Acknowledgements

Council wishes to thank all contributors and stakeholders involved in the development of this document.

Disclaimer

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Appendix A : Quay Line Plan  
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1 Introduction

This Lake Management Plan has been prepared by Sunshine Coast Council to promote effective long-term management of the Parrearra Lake system. It is a 10 year plan that supersedes the original Lake Management Plan developed by Lensworth in 2001.

1.1 Purpose

The purpose of the Lake Management Plan is to:

• outline the rights and responsibilities of the lake owners, residents and users;
• develop an appropriate inspection and maintenance schedule to meet objectives and performance standards;
• provide guidelines and management actions for ensuring the lake continues to function as an effective flood bypass channel (based on previously accepted and approved criteria);
• provide guidelines and management actions for ensuring compliance with secondary contact water quality guidelines;
• provide guidelines for acceptable use of the lake such as sport and recreation; and
• define permitted uses subject to approval such as commercial operations and private structures.

1.2 Objectives

The objectives of the Lake Management Plan are specified in Table 1 below.
Table 1: Management plan objectives

<table>
<thead>
<tr>
<th>Objective</th>
<th>Performance standard</th>
<th>Refer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public use complies with guidelines outlined in this management plan</td>
<td>• Public, residents and sporting bodies are informed of acceptable uses, their rights and responsibilities</td>
<td>Section 5</td>
</tr>
</tbody>
</table>
| Water quality is maintained to a standard suitable for secondary contact recreation use\(^1\) | • Compliance with water quality guidelines  
• Effective operation and maintenance of tidal exchange system and weir  
• Growth of undesirable marine organisms is absent or regulated | Section 6      |
| The lake functions as an effective flood bypass channel                    | • No flooding above Q100 level  
• Compliance with design criteria for lake operation as a flood channel  
• Effective operation and maintenance of tidal exchange system and weir  
• Maintain lake to acceptable tolerances from design profile | Section 7      |
| Amenity and visual quality of the lake is of an acceptable standard        | • The lake is free of litter and debris and/or removed in a timely manner  
• Growth of undesirable marine organisms is absent or regulated  
• Structures are designed and located suitably | Section 6 and 9 |
| Lake assets are maintained in a structurally sound and safe condition      | • Routine inspections and maintenance are undertaken in accordance with relevant schedules  
• Sinking fund adequate to maintain assets | Section 9      |

\(^1\) Secondary contact recreation is any activity where only the limbs are regularly wet, and swallowing water is unusual. Examples of secondary contact recreation are boating, fishing, rowing, kayaking, dragon boating, wading etc.
2 Background

2.1 Site overview

Parrearra Lake Reserve is a brackish artificial tidally restricted lake, 48.6 ha in area, built in accordance with the relevant planning approvals granted by the Department of Natural Resources and Mines and the former Caloundra City Council.

The land abutting the Reserve was developed for urban purposes in accordance with DCP1 - Kawana Waters, except in the south and south east where industrial uses have been established.

The lake is defined as the area contained within the concrete revetment walls upstream of the lock and weir structure adjacent to Chelsea Crescent in the north (Structure Z) to the weir adjacent to the Kawana Industrial Estate in the south (Structure Y). Figure 1 represents the Parrearra Lake system and locality.

The lake has a restricted tidal range of about 300mm and rock protection exists along areas of the bank where design velocities determined such protection was needed when the lake functions as a flood control structure.

Stormwater drainage enters the lake from the adjoining land development through controlled outlet structures and pipes into the lake.

Residents can navigate their powered vessels to Mooloolah River via the lock structure to the north (Structure Z). Public access is available at designated places along the eastern bank and along the substantial majority of the western bank. All public access areas are created as public park abutting the lake. Use of the lake system for recreational purposes is an added benefit and subject to guidelines outlined in this management plan.

2.2 Exclusion

The entry channel between the Mooloolah River and the upstream Structure Y is not included in this Management Plan. This area is designated Drainage Reserve.
Figure 1: Locality plan
### 2.3 Assets

The assets included in this management plan are specified in Table 2 below.

<table>
<thead>
<tr>
<th>Assets</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southern weir (structure Y)</td>
<td>A broad crested weir that controls the entry of flood flows to the Parrearra Channel.</td>
<td>1</td>
</tr>
<tr>
<td>Assets</td>
<td>Description</td>
<td>Quantity</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Northern weir (structure Z)</td>
<td>A broad crested weir that was constructed to restrict the increase in the tidal prism of the Mooloolah River caused by the construction of the Parrearra Channel.</td>
<td>1</td>
</tr>
<tr>
<td>Lock (structure Z)</td>
<td>Allows vessels of a size up to 15 m in length, 4.5 m in width and 2 m draft to pass through safely. There is no height limitation for vessels using the lock, however the bridges within the lake and those further downstream in the Mooloolah River will cause a height restriction.</td>
<td>1</td>
</tr>
<tr>
<td>Assets</td>
<td>Description</td>
<td>Quantity</td>
</tr>
<tr>
<td>-----------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Revetment walls</td>
<td>Lake edge abutting public land only - required to maintain the stability of the lake edge, whilst contributing to the aesthetics and usefulness of the lake. In accordance with the Building Regulations for slab on ground the Finish Floor Level is 0.225m above natural ground level. The top of the revetment wall to residential properties is RL 0.9m AHD.</td>
<td>Approx. 5,500m</td>
</tr>
<tr>
<td>Assets</td>
<td>Description</td>
<td>Quantity</td>
</tr>
<tr>
<td>-------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Rock scour</td>
<td>Rock scour provides protection to revetment walls and associated land assets.</td>
<td>Approx. 8,500 m</td>
</tr>
<tr>
<td>Salinity exchange system (northern*)</td>
<td>Salinity exchange system includes pipe, pit and fittings, including an actuated penstock to control flows.</td>
<td>1</td>
</tr>
<tr>
<td>Assets</td>
<td>Description</td>
<td>Quantity</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Public pontoon</td>
<td>Floating platforms built over the water to facilitate lake access and enjoyment.</td>
<td>2</td>
</tr>
<tr>
<td>Assets</td>
<td>Description</td>
<td>Quantity</td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Public viewing platform</td>
<td>Platforms built partially over or adjacent to the water to facilitate lake viewing and enjoyment.</td>
<td>2</td>
</tr>
<tr>
<td>Assets</td>
<td>Description</td>
<td>Quantity</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Constructed beaches</td>
<td>Beach artificially created to facilitate enjoyment of the lake foreshore areas.</td>
<td>5</td>
</tr>
<tr>
<td>Assets</td>
<td>Description</td>
<td>Quantity</td>
</tr>
<tr>
<td>----------</td>
<td>------------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Portages</td>
<td>Steps built into the southern weir to facilitate non-powered waterway access.</td>
<td>2</td>
</tr>
<tr>
<td>Assets</td>
<td>Description</td>
<td>Quantity</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Non-powered waterway access</td>
<td>Infrastructure facilitating access from public land to the water, e.g. stairs and ramps. There are only 2 accesses in Parrearra which are both stairs.</td>
<td>2</td>
</tr>
<tr>
<td>Assets</td>
<td>Description</td>
<td>Quantity</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Gross pollutant trap (GPT)</td>
<td>Gross pollutant traps (GPT’s) are provided at most outlets from stormwater drainage systems to the lake. The GPT’s provide primary treatment to all road runoff and secondary treatment to surface runoff. Includes those on the western side of the lake only, as those on the east are maintained by the state government (draining a state-owned road).</td>
<td>23</td>
</tr>
<tr>
<td>Stormwater pipe outlet</td>
<td>Stormwater pipes draining directly into the lake. 11 on western side and 20 on eastern side.</td>
<td>31</td>
</tr>
<tr>
<td>Piles</td>
<td>Piles located approximately 30m either side of both weirs to indicate a barrier to non-navigable areas. May house a sign and/or beacon.</td>
<td>28</td>
</tr>
<tr>
<td>Assets</td>
<td>Description</td>
<td>Quantity</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Beacons &amp; channel markers</td>
<td>Beacons and channel markers provide lighting to aid navigation. Blue channel markers are located on bridges and beacons are located on piles either side of both weirs.</td>
<td>18</td>
</tr>
</tbody>
</table>

