

Sunshine Coast Council

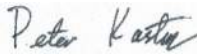
DDA Compliant Pontoon Investigation

Report | Potential Sites Analysis & Preferred Site Assessment

SCMC-23009-ODA-001 | Rev 1 | 19 June 2023



Report: DDA Compliant Pontoon Investigation

Prepared For (Client)		Prepared By		
				
Sunshine Coast Council 54 Industrial Ave, Caloundra West QLD 4551 & Locked Bag 72 Sunshine Coast Mail Centre Qld 4560		Shoreline Civil & Marine Consulting Pty Ltd ABN: 68 633 921 472		
Client Representative(s)		Shoreline Representative(s)		
Kurt Martin A/Natural Areas Manager Environmental Operations Liveability and Natural Assets		Matthew Deane, RPEQ 17380 (Ph: 0435 638 699) Peter Kastrup, RPEQ 10686 (Ph: 0431 674 734) Andrew Turnbull-Miller, RPEQ 15230 (Ph: 0400 721 083)		
Project Title	DDA Compliant Pontoon Investigation			
Project No.	23009			
Document Type	Report			
Document Title	Potential Sites Analysis & Preferred Site Assessment			
Document No.	SCMC-23009-ODA-001			
Prepared By		Reviewed By	Approved By	
Andrew Turnbull-Miller		Peter Kastrup	Peter Kastrup	
				
Revision	Date	Purpose	Description	Amended By
Draft 1	26 April 2023	For Review	Draft issue	-
Rev 1	19 June 2023	For Issue	Issue 1	ATM

Disclaimer / Copyright

© 19 June 2023 Shoreline Civil and Marine Consulting Pty Ltd All Rights Reserved. Commercial in Confidence and Copyright in the whole and every part, including attachments, belongs to Shoreline Civil and Marine Consulting. This document takes into account the particular instructions, inputs provided and/or (if relevant) observations/testing made on site and requirements of our client. This document is not intended for and should not be relied upon by a third party and no responsibility is undertaken to any third party.

Contents

Executive Summary	1
1 Project Introduction	2
1.1 Background	2
1.2 Project Objectives	3
1.3 Overall Project Scope of Work and Scope of Services	3
1.4 Basis of Design	3
1.5 Indicative Concept Design	5
2 Case Studies	7
2.1 Edward River Bridge - NSW National Parks	7
2.2 Parks Victoria Accessible Canoe Launcher	8
2.3 EZ Launch	9
2.4 The Dock Doctors	10
2.5 BoardSafe	11
3 Site Details	12
3.1 Introduction	12
3.2 Site 1: Bradman Avenue – Maroochy River	12
3.3 Site 2: Cotton Tree – Maroochy River	18
3.4 Site 3: Charles Clarke Parke – Mooloolah River	26
3.5 Site 4: Crummunda Park - Currimundi Lake	31
4 Options Development	38
4.1 MCA Framework	38
4.2 Assessment Criteria Definition	38
4.3 Assessment Criteria Weightings	40
4.4 Ranking of Options	41
4.5 Preferred Option – Site 3 Charles Clarke Park	41
4.6 Sensitivity Testing	41
5 Summary and Preferred Site	42

Executive Summary

Sunshine Coast Council (SCC or Council) is seeking to construct a new Disability Discrimination Act (DDA) compliant pontoon tailored for specific water sports activities. SCC have chosen to assess the viability of the pontoon at four sites including:

- Site 1: Bradman Avenue – Maroochy River
- Site 2: Cotton Tree – Maroochy River
- Site 3: Charles Clarke Parke – Mooloolah River
- Site 4: Crummunda Park - Currimundi Lake

This document details 'Phase 1 - Site Location Options Assessment' including Multi-Criteria Assessment (MCA).

The first section of this report summarizes the key basis of design criteria that was used in the MCA assessment including design vessels (non-motorised watercraft including kayaks, canoes and SUPS), pontoon requirements, access path requirements and toilet facilities. The concept design will be developed in the next phase of the project. However, an indicative concept design was been developed for the purposes of the MCA.

A desktop review was performed to identify key case studies and examples of similar facilities which identified the following facilities:

- Edward River Bridge - NSW National Parks
- Parks Victoria Accessible Canoe Launcher
- US companies/products including EZ Launch, The Dock Doctors and BoardSafe

The key characteristics and considerations for each of the four sites being considered were summarized which included:

- Site Appeal & Existing Uses,
- Existing Site Facilities such as toilet facilities, car parks, footpaths, services, refuse bins, drinking water bubbler, shelter structures,
- Water Level Considerations including water depth and tidal range,
- Gangway length to achieve 1:14 slope,
- Constructability.

Options Assessment Summary

The adopted framework for the weighted multi-criteria options analysis (MCA) and the option scoring is detailed in Section 4.

Preferred Option

Based on the agreed options analysis criteria, weightings and scoring, **Site 3: Charles Clarke Parke – Mooloolah River was determined by the MCA as the preferred option.**

1 Project Introduction

1.1 Background

Sunshine Coast Council (SCC or Council) is seeking to construct a new Disability Discrimination Act (DDA) compliant pontoon tailored for specific water sports activities. As shown in Figure 1, SCC have chosen to assess the viability of the pontoon at four sites including:

- Site 1: Bradman Avenue – Maroochy River
- Site 2: Cotton Tree – Maroochy River
- Site 3: Charles Clarke Parke – Mooloolah River
- Site 4: Crummunda Park - Currimundi Lake

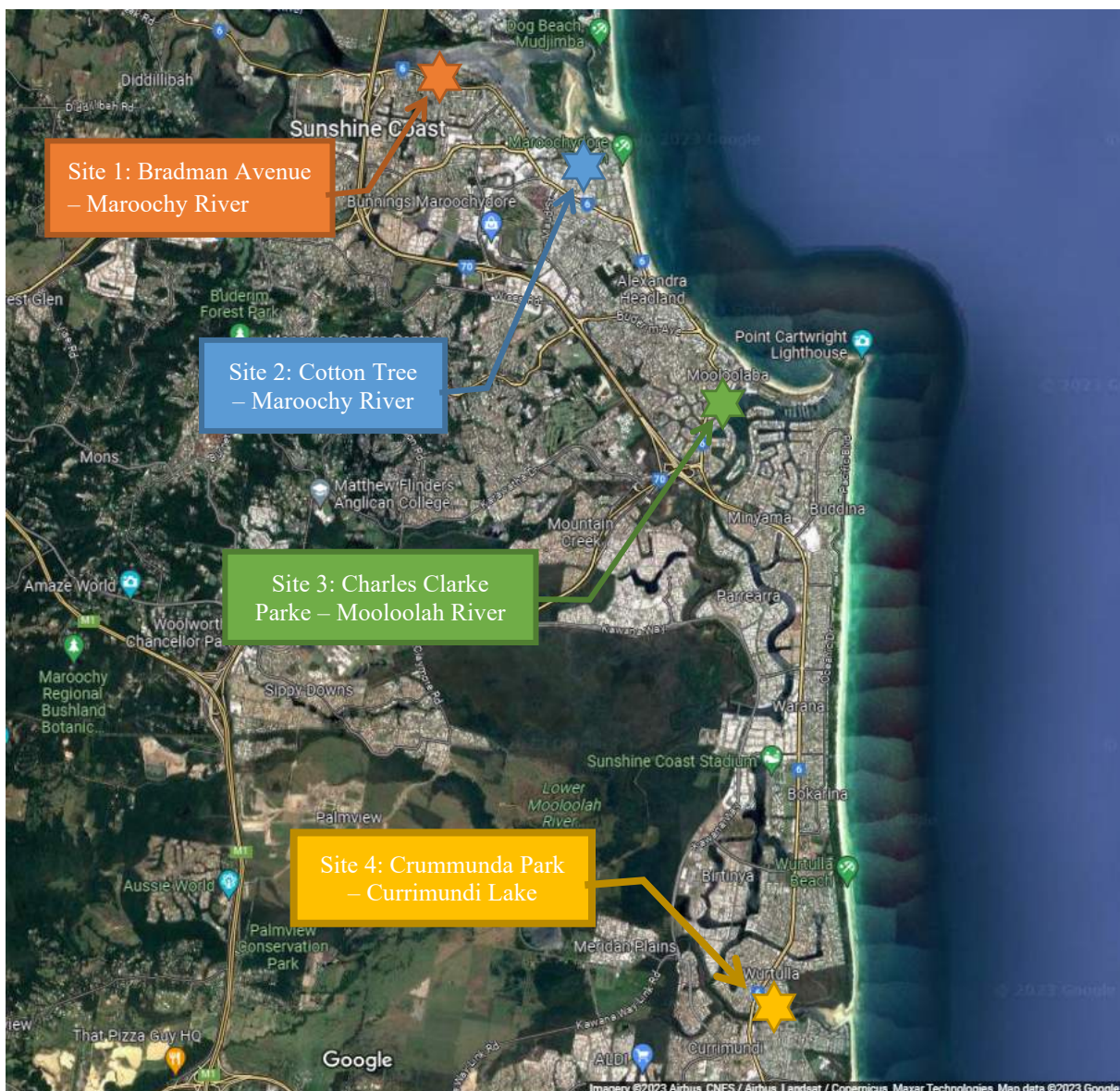


Figure 1: Potential DDA Pontoon Site Locations proposed by SCC

1.2 Project Objectives

It is understood that SCC have performed a non-motorised access study which identified a gap in DDA access for water-based activities. As a result of this study, a project opportunity for a DDA Compliant Pontoon was identified. The target watercraft for the project is non-motorised watercraft including kayaks, canoes and Stand-Up Paddleboards (SUPs).

Council's aspiration is that the pontoon facility is DDA compliant for wheelchair access within the maximum possible tidal range and includes built in features to allow for assisted and unassisted access to the water for a range of disabilities. One of the key features of the pontoon is that it should be suitable for manoeuvring of a double kayak including lifting system to enable dry loading of a person before the kayak is rolled into the water. The pontoon design shall also consider disabilities of all ranges such as intellectual disabilities; sensory disabilities (such as visual or hearing); neurological impairments and ageing related disabilities as far as reasonability practical.

