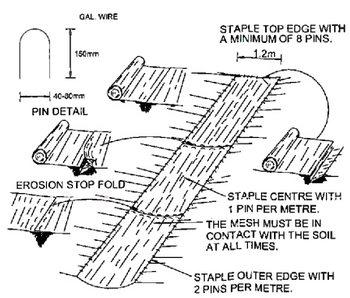


SANDBAG KERB INLET SEDIMENT TRAP.

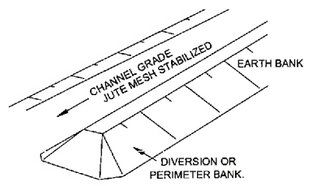


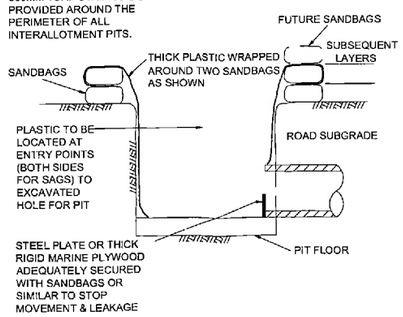
CONSTRUCTION STAGE 2

NOTES:
1. BURY THE TOP END OF THE ORGANIC FIBRE REINFORCED MESH STRIP IN A TRENCH 150mm OR MORE IN DEPTH.
2. TRAMP THE TRENCH FULL OF SOIL. SECURE WITH A ROW OF PINS - MIN. NUMBER 8.
3. LAY MESH ALONG DRAIN WITHOUT STRETCHING THE MESH.
4. OVERLAP-BURY UPPER END OF LOWER STRIP AS IN 1 AND 2. OVERLAP END OF TOP STRIP 150mm AND STAPLE.
5. EROSION STOP FOLD OF MESH BURIED IN SLIT TRENCH AND TAMPED; DOUBLE ROW OF STAPLES.
6. STAPLE THE MESH ALONG EACH EDGE AND CENTRE WITH TWO PINS ON EACH EDGE AND 1 IN CENTRE PER METRE OF MESH.
7. SPRAY ORGANIC FIBRE REINFORCED MESH WITH AN APPLICATION OF SLOW-BREAKING MEDIUM SETTING AN IONIC BITUMEN EMULSION AT A RATE IN ACCORDANCE WITH THE SPECIFICATION. A HEAVIER APPLICATION IS TO BE MADE ON OUTER EDGES AND JOINTS.



EARTH BUND / DIVERSION DRAIN ORGANIC FIBRE REINFORCED JUTE MESH DRAIN





CONSTRUCTION STAGE 1

DURING CONSTRUCTION PIT SEDIMENT CONTROL

NOT FOR CONSTRUCTION

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B	12.9.14	ISSUED FOR INCLUSION IN REPORT	MC	CK	PH
A	6.9.14	ISSUED FOR DA APPROVAL	MC	BP	BP

REVISIONS

CLIENT:

PROJECT:
TRINITY POINT MARINA CARPARK

DRAWING TITLE:
CONCEPT EROSION AND SEDIMENTATION CONTROL PLAN NOTES AND DETAILS

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DRAWN	DATE SEPT 2014	JOB No. 8A0319
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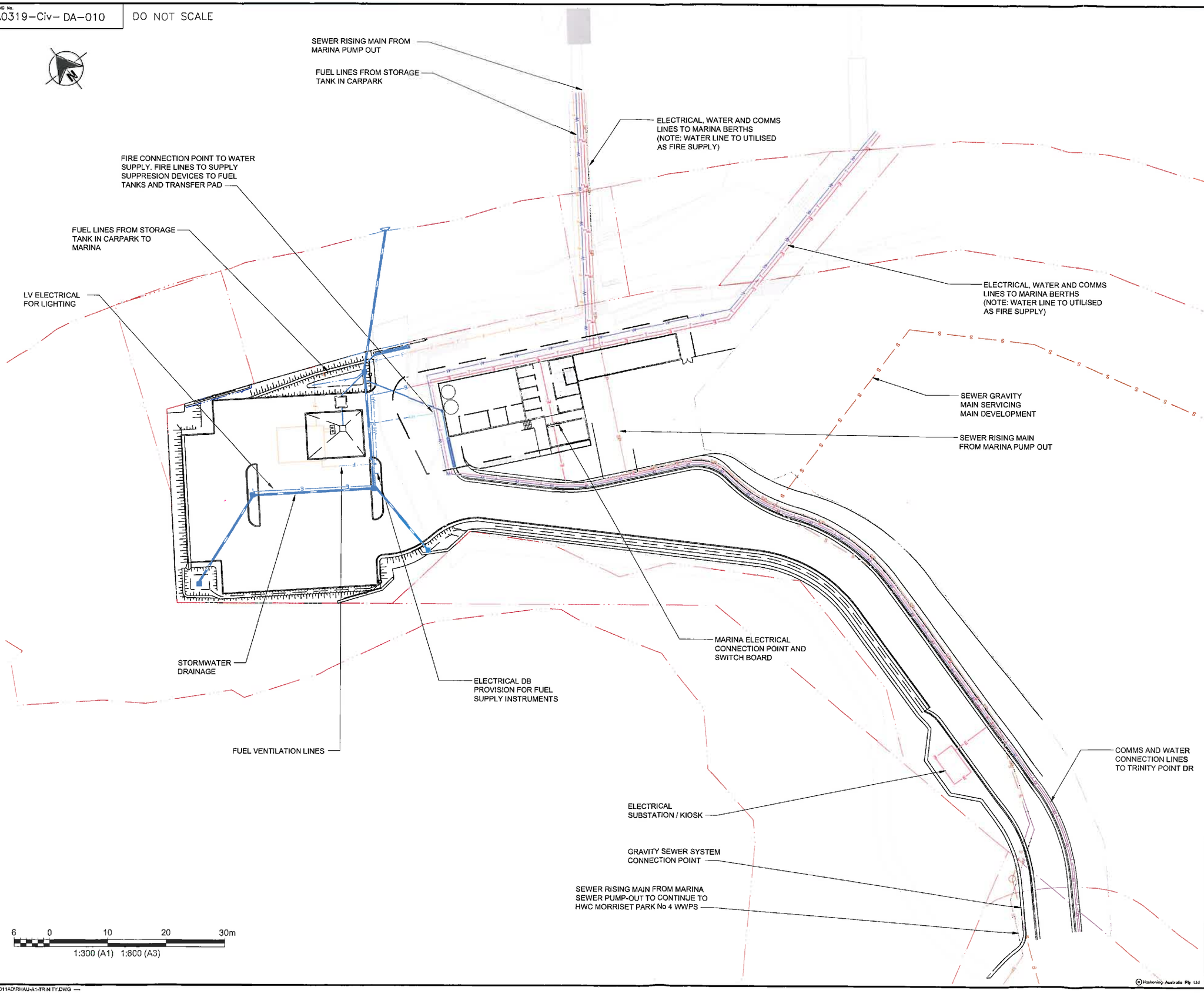
DRAWING No.
8A0319–Civ– DA–010