Note: Any assets managed by state government agencies are not included in this management plan e.g. channel markers on Kawana Way Bridge and GPT's draining Nicklin Way.

* the southern salinity exchange at structure Y forms part of the Lake Kawana Management Plan
3 Land tenure and statutory requirements

3.1 History

As a result of a Design Approval granted by the Department of Natural Resources and Mines on the 26 June 1998 for the creation of a waterway (lake) as shown on plan P-2780-54A, plus an earlier similar approval on 20 October 1997 for additional waterway (lake) as shown on plan P-2780-498, the constructed lake was surrendered out of Development Lease No. 2 in stages for the purpose of a Sport and Recreation Reserve under the provisions of the Land Act 1994.

From 1959 to 2001, the land was held as part of Development Lease No. 2 granted to Lensworth Kawana Waters Ply Ltd and was dedicated as a Sport and Recreation Reserve under council’s control on 26th April 2002.

3.2 Lake ownership details

Name: State of Queensland (DNRME)

3.3 Lake owner’s responsibilities

As trustee of the Reserve, council is responsible for ensuring that the lake system and its infrastructure:

- is maintained to a safe and reasonable standard to the best of council’s ability;
- provides adequate amenity for residents and general public;
- maintain its function as an effective flood bypass channel; and
- residents can access downstream Mooloolah River via their powered craft.

Facilitating water-based recreational use is not a responsibility of council, however guidelines are provided in this plan to allow for this additional community benefit of the lake (refer section 5).

Note that revetment walls fronting private land are contained within the lot and are the responsibility of the abutting landowner.

3.4 Legislation

The Lake Management Plan complies with the following statutory legislation:

- Land Act 1994
- Local Government Act 2009
- Coastal Protection and Management Act 1995
- Planning Act 2016
- Environmental Protection Act 1994
- Waste Reduction and Recycling Act 2011
- Fisheries Act 1994
- Nature Conservation Act 1992
- Transport Operations (Marine Safety) Act 1994
- Aboriginal Cultural Heritage Act 2003
4 Lake purpose and function

4.1 Intent for use

The primary purpose of Parrearra Lake is to provide an effective flood control solution for the surrounding urban development (flood bypass channel). Secondary to that is to provide resident’s navigational access to Mooloolah River via the lock and maintain amenity and visual quality of public spaces. Additional water-based recreation presents an opportunity for added benefit, however it’s not the purpose of the lake.

4.2 Function of lake as a flood bypass channel

Parrearra Lake forms an essential component of the flood solution for the Kawana Waters development. The lake, together with the Parrearra Canal and the channel between Structure Y and the Mooloolah River form the Parrearra Flood Bypass channel. The development on the flood plain and the associated flood solution incorporating the bypass channel were the subject of extensive hydraulic model testing.

Model testing was undertaken by the University of New South Wales, Water Research Laboratory, under the guidance of the Mooloolah River Hydraulic Model Technical Committee. This committee consisted of representatives of the following organisations:

- Land Administration Commission (Joint Principal)
- Kawana Estates Pty Ltd (Joint Principal)
- Co-ordinator General's Department
- Department of Harbours & Marine
- Department of Local Government
- Landsborough Shire Council
- Maroochy Shire Council
- Cardno & Davies Australia Pty Ltd

At its final meeting on 10 March 1983, the Committee accepted the Water Resource Laboratory report on the testing and commended to the joint principals the ultimate development proposal and flood solution.

The flood solution compensates for the loss of flood storage due to the reclamation on the flood plain by providing additional flood conveyance. This is achieved by the construction of a flood bypass channel through the development.

The lake conveys floodwaters from the river just downstream of the sewage treatment works to rejoin the river on the northern side of the Nicklin Way. Downstream of this point, the additional conveyance is provided by dredging the river.

The entry of flood flows to the Parrearra Channel is regulated by a flood control structure located within the channel near its upstream end. The structure is a broad crested weir and has been designated Structure Y. To restrict the increase in the tidal prism of the Mooloolah River caused by the construction of the Parrearra Channel to the limit imposed by the approving authorities, a second broad-crested control structure, Structure Z, was constructed near the downstream end of the channel, approximately 1.5km from its junction with the Mooloolah River. The waterway between the control structures is a tidally restricted lake. Boating access to the lake is provided by a navigation lock incorporated in Structure Z. The Parrearra Canal forms the fully tidal reach of the Parrearra Channel between Structure Z and the river.
5 Lake use

Permitted and prohibited uses are detailed in the following section and must be adhered to at all times.

5.1 Permitted uses

Lake use is open to the general public or ‘sports-based’ user groups providing the use is a ‘permitted use’ as described below.

With the exception of enforcement/safety/disaster response craft in emergency situations, the maximum speed must not exceed 6 knots.

Council, as the trustee, may from time to time utilise the lake and/or surrounding open space for public events (e.g. markets, public displays etc.).

The following uses and/or actions are permitted in or on the lake without any further approval/s from council:

- human powered craft (e.g. canoe, kayak and stand-up paddle board);
- small wind powered sail craft;
- rowing, kayaking and dragon boat user groups (represented by both recreational clubs and schools);
- model boat/yacht user groups;
- recreational fishing;
- motor powered vessels;
- mobile structures (e.g. dry docks, seapens and float bricks) that are secured to an approved privately owned pontoon or jetty;
- approved construction craft (e.g. barges, dredges and support craft);
- flood storage purposes and to control flood discharge at the weir;
- use of lake water for fire control purposes (e.g. helicopter fire services); and
- any other activity prescribed by council from time to time.

Please note: all lake users are encouraged to exercise a personal duty of care when accessing the lake system and/or participating in water-based recreation. Recreating in lakes and canals have inherent risks, including but not limited to potentially hazardous marine creatures such as sharks and stingers. Notification signs have been strategically placed to advise the public of such risks.

5.2 Permitted uses subject to approval

5.2.1 Commercial operations

Council may agree to allow certain commercial operations to occur on the lake such as water taxi, charters, vessel hire, lessons, advertising devices etc. For such operations to be considered for approval, council requires a written submission detailing the type of activity and the likely impact any such activity will have on surrounding residents, other users of the lake, water quality, council-owned assets and overall amenity.