The aim of this project to construct one pontoon in the 'best location' as a test case noting that SCC might install similar pontoons at other sites in the future.

1.3 Overall Project Scope of Work and Scope of Services

As per the SCC Brief, SCMC's scope of work for this project includes the following phases:

1. Phase 1: Site inspection and Site Location Options Assessment
2. Phase 2: Concept Design & Stakeholder Workshop

This document details 'Phase 1 - Site Location Options Assessment' including Multi-Criteria Assessment (MCA).

1.4 Basis of Design

The key design criteria for the pontoon are as follows:

1.4.1 Design Vessels

The target users for the pontoon facility are non-motorised watercraft including kayaks, canoes and SUPS. It is not intended that the pontoon will be used by sailing dinghies or motorized watercraft.

It has been assumed that the largest watercraft using the pontoon is a double canoe with the following parameters:

- maximum length of 5m, and
- maximum width of 1m.

An example of a double canoe is shown in Figure 2 which is a 'Swagman Canoe' with a length of 4.65m and width of 0.97m. The pontoon design should also consider the potential use canoes with stabilizers as shown in Figure 2.



Figure 2: Swagman Canoe which an example of double/tandem canoe. The image right shows the Swagman Canoe with stabilizers fitted¹

1.4.2 Pontoon Layout and Furniture

The pontoon shall have built in features to allow for assisted and unassisted access to the water for a range of disabilities. It has been assumed that an able-bodied carer will be present in most cases.

A key requirement of the pontoon is that it shall have built-in systems and features to assist with the moving of people from the pontoon deck into and out of the watercraft. This is expected to involve a combination of sliding seats, lifting mechanisms (ie: davit arms) and handlebars. It is also noted that use of the davit arm could be restricted through the use of a text message code system to reduce the risk of vandalism and miss-use.

The pontoon shall have a system to hold the watercraft stable during the loading and uploading of the vessel. This is expected to involve either a roller or slide system to enable the dry loading of watercraft which is then rolled into or out of the water.

The layout of the pontoon shall also provide space and facility to lock wheelchairs (and other mobility devices) securely out of the way while the user is out paddling.

Lighting shall be provided and SCC have expressed preference for Orca solar lighting.

The following features will also be considered in future stages:

- drinking water bubblers,
- wash down/cleaning facilities,
- CCTV, and/or
- emergency help button.

1.4.3 Access Path

The access path from the car parking to pontoon shall be DDA compliant as far as reasonably practical. SCC have advised that the pontoon gangway slope shall be suitable for wheelchair users within the maximum possible tidal range with a maximum slope of 1:14 for 90-100% of the tidal range.

¹ https://www.canoes.com.au/index.php?dispatch=products.view&product_id=283

The access path from the car parking to the pontoon facility shall allow for the easy manoeuvring of the design watercraft. It has been assumed that the watercraft would generally be pushed by the able-bodied carer using a small trolley or similar.

1.4.4 Toilet Facilities

DDA compliant toilet facilities to be provided in close vicinity to the car parking and pontoon facility. This is already confirmed by SCC as this was a key requirement during the shortlisting of sites for this project.

1.4.5 Other

The intent is not to encourage fishing from the pontoon facility; however it is understood that fishing cannot be prohibited.

1.5 Indicative Concept Design

The concept design will be developed in the next phase of the project. However, an indicative concept design has been developed for the purposes of this MCA. As shown in Figure 3, the indicative concept design has the following key parameters:

- Gangway width of 2m to enable easy manoeuvring of watercraft,
- Pontoon plan area of 12m x 6m based on layout shown in Figure 3,
- Minimum draft 0.5m. Target water depth of 1m at LAT avoid grounding at low tide and to minimize siltation risk.

This concept design will be refined during the next phase of the project.

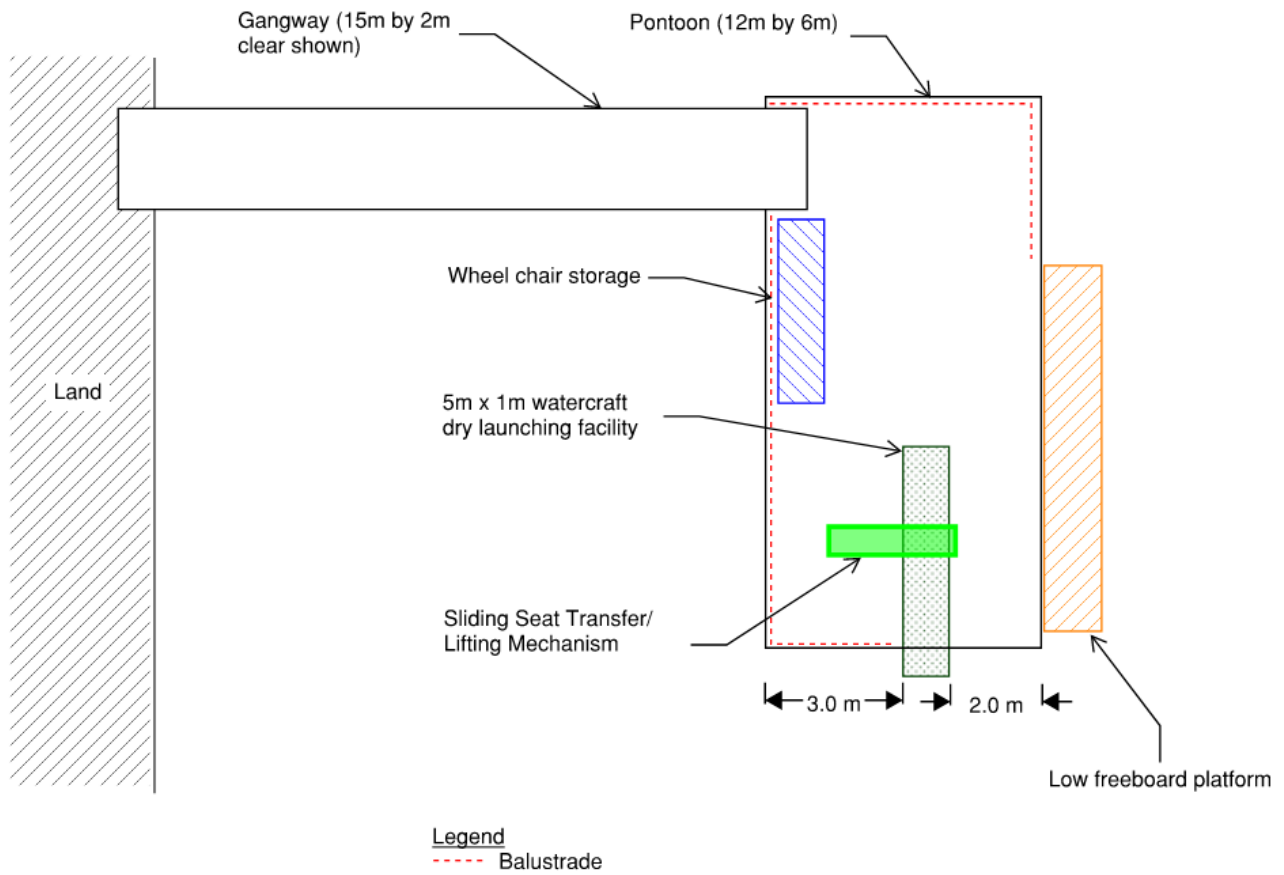


Figure 3: Indicative Concept Design – Plan Layout

2 Case Studies

The following case studies/examples have been identified.

2.1 Edward River Bridge - NSW National Parks

NSW National Parks have constructed a wheelchair-accessible launch at Edward River Bridge picnic area. The pontoon includes a sliding wheelchair accessible transfer system as shown in Figure 4 and Figure 5. The pontoon also includes a kayak launching system that appears to be partially floating to stabilize the watercraft during embarkment and disembarkment. Further information is available at these links:

- https://issuu.com/accessinsight/docs/aaa_july2020magazine/s/10799355
- <https://www.nationalparks.nsw.gov.au/access-friendly/edward-river-bridge-kayak-launch>



Figure 4: Wheelchair Accessible Transfer System²



Figure 5: Wheelchair Accessible Transfer System³

² <https://www.nationalparks.nsw.gov.au/access-friendly/edward-river-bridge-kayak-launch>

³ Source: <https://youtu.be/qHZUPoHB8nY?t=43>

2.2 Parks Victoria Accessible Canoe Launcher

Parks Victoria have constructed an “all-accessible floating pontoon and canoe launcher” that is located at Psyche Bend in Kings Billabong in Mildura. Parks Victoria advised that the “facility provides a stable platform on the static jetty and then a secure ramp to launch into the water for a person with mobility limitations, with hand rails and supportive rollers to guide them easily in and out of the water.”

As per Figure 7, it appears that the roller system is supported by a float system. However, the slope appears relatively steep and it is unclear how users exit the water. As this system is fixed, it appears that this system would only be suitable if there a very small change in water level.

Further information is available at these links:

- <https://www.parks.vic.gov.au/get-into-nature/all-abilities-access/accessible-canoe-launcher>
- <https://www.abc.net.au/local/stories/2015/03/04/4191121.htm>



Figure 6: Parks Victoria 'all-accessible floating pontoon and canoe launcher'⁴



Figure 7: Canoe launcher in use showing⁵

⁴ Source: <https://www.parks.vic.gov.au/get-into-nature/all-abilities-access/accessible-canoe-launcher>

⁵ Source: <https://www.abc.net.au/local/stories/2015/03/04/4191121.htm>

2.3 EZ Launch

EZ Dock in US company that produces a variety of kayak launch systems. EZ Dock produce a Transfer Bench that “is built with two heights for easy transfer from wheelchairs of varying sizes and two Transfer Slide Boards to accommodate differing watercraft heights. The Transfer Slide Boards land securely on a railing system that stabilizes the slide board and provides grab bar assistance for easy side movement. All users can simply sit, slide over and drop down into a kayak or canoe then utilize the side rails to pull off or back on.”