DO NOT SCALE



NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY	CHK	APPD
B	12.9.14	ISSUED FOR INCLUSION IN REPORT	MC	CK	PH
A	5.9.14	ISSUED FOR DA APPROVAL	MC	BP	BP

REVISIONS

CLIENT

PROJECT:
TRINITY POINT MARINA CARPARK

DRAWING TITLE:
SITE SERVICES PLAN

HASKONING AUSTRALIA PTY LTD
NEWCASTLE
Level 1
43 Bolton Street
Newcastle NSW 2300
Australia
+61 2 4926 5100
Telephone
Infoline
www.royalhaskoning.com
Royal HaskoningDHV
Enhancing Society Together

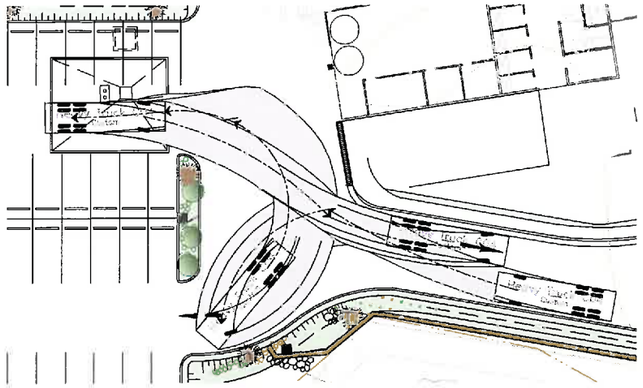
DRAWN MLC	DATE SEPT 2014	JOB No. 8A0319
AUTOCAD REF. 8A0319–010		
SCALE AT A1 1:300		
DRAWING No. 8A0319–Civ– DA–010		REVISION B

C:\RH\0011ADR\HAU-A1-TRINITY.DWG

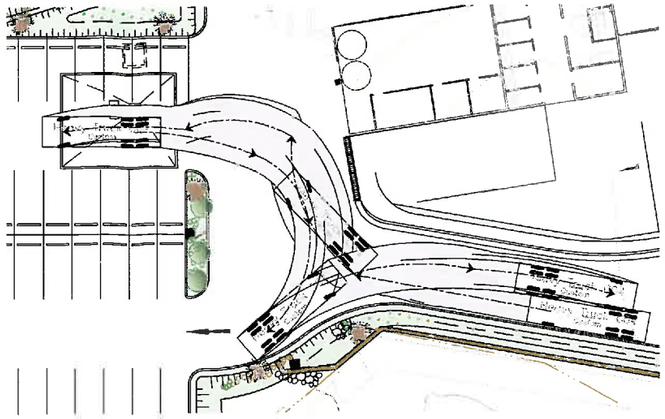
DRAWING No.
8A0319–Civ– DA–011

DO NOT SCALE

5 0 5 10 15 20 25m
1:250 (A1) 1:500 (A3)

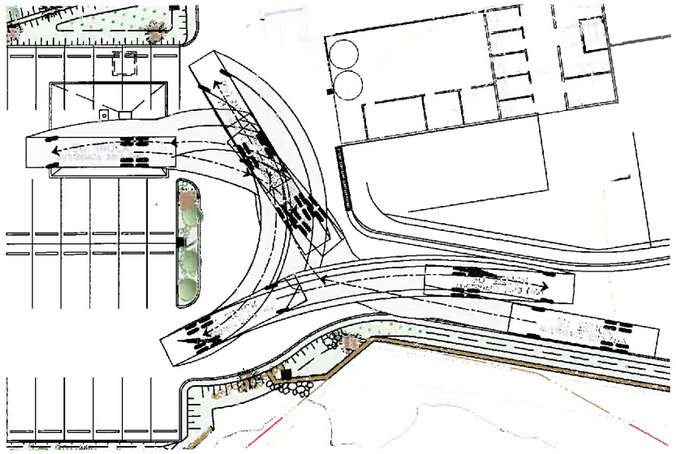


VEHICLE FUEL STORE (REVERSE)