Refer to council’s Community Land and Complementary Commercial Activity Policy for more information.
Revenue gained from fees levied will be retained by council to maintain the lake and abutting public land. The quantum of the fee will be determined by council in association with normal budgetary considerations.

5.2.2 Structures and permanent moorings within the lake

The location of private structures, namely a boat ramp, pontoon, deck or jetty for lot owners abutting the lake, must be approved by council. All works must comply with the standards outlined in the Planning Scheme Policy for Development Works within the Sunshine Coast Planning Scheme 2014. A Quay Line Plan defines the allowable location of any structures available to an adjacent landowner. All works must be constructed in accordance with the Quay Line Plan in Appendix A.

5.2.2.1 Tenure

Prior to any adjoining lot owner lodging an application for approval to construct a boat ramp, pontoon, deck or jetty on part of the lake, they must enter into a lease over the area containing the proposed structure or works and its appurtenances, from council, in accordance with the provisions of Section 57 of the Land Act 1994. Council will charge an application fee and an annual lease fee for the leased area as determined by council from time to time. The lease term would be to a maximum of 30 years. The registration on title of the lease into the name of the adjoining lot owner, must be completed before any applications to council for the proposed structure may be made.

5.2.2.2 Approval of works

Private boat ramps, pontoons, decks and jetties contained within the quay line designated area may be approved by council on application by that lot owner, subject to lodgement of engineering plans for the proposed structure and any/all conditions applied by Council.

For lots that directly abut the lake, if part of a pontoon, deck or jetty is proposed to be located within 1.5 metres of the rear boundary of the lot an application for relaxation under the Standard Building Law 1993, will also be required.

Pontoons may be approved by council for allotments abutting the park fronting the lake in the case of Kawana Island.

Construction of any permanent works must be approved by council and a private building certifier before any onsite work commences. Use of the works or structure must not commence until a final inspection and approval to use has been granted by the relevant authority. Failure to obtain the relevant approval or the carrying out of works to a lesser standard than required, may result in an order to remove the offending works.

The use of standard appropriate design structures is encouraged and provided in Appendix B.

5.2.2.3 Exclusivity and restrictions

By the action of granting a lease over the mooring structure or works, exclusivity of use is secured to the adjacent lot owner to whom the lease was granted, to the exclusion of any other user of the lake reserve.

As described in section 5.4, a lock access card is required should a vessel owner wish to use the lock facility to access Mooloolah River.
5.3 Prohibited uses and practices

The following uses or actions are prohibited in the lake:

- commercial activities (SCC approved permits accepted, refer section 5.2.1);
- construction of ramps/pontoons/decks/jetties (SCC approved structures accepted, refer section 5.2.2);
- temporary moorings\(^2\) (SCC approved event or commercial permits accepted, refer section 5.2.1);
- fishing from any bridge, weir or lock structure;
- diving or jumping off any structure over or in the lake;
- motor powered vessels navigating at speeds exceeding 6 knots (with the exception of enforcement/safety/disaster craft in emergency situations);
- waterskiing, freestyling or wave jumping whilst operating any watercraft;
- living on watercraft whether temporarily, intermittently or permanently;
- the construction, reconstruction, refitting or undertaking of structural repairs on or to watercraft;
- unmarked fishing equipment (e.g. crab pots and fish traps);
- refuelling of watercraft;
- dumping or depositing of any wastes (including garden wastes), contaminants or other pollutants into the lake, adjoining waterways or in a place (e.g. road-side gutter or stormwater drain) where it could reasonably be expected to blow or wash into the lake or adjoining waterways; and
- any other activity prescribed by council from time to time.

Please note: The water quality in the lake is maintained to a secondary contact standard. Direct exposure through swimming is not permitted. At times post major rainfall events and when the water quality in the Mooloolah River is poor, the water quality within the lake may be diminished below secondary contact standards.

5.4 Lock and weirs

The navigation lock allows vessels of a size up to 15 metres in length, 4.5 metres in width and 2.0 metres draft to pass through safely at low tide. Whilst there is no height limitation for vessels using the lock, the downstream bridges and bridges within the lake will cause a height restriction. The maximum speed limit for vessels navigating the lake is six (6) knots (with the exception of enforcement/safety/disaster response craft in emergency situations).

5.4.1 Lock access

The lock may only be accessed by using a lock access card. These cards must be purchased from the Caloundra and Maroochydore Office of the Sunshine Coast Council. An application form must be completed and the applicable fees need to be paid prior to the issue of the access card. For

\(^2\) Temporary moorings include the use of dry docks, seapens, float bricks etc. that are not secured to an approved pontoon or jetty.
security and safety of both the lock and residents, a photo identification with permanent address must be attached to the application form.

All access cards include a 2 year replacement warranty and typically last 3-4 years depending on use.

The fees payable to obtain a lock access card can be found on council’s website at https://www.sunshinecoast.qld.gov.au/Pay-and-Apply/Fees-and-Charges

5.4.1.1 Faulty access card

If an access card is faulty, the following applies:
1. access card to be returned to council;
2. application for replacement card to be completed;
3. if the card is more than 2 years old, pay replacement fee (refer link above);
4. if the card is less than 2 years old and a test confirms the fault, no charge will apply; and
5. new card will be issued

Further enquiries may be made to council’s Customer Services Centre staff on 1300 007 272 (local calls) or (07) 5475 7272 (outside local area and mobile phones).

5.4.1.2 Commerciality

Income from the annual fee for lock access cards and annual lease fee for the leased area pursuant to Section 57 of the Land Act 1994, will be retained by council to assist in the maintenance of the lake and abutting public land.

The quantum of the fee or charge will be determined annually by council in association with normal budgetary considerations.

5.1 Abutting public land

Abutting public land is under the control of council. All normal activities that are permitted in parks and on roads are permitted on abutting public land fronting the lake except as may be restricted elsewhere in this Lake Management Plan, or by approved signs erected on such land.

5.2 Temporary restricted use

Council reserves the right to restrict lake use for a specific purpose at any time, if such action is required to either protect public health and safety or prevent pollution of the lake.

5.3 Future development

No further development within the Lake Reserve or on adjacent Reserves is intended by council, unless determined necessary to support the primary purpose and function of the lake.
6 Water quality management

The lake system is best described as a lower catchment flow through system i.e. an artificial waterway which acts as an estuary in some part, where the flow through rate is determined by a salinity exchange system and weir. As such, the water level and flushing can be controlled to ensure ideal conditions.

Influences on water quality in the lake system are therefore principally impacted by:

- appropriate exchange of water;
- up-stream catchment practices;
- surrounding urban runoff (i.e. hydrocarbons, particulates, pesticides, herbicides etc.);
- activities associated with vessel maintenance; and
- colonisation by marine organisms. Certain species may proliferate at times of elevated nutrient levels and cause other environment and human health risks e.g. algal blooms.

Table 3 provides a framework to effectively manage these influences to ensure acceptable water quality is maintained.