Photos of the system are shown below and further information is available at these links:

- <https://www.ez-dock.com/product/ez-launch-drive-through-ada/>
- <https://www.disabled-world.com/sports/watersports/kayaks-canoes.php>

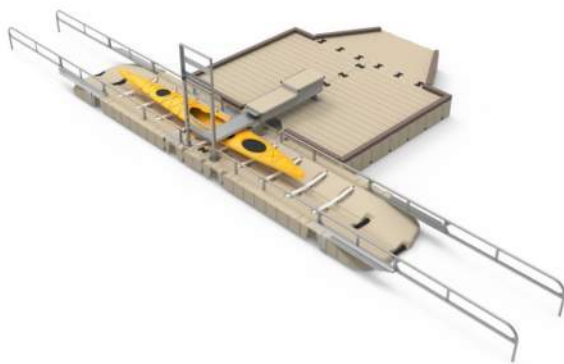


Figure 8: EZ Launch ‘Drive Through ADA’ and ‘Transfer Slide Bench’ systems⁶

⁶ Sources: <https://www.ez-dock.com/product/ez-launch-drive-through-ada/> and <https://www.ez-dock.com/product/transfer-slide-bench-with-grab-rail-and-sign/>

2.4 The Dock Doctors

The Dock Doctors is a US company that produces a roller kayak launch system and wheelchair transfer system. The wheelchair transfer system consists primarily of a fixed 3-step transition platform and various bars including an overhead bar. The system relies on the user using an overhead handrail to slide themselves from the wheelchair, down the steps and into the watercraft.

The roller kayak launch system requires embarkment and dis-embarkment of the watercraft while the watercraft is located on a slope. It appears that the system relies on friction in these rollers to avoid the watercraft moving during embarkment and dis-embarkment as shown in these video <https://www.youtube.com/watch?v=5g2Nlxv8C1E> and <https://www.youtube.com/watch?v=QgL8eCD0bHQ>

Photos of the system are shown below and further information is available at this link:

- <https://thedockdoctors.com/ada-transfer-platform-for-commercial-kayak-launch>

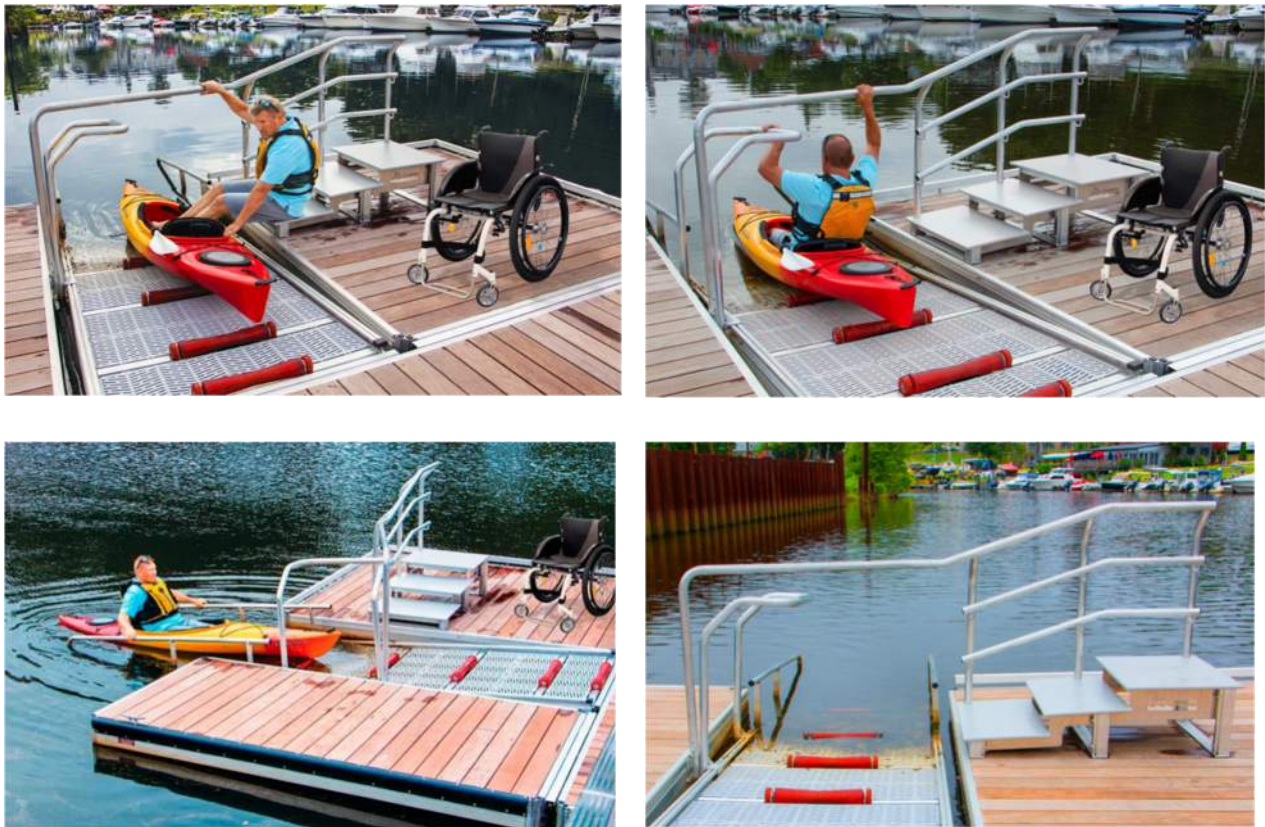


Figure 9: EZ Launch ‘Drive Through ADA’⁷

⁷ Source: <https://thedockdoctors.com/ada-transfer-platform-for-commercial-kayak-launch>

2.5 BoardSafe

BoardSafe is a US company that produces a variety of pontoon systems including an accessible kayak launch pontoon.

The kayak launch system appears to consist of a partially submerged slide system to provide a stable platform for the watercraft during embarkment and dis-embarkments.

The wheelchair transfer system consists primarily of a fixed 3-step transition platform and various bars including an overhead bar. The system relies on the user using an overhead handrail to slide themselves from the wheelchair, down the steps and into the watercraft.

Photos of the system are shown below and further information is available at these links:

- <https://boardsafedocks.com/services/accessible-products/>
- <https://thedockdoctors.com/ada-transfer-platform-for-commercial-kayak-launch>
- <https://www.youtube.com/watch?v=aUPBXvWV4p4>
- <https://www.youtube.com/watch?v=2L2UCK6znMw>



Figure 10: BoardSafe ‘ADA Kayak Dock’ System⁸

⁸ Source: <https://boardsafedocks.com/services/accessible-products/>

3 Site Details

3.1 Introduction

The key characteristics and considerations for each of the four sites being considered are discussed in this section which include:

- Site Appeal & Existing Uses,
- Existing Site Facilities such as toilet facilities, car parks, footpaths, services, refuse bins, drinking water bubbler, shelter structures,
- Water Level Considerations including water depth and tidal range,
- Gangway length to achieve 1:14 slope,
- Constructability.

It is noted that no information on property/lease boundaries has been provided by SCC at this stage and it has been assumed that this is not a significant distinguishing consideration between the respective sites.

3.2 Site 1: Bradman Avenue – Maroochy River

Site 1 - Bradman Avenue is located on the Maroochy River to the east of the Chambers Island bridge on Bradman Avenue as shown in Figure 11.



Figure 11: Navionics map with markup of the proposed Bradman Avenue – Maroochy River location

3.2.1 Site 1: Site Appeal & Existing Uses

Site appeal considerations and existing site uses for this site include:

- Relatively high tidal currents in the Maroochy River, however the currents at the site between Chambers Island are expected to be less than the main waterway.
- Relatively wide waterway which is expected to be more suited to strong canoers/kayakers
- Swan Boat Hire is located immediately to the west of the proposed site which hires both motorized and non-motorized craft including kayaks, canoes and SUPs.
- Maroochy Sailing Club and Sunshine Coast Rowing Club are located on Chambers Island offering potential synergy with this proposed facility.

3.2.2 Site 1: Existing Site Facilities

A summary of the existing site facilities are shown in Figure 12 and are discussed further in this section.



Figure 12: Site 1 Existing Site Facilities markup. Base map is combination of Google Earth image and DSQ Land Surveyors (Dated 18.09.18).

3.2.2.1 Toilet Facilities

There are existing toilet facilities which are located immediately upstream of the Chambers Island Bridge. These toilets facilities appear to be DDA compliant.

3.2.2.2 Car Parks

There is one existing disability car park located upstream (to the west) of the Chambers Island Bridge and toilet facilities. It is unclear if this car park is DDA compliant due to significantly longitudinal slope, limited space to side of car park and steep kerb ramp.

It is noted that the car park is located immediately off Bradman Avenue which is a relatively busy road which is likely to be significant constraint for loading/unloading of canoes/kayaks from the rear of a vehicle.

It is expected that modifications to the existing car parks and adjacent footpaths would be required including re-profiling works and will be relatively difficult.

3.2.2.3 Footpaths

There is an existing 3m wide winding concrete footpath that runs along the promenade parallel to the river.

It is noted that this footpath is relatively highly trafficked which could create conflicts when manoeuvring a kayak/canoe along this path.

3.2.2.4 Services

A DBYD search was performed for this site. Based on the DBYD search and observations on site, existing services in the vicinity of the site appear to include:

- Stormwater (SCC): Stormwater pipes that run perpendicular from 'Bradman Avenue' with outlets through the grouted rock wall that drain into the Maroochy River. There is also a pump station located in the vicinity of the toilet facilities.
- Unitywater: Water main and sewer lines generally in the vicinity of the roadway. There is also a sewer line that appears to be located on the Chambers Island Bridge (or in close proximity) It is also noted that toilet facilities and drinking water bubbler were observed and the water and sewer services to these facilities are partially shown on the DBYD search.
- Telstra: There is an existing Telstra phone box located to the east of the toilet facilities. Various communication cables are located in the vicinity of this site include along Chambers Island Bridge, vicinity of the roadway and the phone box.
- Energex: Overhead powerlines generally in the vicinity of the roadway. It appears that there is an underground electrical cable running from the roadway and then along Chambers Island Bridge.
- NBN: NBN cables generally in the vicinity of the roadway

In summary, there is existing electrical and water supply in the vicinity of the site and existing services are not expected to be a significant constraint to the construction works at this site.