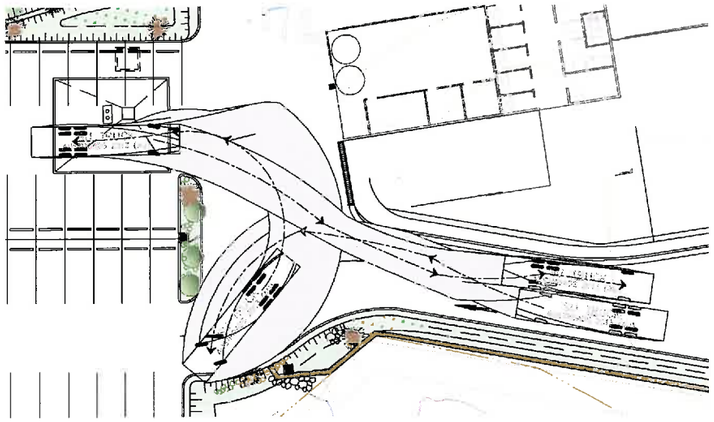


VEHICLE FUEL STORE (FORWARD)

9.9m RIGID SERVICE VEHICLE



VEHICLE FUEL STORE (FORWARD)



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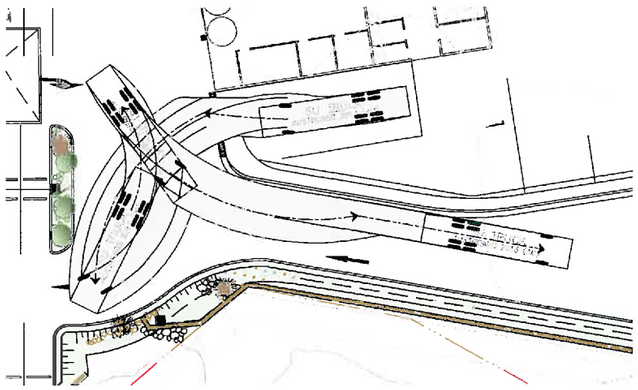
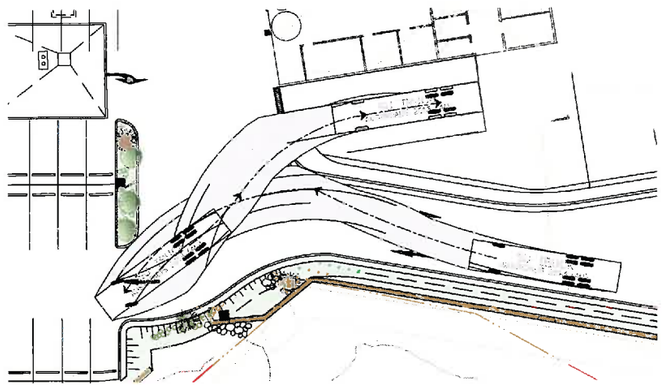


HARDSTAND OUT
(FUTURE MOVEMENT FOR CONSIDERATION
BUT NOT PROPOSED AS PART OF THIS DA)



HARDSTAND IN
(FUTURE MOVEMENT FOR CONSIDERATION
BUT NOT PROPOSED AS PART OF THIS DA)

12.5m RIGID SERVICE VEHICLE

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY	CHK	APPD
B	12.9.14	ISSUED FOR INCLUSION IN REPORT	MC	CK	PH
A	6.9.14	ISSUED FOR DA APPROVAL	MC	BP	BP

REVISIONS

CLIENT:

PROJECT:
TRINITY POINT MARINA
CARPARK

DRAWING TITLE:
SWEPT PATH PLANS
AND
DETAILS

HASKONING AUSTRALIA PTY LTD
NEWCASTLE
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Telephone
Internet