Table 3: Water quality management overview

<table>
<thead>
<tr>
<th>Objective</th>
<th>Water quality is maintained to a standard suitable for secondary contact recreation use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance standards</td>
<td>Water quality is maintained in accordance with scheduled water quality objectives for waterways under the EPP (Water Policy 2009) (which is informed by the Australian and New Zealand Guidelines for Fresh and Marine Water Quality)</td>
</tr>
<tr>
<td></td>
<td>Water quality sampling is in accordance with the methods prescribed in the Queensland Monitoring and Sampling Manual (2018)</td>
</tr>
<tr>
<td></td>
<td>Growth of undesirable marine organisms is absent or regulated</td>
</tr>
<tr>
<td>Management controls</td>
<td>1. Maintain impervious and/or vegetated overland flow paths in accordance with routine inspection and maintenance schedules</td>
</tr>
<tr>
<td></td>
<td>2. Maintain stormwater drainage systems and GPTs in accordance with routine inspection and maintenance schedules</td>
</tr>
<tr>
<td></td>
<td>3. Maintain salinity exchange systems and weir in accordance with routine inspection and maintenance schedules</td>
</tr>
<tr>
<td></td>
<td>4. Educate residents and public to reduce pollutant run-off and/or input (e.g. signage, residents’ handbook and website)</td>
</tr>
<tr>
<td>Corrective action</td>
<td>If the relevant water quality guidelines are exceeded, or a trend of declining water quality develops over an extended period, it will be considered to indicate the need for reassessment of the appropriateness and effectiveness of existing water quality management controls</td>
</tr>
<tr>
<td></td>
<td>Erection of temporary signage if determined necessary</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Visual monitoring to be undertaken concurrent with routine inspections and/or maintenance schedules</td>
</tr>
<tr>
<td></td>
<td>Water quality sampling will be undertaken on a reactive basis if requested and determined necessary</td>
</tr>
<tr>
<td></td>
<td>Maintain customer service request records and incident/non-compliance register</td>
</tr>
<tr>
<td>Reporting</td>
<td>The results of monitoring will be made available to the public at council’s discretion and by request only</td>
</tr>
<tr>
<td>Responsibility</td>
<td>SCC</td>
</tr>
</tbody>
</table>
Flood bypass management

During the design 100 year average recurrence interval flood event, the bypass channel conveys a peak discharge of 370m$^3$/s. Maximum water levels in the lake are RL 2.7m AHD just upstream of Structure Z and RL 2.8m AHD just downstream of Structure Y. At the peak discharge the average flow velocity in the lake is 0.55m/s.

The minimum level of blocks are RL 3.3m AHD just upstream of Structure Z and RL 3.5m AHD just downstream of Structure Y.

In accordance with the Building Regulations for slab on ground the Finish Floor Level is 0.225m above natural ground level. The top of the revetment wall to residential properties is RL 0.9m AHD.

Table 4 provides an overview of management to ensure the lake continues to provide an effective flood bypass solution.

<table>
<thead>
<tr>
<th>Objective</th>
<th>The lake continues to function as an effective flood bypass channel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performance standards</strong></td>
<td></td>
</tr>
<tr>
<td>• No flooding above Q100 level</td>
<td></td>
</tr>
<tr>
<td>• Compliance with design criteria for lake operation as a flood channel</td>
<td></td>
</tr>
<tr>
<td>• Effective operation and maintenance of tidal exchange system and weir</td>
<td></td>
</tr>
<tr>
<td>• Maintain lake to acceptable tolerances from design profile</td>
<td></td>
</tr>
<tr>
<td><strong>Management controls</strong></td>
<td></td>
</tr>
<tr>
<td>1. Adherence to maintenance procedures in Appendix C</td>
<td></td>
</tr>
<tr>
<td>2. Adherence to asset management plans</td>
<td></td>
</tr>
<tr>
<td>3. Asset inspections and maintenance schedules met</td>
<td></td>
</tr>
<tr>
<td><strong>Corrective action</strong></td>
<td></td>
</tr>
<tr>
<td>• Undertake reactive inspection and maintenance of flood mitigation devices (salinity exchange system &amp; weir)</td>
<td></td>
</tr>
<tr>
<td>• Review incident and where required review procedures to ensure effective measures are in place to meet performance standards</td>
<td></td>
</tr>
<tr>
<td><strong>Monitoring</strong></td>
<td></td>
</tr>
<tr>
<td>• Visual monitoring undertaken during asset inspections and maintenance</td>
<td></td>
</tr>
<tr>
<td>• View CCTV at structure Z</td>
<td></td>
</tr>
<tr>
<td>• Maintain customer service request records</td>
<td></td>
</tr>
<tr>
<td><strong>Reporting</strong></td>
<td></td>
</tr>
<tr>
<td>• Contractor maintenance reports</td>
<td></td>
</tr>
<tr>
<td>• Asset inspections logs</td>
<td></td>
</tr>
<tr>
<td><strong>Responsibility</strong></td>
<td>SCC and maintenance contractor</td>
</tr>
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</table>
# 8 Incident, non-compliance and complaint management

Table 5: Incident, non-compliance and complaint management overview

<table>
<thead>
<tr>
<th>Objective</th>
<th>To ensure prompt and efficient response to pollution, environmental incidents, complaints and non-compliance</th>
</tr>
</thead>
</table>
| **Performance standards** | • Prompt removal of pollution spillages from waterways with minimum risk to the public and the environment  
• All complaints and non-compliance are dealt with promptly and efficiently, in accordance with council’s Compliance and Enforcement Policy 2018  
• Appropriate investigations are undertaken to determine the source of pollution and the cause of environmental incidents (e.g. oil spills, fish kills and algal blooms) |
| **Management controls** | 1. Adherence to asset management plans  
2. Asset inspections and routine maintenance schedules met  
3. Adherence to water quality management procedures (refer section 6)  
4. Sufficient signage to communicate prohibitions outlined in this management plan (refer 5.3) |
| **Corrective action** | • Pollution spill, fish kill or other environmental incident - report to the Department of Environment and Science to ensure that appropriate investigations and testing are undertaken  
• Address and/or rectify incident, complaint and/or non-compliance  
• Review customer service requests and incident/non-compliance register and implement improvement to processes and/or signage where deemed necessary |
| **Monitoring** | • Follow up monitoring to be undertaken in the event of an environmental incident  
• Maintain customer service request records and incident/non-compliance register |
| **Reporting** | Complete the appropriate incident report/debrief when required or requested |
| **Responsibility** | SCC |
9 Maintenance

9.1 General

Maintenance of the lake and its assets are the responsibility of council and includes routine, planned and reactive maintenance work activities.

Maintenance work is managed through an asset management system and includes activities such as inspection, assessing condition, prioritising, scheduling, actioning the work and reporting what was done to develop a maintenance history and improve maintenance and service delivery performance.

Routine maintenance is performed on a regular cycle to upkeep visual amenity and/or replacement of components/sub-components of assets. This work generally falls below the capital threshold. Planned maintenance comprises larger scale repair work (below the capital threshold) or asset renewal (capital work). Reactive maintenance is unplanned repair work carried out in response to service requests and management/supervisory directions.