3.2.2.5 Other

Other existing infrastructure at this site includes existing refuse bins, drinking water bubbler, shelter structure (including wheelchair accessible picnic table) and seating by the waterfront.



Figure 13: Photo showing existing disability car park

3.2.3 Site 1: Water Level Considerations

3.2.3.1 Water Depth & Sediment Movement

The latest bathymetric survey that is currently available for this site was performed in September 2018 and an extract of this survey is shown in Figure 14. This survey shows that the water depth in the vicinity of the proposed site is around -1 to -1.25m AHD which is approximately 0.5m to -0.8m CD. It is also noted that there is shallow area located immediate adjacent to the Chambers Island Bridge and the proposed location of the pontoon has been positioned away from this shallow area.

Grounding of the pontoon is therefore a significant concern for this site, especially if siltation occurs around the pontoon. However, it is noted that the hydrographic survey indicates that deep water (approximately -1.5m CD) is located approximately 100m further downstream (to the east) and the pontoon might therefore need to be located further east.



Figure 14: Extract of hydrographic survey by DSQ Land Surveyors (Dated 18.09.18). Note levels are in AHD

SCMC understands that there are no sediment transport studies available for this site. However, the Cardno 'Maroochy River Sediment Investigation Report'⁹ shows that the seabed in the vicinity of the site is sand. It is also noted that there are sand waves visible on aerial imaging. SCMC understands that the bathymetry in the vicinity of the site is relatively stable, however the risk of potential for changes in the bathymetry in the vicinity of the site needs to be acknowledged.

3.2.3.2 Tidal Levels & Gangway Length

The closest tidal plane information for this site is located at Picnic Point and the tidal datum information can be found in Table 1. The spring tidal range (MHWS to MLWS) for this site is around 0.84m and the full tidal range (HAT to LAT) is around 1.41m.

⁹ Cardno 'Maroochy River Sediment Investigation Report' Job Number: 3747/P/137. Dated: 19 December 2011

Table 1: Design Water and Tidal Levels in Chart Datum (CD)¹⁰

Water Level	Picine Point
Highest Astronomical Tide (HAT)	1.41
Mean High Water Springs (MHWS)	0.98
Mean High Water Neaps (MHWN)	0.71
Mean Sea Level (MSL)	0.56
Australian Height Datum (AHD) ¹¹	0.46 (approx.)
Mean Low Water Neaps (MLWN)	0.29
Mean Low Water Springs (MLWS)	0.14
Lowest Astronomical Tide (LAT)	0

SCC flood mapping ArcGIS portal¹² indicates that the site is susceptible to flooding, however no detailed information is available for this site at this stage. However, it is expected that flood debris loading from flooding in the Maroochy River could be significant design consideration for this site.

3.2.4 Site 1: Gangway Length

The existing ground level at the proposed abutment location is approximately 1.3 to 1.4m AHD which is approximately 1.86m CD¹³. It is noted that the surround parkland is at a similar level and it has therefore been assumed that the abutment level will be around 1.9m CD.

Based on Table 2, spring tidal range for this site is around 0.84m and the full tidal range is around 1.41m. This results in an indicative gangway length of approximately 20 to 23m to achieve 1:14 grade at all tidal levels.

It is noted that the gangway length could be reduced by providing a fixed ramp on land so that the abutment level is just above HAT.

3.2.5 Site 1: Constructability

Constructability considerations for this site include:

- Limited space on land for site facilities, storage of minor components and deliveries.
- The gangway abutment would most likely need to be constructed using marine plant due to limited space on land and existing infrastructure constraints.
- Limited water depth for marine plant, in particular for the abutment construction and gangway lift.
- Marine plant mobilized via water would need to cross the Maroochy River bar which will require good weather conditions. Alternatively, marine plant would need small enough to be mobilized via road transport (which is expected the result in significant limitations for pile driving and gangway installation).

¹⁰ Based on MSQ Semidiurnal Tidal Planes – 2023 <https://www.msq.qld.gov.au/tides/tidal-planes>

¹¹ Current level of 0.46m based on DSQ Land Surveyors (Dated 18.09.18).

¹² [MyMaps - Flood Mapping and Information \(arcgis.com\)](#)

¹³ Based on “20357 BRADMAN AVENUE - TOP OF WALL” survey provided by SCC

3.3 Site 2: Cotton Tree – Maroochy River

Site 2 – Cotton Tree is located on the Maroochy River in Cotton Tree Park as shown in Figure 15.



Figure 15: Navionics map with markup of the proposed Cotton Tree – Maroochy River site

3.3.1 Site 2: Site Appeal & Existing Uses

Site appeal considerations and existing site uses for this site include:

- Relatively wide waterway and relatively strong currents which is expected to be more suited to strong canoers/kayakers
- Site is located near the popular (tourism and locals) area of Cotton Tree
- Existing SUP hire companies include:
 - “Ocean Addicts” who operation from Cotton Tree Park. Ocean Addicts also offer SUP lessons.
 - “PlazaPontoon” are located are nearby Sunshine Plaza Shopping Centre and hire Paddle Boats, Kayaks and SUP’s.

3.3.2 Site 2: Existing Site Facilities

A summary of the existing site facilities are shown in Figure 16 and are discussed further in this section.



Figure 16: Site 2 Existing Site Facilities markup. Base map Google Earth image

3.3.2.1 Toilet Facilities

There are no existing toilet facilities located in the immediate vicinity of the proposed site as the closest existing DDA toilet facilities are located approximately 170 to 180m walk from the proposed site as shown in Figure 17. It is therefore likely that new toilet facilities would need to be constructed in the immediate vicinity of site.



Figure 17: Existing toilets at Cotton Tree are approximately 170-180m walk from the proposed site

3.3.2.2 Car Parks

There are two existing disability car parks that are located at the northern end of the existing car park. However, there is relatively steep slope from the car parks to the footpath and it is unclear if this car park is therefore DDA compliant. There is also a stormwater drain located immediately adjacent to the disability carparks that appears to service the whole carpark. If this slope does require rectification, it is also likely reprofiling of a proportion of the carpark and modifications to the stormwater network will be required.

3.3.2.3 Footpaths

There are various footpaths located in the vicinity of the site including a wide footpath parallel to the shoreline and two 5m wide footpaths that leads out to each of the jetties (Refer to Figure 18).



Figure 18: Existing footpath from carpark to eastern jetty. This image also shows the existing stormwater kerb drain

3.3.2.4 Services

A DBYD search was performed for this site. Based on the DBYD search and observations on site, existing services in the vicinity of the site appear to include:

- Stormwater (SCC): Stormwater pipes that run perpendicular from 'The Esplanade' with three outlets that drain into the Marcoochy River. There is also a stormwater kerb inlet drain as shown in Figure 18. Two of the stormwater outlets are located within the two jetty structures with one outlet partially submerged to the east of the two jetties.
- Unitywater: Water main and sewer lines generally in the vicinity of the roadway. It is also noted that toilet facilities and outdoor shower were observed to the west of the proposed site in the parkland, and the water and sewer services to these facilities are partially shown on the DBYD search. It is noted that there is an outdoor shower and drinking water bubbler located near the northern end of the carpark, however the water supply to this shower is not shown on the DBYD search.
- Telstra: Communication cables generally in the vicinity of the roadway.
- Energex: Overhead powerlines generally in the vicinity of the roadway. It is noted that lighting was observed throughout the park, including on the jetties and electrical cabling to these lights are not shown on the DBYD search.
- NBN: NBN cables generally in the vicinity of the roadway

In summary, there is existing electrical and water supply in the vicinity of the site and existing services are not expected to be a significant constraint to the construction works at this site.

3.3.2.5 Other

There are two existing jetties in the vicinity of the site that are approximately 25m long and 5m wide. A large stormwater pipes and outlets is suspended from each of the jetties. Handrail, seating and lighting are provided on the jetty deck and the jetties are popular for fishing.

Other existing infrastructure at this site includes existing refuse bins and drinking water bubbler. The Cotton Tree Park also includes numerous picnic shelters, playground and war memorial. The Cotton Tree Aquatic Centre is also located to the east of the proposed site.

3.3.3 Site 2: Water Level Considerations

3.3.3.1 Water Depth

The latest bathymetric survey that is currently available for this site was performed in February 2017. This survey shows that the water depth in the vicinity of the site is generally around -2m AHD which is approximately -1.5m LAT. However, this survey was only provided in PDF format and there is no aerial overlay. SCMC have attempted to overlay an aerial image over this survey as shown in Figure 19. This overlay shows that there is limited survey data in the immediate vicinity of the existing jetties and the proposed site. Figure 20 is an aerial image from 2020 which appearing to show beach extent out past the end of the two jetties. It has therefore been assumed that the pontoon would be required to located well seaward of the existing jetties.



Figure 19: Extract of hydrographic survey by NorthGroup Consulting (Dated 22.02.17). Note levels are in AHD



Figure 20: Google Earth image from 26/9/2020 appearing to show beach extent out past the end of the two jetties

SCMC understands that there are no sediment transport studies available for this site. However, the Cardno ‘Maroochy River Sediment Investigation Report’¹⁴ and CardnoBowler geotechnical investigation¹⁵ shows that the seabed in the vicinity of the site is generally sand. It is also noted that site is located close to the Maroochy River bar which is a sandy river delta. SCMC understands that the bathymetry in the vicinity of the site is relatively stable, however the risk of potential for changes in the bathymetry in the vicinity of the site needs to be acknowledged.