DRAWN	DATE	JOB No.
MLC	SEPT 2014	8A0319

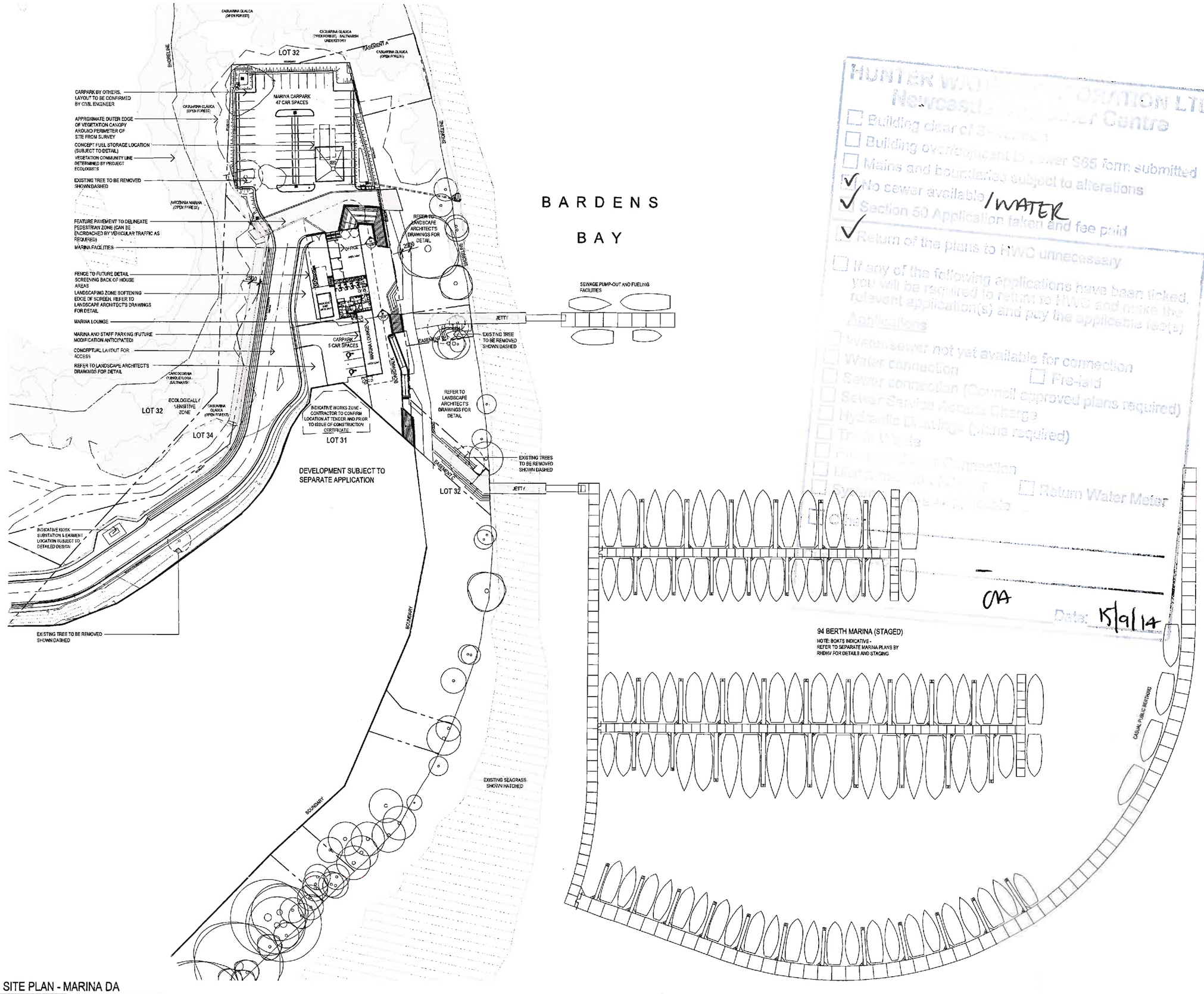
AUTOCAD REF. 8A0319–011

SCALE AT A1 1:250

DRAWING No. 8A0319–Civ– DA–011

REVISION B

C:\RH0011AD\RHAU-A1-TRINITY.DWG —



1 SITE PLAN - MARINA DA
scale - 1:500 @ A1

Member Australian Institute of Architects

STATUS
DEVELOPMENT APPLICATION

Do not scale drawing. Verify all dimensions on site. Report any discrepancies in documentation to archit. This drawing is for the purpose of council approval and as such, is not suitable for construction.

NOTES

A3: 1:1000 @ A3
A1: 0 5 10 1:500 @ A1 25

ISS	DATE	PURPOSE OF ISSUE
A	12.09.14	ISSUED TO LMCC

CLIENT
JOHNSON PROPERTY GROUP

squillace

ARCHITECTS
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SYDNEY
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Ph: +61 2 8354 1300 | Fax: +61 2 8354 1311
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Suite 6001 , Level 6 , Mid Town Plaza
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ABN: 34 137 620 538

NOMINATED ARCHITECT
Vince Squillace Reg No. 6468 (NSW), 17219 (VIC), 3677 (QLD)

