Sunshine Coast
Open Space Landscape Infrastructure Manual

Waterways (watercraft facilities)

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1.0 Overview

This category of the LIM has been developed to provide guidance for the design and construction of watercraft facilities.

This category addresses the following:

- Boat ramps
- Jetties / floating walkways / pontoons
- Portage and access watercraft
- Vehicle beach access (temporary / permanent)
- Locks and weirs
- Materials
- Layouts for watercraft launching facilities
- Equal access beach paths.

Important notes:

- This resource does not try to replicate all of the provisions of Legislation, Australian Standards (AS) and corporate documentation in words and pictures, nor does it seek to define their requirements.
- It aims to draw attention to the fact that effectively applied technical requirements translate into desirable qualities for end users.
- Please refer to the relevant authority websites for updated information and current document distribution dates. These documents are subject to amendments from time to time.
- Product design, manufacture and installation require an appropriately qualified professional to provide site specific solutions.

For further guidance see:

- LIM Boardwalks and viewing platforms
- LIM Handrails and balustrades
- LIM Parking
- LIM Preliminaries
- LIM Ramps and stairs
- LIM Tactiles.
2.0 Location

The *Sunshine Coast Environment and Liveability Strategy 2017* currently prescribes that ‘water access (eg. ramp / jetty / pontoon)’, (LIM terminology is ‘watercraft facilities’) may be located in the following open space types, as indicated per table below:

**Table 1: Type of open space**

<table>
<thead>
<tr>
<th>Embellishments</th>
<th>Recreation</th>
<th>Landscape</th>
<th>Sport</th>
<th>Trails</th>
<th>Environmental reserves</th>
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</tbody>
</table>

**Further technical information for Sport, will be incorporated at a later date. In the interim, the basic Recreation / Landscape information can be adapted to suit the site specific solution required.**

Please note
- The design and construction of coastal and waterways infrastructure is to be consistent with adjacent open space land usage.
- The design and construction of recreation trails infrastructure is to be consistent with adjacent open space land usage or any endorsed SCC document (e.g. Coastal Pathway Master Plan).
- It is expected that council’s open space documents will be reviewed from time to time and this table may be subject to change.

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**INFO**

Sunshine Coast Open Space Landscape Infrastructure Manual  
April 2019

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**LEGEND - Environment and Liveability Strategy (ELS)**

- *may be suitable based on-site assessment*  
- *not suitable*  
- *key locations / trail head only*  
- *where adjacent to coast or waterway*  

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**LEGEND - Open Space Landscape Infrastructure Manual (LIM)**

- *suitable*  
- *not suitable*  
- *suitable dependent on appropriate location*  

**Note:** SC Recreation Park Plan is currently being drafted.
3.0 Performance criteria and quick guide(s)

Criteria direction

The performance criteria in the following sections of this information sheet document, must be satisfied in order for the embellishment to provide a best practice solution.

- **4.0 Planning and design guidance**
  - Best practice guidance for:
    - planning
    - design.

- **5.0 Embellishment guidance**
  - Best practice guidance for:
    - the design,
    - manufacture
    - installation.

- **6.0 Materials fixings and finishes**
  - Best practice guidance for:
    - materials, fixings and finishes.

- **7.0 Positioning guidance**
  - Best practice guidance for:
    - the way embellishments are placed or arranged.

- **8.0 Equal access guidance**
  - Best practice guidance for:
    - solutions that are accessible for ALL users.

- **9.0 Recommended standards**
  - Best practice guidance for:
    - Legislation
    - Australian Standards / industry guidelines
    - Approvals / authorised person
    - Council additional requirements.

- **10.0 Sustainability**
  - Best practice guidance for:
    - achieving strategic sustainability.

- **11.0 Project management and maintenance**
  - Best practice guidance for:
    - project management and maintenance.

Quick criteria guides

see page(s) below
Quick criteria guide – waterways (watercraft facilities)

Embellishments should be designed / selected and installed as follows:
1. Fit for purpose, appropriately positioned and accessible to people seated in a wheelchair.
2. Durable, robust and safe (suitable for corrosive environments).
3. Vandal resistant with parts that are easily replaceable.
4. Easy to maintain (with appropriate warranty and workmanship).

Planning / design / positioning – general
- Factor climate change risks into planning and delivery of infrastructure
- Locate new watercraft facilities near existing recreational facilities such as public amenities, shelters, car parks, fish cleaning facilities
- Where possible separate motorised and non-motorised watercraft facilities
- Where space is limited, co-locate motorised and non-motorised watercraft facilities
- Design facilities which are accessible to people of all abilities

Finishes, footings and connections
- Concrete elements must be high strength and as per engineering specifications
- Stainless steel must be marine grade 316
- Aluminium stair treads and handrails must be marine grade aluminium

Boat ramp
- **User group** – motorised and non-motorised watercraft
- **Design** – Department of Transport and Main Roads (DTMR) standard design

Jetties, floating walkways, pontoons
- **User group** – motorised and non-motorised watercraft and pedestrians
- **Design** – Department of Transport and Main Roads (DTMR) standard design

Planning / design / positioning – general
- Concrete elements must be high strength and as per engineering specifications
- Stainless steel must be marine grade 316
- Aluminium stair treads and handrails must be marine grade aluminium

Beach access – vehicles
- **User group** – vehicles
- **Design** – Moulded plastic modular vehicle panels or recycled conveyor belt
  - Surface must be backfilled with local material to preserve natural aesthetic

Portage and water access
- **User group** – non-motorised watercraft and pedestrians
- **Design** – Department of Transport and Main Roads (DTMR) standard design
  - Retro-fitted stairs design loads must be independent of the marine structure (weir or revetment wall)

Beach access – wheelchairs
- **User group** – wheelchairs and pedestrians
- **Design** – Recycled portable roll-out, removable beach access mat
  - Temporary surface material to enable wheelchair access to the water

Weirs – canoes / kayaks
- **User group** – non-motorised watercraft such as canoes / kayaks
- **Design** – To alter the waterway flow characteristics
  - Engage a suitably qualified engineer
  - Weirs are to include access (stairs / skids / slides)

Please note:
Further guidance and clarification of the content on this page, can be found in the relevant sections of this information sheet.
4.0 Planning and design guidance

Best practice guidance for the planning and design of embellishments includes:

Planning

All watercraft infrastructure must be located, designed and constructed in accordance with identified coastal hazards.

- Consider flood debris impacts on new and existing embellishments when designing watercraft infrastructure.

All new watercraft launch facilities should be located near existing recreation park facilities, where possible to enhance the use of recreation parks and to ensure the following:

- People participating in water based activities have access to supporting infrastructure such as water, toilets, car parks.
- Where it is not possible to locate new facilities near existing recreational parks, the new infrastructure should be located along a recreation trail
- Consult with stakeholders and identified users, in the planning stage of a project.
- Consider watercraft facility proximity to residential properties. Boat users / fishermen seek optimum fish feeding times which can be early morning and may disturb the quiet enjoyment of nearby residential property. Refer to Environmental Protection (Noise) Policy 1997 for further guidance.

- Consider that easy access to a waterbody is critical for undertaking maintenance activities such as sediment removal or weed control.
- Ensure embellishment location and materials are fit for purpose.
- Works are to be located clear of any existing stormwater outlet.

- Consider the Tobacco and Other Smoking Products Act 1998. Smoking is banned at
  - public swimming facilities such as swimming pools and associated areas
  - between the flags on a patrolled beach
  - at some artificial beaches between sunrise and sunset
  - within 5.0 metres of a ferry terminal.

- Smoking related infrastructure such as outdoor ashtrays are to designed outside the required anti-smoking offsets.
- Facilities are to be designed and constructed to ensure they are structurally sound and have regard to the impacts of flooding and hydrodynamic changes.

Please note:

It is preferred that new watercraft facilities are located within or alongside existing recreational parks where possible.
Preliminary considerations

Waterbody management

Waterbodies are visible bodies of surface water, such as lakes, streams, estuaries and canals. They are an important part of our landscape and have environmental, economic, social and recreational value.

The design and placement of watercraft launching and water based recreational access facilities should be undertaken in a way that does not alter natural erosion and accretion processes or cause erosion problems in neighbouring areas.

- Some recreational activities that occur in waterbodies include:
  - swimming
  - fishing
  - kayaking
  - kite surfing
  - boating and other activities.

- Suitable recreational space and facilities are required to support these activities.

- Waterbodies play important hydraulic and hydrologic roles within stormwater and broader waterway network catchment.

- Waterbodies and wetland systems as classified by the Queensland state classification of wetlands and include:
  - Natural waterbody with no modifications to its water flow.
  - May have been naturally present but has since had its water flows modified.
  - Is totally artificial and was never previously present in the landscape.

- Sunshine Coast’s streams and estuaries are assessed under the Ecosystem Health Monitoring Program (EHMP) that is coordinated by Healthy Land and Water. Council also undertakes water quality monitoring in priority waterways.

- In addition, the Waterwatch Program operates as a community based network of local volunteers who test the water quality of local creeks and gather data for council.

- Maintenance of natural coastal processes is synonymous with waterbody management. It supports, State and Council policy positions on erosion (specifically SC Coastal Management Policy: 7.3.1 ‘Community infrastructure that supports social and recreational use, is planned and developed to protect and enhance coastal values’).

- Weathering and the erosion, transport and accretion of sediments is very important, as are other outcomes of waves, surges and water level variations - specifically inundation. Ecological and bio-chemical processes are also important processes.