It is also noted that this site could potentially be relative exposed during extreme metocean event if there is a minimal sand spit extending from Cotton Tree as shown in Figure 21.



Figure 21: Google Earth aerial image showing minimal sand spit extending from Cotton Tree resulting in relatively exposed conditions at the proposed site

¹⁴ Cardno ‘Maroochy River Sediment Investigation Report’ Job Number: 3747/P/137. Dated: 19 December 2011

¹⁵ CardnoBowler. “Results Of Geotechnical/Acid Sulfate Soils Investigation Work On The Boatshed To Cornmeal Creek Project.” Ref 8755. Date 20/12/2010

3.3.3.2 Tidal Level

The closest tidal plane information for this site is located at Picnic Point and the tidal datum information can be found in in Table 2. The spring tidal range (MHWS to MLWS) for this site is around 0.84m and the full tidal range (HAT to LAT) is around 1.41m.

Table 2: Design Water and Tidal Levels¹⁶

Water Level	Picnic Point
Highest Astronomical Tide (HAT)	1.41
Mean High Water Springs (MHWS)	0.98
Mean High Water Neaps (MHWN)	0.71
Mean Sea Level (MSL)	0.56
Australian Height Datum (AHD) ¹⁷	0.46 (approx.)
Mean Sea Level (MSL)	0.56
Mean Low Water Neaps (MLWN)	0.29
Mean Low Water Springs (MLWS)	0.14
Lowest Astronomical Tide (LAT)	0

SCC flood mapping ArcGIS portal¹⁸ indicates that the site is susceptible to flooding, however no detailed information is available for this site at this stage.

3.3.4 Site 2: Gangway Length

The existing deck level of the existing jetty is 1.8m AHD¹⁹ which is 2.26m CD. It is noted that the surround parkland is at a similar level and it has therefore been assumed that the abutment level will be around 2.26m CD.

Based on Table 2, spring tidal range for this site is around 0.84m and the full tidal range is around 1.41m. This results in an indicative gangway length of approximately 25 to 28m site to achieve 1:14 grade at all tidal levels. This is relatively long for a pontoon gangway, however the gangway length could be reduced by providing a fixed structure at the landward end to reduce the abutment level as the abutment level is around 0.85m above HAT.

It is noted that the gangway length could be reduced by providing a fixed ramp on land so that the abutment level is just above HAT.

3.3.5 Site 2: Constructability

Constructability considerations for this site include:

- Large area of parkland that could be used for site facilities and on-land storage

¹⁶ Based on MSQ Semidiurnal Tidal Planes – 2023 <https://www.msq.qld.gov.au/tides/tidal-planes>

¹⁷ Current level of 0.46m based on DSQ Land Surveyors (Dated 18.09.18).

¹⁸ [MyMaps - Flood Mapping and Information \(arcgis.com\)](#)

¹⁹ Based on Arup drawings 82508 S0-3 and S0-4. Dated December 2002.

- Marine plant mobilized via water would need to cross the Maroochy River bar which will require good weather conditions. Alternatively, marine plant would need small enough to be mobilized via road transport (which is expected the result in significant limitations for pile driving and gangway installation).

3.4 Site 3: Charles Clarke Parke – Mooloolah River

Site 3 – Charles Clarke Parke is located on the Mooloolah River near Mooloolaba Wharf, as shown in Figure 22.

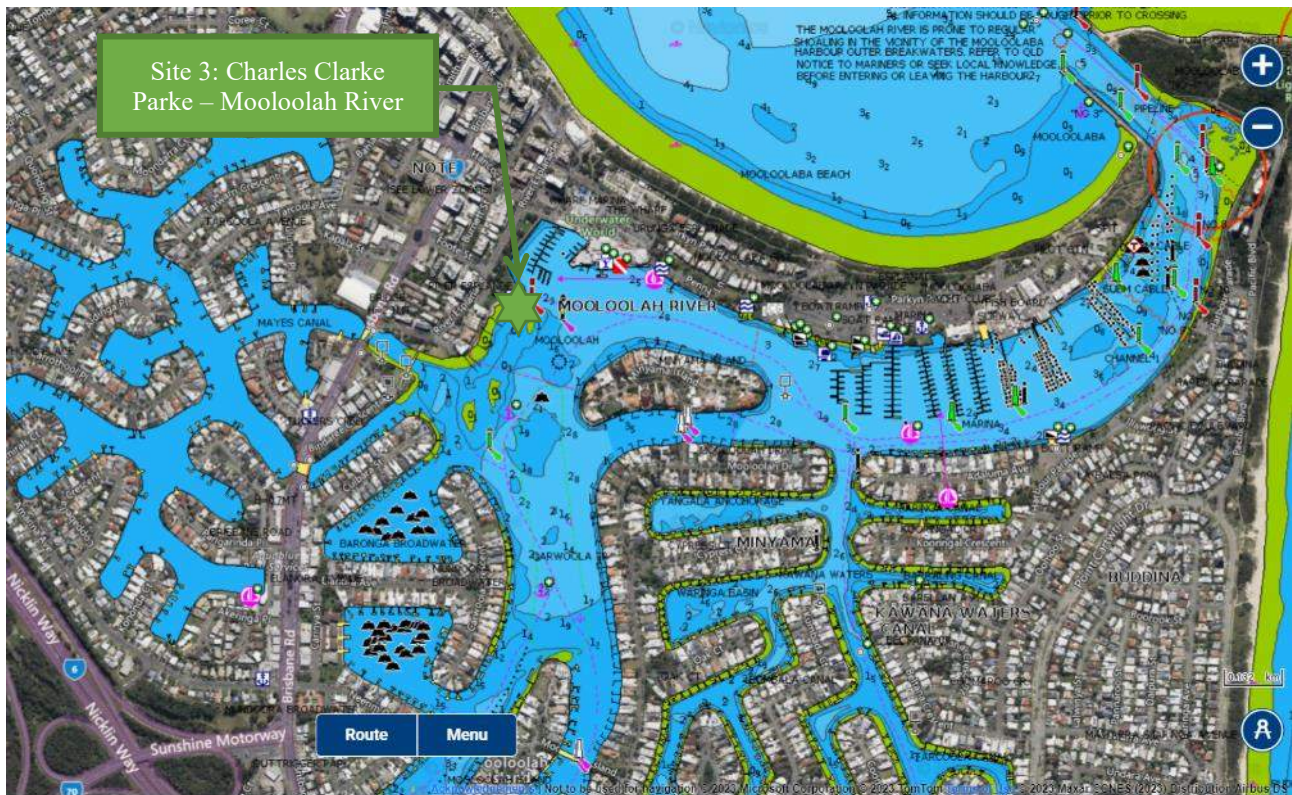


Figure 22: Navionics map with markup of the proposed Charles Clarke Parke – Mooloolah River site

3.4.1 Site 3: Site Appeal & Existing Uses

Site appeal considerations and existing site uses for this site include:

- Mooloolah River in the vicinity of the site generally consist of residential developments unless users paddle approximately 1.5km upstream of the Sunshine Motorway.
- Relatively moderate tidal currents in main river, however there is a large extent of very sheltered residential canal waterways to explore.
- Site is located near the popular tourism area of Mooloolaba.
- Sailability Sunshine Coast Queensland²⁰ is located just downstream of the proposed site
- Relatively large amount of existing vessel traffic include commercial vessels

²⁰ <http://sailabilitysunshinecoast.org/>

3.4.2 Site 3: Existing Site Facilities

A summary of the existing site facilities are shown in Figure 23 and are discussed further in this section.

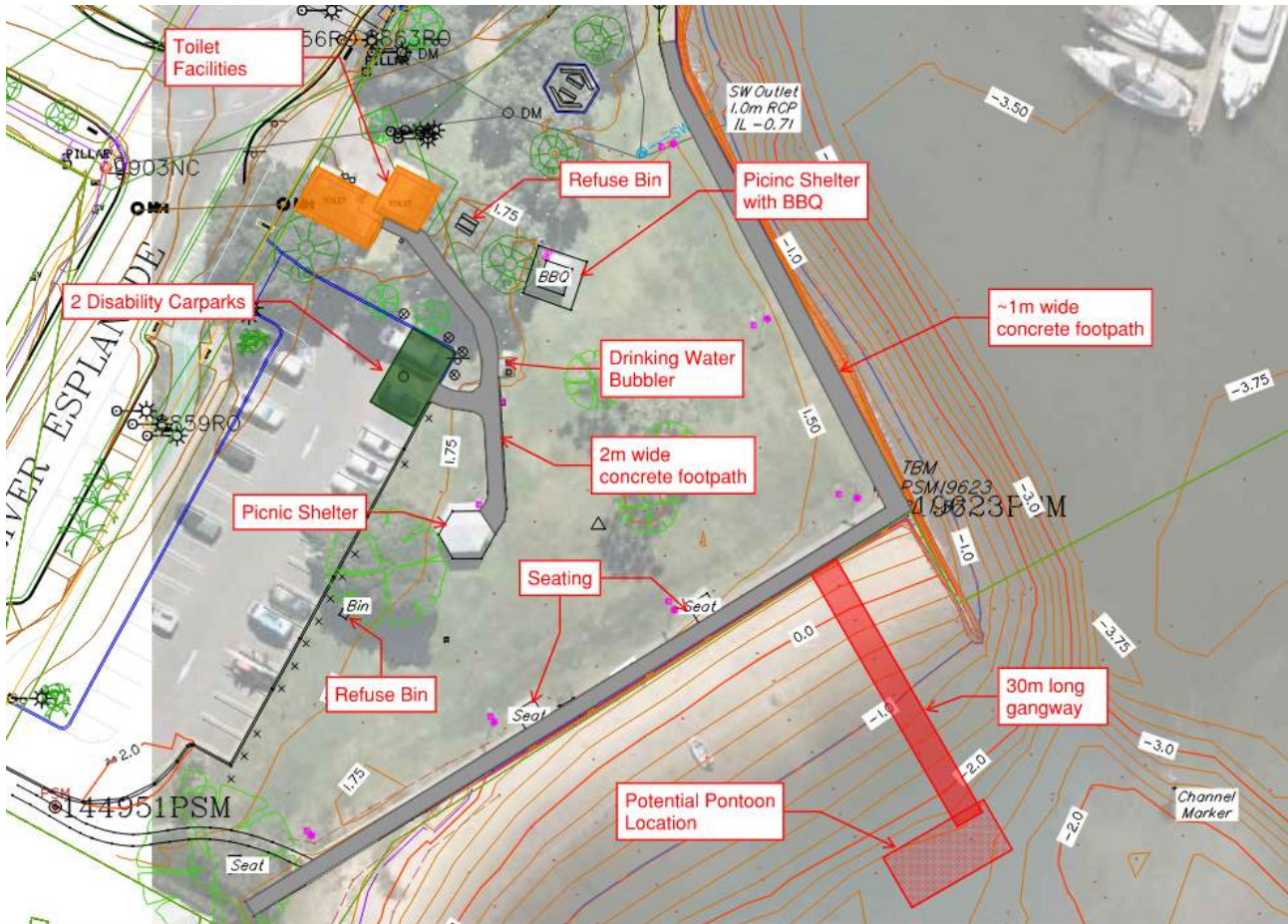


Figure 23: Site 3 Existing Site Facilities markup. Base map: Survey by NorthGroup Consulting (Dated 22.02.17).