squillace.com.au

PROJECT
TRINITY POINT MARINA

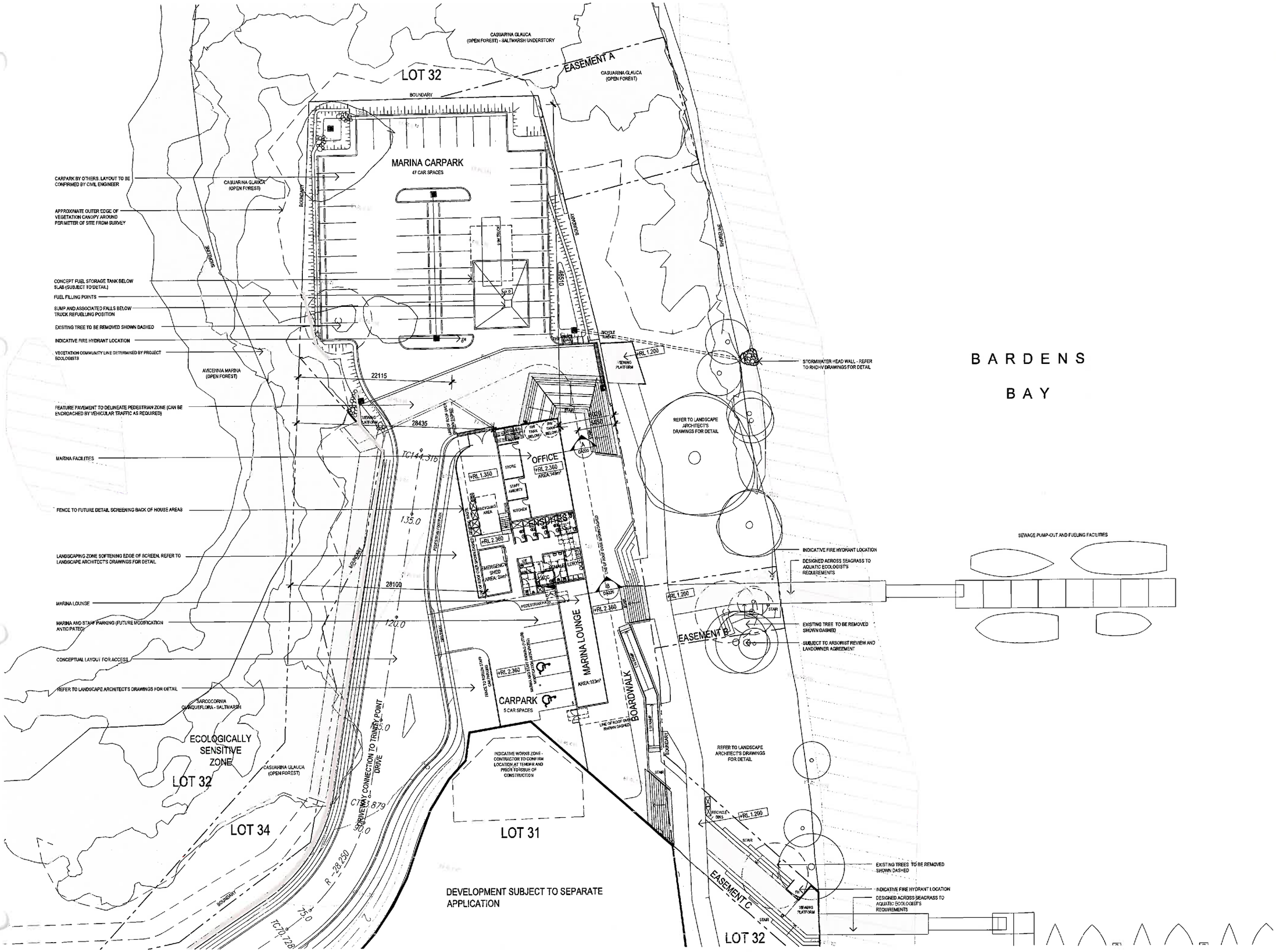
LAKE MACQUARIE

DRAWING NO. DA050
ISSUE A

JOB NO. JPG1402
SCALE 1:500 @ A1
DATE JUN 201

DRAWING TITLE
MARINA SITE PLAN

DRAWN BY BN
CHECKED BY VS



1 GROUND FLOOR PLAN - MARINA DA
scale - 1:250@ A1

BARDENS

BAY

Member Australian Institute of Architects

STATUS

DEVELOPMENT APPLICATION

Do not scale drawing. Verify all dimensions on site. Report any discrepancies in documentation to architect. This drawing is for the purpose of council approval and as such, is not suitable for construction.

NOTES

A3. 1:500 @ A3
A1 0 2.5 5 1:250 @ A1 12.5

ISS	DATE	PURPOSE OF ISSUE
A	12.09.14	ISSUED TO LMCC

CLIENT
JOHNSON PROPERTY GROUP

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PROJECT
TRINITY POINT MARINA