- Infrastructure design must take into account the issues and interests of waterway and land users, environmental impacts, safety, general amenity, as well as the enforceability of regulations.

See Waterbody Management Guideline Overview 2013 by Water by Design for further guidance.
**Waterways**

Within the LIM a waterway is any navigable body of water such as rivers, canals, lakes, oceans, seas.

**Coastal Management**

The Sunshine Coast has over one hundred kilometres of coastal foreshores which council manages. Council has developed a coastal planning and management framework that delivers policy and planning tools to support protection and sustainable use of our beaches, headlands and estuaries.

- The Environment and Liveability Strategy 2017 coastal theme provides policies and desired standards of service that apply to coastal foreshores and adjacent areas, which may in certain cases modify or inform the suitability of specific actions and uses.
- These environments are highly valued for their cultural, ecological and recreational functions.
- Unless carefully designed and constructed, infrastructure in and adjacent to waterbodies can exacerbate erosion issues.
- Where beach erosion threatens community infrastructure such as buildings and roads, council may consider management options such as:
  - beach scraping
  - dune building
  - beach nourishment
  - sand recycling
  - groynes
  - seawalls
  - artificial reefs.

- The council *Shoreline Erosion Management Plan* (SEMP) provides an action plan that describes coastal processes and identifies council controlled assets exposed to erosion threats.

**Flora and fauna**

Managing flora and fauna is an important component of managing all waterbodies and needs to be undertaken with consideration of the surrounding riparian and wetland fringes, and the broader catchment.

- During the summer months Sunshine Coast waterways rest and feed up to 50,000 migratory birds.
- Mangroves, tidal mudflats and seagrass beds provide habitat for juvenile fish, crabs, prawns, dugongs and turtles.
- Mangroves mitigate bank erosion, provide buffers to waterways from adjacent land use and may supply nutrients to nearby seagrass meadows.
- Seagrasses are breeding and feeding grounds for fish and invertebrate species and provide a key food source for dugongs and turtles.
- Block and tackle moorings rip out seagrass as the mooring chain drags on the sea floor. Replace existing block and tackle moorings with environmentally friendly designs to allow seagrass to regrow and improve the condition of marine habitats.
- Heath wetlands filter sediments / pollutants before they enter waterways.
- Heathland and paperbarks (known as “wallum”) may be home to threatened animals such as acid frogs.

- Riverine or gallery rainforests plays a role in stabilising stream banks from erosion and sedimentation of waterways.
- Rainforests generally have high plant and animal species diversity.
- Plant appropriate new tree species to provide future shade and habitat.
**Water sensitive urban design (WSUD)**

Water sensitive urban design, often referred to as WSUD, is a holistic approach to the planning and design of urban development that aims to minimise impacts on the natural water cycle and protect the health of aquatic ecosystems.

**Principals include:**
- Protect existing natural features and ecological processes.
- Maintain natural hydrologic behaviour of catchments.
- Protect water quality of surface and ground waters.
- Minimise demand on the reticulated water supply system.
- Minimise sewage discharges to the natural environment.
- Integrate water into the landscape to enhance visual, social, cultural and ecological values.
- When designing WSUD assets, consider whole of life maintenance impacts.
- An erosion and sediment control plan is to be prepared and approved by a Certified Professional in Erosion and Sediment Control (CPESC), and implemented as part of the works.


**Acid sulfate soils**

Acid sulfate soils (ASS) occur naturally around Australia’s coastline. Acid sulfate soils are saturated with water, almost oxygen-free and contain microscopic crystals of iron sulfide minerals (commonly pyrite).

- In their natural state acid sulfate soils are generally overlain by other soils and pose little or no problem for the environment.
- Colours are dark blue-grey (sometimes black) and wet with no structure.
- When disturbed or exposed to oxygen, acid sulfate soils produce large quantities of sulfuric acid.
- The iron released from the pyrite breakdown forms a range of brightly coloured minerals - first yellow, then brown then red.
- Acid drainage water is produced when these soils are rewetted, which results in large scale acid generation and runoff, causing adverse impacts to the environment, coastal development, structures and the fishing and agricultural industries.

**Acid sulfate soils typically occur along the Queensland coastline in:**
- Estuaries
- Floodplains
- Mangrove flats
- Lakes
- Wetlands
- Swamps.

- Coastal areas lower than 5.0m Australian Height Datum (AHD) are likely to have acid sulfate soils present.

- Acid sulfate soils can also be found buried beneath newer soils at elevations below 20m AHD.

See the following:
- [Figure 1: Acid sulfate soils](#)
- See LIM Preliminary – Land management - ASS treatment for further guidance.

![Acid sulfate soils](image-url)
Climate change

Queensland’s highly developed and populated coastal communities are likely to be substantially affected by the impacts of climate change.

There is now clear evidence that our climate is shifting. Scientific analysis suggests that this will lead to sea level rise and changes to rainfall characteristics, which will present risks to our built and natural environment.

Climate change is a key issue for Sunshine Coast Council (SCC). Coastal areas are already at risk from a range of coastal hazards and, over time, these risks are expected to increase due to changes in extreme events and increased climate variability.

Sea level rise is a key concern as are changes to tropical cyclones and coastal lows due to its potential influence on the location and severity of extreme events. Key hazards of concern are:

- Storm surges
- Flooding
- Sea level rise
- Tidal inundation
- Shoreline erosion.

Council response to climate change

Both Council and State policies are not supportive of private coastal protection works as they interfere with natural coastal processes and often cause erosion issues in neighbouring lands.

Council undertakes the following coastal protection:

- Re-nourishment of beaches to protect dunes and infrastructure with dredged sand from the local coastal zone and offshore sources.
- Back pass sand (relocate sand from the nearshore) to protect dunes during times of sand accretion.
- Raise shoreline revetment walls where appropriate to mitigate the effects of storm tides and sea level rise.
- Support private property owners seeking to protect their assets against sea level rise.
- Provide advice only on suitably qualified coastal engineering practices and ensure appropriate approvals are adopted.
- All solutions presented must align with Council’s Shoreline Erosion Management Plan. See Figure 2: Beach restoration for further guidance.

Tropical cyclones and extreme storms

Current scientific evidence indicates that, by the end of the 21st century, tropical cyclones globally may become less frequent but, on average, they will be more intense and are likely to track further south. These changes would increase the potential for the Sunshine Coast to be exposed to these events. It would also increase risk due to the potential for increased exposure to:

- Coastal inundation
- Coastal erosion
- Flooding
- More intense winds and extreme rainfall resulting in damage to infrastructure.

Storm events, including east coast lows, are also expected to become more extreme. This has similar implications for the Sunshine Coast region, as these changes also have the potential to change our exposure to coastal inundation, coastal erosion, flooding, more intense winds and extreme rainfall.
Storm surge and coastal inundation

A storm surge is a rise above the normal water level along a shore resulting from strong onshore winds and / or reduced atmospheric pressure. Storm surges accompany a tropical cyclone as it comes ashore. They may also be formed by intense low pressure systems in non-tropical areas.

Locally storm surge characteristics are expected to change due to:
• Changes in tropical cyclones
• Extreme storms
• Local sea level rise.

These changes are likely to increase the risk to the region’s natural and built environments due to changes in exposure to coastal inundation and coastal erosion.

See Figure 3: Storm damage for further guidance.

Flooding

Rainfall events are expected to increase in intensity and this will increase the potential risk to the region’s natural and built environments, as flooding events are expected to become more extreme.

Sea level rise

Over the period 1966 to 2009 sea levels around the Australian coastline have risen at an average rate of 2.1 mm per year. This has accelerated in the period 1993 to 2009, rising at 3.1 mm per year.

• Analysis by the CSIRO indicates that sea level rise has been occurring along the Sunshine Coast at a rate which is consistent with the national trend.
• Current statutory benchmarks utilise a projected sea level rise of 0.8 metres by 2100. This would increase areas of permanent inundation. It would also change the characteristics of flooding, storm tide inundation, coastal erosion and salt water intrusion within coastal areas.

Tidal inundation

Tides are the periodic rise and fall of the surface of the oceans, due to the gravitational interactions between the moon, sun and earth.

• While climate change will not change the tides themselves, risks associated with spring tides and similar extreme tidal events are expected, as coastal waters become higher due to local sea level rises.
• This process has particular implications with regard to the inundation of open space and infrastructure in coastal areas.
Climate change design strategies.

Given the vulnerability of the Sunshine Coast to projected climate change, it is important that appropriate actions are taken to ensure effective adaptation is possible in a changing environment.

Proactive strategies to address climate change challenges include:
- Factoring climate risks into decision making particularly with regard to delivery of coastal infrastructure.
- Utilising an evidence-based, risk management approach to mitigate risks.
- Seeking to increase the climate resilience of our natural and built environments.
- Revisiting decisions and outcomes over time to ensure that assets remain fit for purpose.
- Adjust maintenance programs for public infrastructure to consider climate change implications.

Q100

Extreme rainfall intensity is projected to increase. Although projections show that total rainfall across most of Queensland will remain stable or decrease, the projected increase in rainfall intensity could result in more flood-events.