3.4.2.1 Toilet Facilities

There are existing toilet facilities located at this site and these toilet facilities appear to be DDA compliant.

3.4.2.2 Car Parks

There are two existing marked disability car parks that appear to be DDA compliant. It is expected that car park upgrades will be required to provide additional parking, however this is expected to be relatively easy.

3.4.2.3 Access Path

There are various 2m concrete paths located in the parkland that connect the carpark, toilet facilities and picnic shelters.

There is also a narrow footpath along the seawall edge, however it is understood that SCC are planning to upgrade the seawall which will include a new 2m wide footpath.

3.4.2.4 Services

A DBYD search was performed for this site. Based on the DBYD search and observations on site, existing services in the vicinity of the site appear to include:

- Stormwater (SCC): Stormwater pipes generally in the vicinity of the roadway and into the park at the northern end of the proposed site (located to the north of the toilet facilities).
- Unitywater: Water main and sewer lines generally in the vicinity of the roadway. It is also noted that toilet facilities and water taps were observed in the parkland, however services to these facilities do not appear to be fully shown on the DBYD search.
- Telstra: Communication cables generally in the vicinity of the roadway.
- Energex: Overhead powerlines and underground generally in the vicinity of the roadway. It is noted that lighting was observed throughout the park and electrical cabling to these lights are not shown on the DBYD search.
- NBN & Optus: Fibre optic cables generally in the vicinity of the roadway

In summary, there is existing electrical and water supply in the vicinity of the site and existing services are not expected to be a significant constraint to the construction works at this site.

3.4.2.5 Other

Other existing infrastructure at this site includes existing refuse bins, picnic shelters with BBQ's and seating by the waterfront.

3.4.3 Site 3: Water Level Considerations

3.4.3.1 Water Depth

The latest bathymetric survey that is currently available for this site was performed in February 2017 and an extract of this survey is shown in Figure 14. This survey shows that the water depth in the vicinity of the site is generally around -2m AHD which is approximately -1.0m CD.



Figure 24: Extract of hydrographic survey by NorthGroup Consulting (Dated 22.02.17). Note levels are in AHD

SCMC understands that there are no sediment transport studies available for this site. However, Core Consultants geotechnical investigation²¹ imply the seabed in the vicinity of the site is likely to be sand. It is also noted there is a sand beach located at the southern end of Charles Clarke Park and there is evidence of sedimentation behind the private pontoon located south of Charles Clarke Park. There is a risk of potential for changes in the bathymetry in the vicinity of the site, however this is expected to be lower than the other sites being considered.

3.4.3.2 Tidal Level

The closest tidal plane information for this site is located at Mooloolaba and the tidal datum information can be found in in Table 3. The spring tidal range for this site is around 0.84m and the full tidal range is around 1.41m.

²¹ Core Consultants. Geotechnical Investigation Report. Proposed Retention Wall Charles Clarke Park. Report Number: J001202-001-R-Rev0. Dated November 2020.

Table 3: Design Water and Tidal Levels

Water Level	Mooloolaba
Highest Astronomical Tide (HAT)	2.21
Mean High Water Springs (MHWS)	1.7
Mean High Water Neaps (MHWN)	1.38
Australian Height Datum (AHD)	1.01 ²²
Mean Sea Level (MSL)	1
Mean Low Water Neaps (MLWN)	0.63
Mean Low Water Springs (MLWS)	0.3
Lowest Astronomical Tide (LAT)	

SCC flood mapping ArcGIS portal²³ indicates that the site is susceptible to flooding, however no detailed information is available for this site at this stage.

3.4.4 Site 3: Gangway Length

The abutment level is around 1.5m AHD which is approximately 2.5m CD. It is noted that the surround parkland is at a similar level and it has therefore been assumed that the abutment level will be around 2.5m CD.

Based on Table 3, spring tidal range for this site is around 1.4m and the full tidal range is around 2.21m. This is significantly larger than the other sites being considered. This results in an indicative gangway length of approximately 28 to 32m site to achieve 1:14 grade at all tidal levels.

This is relatively long for a pontoon gangway and significantly longer than the other sites being considered. The gangway length could be reduced by increasing the freeboard where the gangway lands on the pontoon and providing ramps on the pontoon down to the required freeboard level. However, this will increase the required size of the pontoon.

3.4.5 Site 3: Constructability

Construability considerations for this site include:

- Large area of parkland that could be used for site facilities and on-land storage
- Marine plant mobilized via water would need to cross the Mooloolaba River bar which is not expected to be a significant constraint.

²² Based on PSM 37055 AHD=4.709m and Reference Level 5.719

²³ [MyMaps - Flood Mapping and Information \(arcgis.com\)](#)

3.5 Site 4: Crummunda Park - Currimundi Lake

Site 4 – Crummunda Park is located on the Currimundi Lake as shown in Figure 25.

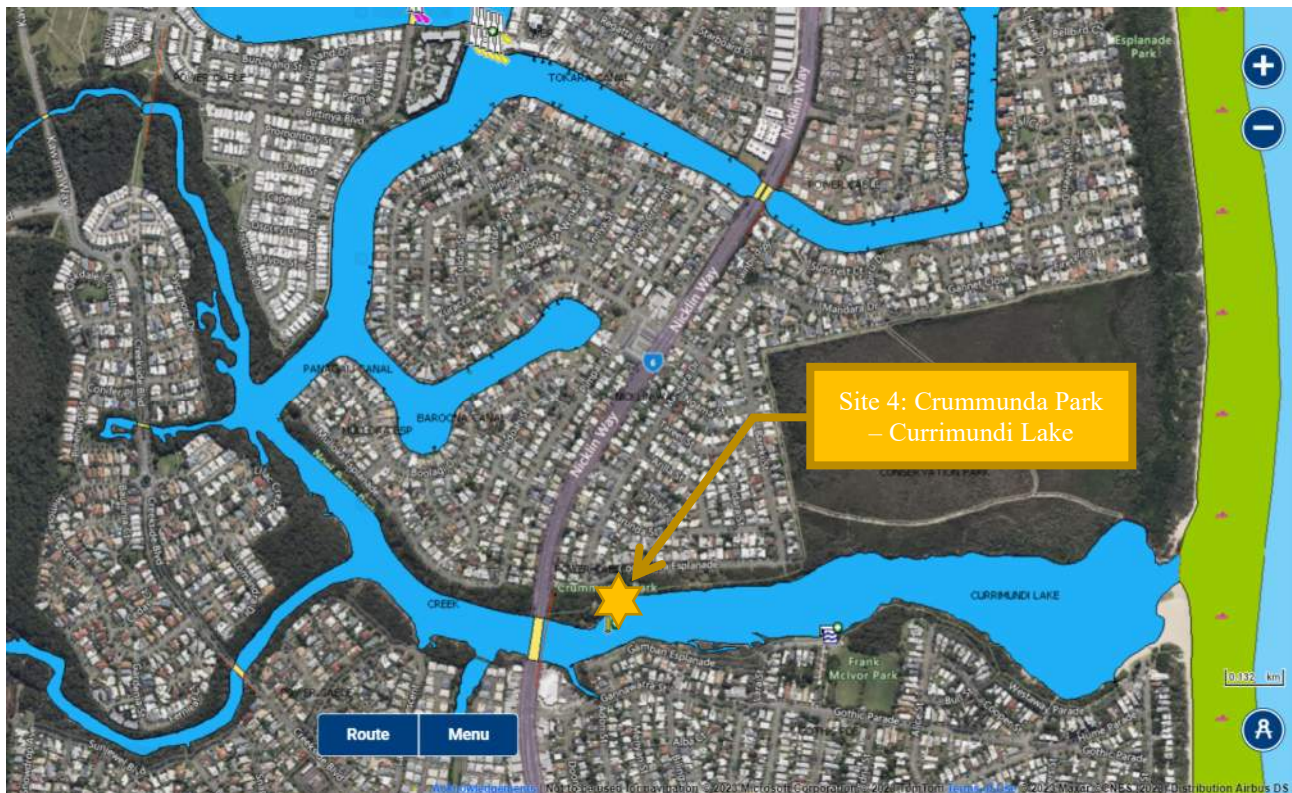


Figure 25: Navionics map with markup of the proposed Crummunda Park - Currimundi Lake site

3.5.1 Site 4: Site Appeal & Existing Uses

Site appeal considerations and existing site uses for this site include:

- Generally very calm waterway with minimal currents.
- Large area of waterways to explore with riverbanks that are generally undeveloped.
- Crummunda Park is currently a recreational park with playground and half basketball court. There is an existing shower facility.
- Crummunda Park is located in a quiet residential area.
- Crummunda Park is located adjacent to Nicklin Way which provides good connectivity to the local area and adjacent regions.