Types of maintenance may include:

- on-going maintenance of the navigation locks and inlet/outlet weirs;
- on-going maintenance of the salinity exchange system;
- removal of siltation from bed and banks of the lake, as required, to ensure that it does not become a constraint on the function of the lake;
- removal of debris, rubbish and undesirable marine organisms/weeds from the lake and public foreshore areas;
- maintaining the revetment walls and scour where they front public lands; and
- maintaining navigation aids within the lake etc.

Council is also responsible for:

- regulating stormwater run-off into the lake through the underground pipe system;
- ensuring no drainage is allowed to enter the lake from any dwelling, or other premises, abutting the lake, other than that which can, lawfully, be discharged into the underground piped drainage system contained within the road reserve;
- ensuring no materials or liquids likely to cause pollution are to be allowed to enter the lake;
- erecting and maintaining signage in appropriate locations; and
- the maintenance of any installations, fixtures and fittings required for the purposes of any organised events.
### 9.2 Maintenance management

The following section provides an overview of the maintenance framework for lake features and assets to meet specific management plan objectives outlined in Table 1. Refer Appendix C to view associated weir and lock maintenance procedures.

**Table 6: Maintenance framework overview**

<table>
<thead>
<tr>
<th>Feature / asset</th>
<th>Performance standard</th>
<th>Performance indicator</th>
<th>Comments / considerations</th>
<th>Inspection frequency</th>
<th>Routine maintenance frequency</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Waterway feature</strong></td>
<td><strong>Litter, debris etc.</strong></td>
<td>a) Inspection and maintenance schedules met&lt;br&gt;b) Reactive works undertaken in a timely manner&lt;br&gt;c) No complaints</td>
<td>• Officers undertaking litter removal should ensure that appropriate precautions are taken against hazardous objects such as discarded hypodermic syringes&lt;br&gt;• Collected litter should be recorded in AMDI database and disposed of at council’s refuse tip&lt;br&gt;• A public education programme should be considered by council if litter is a persistent problem&lt;br&gt;• If fishing equipment (e.g. crab pot or fish trap) is found either unmarked and/or in state of disrepair to a point of it being non-functional then it shall be removed as marine litter (report to DAFF for their agency to remove)</td>
<td>Monthly</td>
<td>Monthly</td>
<td>SCC Waterways team</td>
</tr>
<tr>
<td></td>
<td><strong>Undesirable marine organisms / weeds</strong></td>
<td>a) Inspection schedule met&lt;br&gt;b) Reactive works undertaken in a timely manner&lt;br&gt;c) No complaints</td>
<td>• Any vegetation or plant material, living or dead, located below the level of the highest astronomical tide (Approximately RL 1.05m AHD) is classified as “marine vegetation” under the Fisheries Act. Refer to relevant fisheries ‘code for accepted development’ before undertaking any works involving marine vegetation&lt;br&gt;• Although herbicides are a possible means of weed control, only herbicides registered for use in aquatic environments should be used&lt;br&gt;• All removed vegetation should be disposed of at council’s refuse tip&lt;br&gt;• In the event of algal blooms, refer to Queensland Harmful Algal Bloom Response Plan 2014. Appropriate laboratory testing should be undertaken to determine the species present and likely cause of the outbreak. If testing indicates the presence of toxic species, specialist advice should be sought regarding any necessary health precautions.</td>
<td>6 monthly</td>
<td>No routine maintenance. Any required works are determined based on inspection condition assessment</td>
<td>SCC Lakes and Wetlands team</td>
</tr>
<tr>
<td><strong>Lake profile</strong></td>
<td><strong>Lake is maintained to acceptable tolerances from design profile</strong></td>
<td>a) Survey completed as scheduled&lt;br&gt;b) Maintenance is undertaken in a timely manner before degradation of waterway profile affects vessel movement or the stability of revetment walls&lt;br&gt;c) No complaints</td>
<td>• Appropriate geotechnical and chemical testing should be undertaken of material proposed to be dredged or excavated in maintenance operations&lt;br&gt;• Approvals to undertake dredging, or other excavation, within a waterway are required under the Planning Act 2016 (Tidal Works) and the Environmental Protection Act 1994 (ERA 16) (dependant on volume of material to be managed)</td>
<td>7 yearly</td>
<td>No routine maintenance performed. Any required works are determined based on visual observation and 7 yearly lake survey</td>
<td>SCC Coast &amp; Canals team</td>
</tr>
<tr>
<td><strong>Constructed beaches</strong></td>
<td><strong>Accessible, safe and provides adequate amenity and visual quality</strong></td>
<td>a) Open for use 90% of the time&lt;br&gt;b) Clear of marine fouling and debris&lt;br&gt;c) Safe&lt;br&gt;d) Inspection schedule met&lt;br&gt;e) Reactive works undertaken in a timely manner&lt;br&gt;f) No complaints</td>
<td>• Weeding is performed by physical / mechanical means, no herbicides to be used&lt;br&gt;• Sand profiles are maintained as designed</td>
<td>6 monthly</td>
<td>No routine maintenance. Any required works are determined based on inspection condition assessment</td>
<td>SCC Coast &amp; Canals team</td>
</tr>
<tr>
<td><strong>Infrastructure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feature / asset</td>
<td>Performance standard</td>
<td>Performance indicator</td>
<td>Comments / considerations</td>
<td>Inspection frequency</td>
<td>Routine maintenance frequency</td>
<td>Responsibility</td>
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</tr>
</tbody>
</table>
| Tidal exchange system | The system is operating as designed and providing effective flood management and water flows | a) Water is turned over every 60 days  
b) Floods successfully mitigated  
c) Inlet and outlet structures are not impeded by marine growth or sedimentation  
d) Inspection and maintenance schedules met  
e) Reactive works undertaken in a timely manner  
f) No complaints | Underwater inspections of the structures are likely to be required. This applies particularly to the inlet structure. A qualified commercial diver should be employed for this work and the required safety measures implemented | Fortnightly | Annual | SCC Coast & Canals team |
| Lock | Provides effective and safe access for marine vessels transporting in and out of the lake system | a) Inspection and maintenance schedules met  
b) Reactive works undertaken in a timely manner  
c) No complaints from lock access card holders | Refer Appendix C for maintenance procedures. Refer Section 5.4.1 for more information on lock access and cards | Fortnightly | As per maintenance procedures | SCC Coast & Canals team Contractor |
| Weirs | The system is operating as designed and providing effective flood management | a) Floods successfully mitigated  
b) Inspection and maintenance schedules met  
c) Reactive works undertaken in a timely manner  
d) No complaints | Refer Appendix C for maintenance procedures | Fortnightly | As per maintenance procedures | SCC Coast & Canals team |
| Revetment wall | Revetments are maintained in a suitable condition to provide satisfactory protection to adjacent land and assets | a) Structure maintained to design  
b) Inspection schedules met  
c) Reactive works undertaken in a timely manner  
d) No complaints | • The stability of revetment walls and other concrete structures is heavily reliant on the condition of the associated scour (see scour maintenance below)  
• The maintenance of revetments is the responsibility of the abutting landowner (i.e. council for public land only). However, council are responsible for the associated scour and thus must ensure it is adequate to protect private landowners’ revetment | Annually | No routine maintenance. Any required works are determined based on inspection condition assessment | SCC Coast & Canals team |
| Scour | Scour are maintained in a suitable condition to provide satisfactory protection to revetment walls | a) Structure maintained to design  
b) Inspection schedules met  
c) Reactive works undertaken in a timely manner  
d) No complaints | • The stability of revetment walls and other concrete structures can be rapidly compromised due to the loss of foundation support if the associated scour are not well maintained  
• Council are responsible for maintaining all scour including those abutting private land | Annually | No routine maintenance. Any required works are determined based on inspection condition assessment | SCC Coast & Canals team |
| Stormwater outlets | Provides effective drainage of stormwater run-off | a) Structure maintained to design standards  
b) Inspection and maintenance schedules met  
c) Reactive works undertaken in a timely manner  
d) No complaints | Piping failures, resulting in loss of support behind and beneath stormwater drainage outlet structures can result in rapid deterioration of these structures. This damage can quickly spread to adjacent revetment walls. It is important, for the longevity of these structures, to ensure that piping problems are promptly addressed | Annually | Annually | SCC Stormwater Services team |
| GPT’s | Provides an effective pollutant trap to minimise litter, debris and sediment from entering the lake system | a) Structure maintained to design  
b) Inspection and maintenance schedules met | Refer to manufacturer for design standard details | Monthly | Annually | SCC Stormwater Services team |
<table>
<thead>
<tr>
<th>Feature / asset</th>
<th>Performance standard</th>
<th>Performance indicator</th>
<th>Comments / considerations</th>
<th>Inspection frequency</th>
<th>Routine maintenance frequency</th>
<th>Responsibility</th>
</tr>
</thead>
</table>
| Viewing platform | Accessible and safe, providing additional enjoyment of the lake amenity | a) Structure maintained to design | c) Reactive works undertaken in a timely manner  
d) No complaints  
e) Minimal litter, debris and sediment entering the lake directly from stormwater outlets | 6 monthly | No routine maintenance. Any required works are determined based on inspection condition assessment | SCC Transport Infrastructure team |
| Jetty/pontoon | Accessible, user-friendly and safe, providing additional access and enjoyment of the lake | a) Structure maintained to design  
b) Open for use 90% of the time  
c) Clear of marine fouling and debris  
d) Inspection schedule met  
e) Reactive works undertaken in a timely manner  
f) No complaints | | Annually | No routine maintenance. Any required works are determined based on inspection condition assessment | SCC Coast & Canals team |
| Waterway accesses (including portages) | Accessible, user-friendly and safe, providing additional access and enjoyment of the lake | a) Structure maintained to design  
b) Open for use 90% of the time  
c) Clear of marine fouling and debris  
d) Inspection schedule met  
e) Reactive works undertaken in a timely manner  
f) No complaints | | Annually | No routine maintenance. Any required works are determined based on inspection condition assessment | SCC Coast & Canals team |
| Signs | Signs are reader-friendly, clearly visible, safe, and not impact on the visual qualities of the lake | a) Structure maintained to design  
b) Inspection schedule met  
c) Reactive works undertaken in a timely manner  
d) Vessel operators are compliant with marine safety laws  
e) No complaints  
(f) If non-compliance and/or complaints register indicate a growing trend of users whom are not complying with regulations, assess suitability of all forms of public education, including signage. Implement any improvements where determined necessary (see more section 8) | | Annually | No routine maintenance. Any required works are determined based on inspection condition assessment | SCC Coast & Canals team |
| Beacons, piles and channel markers | Effectively assist vessel operators to safely navigate the lake, without negatively impacting on vessel traffic or amenity | a) Structure maintained to design  
b) Inspection schedule met  
c) Reactive works undertaken in a timely manner  
d) No complaints or on-water incidents | | Annually | No routine maintenance. Any required works are determined based on inspection condition assessment | SCC Coast & Canals team |
9.3 Standards and specifications