The term Q100 is interchangeable with 100 year ARI (average recurrence interval) flood, 100 year flood or 1 in 100 year flood.
- Design infrastructure to Q100.
- Q100 is a rain event that has 1.0% probability to occur or be exceed any given year. Also known as 1.0% Annual Exceedance Probability (AEP).
- Where no hydraulic modelling data is available, assume the Q100 flood levels to be 700mm above the highest recorded flood levels.
- Allow for wave run-up for coastal sites.
- Engage a suitably qualified Registered Professional Engineer in Queensland (RPEQ) to undertake appropriate hydrologic and hydraulic assessment.

Shoreline erosion

Many beaches and foreshores are expected to experience recurring or persistent shoreline erosion problems, as a result of the dynamic nature of the coastal environment and changes to this environment caused from a changing climate.

- Management of coastal areas that are vulnerable to erosion, is complex due to:
  - varying land tenure
  - high recreational and ecological values
  - competing interests in the land
  - coastal processes.

- Rising temperatures and temperature extremes are of concern due to their potential impacts on natural areas infrastructure, if they are not resilient to these changes

See Figure 4: Impacts of shoreline erosion for further guidance.
Preliminaries investigations

The ultimate selection of a waterway structure’s components depends primarily on site tests such as:

- Land survey
- Hydrographic survey
- Acid sulfate soils test
- Geotechnical survey

Land survey

Land surveying is the spatial science of measuring and mapping of the surrounding environment and boundaries of a site.

- The survey data provides detail to determine contours, and natural and artificial features to guide engineers and designers.
- Engage a surveyor registered in Queensland to undertake a land survey.

Hydrographic survey

Hydrographic survey is the specialist science of measurement and description of features which affect maritime navigation, marine construction and related activities.

- Measurement of depth and features below water level is used typically for detection of underwater obstructions and the shape of beds and banks for engineering design and construction.
- Engage a surveyor registered to international standards with the Australasian Hydrographic Certification Panel (AHSCP).

Acid sulfate soils test

Acid sulfate soils (ASS) can occur along the Queensland coastline.

- ASS can occur inland.
- Tests are to be undertaken for the assessment of the likelihood of acid sulfate soils, to determine the liming rate or management strategy.
- For investigation and management plans engage a Certified Professional Soil Scientist (CPSS) experienced with ASS.

Geotechnical survey

Below ground investigations by boring, sampling and testing to obtain information about the physical properties of soil and rock at a site.

- Test results include soil compressibility, strength and other characteristics likely to influence a construction project.
- Geotechnical (soil test) results indicate the potential for structural instability. Transport and Main Roads – Design Criteria for Boat Ramps assumes stable conditions.
- Engage a Registered Professional Engineer in Queensland (RPEQ) geotechnical engineer.
5.0 Embellishment guidance

Best practice guidance for the design, manufacture and installation of embellishments includes:

- See 3.0 Performance criteria and quick guide(s) for a summary of council’s minimum requirements.

General requirements

Embellishments must be designed / selected and installed as follows:

1. **Fit for purpose, appropriately positioned and accessible**
   - Universal access.
   - Comfortable and suitable for the average person.
   - See 7.0 Positioning guidance and 8.0 Equal access guidance.

2. **Durable, robust and safe (suitable for corrosive environments)**
   - Made from materials that will be durable and can be suitably protected from exterior elements, such as salt spray and UV exposure.
   - Robust and sturdy to withstand constant public use and be resistant to vandalism.
   - Fixings are to be 316 marine grade stainless steel (unless otherwise stated).

3. **Vandal resistant with parts that are easily replaceable**
   - Tamper proof fixings should be used.
   - Graffiti protection coatings applied (where applicable).
   - Fire retardant (where applicable).

4. **Easy to maintain (with appropriate warranty and workmanship)**
   - Warranties should be as listed below.
   - Easily repairable or replaceable.
   - Sourced locally and use standard fittings.
   - Reputable suppliers should be used who keep a supply of stock parts on hand for the life of the product.
   - Use sustainable materials, although sustainability needs to be considered over the lifetime of the embellishment.
   - Install on paved, concrete or other hard surfaces.

5. **Comply with relevant standards / legislation / corporate documents / approvals**
   - Manufactured to engineering specifications (where applicable).
   - See 9.0 Recommended standards.

**Warranty and asset life**

<table>
<thead>
<tr>
<th>Product / embellishment</th>
<th>Warranty (suggested minimum)</th>
<th>Asset life (typical useful life)</th>
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<tbody>
<tr>
<td>boat ramps and stairs, floating walkways and pontoons</td>
<td></td>
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<tr>
<td>concrete</td>
<td>50 years</td>
<td>50 years ^1</td>
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<tr>
<td>recycled plastic / composite fibre</td>
<td>25 years</td>
<td>25 years ^1</td>
</tr>
<tr>
<td>stainless steel</td>
<td>25 years</td>
<td>25 years ^1</td>
</tr>
<tr>
<td>hot dipped galvanised (after fabrication)</td>
<td>25 years</td>
<td>25 years ^1</td>
</tr>
<tr>
<td>aluminium</td>
<td>40 years</td>
<td>40 years ^2</td>
</tr>
<tr>
<td>Locks and weirs</td>
<td>25 years</td>
<td>60 years ^1</td>
</tr>
</tbody>
</table>

^1 Sunshine Coast Council Asset Management Plan 2017/18-2022/23 – Parks and Gardens
^2 Design Criteria for Floating Walkways and Pontoons, Transport and Main Roads, October 2015.
Marine structures and their use

There is no legal limit to where non-motorised craft can launch.

See Table 2: Uses - marine structures for further guidance.

<table>
<thead>
<tr>
<th>Marine facility</th>
<th>Intended use (examples only)</th>
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</table>
| Boat ramp                              | launch and retrieving small or large motorised craft on trailers towed by vehicles  
launch and retrieving small or large non-motorized craft on trailers towed by vehicles. e.g. trailer sailer, multi-person canoes                                                                                          |
| Jetties / floating walkways / pontoons | non motorised craft suitable all sizes. Live loads for unrestricted access are intended to apply to all situations other than private marina facilities for one or two boats. Refer to AS3962:2001 Guidelines for design of marinas.  
genral pedestrian access                                                                                     |
| Portage and access                     | light craft e.g. canoes / kayaks access to low flow velocity waterbodies  
genral pedestrian access                                                                                              |
| Canoe / kayak Trails                   | canoe launching and landing for water trails  
access to water for pedestrians and non-motorised craft portage, using a wheeled transporting apparatus or by manual carrying                                                                                             |
| Temporary / permanent / vehicle access| maintenance vehicles  
emergency vehicles such as surf life saving, ambulance, fire and rescue, police services.  
temporary events set up and removal                                                                                                                                       |
| Locks and weirs                        | recreational fishing  
to access open water bodies for motorised water craft  
non-motorised watercraft  
other recreational water sports                                                                                                                                                    |
| Equal access beach paths              | water access for mobility devices such as beach wheelchairs  
beach access tracks for injured people, older people and people with limited mobility                                                                                               |
Boat ramp (motorised / non-motorised watercraft)

Boat ramps provide access for launching and retrieval of trailable vessels into a waterway. Standard boat ramp design and construction of in-water components is provided by Department of Transport and Main Roads (DTMR).

- Council may project manage the construction of the in-water components of a boat ramp.
- Council provides the land-based components and manages the facility when completed.

DTMR Design Manual applies to the design of boat ramps for the launch and retrieval of recreational trailer boats where the gross combined vehicle mass (GCVM) including trailer with vessel and tow vehicle, does not exceed 8,000 kg.

Boat ramps within the Sunshine Coast Council are sign limited to a GCVM of 5,000 kg.

- Design boat ramps for safety considering:
  - Pedestrian movements
  - Operational movement of vehicles on the ramp
  - Vessels near the ramp
  - Future sea level rise caused by global warming.
- DTMR design manual provides a set of standard drawings for use in new and upgraded boat ramps.

Please note:
The Department of Transport and Main Roads (DMTR) works in partnership with local government and port/water authorities to provide new and improved recreational boating facilities throughout Queensland. Under these long standing arrangements, Transport and Main Roads builds the in-water components of a facility and councils and port/water authorities provide the land-based components, and then manage the whole facility when completed.

Ramp components

Boat ramps (minimum width 4.0m) comprise the anchor beam or start of the connecting slab, the batters of the ramp and the toe of the ramp. Typical boat ramp components, such as, the number of planks recommended, are detailed and specified in DTMR standard drawings and include:

- Crushed rock core or base.
- Grouted shoulders and shoulder batters.
- Crushed rock shoulders.
- Cast in-situ anchor beam or connecting slab with anchor beam.
- Geotextile and geogrid for separation of base materials and containment of the core.

Rock base, shoulders and batters

- Depth of footings below existing surface are site specific dependant upon factors such as lowest astronomical tide (LAT) and geotechnical site constraints.
- Batters to be 400mm thick and grouted.
- Select durable stone. Seek professional advice when selecting stone type. Consider the effects salt water may have on some stone types, such as disintegration.
- Shoulder ramps in cut have a drainage channel 10mm clearance below the invert of the plank or ramp drainage groove to ensure free drainage of the ramp surface.
- Shoulder ramps on fill to have stone pitched surface 30mm below the ramp surface so that drainage grooves are free draining.
- Stone faces are to be essentially flat. Avoid protrusions to reduce potential hull damage and trip hazards to pedestrians.

Concrete anchor beams

- Resist permanent loads and flood, wave action and operational loads.
- Full length lanes should use an anchor beam which may either be a discrete component or integrated with a ramp or connecting slab.