3.5.2 Site 4: Existing Site Facilities

A summary of the existing site facilities is shown in Figure 26 and discussed further in this section.

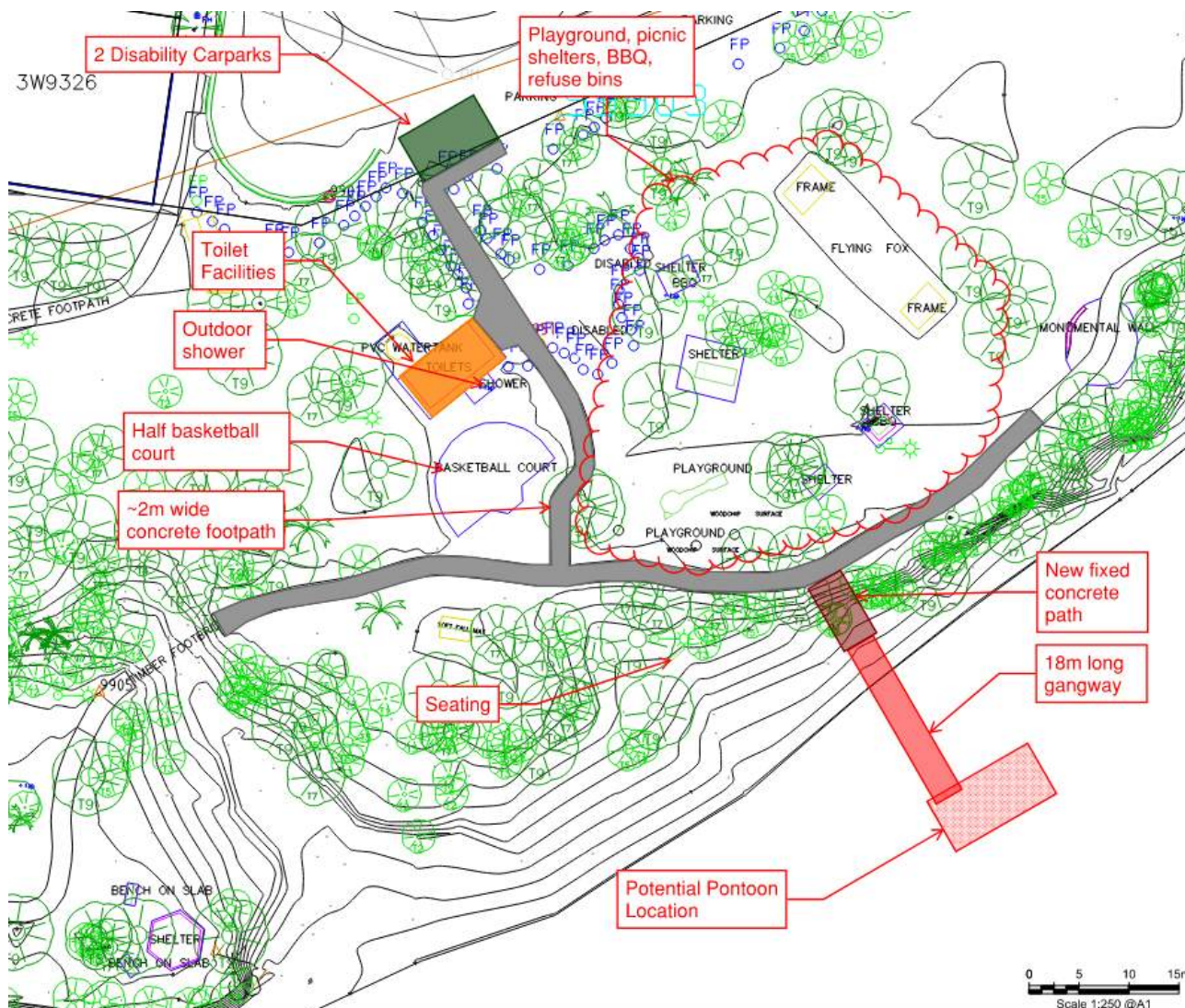


Figure 26: Site 3 Existing Site Facilities markup. Base map: Transport & Engineering ‘Detail Survey of Crummunda Park. Dated 2/07/2014

3.5.2.1 Toilet Facilities

There are existing toilet facilities located at this site and these toilet facilities appeared to be partially DDA compliant. It is expected that minor upgrades to the toilet facilities will be required.

3.5.2.2 Car Parks

There are two existing marked disability car parks, however they do not appear to be fully DDA compliant as shown in Figure 27. It is noted that there appeared to be existing grass verge and roadway to the west of the existing car parks that could be reconfigured for additional car parks as shown in Figure 28. It is expected that car park upgrades will be required to provide additional parking, however this is expected to be relatively easy.

3.5.2.3 Access Path

There is an existing 2m concrete path from the car parking to the proposed location. The path does include a 90 degree corner, however there is not expected to be an significant issue for manoeuvring a kayak/canoe around this corner due to adjacent half basketball court. It is expected that upgrades to the existing paths will be required (in particular adjacent to the pontoon), however this is expected to be relatively easy.



Figure 27: Current disability car parking at Crummunda Park



Figure 28: Grassed verge and roadway to the west of the existing car parks that could be reconfigured to additional car parks

3.5.2.4 Services

A DBYD search was performed for this site. Based on the DBYD search and observations on site, existing services in the vicinity of the site appear to include:

- Stormwater (SCC): Stormwater pipes generally in the vicinity of the roadway. There are also two stormwater outlets that drain into Currmundi Lake downstream (to the east) of the proposed site.
- Unitywater: Water main and sewer lines generally in the vicinity of the roadway. It is also noted that toilet facilities and outdoor shower were observed in the parkland, however services to these facilities are not shown on the DBYD search.
- Telstra: Communication cables generally in the vicinity of the roadway
- Energex: Overhead powerlines generally in the vicinity of the roadway. It is noted that lighting was observed throughout the park and electrical cabling to these lights are not shown on the DBYD search.
- NBN: NBN cables generally in the vicinity of the roadway

In summary, there is existing electrical and water supply in the vicinity of the site and existing services are not expected to be a significant constraint to the construction works at this site.

3.5.2.5 Other

Other existing infrastructure at this site includes existing refuse bins, picnic shelters, half basketball court, playground, exercise equipment and seating by the waterfront.

3.5.3 Site 4: Water Level Considerations

3.5.3.1 Water Depth

The latest bathymetric survey that is currently available for this site was performed in 2015 and an extract of this survey is shown in Figure 29. The quality of this image is relatively poor, however the survey report does state the following “Depths range from -4.2m to 0.15m (AHD). The greatest depth occurs across a scour hole approximately 300m east of the bridge spanning the lake.” The water depth in the vicinity of the site therefore appears to be greater than ~1m AHD, however there is shallow bank in the immediate vicinity of the site which was also observed by SCMC on site. If this site is chosen as the preferred site, further survey will be required to determine the pontoon location.



Figure 29: Extract of bathymetry survey from Acoustic Imaging ‘Currimundi Lake Survey’ (December 2015)

The Acoustic Imaging survey also noted that backscatter data suggests unconsolidated sediment covers the bulk of the lake body. However, it was noted that there was an area with high backscatter in the vicinity of the proposed site (refer to Figure 30) which suggests of coarser or consolidated sediment possibly related to increased current flow



Figure 9: Backscatter mosaic across Currimundi Lake.

Figure 30: Extract of Figure 9 from Acoustic Imaging ‘Currimundi Lake Survey’ (December 2015) showing area of high backscatter

3.5.3.2 Tidal Level

Currimundi Lake is connected to the ocean is connected and is also connected to Lake Kawana via the Wurtulla canal system. It receives inflows every day via the mechanical pumping system at the northern tip of Lake Kawana. In

addition the mechanical pumping from Lake Kawana, SCC also actively manages the sand 'berm' at the lake mouth to manage the water level. It is noted that the lake sometimes naturally closes to the ocean and SCC have also manually closed and opened the lake mouth on occasions²⁴. In summary, the water levels in Currumndi Lake are complicated and do not follow the standard semidiurnal tidal planes that are common along the east coast of Australia.

SCC have provided water level data from Jan 2009 to March 2023 from a nearby flood gauge. As can be seen in Figure 31, water levels in Currumndi Lake are between +1m AHD and -0.5m AHD for 99% of the time. Furthermore, the water level is between 0.7m AHD and -0.3m AHD for 90% of the time and 0.6m AHD and -0.2m AHD for 80% of the time.

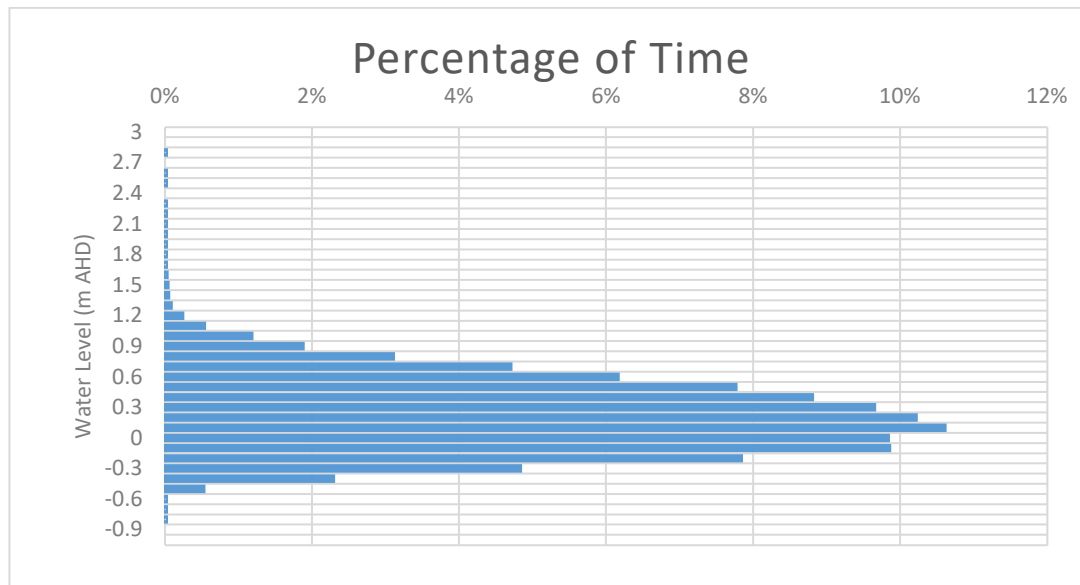


Figure 31: Histogram of water level in Currumndi Lake

SCC flood mapping ArcGIS portal²⁵ indicates that the site is susceptible to flooding, however no detailed information is available for this site at this stage.