LAKE MACQUARIE

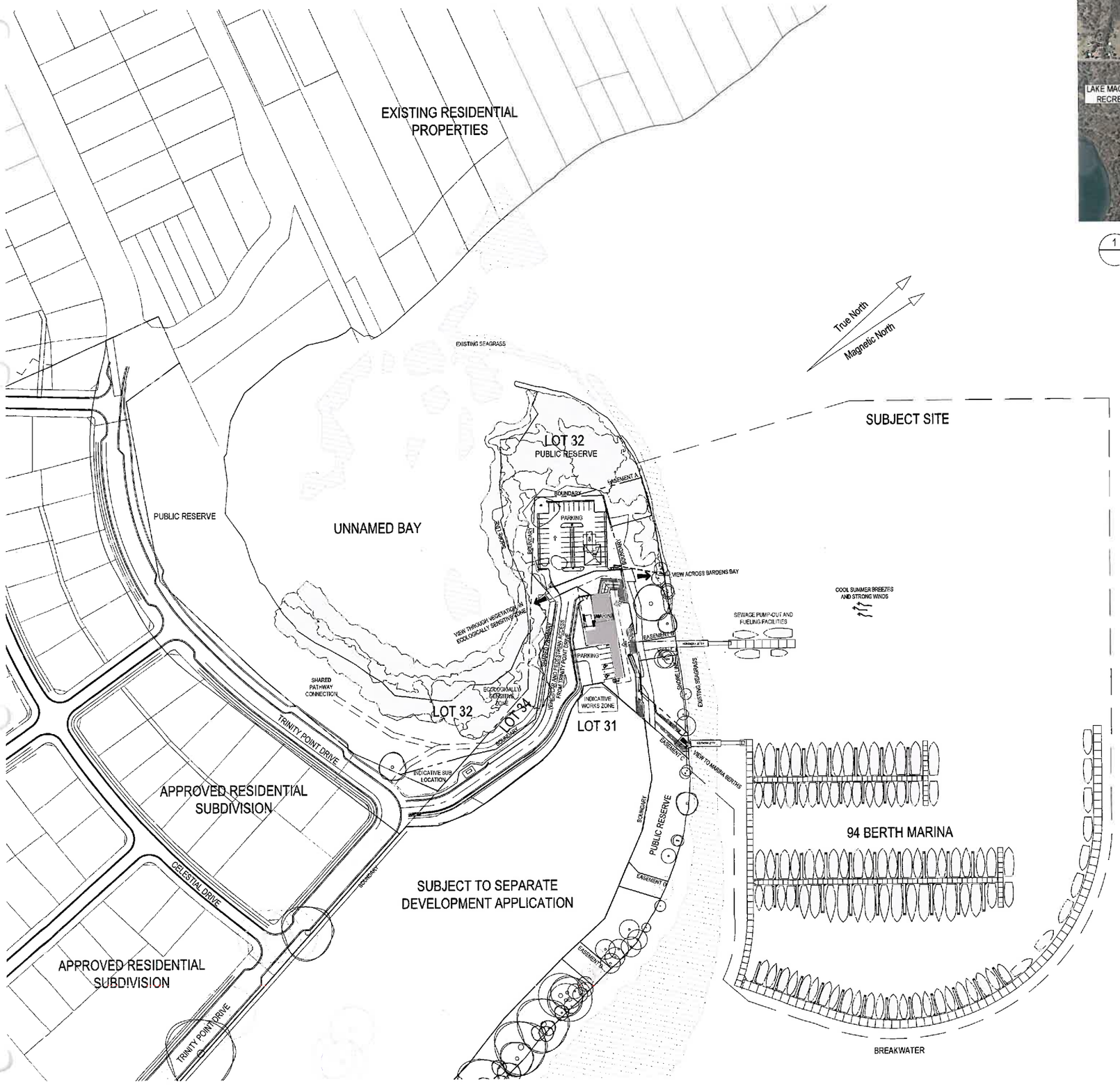
DRAWING NO. DA051
ISSUE A

JOB NO. JPG1402
SCALE 1:250 @ A1
DATE JUN 201

DRAWING TITLE
MARINA GROUND FLOOR PLAN

DRAWN BY BN
CHECKED BY VS

1 KEY PLAN - MARINA DA
scale - NTS@ A1



2 OVERALL SITE ANALYSIS PLAN - MARINA DA
scale - 1:1000@ A1

BARDENS BAY

Member Australian Institute of Architects

STATUS
DEVELOPMENT APPLICATION

Do not scale drawing. Verify all dimensions on site. Report any discrepancies in documentation to archit This drawing is for the purpose of council approval and as such, is not suitable for construction.

NOTES

A3 1:500@A3
A1: 0 10 20 1:1000@A1 50

LEGEND

- BOUNDARY
- TREE TO BE RETAINED
- TREE TO BE REMOVED
- VEGETATION COMMUNITY LINE DETERMINED BY PROJECT ECOLOGISTS
- APPROXIMATE OUTER EDGE OF VEGETATION CANOPY AROUND PERIMETER OF SITE FROM SURVEY
- SEAGRASS DETERMINED BY MARINE ECOLOGIST

ISS	DATE	PURPOSE OF ISSUE
P1	29.08.14	PRELIMINARY ISSUE

CLIENT
JOHNSON PROPERTY GROUP

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Vince Squillace Reg No. 6468 (NSW),
17219 (VIC), 3677 (QLD)

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PROJECT
TRINITY POINT MARINA

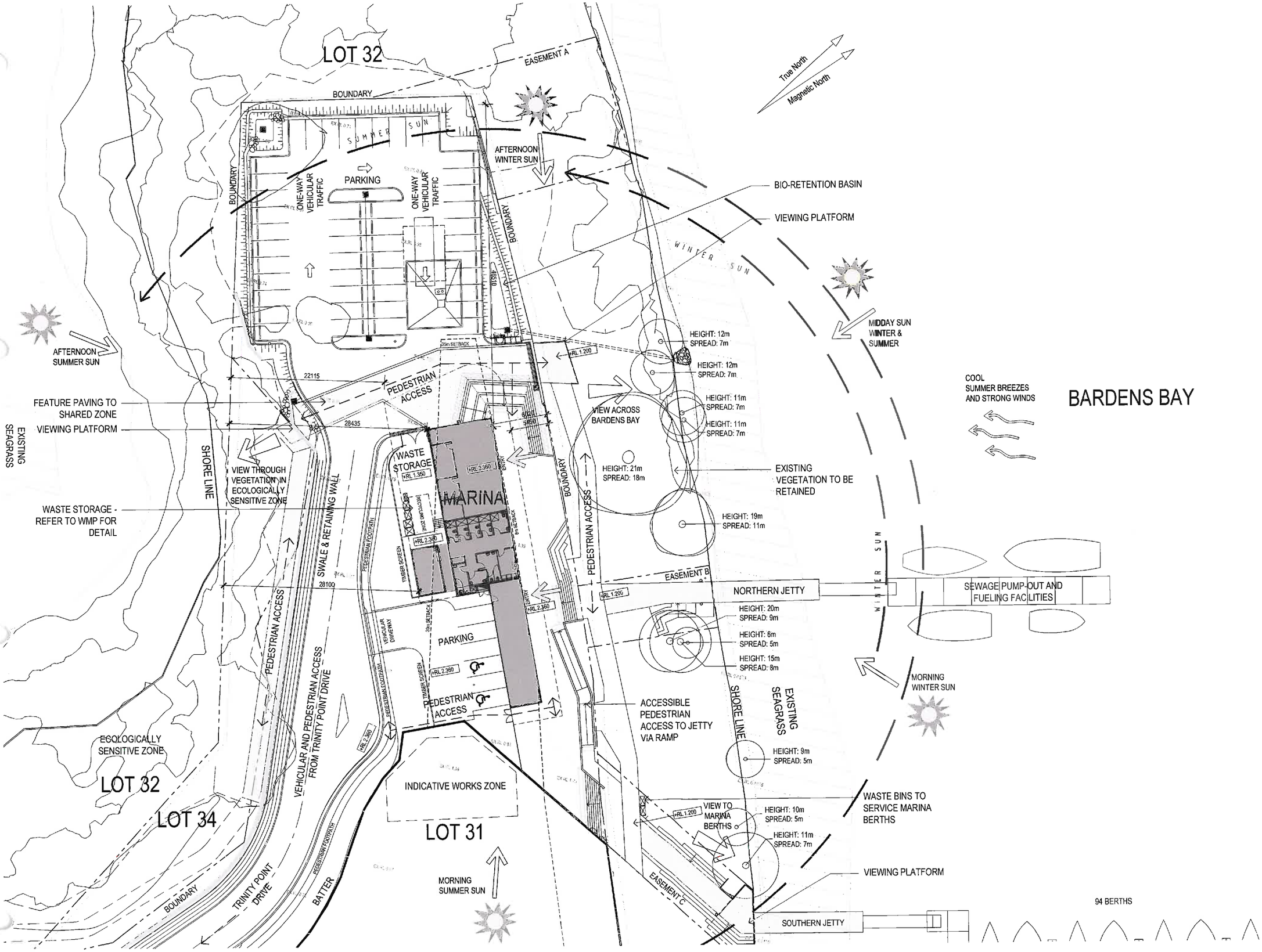
LAKE MACQUARIE

DRAWING NO. DA052
ISSUE A

JOB NO. JPG1402
SCALE 1:1000 @ A1
DATE JUN 201

DRAWING TITLE
MARINA OVERALL SITE ANALYSIS PLAN

DRAWN BY BN
CHECKED BY VS



1 SITE ANALYSIS PLAN - MARINA DA
scale - 1:250@ A1

Member Australian Institute of Architects

STATUS
DEVELOPMENT APPLICATION

Do not scale drawing. Verify all dimensions on site. Report any discrepancies in documentation to archit This drawing is for the purpose of council approval and as such, is not suitable for construction