Ramp planks

- Ramp plank numbers are guided by a DTMR demand study.
- Planks are constructed from pre-cast concrete.
- Principal plank type is 4.0m wide for a single lane ramp.
- Multi lane ramp may be required where there is demand.

See the following figures for further guidance:

- Figure 5: Boat ramp
- Figure 6: Typical section boat ramp components.

Figure 5: Boat ramp
Figure 6: Typical section boat ramp components
(not to scale – for guidance only – site specific design required)
Associated embellishments

Incorporate new watercraft facilities into existing compatible recreational parks where possible.

The location of facilities should be alongside existing recreation parks or boat ramps to allow for shared use of existing facilities.

- Associated boat ramp embellishments may include:
  - Car parks / roads. See Department of Transport and Main Roads (DTMR) Guidelines and standard drawings.
  - Signs and line marking
  - Lighting and water supply
  - Waste facilities
  - Fish cleaning tables
  - Fishing line disposal units
  - Toilets
  - Shelters
  - Shade trees and shade structures.

- Watercraft transferred to boat ramps by vehicle require longer parking spaces to accommodate a vehicle and boat trailer. See DTMR Guidelines.

- Rigging / de-rigging bays are required for motorised and non-motorised watercraft.

- Waiting bays are required at high volume sites.

See the following LIM categories for further guidance:

- LIM Parking
- LIM Bins
- LIM Electrical
- LIM Fishing facilities.
- LIM Shelters
- LIM Signage
Jetties, floating walkways, pontoons (non-motorised watercraft / pedestrian use)

Landings can provide short-term shore access for deep-drought vessels for the transfer of passengers and provisions or for short-term shore excursions.

Recreational boating infrastructure is to be designed in accordance with Department of Transport and Main Roads (DTMR) requirements.

DTMR design manual applies to jetties and floating structures which are intended to support launching and retrieval of recreational vehicles.

Floating structures include:

- Modular floating walkways for pedestrian use, may be constructed adjacent to a shoreline.
- Pontoons with gangways are usually located adjacent to boat ramps.
- Pontoons must display manufacturer’s name and serial number.
- Pontoons are to be designed to sit on the canal, river or seabed at low tide without incurring any structural damage.
- Both motorised and non-motorised water craft may moor at a pontoon.

The design generally extends from the connection with landside facilities to the flotation module(s) including:

- Piles and pile restraint system.
- Flotation modules including deck furniture
- Abutment, connections with the flotation modules and interaction between the abutment and floating walkway support lane (floating walkways only).
- Abutment, and fixed and hinged sections of the gangway (pontoons only).
- DTMR design manual provides a list of standard drawings for use in new jetties and floating structures.

See Figure 7: Typical section pontoon with gangway for further guidance.
**Components**

Typical jetty and floating structure components as detailed and specified in DTMR standard drawings include:

**Jetty**
A horizontal decked pedestrian walkway on piered or piled footings which provides pedestrian access from the shore to a waterway. Boats can dock or be moored to a jetty.

**Gangway**
A raised platform or walkway providing pedestrian access between a walkway or shore and a floating structure or vessel. Minimum clear width of 1.8m.

**Floating walkway**
A linear pontoon system constructed from multiple hinged flotation modules. May be supported on a boat ramp lane at low tides. Minimum clear width of 1.8m.

**Pontoon**
A floating platform used for access to the water or a vessel. Flotation modules are to be secured to each other and the abutment by 316 stainless steel wire rope and shackle anchor system to restraint piles.

**Fenders**
Absorb energy and may be constructed from moulded HDPE or rubber to protect vehicles against damage during berthing.

- Council does not prefer the use of rubber tyres as fenders due to concerns about the impacts of petrochemical and heavy metal leachate.

See Figure 7: Typical section pontoon with gangway.

---

**Figure 7:** Typical section pontoon with gangway

(not to scale – for guidance only – site specific design required)
Portage and access (non-motorised watercraft and pedestrians)

Portage or portaging is the practice of carrying watercraft across land, between two bodies of water. A place where this occurs is called a portage.

Kayak / canoe access from land to water is to be provided via stairs and ramps.

A skid, slide or mat is an inclined ramp used for the manual launching of small watercraft from land to water.

Access stairs design

Consider the following when designing new or retro-fit stair systems for canoe / kayak / non-powered watercraft:

- When retro-fitting a stair access system to an existing wall, stairs vertical loading must be independent of the marine structure (weir or revetment wall).
- Determine structural soundness of the revetment wall for intermediate support if required.
- Consider all connections, especially for relocatable structures.
- Determine existing ground conditions such as rock, clay, or sand.
- The vertical force (weight of stairs acting downwards) should not exceed the bearing capacity of the soil.
- Scour protection such as rip rap may be required at the foot of the stairs.
- Install geofabric material to ensure separation of rip rap and underlying material.
- Consider stairs loading:
  - Dead load (DL) to AS 1170.1:1989 Dead and Live Loads and combinations (SAA Loading Code)
  - Live load (LL) to AS 1170.1:1989 Impact load (IL) such as boats and kayaks
- Types of support for independent foundations include:
  - pre-cast-concrete
  - driven piles-
  - timber or sheet piles.
- Stair treads and handrails are to be constructed from an appropriate material to minimise marine build up.
- High profile sites such as lakes and canals may require a platform at the bottom of the stairs.
- An anti-fouling material is required for construction of stair treads, platforms / sunken landings to prevent accumulation of marine organisms.
- Consider a range of watercraft and longer kayaks when designing an access system.
- Consider requirements for all abilities and age groups including seniors when designing an access system. Such as:
  - Handrail design (height and diameter).
  - TGSIs (where appropriate)
  - Luminance contrast stair nosing treatment.
- For permit application drawing requirements refer to Department of Environment and Heritage Protection (DEHP) guideline Constructing Tidal Works.

See the following for further guidance:
- Figure 8: Typical section stairs
- Table 4: Materials for water access facilities.
- LIM Walls for further guidance.
**Slides, skids and ties**

A skid is an inclined ramp used for the manual launching of small, light craft.

- Where appropriate include a slide / mat mechanism such as soft rubber (or other material) adjacent to stairs, to prevent watercraft damage when hauled across it.
- A weatherproof corrosion resistant pulley system such as galvanised cord / wire may be attached to stairs at the water line to allow watercraft to be secured for boarding or disembarking.
- Watercraft wash down facilities such as a shower with a hose or a stand. are desirable in close proximity to a portage system.
- Recommended design is two posts with a crossbeam cradle covered in rubber or artificial turf. Users can place their craft on the cradle to be washed down.

See the following figures for further guidance:

- Figure 9: Stairs with slide
- Figure 10: Stairs with mat
- Figure 11: Stairs with skid.
Canoe and kayak trails

Canoe and kayak trails allow individuals to experience a way to connect to the natural environment.

When designing canoe launch locations, consider the use of natural features such as deposition zones and rock outcrops, before installing formal infrastructure.

- Canoes and other non-motorised watercraft should be launched and landed from designated public or identified access sites (put-ins).
- Use of shoreline areas other than designated locations can cause degradation and bank erosion.
- Ensure that main entry point launching sites are located near to embellishments (where possible) such as:
  - Car parking
  - Waste bins
  - Public amenities
  - Showers or wash down facilities (to minimise the spread of aquatic weeds)
  - Shelters
  - Picnic and barbecue facilities.
- Weirs are to include canoe / kayak access arrangements.

See Figure 12: Launching site (put-in) for further guidance.

Signs

Signage should clearly show all required information to inform people where a river trail is intended for non-motorised watercraft such as canoes and kayaks.

- Install a Trailhead map sign at the beginning of a canoe trail. This sign should provide information about facilities and details such as paddling times.
- Install environmental signs to provide information about caring for rainforest, protected areas and environmentally sensitive areas.
- Install numbered signing (Reserve activity entry sign – River trail sign) along the banks of a canoe trail to assist with paddler orientation and planning. This sign type should also include the current location and forward and backward destinations.
- All signs should be constructed from robust materials such as marine grade aluminium and should include anti-graffiti coating.

See the following for further guidance:

- Figure 13: River trail sign template
- LIM Signage – Environment, coastal and waterways suite.
Vehicle beach access (temporary / permanent)

Permanent vehicle access onto beach foreshores may be required for emergency services vehicles such as Surf Life Saving Australia, Queensland Ambulance Services and State Emergency Services.

Recycled plastic, composite fibre material and rubber matting can be installed wherever vehicle access is required and the natural surface does not support vehicle loads.

Temporary vehicle access may be required during:
• Construction projects for materials / plant delivery.
• In emergency disaster situations such as vehicle access for accident, flood, fire and oil spill clean up.
• For major beach event temporary facility set-up and removal.

Vehicle access systems

TrackPad (or equivalent)
• Replas (or equivalent) TrackPad system comprises moulded polyethylene (PE) plastic pads.
• Modular vehicular panels may be installed in ground for temporary or permanent vehicle beach access.
• The surface is able to be backfilled with local material to preserve a natural aesthetic.

Enviro Belt 40 (or equivalent)
• Rubber Enviro Belt 40 (or equivalent) is recycled mine conveyor belt with 40mm holes punched at 100mm centres
• Enviro Belt can be installed to provide temporary or permanent vehicle access.
• The surface is able to be backfilled with local material to preserve a natural aesthetic.

See the following for further guidance:
• Figure 14: Track pad beach access
• Figure 15: Enviro Belt 40 beach access
Locks and weirs

Weir

A weir is a horizontal barrier across a waterway designed to alter the flow characteristics. Water pools behind the weir and may be allowed to flow steadily over the top. A weir can act as a flood bypass channel.