3.5.4 Site 4: Gangway Length

The existing concrete path level is approximately 2.3mAHD with a ~1:3 slope down to the waters edge. It has been assumed that the abutment level will be around 1.2m AHD so that the abutment is above HAT. It has therefore been assumed DDA compliant path will be build down to the abutment level which will likely be slightly raised above the existing ground level.

Based on, it has been assumed that the target water range to achieve 1:14 grade is between +1m AHD and -0.5m AHD. This results in an indicative gangway length of approximately 18 to 22m site to achieve 1:14 grade for 99% of the time.

It is noted that the gangway length could be reduced by increasing the pontoon freeboard where the gangway lands on the pontoon and providing ramps on the pontoon down to the required freeboard level. However, this will increase the required size of the pontoon.

²⁴ <https://www.sunshinecoast.qld.gov.au/Environment/Education-Resources-and-Events/Environment-Resources-and-Publications/Coast-and-Marine/Currumndi-Lake-Maintenance>

²⁵ [MyMaps - Flood Mapping and Information \(arcgis.com\)](#)

3.5.5 Site 4: Constructability

Constructability considerations for this site include:

- Marine plant mobilized via water would need to cross the Currimundi Lake mouth which is unlikely to be possible. It is therefore likely that, marine plant would need to be mobilized via road transport. This is expected to result in significant limitations for pile driving and gangway installation.
- Large area of parkland that could be used for site facilities and on-land storage
- Existing parkland and trees will be a significant constraint for construction of the gangway abutment which would need to be constructed using small land based plant or marine plant
- Limited water depth for marine plant, in particular for the abutment construction and gangway lift

4 Options Development

A weighted, multi-criteria analyses (MCA) was undertaken for the 4 potential sites.

4.1 MCA Framework

The adopted approach for the MCA documented herein is summarised below:

1. Asses the four sites being considered MCA (refer Section 3)
2. Determine and define assessment criteria for the MCA (refer Section 4.2)
3. Determine assessment criteria weightings for the MCA (refer Section 4.3)
4. Undertake MCA of the options to determine ranking and preferred option (refer Section 0)

4.2 Assessment Criteria Definition

The assessment criteria, developed in collaboration with SCC, and subsequently adopted for the MCA are provided in Table 4. These criteria were developed to encompass the key project objectives and the functional requirements of the project.

Table 4: MCA Assessment Criteria

No.	Criteria	Definition	Scoring
1	Site Appeal & Existing Uses	To what extent is there site appeal for the location . To what extent are there synergies with existing uses of the site	1 = Very poor site appeal and very poor synergies with existing uses 2 = Poor site appeal and poor synergies with existing uses 3 = Moderate site appeal and moderate synergies with existing uses 4 = High site appeal and good synergies with existing uses 5 = Very high site appeal and very good synergies with existing uses
2	Existing Site Facilities	To what extent are existing site facilities able to be used and to what extent is new infrastructure required	1 = Very limited/poor existing facilities with very significant upgrades required (eg: New toilet facilities and major carpark upgrade) 2 = Limited/poor existing facilities with significant upgrades required (eg. Major carpark upgrade required) 3 = Some existing facilities with upgrades required (eg. Minor toilet facilities upgrade and minor carpark upgrade) 4 = Good existing facilities with minor upgrades required (eg. Minor upgrades to carparks) 5 = Very good existing facilities with very minimal upgrades required
3	Water Level Considerations	To what extent does the existing bathymetry and tidal range result in constraints on the design	1 = Very significant bathymetry and/or tidal range constraints on design 2 = Significant bathymetry and/or tidal range constraints on design 3 = Moderate bathymetry and/or tidal range constraints on design 4 = Minor bathymetry and/or tidal range constraints on design 5 = Negligible bathymetry and/or tidal range constraints on design
4	Gangway length	What is the required gangway length required to achieve 1:14 grade for 90-100% of the time.	1 = Very long gangway required (> 35m), fixed ramp structure on land and/or ramps on pontoon (2 = Moderate to long gangway required (in the order of 30m) with fixed ramp structure on land and/or ramps on pontoon 3 = Moderate length gangway (in the order of 25m) 4 = Short gangway required (in the order of 20m) 5 = Very short gangway required (< 20m)
5	Constructability	To what extent will the site result in constructability constraints	1 = Very high risk of constructability constraints 2 = High risk of constructability constraints 3 = Moderate risk of constructability constraints 4 = Low risk of constructability constraints 5 = Very low risk of constructability constraints

4.3 Assessment Criteria Weightings

4.3.1 Assessment Criteria Priority

Weightings for each selection criterion were derived by assessing the relative priority / importance of each criterion, against all other assessment criteria. Each criterion was compared against the other criteria in Table 4, in collaboration with SCC and scored as follows:

- 0 = Criterion is less important than comparison criterion
- 1 = Criterion is equally important as comparison criterion
- 2 = Criterion is more important than comparison criterion

4.3.2 Assigned Weightings

Based on the priority scoring outlined in Section 4.3.1, the weightings for each selection criterion were derived using the matrix shown in Table 5. These weightings were determined in collaboration with and endorsed by SCC.

Table 5: Assessment Criteria Assigned Weightings

Selection Criteria		Site Appeal & Existing Uses	Existing Site Facilities	Water Level Considerations	Gangway length	Constructability	Weighting (%)
		1	2	3	4	5	
Site Appeal & Existing Uses	1	1	1	1	0	0	28%
Existing Site Facilities	2	1	1	1	0	1	24%
Water Level Considerations	3	1	1	1	1	1	20%
Gangway length	4	2	2	1	1	2	8%
Constructability	5	2	1	1	0	1	20%
Total		7	6	5	2	5	100%

4.4 Ranking of Options

The final stage of the MCA framework involved the application of weightings to the above allocated scores to provide a weighted total score for each developed option.

The un-weighted and weighted scoring results for each option group are shown separately in Table 6.

Table 6: MCA Results

OPTIONS		CRITERIA					Total	Ranking
		Site Appeal & Existing Uses	Existing Site Facilities	Water Level Considerations	Gangway length	Constructability		
WEIGHTING		28%	24%	20%	8%	20%	100%	
UN-WEIGHTED SCORES								
Site 1	Bradman Avenue – Maroochy River	2	2	3	4	2	13	3
Site 2	Cotton Tree – Maroochy River	3	1	3	3	3	13	3
Site 3	Charles Clarke Park – Mooloolah River	4	4	2	2	4	16	2
Site 4	Crummunda Park - Currimundi Lake	4	3	5	4	1	17	1
WEIGHTED SCORES								
Site 1	Bradman Avenue – Maroochy River	0.56	0.48	0.60	0.32	0.40	2.36	4
Site 2	Cotton Tree – Maroochy River	0.84	0.24	0.60	0.24	0.60	2.52	3
Site 3	Charles Clarke Park – Mooloolah River	1.12	0.96	0.40	0.16	0.80	3.44	1
Site 4	Crummunda Park - Currimundi Lake	1.12	0.72	1.00	0.32	0.20	3.36	2

Note: There may be other potential constraints outside the scope of this analysis (excluded as agreed with SCC) such as environmental/statutory approvals i.e. due to changed footprint. If any options are found to be unviable due to constraints outside the scope of this analysis, then these options can be removed, however the ranking order is still representative for the remaining options.

4.5 Preferred Option – Site 3 Charles Clarke Park

As per Table 6, Site 3: Charles Clarke Parke is the preferred site– when considering the MCA as per this report and the key design criteria discussed in Section 1.4.

4.6 Sensitivity Testing

A range of sensitivity tests have been done to challenge the above results. The MCA is relatively sensitive, it has been found that only one score can change the preferred option to Site 3 to become the preferred site instead of Site 3. It is therefore recommended to re-assess the MCA should any weighting or score or other option parameter change. However, based on the adopted weightings and scoring Option 2 is the preferred option.

5 Summary and Preferred Site

The first section of this report summarizes the key basis of design criteria that was used in the MCA assessment including design vessels (non-motorised watercraft including kayaks, canoes and SUPS), pontoon requirements, access path requirements and toilet facilities. The concept design will be developed in the next phase of the project. However, an indicative concept design was been developed for the purposes of the MCA.

A desktop review was performed to identify key case studies and examples of similar facilities which identified the following facilities:

- Edward River Bridge - NSW National Parks
- Parks Victoria Accessible Canoe Launcher
- US companies/products including EZ Launch, The Dock Doctors and BoardSafe

The key characteristics and considerations for each of the four sites being considered were summarized which included:

- Site Appeal & Existing Uses,
- Existing Site Facilities such as toilet facilities, car parks, footpaths, services, refuse bins, drinking water bubbler, shelter structures,
- Water Level Considerations including water depth and tidal range,
- Gangway length to achieve 1:14 slope,
- Constructability.

Options Assessment Summary

The adopted framework for the weighted multi-criteria options analysis (MCA) and the option scoring is detailed in Section 4.

Preferred Option

Based on the agreed options analysis criteria, weightings and scoring, **Site 3: Charles Clarke Parke – Mooloolah River was determined by the MCA as the preferred option.**