NOTES

A3: 1:500 @ A3
A1: 0 2.5 5 1:250 @ A1 12.5

LEGEND

- TREE TO BE RETAINED
- TREE TO BE REMOVED
- VEGETATION COMMUNITY LINE DETERMINED BY PROJECT ECOLOGISTS
- APPROXIMATE OUTER EDGE OF VEGETATION CANOPY AROUND PERIMETER OF SITE FROM SURVEY
- EXISTING SPOT LEVELS (EX RL 1.17)
- PROPOSED SPOT LEVELS (+RL —)

ISS	DATE	PURPOSE OF ISSUE
A	15.09.14	PRELIMINARY ISSUE

CLIENT
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ABN: 34 137 620 538

NOMINATED ARCHITECT
Vince Squillace Reg No. 6468 (NSW), 17219 (VIC), 3677 (QLD)

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PROJECT
TRINITY POINT MARINA

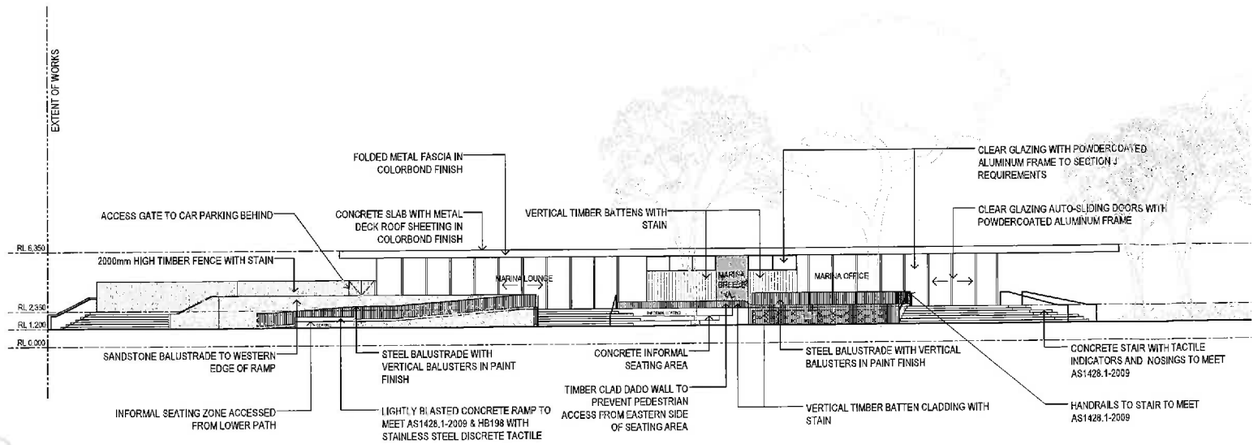
LAKE MACQUARIE

DRAWING NO: DA053
ISSUE: A

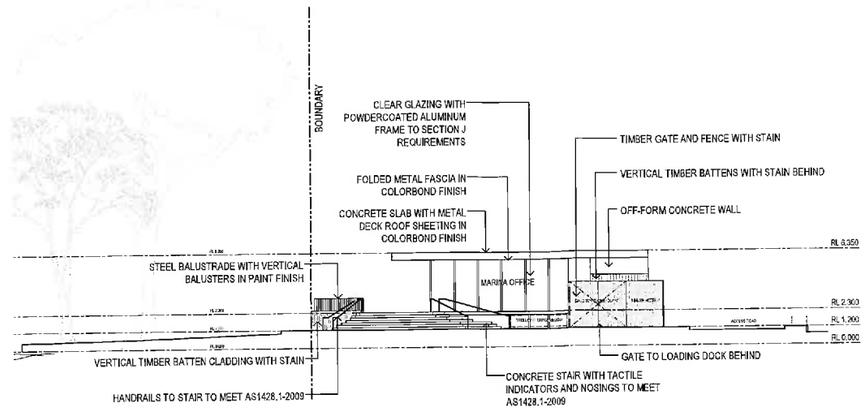
JOB NO: JPG1402
SCALE: 1:250 @ A1
DATE: JUN 201