- Weirs provide the opportunity for recreational activities including:
  - Fishing
  - Canoeing
  - Kayaking
  - Boating
  - Other water sports
  - Walking.

- Weirs are to include kayak / canoe access systems.

Lock

A lock is a mechanical fixed chamber in which the water level can be varied. Locks are used to provide watercraft access from tidal waterways into lake and canal systems.

- The function of the mechanical lock and weir is to maintain a constant water level in a canal system or lake, independent of the high and low tides which occur in a tidal waterway.
- Marine vessels are able to travel between river and canal systems and tidal waterways.
- Access can be provided via an electronic key / card reader near lock gates.
- Access keys / cards are available on payment of fees and charges.

The very nature of lock and weir systems on natural waterways is highly sensitive with regards to hydrodynamic and ecological impacts and should be assessed and guided by relevant experts accordingly.

Engage a suitably qualifies Registered Professional Engineer in Queensland (RPEQ) to undertake design of locks and weirs.

See Figure 16: Lock and weir for further guidance.

Please note:
It is recommended that assessment by an Aquatic Ecologist (or relevant expert) is undertaken prior to commencing lock and weir investigations.

Figure 16: Lock and weir
6.0 Materials, fixings, finishes

Overview

Marine structures require materials that are subject to severe coastal conditions. Material selection is dependent on the level of exposure at the site and the expected usage of the site:

- High profile areas require a higher level of finish and materials.
- Beach locations are subject to direct and severe weather conditions and corrosive environments.
- Canal and river systems are less subject to the direct severe weather, but are still subject to the corrosive environment.
- Seek professional advice regarding selection of stones for marine structures. Avoid stone faces with protrusions which may cause injury.

 See Table 4: Materials for water access facilities

Coatings

Protective coatings may also enhance the appearance of the substrate to which it is applied (such as concrete and galvanised steel).

Two part coating systems on concrete and steel give resistance to water, alkali and acids.

- An effective coating must provide the desired protection level against environmental and chemical damage, for as long as possible.
- Good adhesion to the surface, resistance to moisture and untraviolet (sunlight) are essential.
- In aggressive environments both epoxy and polyurethane two part coating systems offer significant advantages over one-componant coatings.

- Epoxy coatings are formulated based upon the performance requirements for the end product.
- One componant coatings rely on drying or surface oxidation to cure.

Two part coating systems

- With both epoxy and polyurethane two part coating systems (solvent free and solvent-based types) the base resin and a hardener are combined just prior to application.
- Once applied to the surface the coating cures immediately in solvent-free products.
- In solvent based systems the coating cures after solvents have evaporated from the film.
- Generally polyurethane systems cure faster than their epoxy counter-parts however they can be difficult to use when cured in moist conditions at low temperatures.
- Two part epoxy and polyurethane coating systems are preferred over conventional one component products due to their superior mechanical properties and protection against long term environmental degradation.
- All solvents are potentially hazardous and care should be taken to apply solvent-based systems in a well ventilated area.

See Table 3: Materials for marine structures for further guidance.

Please note:
Liaise with SCC Development Services to determine the acceptability of various materials for particular applications, particularly timber and galvanised steel.
Table 3: Materials for marine structures

<table>
<thead>
<tr>
<th>Materials</th>
<th>Key considerations</th>
<th>Recommended applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stainless steel</td>
<td>where a high level finish is required, steelwork is to be marine grade SS316, No.6 finish and electro polished</td>
<td>handrails, barrier rails</td>
</tr>
<tr>
<td>Concrete (in-situ and precast)</td>
<td>use high strength (50MPa and above) low water to binder ratio concrete mixes to limit crack width and to withstand regular water only pressure cleaning. Oil or other contamination is to be spot cleaned prior to pressure cleaning to ensure it is not washed into a waterway.</td>
<td>high profile, high use areas – boat ramps, jetties, floating walkways, pontoons.</td>
</tr>
<tr>
<td></td>
<td>use chemical absorption agents in the concrete mix</td>
<td></td>
</tr>
<tr>
<td></td>
<td>use pore blockers (admixtures) to wet concrete, or surface application</td>
<td></td>
</tr>
<tr>
<td></td>
<td>paint concrete members</td>
<td></td>
</tr>
<tr>
<td></td>
<td>use galvanised steel, stainless steel, plastic filament and carbon fibre reinforcement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>sealers are not to be used on any boat ramp. To protect a concrete area not related to a boat ramp, coat with a two part epoxy coating system to give resistance to water, alkali and acids. Ensure a non-slip transparent sealant is used.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>cover for reinforced concrete must be in the range 25-40mm, Salt water exposure 65mm min. as per AS:3600:2009 Concrete structures</td>
<td></td>
</tr>
<tr>
<td></td>
<td>encapsulate pre-stressed tendons within grout or watertight plastic conduit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>consider cathodic protection for structures, as per AS 3600, this will avoid significant deterioration during the typical lifespan of the structure. It is designed to halt and prevent all active corrosion that may occur.</td>
<td></td>
</tr>
<tr>
<td>Timber</td>
<td>shorter lifespan than concrete or steel. Reduced life cycle (subject to decay and infestation)</td>
<td>identified areas wash down areas, temporary vehicle and pedestrian beach access.</td>
</tr>
<tr>
<td></td>
<td>AS 5604:2005 Timber natural durability ratings. Hardwood timbers are to be durability class 1 or 2 in accordance with AS 1720.1:2010 Timber structures, Design methods</td>
<td></td>
</tr>
<tr>
<td></td>
<td>requires careful selection of hazard rating for the specific application (see LIM Bollards). Requires coating with Ultradeck, Lanotec or approved equivalent</td>
<td></td>
</tr>
<tr>
<td></td>
<td>less cost effective than concrete</td>
<td></td>
</tr>
<tr>
<td>Aluminium</td>
<td>specify marine grade aluminium including corrosion protection to minimise premature component failure</td>
<td>jetties, floating walkways, pontoons, stairs.</td>
</tr>
<tr>
<td></td>
<td>specify aluminium fixings or separate different metals with nylon washers / sleeves to prevent galvanic corrosion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100% recyclable, can be re-used endlessly</td>
<td></td>
</tr>
<tr>
<td>Recycled plastic and fibre composite</td>
<td>long warranted life cycle (no historical information available)</td>
<td>identified areas jetties, floating walkways, pathways, boat ramps, stairs, viewing platforms, shower bases, wash down areas, temporary / permanent vehicle beach access.</td>
</tr>
<tr>
<td></td>
<td>suitable for stair treads, small craft skids, platforms</td>
<td></td>
</tr>
</tbody>
</table>
Table 3: Materials for marine structures continued

<table>
<thead>
<tr>
<th>Materials</th>
<th>Key considerations</th>
<th>Recommended applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Galvanised Steel</td>
<td>cost effective</td>
<td>low use, low profile areas - stairs, viewing platforms, shower bases, wash down areas.</td>
</tr>
<tr>
<td></td>
<td>long life, durable, reduced maintenance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>select hot dipped galvanised (after fabrication) steel for low usage low profile sites</td>
<td></td>
</tr>
<tr>
<td></td>
<td>coat with a two part epoxy coating system for superior protection against long term environmental degradation</td>
<td></td>
</tr>
<tr>
<td>Stone</td>
<td>seek professional advice for selection of stone which does not disintegrate in contact with salt water</td>
<td>revetment walls, boat ramp batters</td>
</tr>
<tr>
<td></td>
<td>select stone faces which are essentially flat (avoid protrusions)</td>
<td></td>
</tr>
</tbody>
</table>

Table 4: Materials for water access facilities

<table>
<thead>
<tr>
<th>Element</th>
<th>Corrosion resistant material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stairs treads and platforms / sunken landings</td>
<td>marine grade aluminium open grating with floor plate nosing. With larger openings, less marine growth will be encountered.</td>
</tr>
<tr>
<td></td>
<td>aqua deck (or approved equivalent), recycled plastic or fibre composite material</td>
</tr>
<tr>
<td></td>
<td>fixings to be 316 marine grade stainless steel or insert to prevent contact with aluminium (prevents galvanic corrosion)</td>
</tr>
<tr>
<td>Handrail</td>
<td>low volume locations - marine grade alloy pipe including a two part epoxy coating system for extended rust protection</td>
</tr>
<tr>
<td></td>
<td>medium volume locations - marine grade aluminium</td>
</tr>
<tr>
<td></td>
<td>high volume / high profile locations - 316 marine grade stainless steel</td>
</tr>
<tr>
<td>Slides / mats</td>
<td>soft rubber matting</td>
</tr>
<tr>
<td></td>
<td>other appropriate material such as recycled plastic</td>
</tr>
<tr>
<td>Pulley system</td>
<td>HDG steel (after market) cord / wire</td>
</tr>
<tr>
<td></td>
<td>316 marine grade stainless steel</td>
</tr>
<tr>
<td>Watercraft wash down</td>
<td>posts - HDG (after market) steel with two part epoxy coating</td>
</tr>
<tr>
<td></td>
<td>watercraft cradle - rubber mat or artificial turf</td>
</tr>
</tbody>
</table>
7.0 Positioning guidance

Best practice guidance for the way embellishments are placed or arranged, includes:

Positioning

When positioning recreational watercraft facilities, consider the following:

- Avoid interference with natural coastal processes where possible.
- Minimise interference with natural coastal processes where interference is unavoidable.
- Position infrastructure for watercraft access to waterways at safe, protected locations.
- Consider all modes of transport to watercraft launching facilities for vehicles and pedestrians.
- Consult with watercraft user groups to identify areas such as temporary storage / setup / pre-launch sites. Incorrect positioning of future infrastructure such as tables / seats may impede or block existing temporary use areas. Any new infrastructure should avoid such areas where possible.