Maintenance work is carried out in accordance with the following standards and specifications.

1. Building Code of Australia
   a) BCA Vol 2 Part 3.1.2.0 – Drainage (AS 3500.3.2)
   b) BCA Vol 2 Part 3.1.2.2 (d) – Excavation and Piling near Sewers and Drains
   c) BCA Vol 2 Part 3.1.1 – Earthworks

2. Australian Standards
   a) AS 1141: Methods for sampling and testing aggregates
   b) AS 1428: Design for Access and Mobility
   c) AS 1604: Treatment of piles
   d) AS 1664.1: Aluminium Structures Code
   e) AS 1665: Welding
   f) AS 1170.1 and 1170.2: Loading Codes
   g) AS 1650: Galvanising
   h) AS 1720: Timber Structures Code
   i) AS 2159: Piling Code
   j) AS 2239: Galvanic (Sacrificial) Anodes for Cathodic protection
   k) AS 2312: Two Pack Epoxy Paints
   l) AS 2832.3: Guide to the Cathodic protection of metals-fixed immersed structures.
   m) AS 3500: Part 3.2, Stormwater Drainage – Acceptable Solutions
   n) AS 3600: Concrete Structures Code
   o) AS 3700: Masonry Structures Code
   p) AS 3706: Geotextiles Methods of test
   q) AS/NZ 3004: Marinas and Recreational Boats
   r) ANZECC: Guidelines for fresh and Marine Water Quality
   s) AS 3962: Guidelines for Design of Marinas Code
   t) AS 4110: Steel Structures Code
   u) AS 4133: Methods of testing rocks for engineering purposes
   v) AS 4997: Guidelines for the design of maritime structures


5. Healthy Waterways – Water by Design Construction and Establishment Guidelines

6. Any other relevant regulations, policies, codes and/or guidelines that fall under the Acts listed in section 3.4
# Contacts

<table>
<thead>
<tr>
<th>Entity</th>
<th>Contact details</th>
<th>Enquiry type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunshine Coast Council - Customer Service</td>
<td>(07) 5475 7272 1300 007 272</td>
<td>All</td>
</tr>
<tr>
<td>Maritime Safety Queensland</td>
<td>(07) 5373 2310 A/H (07) 3305 1700</td>
<td>Marine safety and marine pollution, including oil spills</td>
</tr>
<tr>
<td>Mooloolaba Coast Guard</td>
<td>Radio: 88-90, 16-67-21-73-80 (07) 5444 3222</td>
<td>Marine safety</td>
</tr>
<tr>
<td>Sunshine Coast District Water Police</td>
<td>(07) 5457 6711 A/H 0438 200 705</td>
<td>Search and rescue, on-water criminal matters and marine safety complaints</td>
</tr>
<tr>
<td>Queensland Boating and Fisheries Patrol</td>
<td>(07) 5444 4599 (Mooloolaba)</td>
<td>Marine safety and fisheries complaints</td>
</tr>
<tr>
<td>Department of Environment &amp; Science</td>
<td>1300 130 372</td>
<td>Involving pollution, environmental harm, fish kills and marine strandings</td>
</tr>
<tr>
<td>Department of Agriculture and Fisheries</td>
<td>(07) 3404 6999</td>
<td>Involving marine plants</td>
</tr>
<tr>
<td>RSPCA QLD</td>
<td>1300 ANIMAL (1300 264 625)</td>
<td>Involving injured wildlife. Will likely be attended by Queensland Parks and Wildlife Service (QPWS)</td>
</tr>
</tbody>
</table>
11 Review

This document may be reviewed and updated as determined necessary by council in response to new information, challenges in implementation or changing external factors such as technology, land use, the environment, legislation and community values.
<table>
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<tr>
<th>Drawing No:</th>
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</table>
NOTES
1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.