DRAWING TITLE
MARINA SITE ANALYSIS PLAN

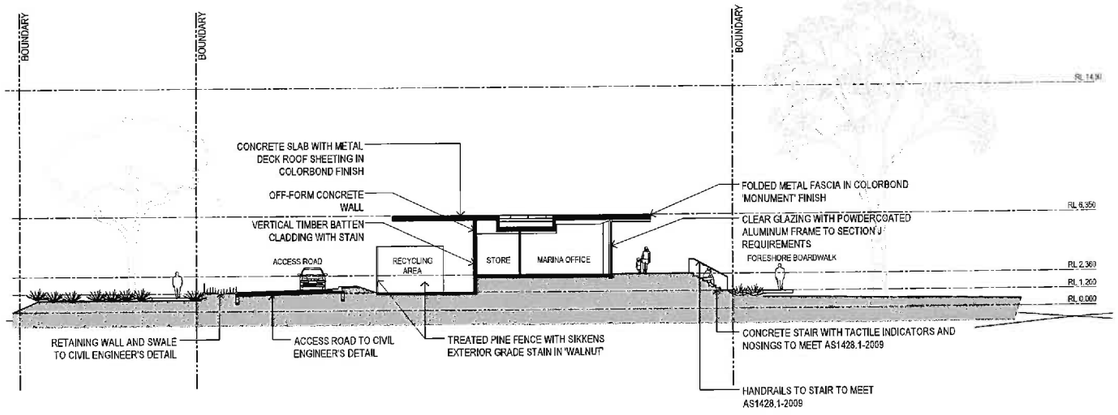
DRAWN BY: BN
CHECKED BY: VS



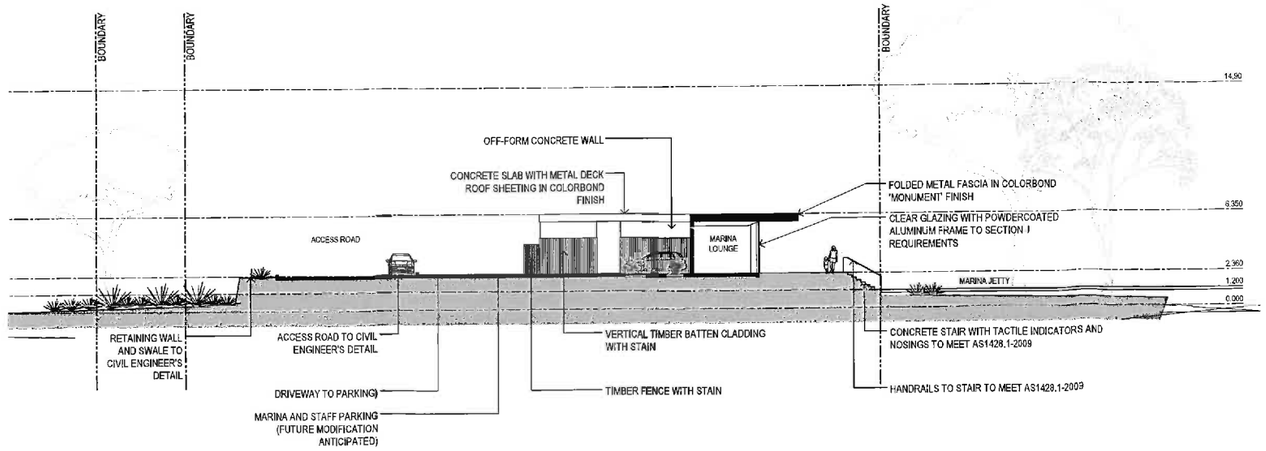
1 EAST ELEVATION - MARINA
scale - 1:200 @ A1



2 NORTH ELEVATION - MARINA
scale - 1:200 @ A1



3 SECTION A
scale - 1:200 @ A1



4 SECTION B
scale - 1:200 @ A1

Member Australian Institute of Architects

STATUS
PRELIMINARY

Do not scale drawings. Verify all dimensions on site. This drawing is NOT SUITABLE for construction.

NOTES

A3 1:400 @ A3
A1: 0 1 5 1:200 @ A1 10

ISS	DATE	PURPOSE OF ISSUE
P4	03.09.14	PRELIMINARY ISSUE
P3	29.08.14	PRELIMINARY ISSUE
P2	13.08.14	PRELIMINARY ISSUE
P1	30.07.14	PRELIMINARY ISSUE

CLIENT
JOHNSON PROPERTY GROUP

squillace

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INTERIOR DESIGNERS

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Suite 5001, Level 6, Mid Town Plaza
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ABN: 34 137 620 538

NOMINATED ARCHITECT
Vince Squillace Reg No. 6468 (NSW), 17219 (VIC), 3677 (QLD)

squillace.com.au

PROJECT
TRINITY POINT

LAKE MACQUARIE

DRAWING NO. DA220
ISSUE P4

JOB NO. JPG1402
SCALE 1:200 @ A1
DATE DEC 2013

DRAWING TITLE
ELEVATIONS & SECTIONS

DRAWN BY BN
CHECKED BY AG

1 PERSPECTIVE LOOKING WEST FROM WATER - MARINA DA
scale - NTS @ A1

2 PERSPECTIVE LOOKING WEST FROM FORESHORE - MARINA DA
scale - NTS @ A1

Member Australian Institute of Architects

STATUS
DEVELOPMENT APPLICATION

Do not scale drawing. Verify all dimensions on site. Report any discrepancies in documentation to architect. This drawing is for the purpose of council approval and as such, is not suitable for construction.

NOTES

ISS	DATE	PURPOSE OF ISSUE
A	11.09.14	ISSUE FOR DA

CLIENT
JOHNSON PROPERTY GROUP

squillace

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INTERIOR DESIGNERS

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ABN: 34 137 620 538

NOMINATED ARCHITECT
Vince Squillace Reg No. 6468 (NSW), 17219 (VIC), 3677 (QLD)

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PROJECT
TRINITY POINT

LAKE MACQUARIE

DRAWING NO. **DA851**
ISSUE **A**
JOB NO. **JPG1402**
SCALE **NTS @ A1**
DATE **JUL 2014**

DRAWING TITLE
MARINA PERSPECTIVES

DRAWN BY **AA**
CHECKED BY **VS**

1. General concrete slab

2. Feature concrete slab

3. Feature concrete slab

4. Timber wall cladding

5. Off-form concrete wall

6. Open metal balustrade

7. Sandstone balustrade

8. Timber lined soffit

9. Aluminium framed glazing

10. Metal deck roofing

11. Timber fence

EXTERNAL COLOUR SCHEDULE
Trinity Point- Marina
71 Trinity Point Road, Morriset NSW 2264

squillace