- Provide clearly defined canoe put-in areas to discourage watercraft users from selecting other locations which may worsen erosion.
- Consider CPTED principles (Crime Prevention Through Environmental Design) when positioning watercraft facilities. Ensure adequate passive surveillance so that users feel safe.
- Connecting pathways are required for canoe / kayak transfer by people living nearby who use hand powered trolleys to access launching sites.
- Ensure that where canoe / kayak launching occurs, this facility does not diminish or detract from the open space and park areas, these functions should be separated.
- Design a designated vehicle access to prevent vehicles from driving through parks and play spaces to launch watercraft as this creates potential conflicts with pedestrians.

See Figure 17: Watercraft categories for further guidance

![Figure 17: Watercraft categories](image-url)

*Some trailer launched watercraft may be non-motorised e.g. a sail powered yacht
Preferred layouts for watercraft launching facilities

**Preferred layout 1**
When positioning recreational watercraft launching facilities, the preferred design layout, is **separated locations**:

Non-motorised (human powered) facilities and trailer launched watercraft ramps are totally separated and at different locations.

See Figure 18: Separated facilities for further guidance.

**When designing separated recreational watercraft launching facilities, consider the following:**

- A distinct site separation of use is desirable in order to protect areas such as parks and open spaces and to protect pedestrian activity.
- Where non-motorised craft are launched ensure the activity does-not detract from the amenity of any open space / park area that may be nearby as:
  - vehicles may be tempted to drive through a park to launch watercraft.
  - safety at facilities such as playgrounds could be compromised by vehicle movements.

**Preferred layout 2**
When positioning recreational watercraft launching facilities (and totally separated sites are not possible), the second preferred design layout, is **co-located facilities**:

Non-motorised (human powered) facilities and trailer launched watercraft ramps have distinct facilities but operate side by side, at one location.

See Figure 19: Co-located facilities for further guidance.

**When designing co-located recreational watercraft facilities, consider the following:**

- Where facilities are co-located (side by side), provide maximum separation. See Figure 20: Typical co-located (side by side) watercraft facilities.
  - Install the following to delineate trailer launched and non-motorised watercraft areas:
    - Signs clearly designating different activity areas
    - Line marking and signage clearly designating preparation areas such as rigging / de-rigging / unloading and other short-term activity areas such as wash down sites.

All watercraft facilities

- Install all required regulatory and information Transport and Main Roads boat ramp signage such as ‘Public Boat Ramp’, ‘Load Limit’ and ‘Overhead Wires’ (where required).
- Locate signs where they could reasonably be expected to be visible to ramp users.
- For water installed signage such as buoys use environmentally friendly moorings, not block and tackle moorings which rip out seagrass beds.
- To minimise impacts on sensitive shoreline environments, construct well defined and safe pedestrian pathway connections from car parking to launch areas.
- Provide clearly defined portage pathways and canoe launch (put-in) areas to discourage craft from being launched, retrieved or beached other than at designated areas. Establish a designated launching site to protect coastal and river environments from erosion.
- Connecting pathways are required for canoe / kayak transfer by people living nearby who use hand powered trolleys to access launching sites.
- Locate all associated embellishments such as car parking as close as possible to watercraft facilities.
- Where space is available, provide a vehicle queueing area beside / near to the boat ramp and in addition to the preparation areas.
- Provide a queueing beach beside the boat ramp, to allow temporary boat parking prior to access of the ramp. A queueing beach allows for watercraft to temporarily anchor on the beach (beside the ramp), to allow users to park / retrieve their vehicle and trailer.
Typical design for co-located watercraft launching facilities at one location:

Co-locate non-motorised and trailer launched watercraft facilities side by side at one location.

- Combination watercraft facilities provide an opportunity for the shared use of associated embellishments.
- Non-motorised and trailer launched facilities are to have clearly identified, separated activity areas. Provide maximum possible separation to avoid conflict of use.
- Long term car parking may be shared
- Short term car parking provides for specific activities associated with the type of watercraft, such as a rigging/de-rigging area for yachts / motor boats.
- A connection pathway provides safe pedestrian movement and minimises pedestrian / vehicle conflicts.

See Figure 20: Typical co-located (side by side) watercraft facilities for further guidance.
Clearances

**Pontoons**

Pontoons must be constructed to allow for maximum tidal changes so they do not present dangerous access options.

- A registered professional engineer Queensland (RPEQ) is required to provide specifications for tidal structure to ensure the design incorporates maximum tidal changes.

**Boat ramps**

- To calculate design HAT and LAT refer to *Queensland Tide Tables (current edition)*.

See the following for further guidance:

- *Table 5: Clearances*

### Table 5: Clearances

<table>
<thead>
<tr>
<th>Embellishment</th>
<th>Distance from</th>
<th>Minimum distance</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boat ramp head</td>
<td>highest</td>
<td>+0.5m</td>
<td>The facility is usable across the full tidal range</td>
</tr>
<tr>
<td></td>
<td>astronomical</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>tide (HAT)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boat ramp toe</td>
<td>lowest</td>
<td>-0.5m</td>
<td>The facility is usable across the full tidal range</td>
</tr>
<tr>
<td></td>
<td>astronomical</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>tide (LAT)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boat ramp</td>
<td>clear area to</td>
<td>2.5m</td>
<td>For deck mower clearance (where possible). Avoid creating small,</td>
</tr>
<tr>
<td></td>
<td>any other</td>
<td></td>
<td>difficult to mow areas</td>
</tr>
<tr>
<td></td>
<td>land based</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>embellishment</td>
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8.0 Equal access guidance

Implement equal access for all users by adopting the following principles:

The Disability Discrimination Act (DDA) defines ‘premises’ as the whole of the built environment and includes existing buildings, new or proposed buildings, transport systems, car parks, pathways, and public parks and gardens.

Elements required for equal access

Structures which will be used by the public are to be designed to provide equal access in accordance with AS 1428 Design for Access and Mobility the set and Disability Standards for Accessible Public Transport Guidelines 2001.

Private tourism / event operators need to consider that any new structures which will be used by the public are to be designed to provide equal access.

- Where watercraft facilities are constructed, consider equal access for all open spaces associated embellishments such as:
  - Stairs
  - Ramps
  - Pathways
  - Seats
  - Shelters
  - Barbecues
  - Fish cleaning tables
  - Public amenities (toilets).

- Stairs require tactile ground surface indicators (TGSIs) at upper and lower landings where handrails are not continuous.

- TGSIs are not required on the lower landing of stairs where the landing is designed to be submerged as part of access to bodies of water.

- Stairs to be designed with consideration of the content of AS 1657 Fixed Platforms, Walkways, Stairways and Ladders – Design construction and installation.

- All stairs rises and goings must be a uniform dimension as differing rises and going dimensions can create a trip hazard.

- Terminate stairs and ramps a minimum 900mm back from any perpendicular path of travel so that handrail ends and TGSIs do not protrude into the path of travel.

- Where the lower landing of stairs is designed to be submerged, include a raised dome on the handrail, 150mm from the termination.

- Handrails are to be positioned / designed outside of 3.0m from the edge of any road lane due to the potential for the handrail to become a ‘spearing hazard’ in the event of an accident.

- Provide a continuous accessible path of travel (CAPT) from an equal access car parking space to watercraft facilities.

- Ramps or walkways which provide access to a floating pontoon should be designed to ensure that gradients do not exceed 1:20 based on mean maximum high and low tides.

- Avoid finished height difference between a concrete slab and adjoining surfaces to prevent trip hazards and to prevent ‘tramlining’ of pram, bicycle and wheelchair wheels.
Colour requirements

• Provide sufficient contrast with the background against which embellishments are viewed and have a luminance factor of not less than 30%, for ease of identification for people with low vision.
  ○ Where luminance contrast cannot be achieved (such as grey aluminium furniture on grey concrete), luminance contrast can be improved by providing a coloured base slab which has a minimum 30% luminance contrast with the embellishment base, resulting in the embellishment being more visible for people who have low vision and people who are blind.

• Where embellishments are predominantly in shade, consider the use of high visibility painted components or high visibility tape to increase awareness for people with low vision.

• Add paint, tape or integrated high visibility colour treatment to handrail ends to improve visibility.

See LIM Tactiles for further guidance.
Equal access beach paths

Beach wheelchair access
People who use wheelchairs require a firm surface to enable equal access to the waterfront across sand or other soft surfaces.

Removable beach access facilities are suitable for high profile locations where personnel are available to deploy, recover and store the product.

Sites are preferred where life saving services are located and beach wheelchair hire is available.

- Beach wheelchairs can be hired at:
  - Alexandra Headland Surf Life Saving Club (SLSC).
  - Maroochydore SLSC (beach matting is also available at this location).
  - Other locations such as Currimundi Lake.