2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.

3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way bridges and the width of the lock.

4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws.

5. The mooring allocations shown on this plan are only for the potential use of lots 94-97 as shown on this plan.

6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter.

7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring.
NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1984. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.

2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.

3. Restrictions to the height and beam of vessels may apply due to the Middleton Way bridges and the width of the lock.

4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the size of the lake and environs is subject to control by local laws.

5. The mooring allocations shown on this plan are only for the potential use of lots 160-165 and 169-172 as shown on this plan.

6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter.

7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring.
NOTES

1. Coffs Harbour City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before existing in a lease under Section 57 of the Land Act, 1954. The structures must be approved in accordance with the approval process and comply with the structural and operational requirements as outlined in the Parrearra Lake Management Plan.

2. A vessel berthed at a pontoon must not at any time, extend within 0.5 metres of the side boundary of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.

3. Restrictions to the height and beam of vessels may apply due to The Noosan Way bridges and the width of the lock.

4. The lake area is a Sport and Recreation Reserve under the control of the Coffs Harbour City Council and the use of the lake and environs is subject to control by local laws.

5. The mooring allocations shown on this plan are only for the potential use of lots 142, 143, 148, 149, 151, 150, 157 as shown on this plan.

6. Underwater cabling outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter.

7. The easement shown across the park from a lot to a quay line allocation is for the purpose of an underground extension of the water and electricity services from that lot to the mooring.

J.B. Goodwin, Midson
& Partners
consulting surveyors, planners
and development
consultants

LENSWORTH KAWANA WATERS PTY LTD
Plan of Mooring Layout
Stage 2 Kawana Island

Amend A 15-01 NI (CCC) Amend Notes

Surveyed: JAH
Designed: DKB
Check: A3

A3
scale: 1:500
ref no: P-2780-84-1

4932 1999

Brisbane 132 Connaghan Drive Townsville 4810
Ph (07) 3087 2011 Fax (07) 3087 2045
Kawana 5/12 Technology Drive Kawana 4575
Ph (07) 55483 4750 Fax (07) 55483 4880
Brisbane 2 Punt Street South 4110
Ph/Fax (07) 55483 1564

Amend A 15-01 NI (CCC) Amend Notes
NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrara Lake). No structures can be erected in Parrara Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operational requirements as outlined in the Parrara Lake Management Plan.

2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrara Lake Management Plan.

3. Restrictions to the height and beam of vessels may apply due to The Ninth Way bridges and the width of the lock.

4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws.

5. The mooring allocations shown on this plan are only for the potential use of lots 183-188 as shown on this plan.

6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter.

7. The easement shown across the park from a lot to a quay line allocation is for the purpose of an underground extension of the water and electricity services from that lot to the mooring.
1. Caloundra City Council is the trustee of the Sport and Recreation Reserve Parrearra Lake. No structures can be erected in Parrearra Lake before entering into a lease under Section 77 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.

2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.

3. Restrictions to the height and beam of vessels may apply due to The Rivulet Way bridges and the width of the lock.

4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws.

5. The mooring allocations shown on this plan are only for the potential use of lots 205-208 as shown on this plan.

6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter.

7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring.
NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lane). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operational requirements as outlined in the Parrearra Lake Management Plan.

2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.

3. Restrictions to the height and beam of vessels may apply due to the Mooloolaba Bridge and the width of the lock.

4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws.

5. The mooring allocations shown on this plan are only for the potential use of lots 254-261 as shown on this plan.

6. Underwater shallower outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter.

7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring.

J.B. Goodwin, Midson & Partners
consulting surveyors, planners
and development consultants

LENSWORTH KAWANA WATERS PTY LTD
Quay Line Plan for Lots 254-261
Stage 4 Kawana Island

Amend C NE 15-11-01 (CCC) Amend Notes and SJP 15-11-01 Amend Mooring Allocation Lot 254
Amend B SJP 15-10-01 Amend Mooring Allocations and Lots 255-257
Amend A SJP 04-10-01 Amend Quay Line Allocation for Lot 261

Surveyed Drawn JAH 29-08-01 Designed SJG

scale: 1:500 ref. no. P-2780-93-5

LENSWORTH KAWANA WATERS PTY LTD
quay line plan for lots 254-261
stage 4 kawana island

Amend C NE 15-11-01 (CCC) Amend Notes and SJP 15-11-01 Amend Mooring Allocation Lot 254
Amend B SJP 15-10-01 Amend Mooring Allocations and Lots 255-257
Amend A SJP 04-10-01 Amend Quay Line Allocation for Lot 261

Surveyed Drawn JAH 29-08-01 Designed SJG

scale: 1:500 ref. no. P-2780-93-5

LENSWORTH KAWANA WATERS PTY LTD
quay line plan for lots 254-261
stage 4 kawana island

Amend C NE 15-11-01 (CCC) Amend Notes and SJP 15-11-01 Amend Mooring Allocation Lot 254
Amend B SJP 15-10-01 Amend Mooring Allocations and Lots 255-257
Amend A SJP 04-10-01 Amend Quay Line Allocation for Lot 261

Surveyed Drawn JAH 29-08-01 Designed SJG

scale: 1:500 ref. no. P-2780-93-5

LENSWORTH KAWANA WATERS PTY LTD
quay line plan for lots 254-261
stage 4 kawana island

Amend C NE 15-11-01 (CCC) Amend Notes and SJP 15-11-01 Amend Mooring Allocation Lot 254
Amend B SJP 15-10-01 Amend Mooring Allocations and Lots 255-257
Amend A SJP 04-10-01 Amend Quay Line Allocation for Lot 261

Surveyed Drawn JAH 29-08-01 Designed SJG

scale: 1:500 ref. no. P-2780-93-5

LENSWORTH KAWANA WATERS PTY LTD
quay line plan for lots 254-261
stage 4 kawana island

Amend C NE 15-11-01 (CCC) Amend Notes and SJP 15-11-01 Amend Mooring Allocation Lot 254
Amend B SJP 15-10-01 Amend Mooring Allocations and Lots 255-257
Amend A SJP 04-10-01 Amend Quay Line Allocation for Lot 261

Surveyed Drawn JAH 29-08-01 Designed SJG

scale: 1:500 ref. no. P-2780-93-5

LENSWORTH KAWANA WATERS PTY LTD
quay line plan for lots 254-261
stage 4 kawana island

Amend C NE 15-11-01 (CCC) Amend Notes and SJP 15-11-01 Amend Mooring Allocation Lot 254
Amend B SJP 15-10-01 Amend Mooring Allocations and Lots 255-257
Amend A SJP 04-10-01 Amend Quay Line Allocation for Lot 261