Mobi-Mat Beach Access Mat (or equivalent)
A portable roll-out, removable beach access mat.
- The mat can extend into the water to allow people who use wheelchairs to transfer into a beach wheelchair to access the sea.
- Made from 100% recycled PET bottles. This product is a non-slip, tear resistant, firm and stable surfacing.
- Weight 1.3 Kg/m2.
- Mat is available in 2 widths - 1.53m and 1.98m. Lengths range from 5.0m to 30m, interconnecting lengths joined by a tongue and groove arrangement to allow the length to suit the beach and the tide conditions.
- Mat length 50m x 1524mm wide.
- Recyclable material.
- **Bobi-Mat Wing** (or equivalent) is an add-on which can be attached to the side of the main mat path to provide a rest / viewing area for a person who uses a wheelchair.
- **Mobi-Roll’N Stow** (or equivalent) roll up dispenser (weight 45Kg) is constructed from corrosion resistant materials and may be dismantled for storage.
- Designed to be deployed forward or backward by one person.
- Life expectancy 10+ years.

Refer to Safe Work Australia National Code of Practice for Manual Handling for further guidance.

Rubber mat beach access

**Envirobelt 40** (or equivalent) is disused woven and or ply conveyor belt from Australian mines.
- Thickness is 7.0mm to 18mm, width is 1000mm to 1800mm.
- Provides a firm surface over sand to facilitate access by older people, injured people, people with limited mobility and people who use mobility devices.

See the following for further guidance:
- Figure 21: Envirobelt 40 Beach Access.
- Figure 22: Mobi-Mat Beach Access.
9.0 Recommended standards

Embellishment design, manufacture and installation require an appropriately qualified professional to provide site specific solutions. Where Australian Standards or part thereof have been adopted by legislation, they are a legal requirement.

Embellishments should satisfy the following requirements, including but not limited to:

**Legislation**

**International legislation**

- The United Nations (UN) – Convention on the Rights of Persons with Disabilities. Recognises the inherent dignity and worth and the equal and inalienable rights of all members of the human family.

**National legislation**

- Disability Discrimination Act (DDA) 1992. Provides protection for everyone in Australia against disadvantage based upon disability. Disability discrimination happens when people with a disability are treated less fairly than people without a disability. Access to waterways (watercraft facilities) falls under the definition of ‘premises’ (DDA Section 4).

**Queensland legislation**

- Aboriginal Cultural Heritage Act 2003. The main purpose of this Act is to provide effective recognition, protection and conservation of Aboriginal cultural heritage.
- Anti-Discrimination Act 1991 (ADAQ Section 46). To promote equality of opportunity for everyone and to protect them from unfair discrimination. Access to ramps and stairs falls under the provision of services.
- Water Act 2000. The sustainable management of Queensland’s water resources and quarry material and riverine protection.
- Coastal Protection and Management Act 1995. Provides guidance for the protection, conservation, rehabilitation and management of the coastal zone, including its resources and biological diversity.
- Environment Protection Act 1994 and regulations. The object of this Act is to protect Queensland’s environment while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends (ecologically sustainable development).
- Fisheries Act 1994. An Act for the management, use, development and protection of fisheries resources and fish habitats, the management of aquaculture activities and helping to prevent shark attacks, and for related purposes.
- Local Government Act 2009 (LGA) and regulations. Provides for the extent and nature of local government responsibilities and powers.
- Planning Act 2016 and regulations, establishes the framework for Queensland’s planning system and provides the foundation for elements such as plan-making, development assessment and dispute resolution.

Please note:

Please refer to the relevant authority websites for updated information and current document distribution dates. These documents are subject to amendments and supplements from time to time.
Waterways (watercraft facilities)

Australian Standards / industry guidelines

National Construction Code (NCC)
Watercraft facilities shall be developed in accordance with the NCC (current edition):
- Building Code of Australia (BCA) Volume 1 and 2
- Plumbing Code of Australia (PCA) Volume 3.

Safety in design (SiD)
Include Safety in Design (SiD) principles to eliminate, or if not reasonably practical, minimise risks to health and safety throughout the design, construction and life of the embellishment.

See the following for additional safety guidance:
- LIM Preliminaries – General – Health and safety.

Watercraft facilities
- AS 4586:2013 – Slip resistance classification of new pedestrian surface materials. Provides means of classifying pedestrian surface materials according to their frictional characteristics when determined in accordance with the test methods set out in Appendices A, B, C, D and E. The test methods enable characteristics of surface materials to be determined in either wet or dry conditions. This Standard is referenced in legislation.
- AS 4663:2013 – Slip resistance measurement of existing pedestrian surfaces. Provides methods of measuring the frictional characteristics of existing pedestrian surfaces in wet and dry conditions.
- Design Criteria for Floating Walkways and Pontoons: October 2015 – Department of Transport and Main Roads. Design for modular floating walkways that are to be constructed on boat ramps lanes and standalone pontoons with gangways.

• Work Health and Safety Act 2011 and regulations e.g. Work Health and Safety Regulation 2011. To provide comprehensively for work health and safety. Designers have a duty of care to comply with, and to ensure, as far as is reasonably practical, that the design is without risks to health and safety.
• Tobacco and Other Smoking Products Act 1998 and regulation. To improve the health of members of the public by reducing their exposure to tobacco and other smoking products.

• AS 2156.2:2001 – Walking Tracks Part 2: Infrastructure Design – barrier design based on path classification, to prevent the risk of falls.
• AS 4586:2013 – Slip resistance classification of new pedestrian surface materials. Provides means of classifying pedestrian surface materials according to their frictional characteristics when determined in accordance with the test methods set out in Appendices A, B, C, D and E. The test methods enable characteristics of surface materials to be determined in either wet or dry conditions. This Standard is referenced in legislation.
• AS 4663:2013 – Slip resistance measurement of existing pedestrian surfaces. Provides methods of measuring the frictional characteristics of existing pedestrian surfaces in wet and dry conditions.
• Design Criteria for Floating Walkways and Pontoons: October 2015 – Department of Transport and Main Roads. Design for modular floating walkways that are to be constructed on boat ramps lanes and standalone pontoons with gangways.
• Design Criteria for Boat Ramps: October 2015 – Department of Transport and Main Roads. Boat ramp design for recreational trailer boats where the trailer with vessel and tow vehicle does not exceed 8,000 kg.
• QUDM (Queensland Urban Drainage Manual), Australian Rainfall and Runoff 1999.
• Australian Rainfall and Runoff (AR&R). Guidance to produce flood studies and mapping across Australia.
• AS / NZS 2416.1: 2010 Water safety signs and beach safety flags – Specifications for water safety signs used in workplaces and public areas. Safety signs where water sports may be undertaken such as at the seaside, rivers, creeks, dams and open drains.

Queensland Recreational Boating Facilities Demand Forecasting Study 2017, Sunshine Coast Regional Council Assessment – Department of Transport and Main Roads. A tool to select and prioritise sites for development of watercraft facilities.

Please note:
Queensland Department of Transport and Main Roads (DMTR) works in partnership with local government and port / water authorities to provide new and improved recreational boating facilities throughout Queensland. Under these long standing arrangements, Transport and Main Roads builds the in-water components of a facility and councils and port / water authorities provide the land-based components, and then manage the whole facility when completed.

Designing for access and inclusion
• AS 1428 Set – Design for Access and Mobility. Design requirements for new building work to provide access for people with disabilities. This Standard is referenced in legislation.
• Disability Standards for Accessible Public Transport Guidelines 2002. The purpose of this guideline is to remove discrimination on the basis of disability from public transport, such as ramps, access paths and boarding devices at a ferry ramp (linkspan) or a barge slip.

Designing for safety (CPTED)

Trees
• AS 4970:2009 – Protection of Trees on Development Sites. Provides guidance on the principles for protecting trees on land subject to development.
Approvals / authorised person

Assessable development

- Where watercraft facilities are located in a lake and deemed ‘assessable development’ (requires building approval from a private building certifier) or it may be ‘self assessable’ / ‘exempt development’. In both cases it must meet all of the requirements of the Building Regulation 2006, the BCA (current edition) and the Sunshine Coast Planning Scheme 2014.
- The access requirements for new building works are outlined throughout various sections of the NCC (current edition), BCA Volume 1 and these apply to car parking, external paths to buildings, building entrances and accessibility requirements within a building (such as accessible or ambulant toilets, stairs, ramps and exit signs).
- Works may require other approvals such as an authorisation under the Land Act 1994 to occupy and use state owned or managed land (Owners Consent).
- Works are to be certified by a Registered Professional Engineer of Queensland (RPEQ).

QBCC licensed builder

In Queensland, individuals and companies must hold a Queensland Building and Construction Commission (QBCC) license to carry out:
- Any building work valued over the QBCC amount (includes all labour and material costs regardless of who supplies the materials)

Coastal management district, natural waterways and canals

Waterways are not to be altered without written approval of the relevant administering authority.
- Ensure appropriate environmental approvals are obtained and the conditions observed where any building work is proposed in the Coastal Management District, natural waterways and in canals.
- Under the Coastal Protection and Management Regulations 2003, the definition of tidal work includes: ‘tidal work that is completely or partly within a local government tidal area and includes integral parts of the structure that extends onto land above high water mark’.
- Federal approvals may be triggered.
- Consult with Queensland Government Department of State Development, Manufacturing, Infrastructure and Planning (DSDMIP) – State Assessment and Referral Agency (SARA) for application forms, guidelines and information sheets.
- State Development Assessment Provisions (SDAP) guidelines include provisions around maritime safety, marine plants and fish habitat areas.

Tidal works

Local government is the assessment manager for prescribed tidal works.
- Compliance with the Department of Environment and Heritage Protection (DEHP) guideline Purpose and use of the Code for assessable development that is prescribed tidal works - Guideline for coastal management. Assistance for local government and those applying for the development approval for a prescribed tidal work.
- An application for Prescribed Tidal Works is required.
- Works in tidal waters may also require referral to Maritime Safety Queensland regarding navigation issues, and the Department of Natural Resources if within a Fish Habitat Area.
- For private works in prescribed tidal areas, a lease is required over any structure. Application is through Development Services, Council’s Property Branch.

Other

- Ensure all relevant approvals are obtained from the appropriate governing bodies and all conditions are observed.
- Department of Transport and Main Roads (DTMR) approval is required for works near state controlled roads, as well as navigational aspects of works within canals and waterways. This applies to any part of the road reserve including footpath, kerb and channelling, nature strip and traffic island.
- DTMR approval is required for local government and other organisations to improve, develop and maintain boating facilities for recreational boat users in Queensland through Marine Infrastructure Capital and Maintenance Program (MICMP).
SC Council additional requirements

Corporate documents

- Sunshine Coast Planning Scheme 2014 – provides guidance and technical advice for development.
- Sunshine Coast Environment and Liveability Strategy 2017 – sets guiding principles, an implementation plan and technical detail to address; the natural environment, population growth, climate change, renewable energy, create liveable spaces and fulfil expectations of future generations. In particular, the policy positions and the desired standards of service for the “waterways and wetlands” and “coastal” themes provide guidance relevant to watercraft facilities.
- Sunshine Coast Social Strategy 2015 – aims to maintain the community’s high perceptions and levels of safety. It also promotes wellbeing and ensures an older population is supported and provided for.
- Sunshine Coast Strategic Policy: Coastal Management Policy (Public Lands) 2014. This policy provides council positions with respect to:
  - coastal processes and location of infrastructure
  - shoreline erosion management measures and adaptive management
  - economic, social and recreational values
  - cultural and natural values
  - community engagement.
- A lake management plan endorsed for each of the Sunshine Coast lakes. All watercraft infrastructure and activities within “non-tidal” waterways must adhere to the relevant lake management plan requirements as follows:
  - Parrearra Lake Management Plan.
  - Lake Kawana Birtinya Lake Management Plan.
- Sunshine Coast Coastal Management Overview 2015. To ensure valuable coastal assets are protected, healthy and enjoyed, council employs a range of proactive coastal planning, management and maintenance activities.
- Sunshine Coast Access and Inclusion Plan 2011-2016 and Sunshine Coast Council Access and Inclusion Policy, 5 Oct 2011 – to guide the establishment and implementation of access and inclusion and promote social justice and social inclusion. The aim is to reduce barriers to civic and community participation.
- Sunshine Coast Positive Ageing Strategy 2011 - 2016 – addresses the changing needs of older people on the Sunshine Coast.
- Smart City Implementation Plan 2016-2019 – lays out a structure, program of works and deliverables for the implementation of the Smart City Framework into Council projects, systems and processes.
- Sunshine Coast Manual for Erosion and Sediment Control (V1.2) Nov 2008 – An overview of how development activities can comply with the environmental objectives of council’s planning scheme.
- Sunshine Coast Manual for Erosion and Sediment Control (V1.2) Nov 2008 – An overview of how development activities can comply with the environmental objectives of council’s planning scheme.
- Sunshine Coast Centres Design Palette – a manual that provides hard and soft infrastructure palettes for activity centres across the Sunshine Coast.
- Sunshine Coast Centres Design Palette – a manual that provides hard and soft infrastructure palettes for activity centres across the Sunshine Coast.
Corporate liaison

Developer delivered assets

- SCC Development Services – all works associated with any development application.

Council delivered assets

- SCC Parks and Gardens – asset management, business planning and direction for recreation parks, amenity reserves, linear parks, landscape corridors, sports grounds and recreation trails.
- SCC Environmental Operations – recreation trails, foreshore infrastructure, environment reserves, constructed waterbodies and wetlands.
- SCC Design and Placemaking Services – recreation parks, amenity reserves, linear parks, landscape corridors, sports grounds, specific purpose (sports), recreation trails and streetscape / centres enquiries relating to design.
- SCC Sport and Community Venues – sports ground planning and asset management.
10.0 Sustainability

To attain strategic sustainability the following principles should be considered where suitable:

Materials and products

- Local materials and local products.
- Material selection should be based on recycled or recyclable material wherever possible.
- Metals / plastics that can be:
  - recycled at the end of productive life
  - used in a buy back scheme.
- Finishes / treatments / products that are the least harmful to the environment and park users.
- Ensure materials are flame retardant and resistant to fire.
- Consider maintenance, whole of life costs and aesthetic values.
- Materials and design which initially costs more can result in reduced future maintenance costs and / or longer useful life.
- Where timber is not in ‘frequent and intimate contact by the public’, treatment by chemical preservative application of CCA (chromated copper arsenate) is preferred, alternatively ACQ (alkaline copper quaternary) or LOSP (light organic solvent preservative).
- Made from robust materials that are vandal and corrosion resistant (particularly in coastal areas).
- Install erosion and sediment control products and practices such as mulching to reduce erosion on excavated areas during construction.
- Stabilise exposed soils prior to handover.

Tree and vegetation management

- Protect existing trees by using tree root sensitive design and / or appropriate setbacks to ensure the ongoing provision of shade and amenity (consult a qualified arborist).
- Protect existing trees from damage during project delivery to ensure continued environmental benefits such as oxygen production, temperature control, flood mitigation and stormwater filtration.
- Plant new trees to provide additional shade in the future as well as successional tree population.
- Plan to incorporate all relevant design guidelines at the design stage of a project. This will reduce the need for premature vegetation losses as a result of conflict or ongoing costly maintenance to maintain clearances.
- Plan to select species tolerant to the local conditions at the design phase and choose quality specimens at the project delivery phase to minimise early losses and reduce ongoing maintenance.
- Ensure new plantings are appropriately setback from infrastructure. This will reduce long-term maintenance requirements and maximise the longevity of plantings.

Planning for future works

- Co-locate similar embellishments to reduce infrastructure – such as water use facilities and underground services.
- The consideration of climate change impacts is also expected to be informed by Projects being progressed as a result of Councils adoption of the Sunshine Coast Environment and Liveability Strategy 2017. In particular, planning for future works should be informed by the development of a Coastal Hazard Adaptation Strategy (CHAS) for the Sunshine Coast Local Government Area (LGA). The CHAS will set strategic direction for coastal hazard planning. Outputs from the project could also prescribe requirements for the location, design and construction of coastal assets.
- Consider climate change impacts on embellishment location and construction. In coastal areas, or near waterways, design should consider rise in sea level predictions and severe storm events. Near bushland areas, design should consider the occurrence of bushfires.
- Positioning should consider flooding, seasonal/ephemeral water bodies and water table changes.
- As a sustainable approach, consider installation of additional conduits under concrete slabs for future provision where electrical / irrigation services are planned. Ensure conduit is capped to prevent ingress of water and debris.
- Where underground services/utilities are installed, set brass markers to concrete slab edges to indicate the location.

3 Australian Pesticides and Veterinary Medicines Authority document The Reconsideration of Registrations of Arsenic Timber Treatment Products (CCA and arsenic trioxide) and Their Associated Labels. The APVMA restricted the application of CCA treated wood in uses such as playground equipment and decks as a precautionary measure.

4 Sunshine Coast Environment and Liveability Strategy 2017
11.0 Project management and maintenance

Documentation

The submission of design documentation and technical specifications for each item (where applicable), is to include, but not be limited to:

- approvals, searches, compliant drawings and documentation – written compliance with relevant legislation, Australian Standards and corporate documents (including specifications and access and mobility requirements)
- preliminary site setup (refer LIM category) – compliance with safety, tree protection, erosion and sediment control measures
- technical information – the manufacturer’s product, installation, inspection, warranties and maintenance information
- materials – specification of materials
- schedule of finishes
- engineered design and any required certifications
- unusual requirements for handling or installation and competency requirements
- workplace health and safety plan, where applicable
- environmental management plan (EMP) and / or erosion and sediment control plan, where applicable.

Practical completion – technical information to be supplied:

At practical completion, the contractor must supply technical specifications, including but not limited to:

- certification – inspections, final approvals and documentation
- as constructed drawings and specifications which should detail the location of any sub-surface services (e.g. drainage, electrical)
- operational manuals – inspection / maintenance details including parts and service manuals, and manufacturer’s guarantees
- construction and / or maintenance tools including non-standard maintenance tools for bolt tightening and replacement parts
- all required signage should be installed prior to hand-over of the asset, where applicable
- manufacturer’s guarantees / warranties and any other documents or items, including quality management compliance and accreditation.

Maintenance period and / or defects liability period

Developer delivered assets

The development maintenance period and requirements are nominated in the conditions of approval (decision notice).

Council delivered assets

The maintenance period and requirements are nominated in the letter of appointment of contractor (contract).

Prior to the end of the pre-determined maintenance period or defects liability period, a ‘pre-handover inspection’ should be conducted by an authorised council officer. The following items will apply:

- Compliance Audit
- Rectification Action Plan (RAP) is provided identifying any faults and non-compliance
- RAP items are to be rectified prior to handover.
Sunshine Coast Open Space Landscape Infrastructure Manual DISCLAIMER

Acknowledgements
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