Surveyed Drawn JAH 29-08-01 Designed SJG

scale: 1:500 ref. no. P-2780-93-5

LENSWORTH KAWANA WATERS PTY LTD
quay line plan for lots 254-261
stage 4 kawana island

Amend C NE 15-11-01 (CCC) Amend Notes and SJP 15-11-01 Amend Mooring Allocation Lot 254
Amend B SJP 15-10-01 Amend Mooring Allocations and Lots 255-257
Amend A SJP 04-10-01 Amend Quay Line Allocation for Lot 261

Surveyed Drawn JAH 29-08-01 Designed SJG

scale: 1:500 ref. no. P-2780-93-5

LENSWORTH KAWANA WATERS PTY LTD
quay line plan for lots 254-261
stage 4 kawana island

Amend C NE 15-11-01 (CCC) Amend Notes and SJP 15-11-01 Amend Mooring Allocation Lot 254
Amend B SJP 15-10-01 Amend Mooring Allocations and Lots 255-257
Amend A SJP 04-10-01 Amend Quay Line Allocation for Lot 261

Surveyed Drawn JAH 29-08-01 Designed SJG

scale: 1:500 ref. no. P-2780-93-5

LENSWORTH KAWANA WATERS PTY LTD
quay line plan for lots 254-261
stage 4 kawana island

Amend C NE 15-11-01 (CCC) Amend Notes and SJP 15-11-01 Amend Mooring Allocation Lot 254
Amend B SJP 15-10-01 Amend Mooring Allocations and Lots 255-257
Amend A SJP 04-10-01 Amend Quay Line Allocation for Lot 261

Surveyed Drawn JAH 29-08-01 Designed SJG

scale: 1:500 ref. no. P-2780-93-5

LENSWORTH KAWANA WATERS PTY LTD
quay line plan for lots 254-261
stage 4 kawana island

Amend C NE 15-11-01 (CCC) Amend Notes and SJP 15-11-01 Amend Mooring Allocation Lot 254
Amend B SJP 15-10-01 Amend Mooring Allocations and Lots 255-257
Amend A SJP 04-10-01 Amend Quay Line Allocation for Lot 261

Surveyed Drawn JAH 29-08-01 Designed SJG

scale: 1:500 ref. no. P-2780-93-5
1. Caloundra City Council is the Trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.

2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.

3. Restrictions to the height and beam of vessels may apply due to The Nichols Way, Kawana Island Boulevard bridges and the width of the lock.

4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws.

5. The mooring allocations shown on this plan are only for the potential use of lots 322-326 as shown on this plan.

6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter.

7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring.
NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearrpa Lake). No structures can be erected in Parrearrpa Lake before entering into a lease under Section 37 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearrpa Lake Management Plan.

2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearrpa Lake Management Plan.

3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way, Kawana Island Boulevard bridges and the width of the inshore.

4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environment is subject to control by local laws.

5. The mooring allocations shown on this plan are only for the potential use of lots 327, 328 & 331-334 as shown on this plan.

6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter.

7. The pavement shown across the port from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring.
NOTES:

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operating requirements as outlined in the Parrearra Lake Management Plan.

2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.

3. Restrictions to the height and beam of vessels may apply due to The Mooloolaba Road, Kawana Island Boulevard bridges and the width of the lock.

4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws.

5. The mooring allocations shown on this plan are only for the potential use of lots 335-338 & 347 as shown on this plan.

6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter.

7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring.
1. Caloundra City Council is the owner of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.

2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.

3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way, Kawana Island Boulevard bridges and the width of the lock.

4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws.

5. The mooring allocation shown on this plan are only for the potential use of lots 348-352 as shown on this plan.

6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter.

7. The easement shown across the plot from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring.
1. An adjacent land owner seeking to construct a mooring facility opposite their landholding must first obtain a Permit to Occupy Crown Land from the Hamburgh Office of the Department of Natural Resources and Mines and then obtain construction permission for a facility in tidal waters from the appropriate authority.

2. Land owners proposing to construct mooring facilities are advised that Operational Works Approval is required from the relevant State Authority before any works in the waterway can commence.

3. A vessel berthed at a pontoon must not at any time, extend more than 0.5 metres of the side boundaries of the designated Mooring Allocation as shown herein.

4. Restrictions to the height and beam of vessels may apply due to The Mooloolaba Bridge.

5. The mooring allocations shown on this plan are for the purpose only of the water and electricity services from that lot to the mooring.

6. Underwater stormwater outlets into the waterway may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter.

7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring.

Amdt B 5-05-04 SJS Amended Note 2
Amdt A 19-04-04 SJS Amended Notes
NOTES
1 An adjacent land owner seeking to construct a mooring facility opposite their landholding must first obtain a Permit to Occupy Crown Land from the Harbour Office of the Department of Natural Resources and Mines and then obtain construction permission for a facility in tidal waters from the appropriate authority.

2 Land owners proposing to construct mooring facilities are advised that Operational Works Approval is required from the relevant State Authority before any works in the waterway can commence.

3 A vessel berthed at a pontoon must not at any time, extend within 10 metres of the side boundaries of the designated Mooring Allocation as shown herein.

4 Restrictions to the height and beam of vessels may apply due to The Nixson Way bridge.

5 The mooring allocations shown on this plan are only for the potential use of lot 883 as shown on this plan.

6 Underwater stormwater outlets into the waterway may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter.

7 The easement shown across the park from a lot to a quay line allocation, is for the purposes of an underground extension of the water and electricity services from that lot to the mooring
NOTES

1. An adjacent land owner seeking to construct a mooring facility opposite their landholding must first obtain a Permit to Occupy Green Land from the Nambour Office of the Department of Natural Resources and Mines and then obtain construction permission for a facility in Noel waters from the appropriate authority.

2. Land owners proposing to construct mooring facilities are advised that Operational Works Approval is required from the relevant State Authority before any works in the waterway can commence.

3. A vessel berthed at a pontoon must not at any time extend within 15 metres of the side boundaries of the designated Mooring Allocation as shown herein.

4. Restrictions to the height and beam of vessels may apply due to the Nicklin Way bridge.

5. The mooring allocations shown on this plan are only for the potential use of lot 869 as shown on this plan.

6. Underwater stormwater outlets into the waterway may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter.

7. The easement shown across the park from a lot to a quay line allocation is for the purpose of an underground extension of the water and electricity services from that lot to the mooring.

J.B. Goodwin, Midson & Partners
STOCKLAND KAWANA WATERS PTY LTD
Mooring Allocation Plan for Lots 858-861, 873 and 874
Stage 8 Kawana Island

scale: 1:500  ref no P-2780-536 3 of 5
1. An adjacent land owner seeking to construct a mooring facility opposite their foreshore must first obtain a Permit to Occupy Crown Land from the Harbour Office of the Department of Natural Resources and Mines and then obtain construction permission for a facility in tidal waters from the appropriate authority.

2. Land owners proposing to construct mooring facilities are advised that Operational Works Approval is required from the relevant State Authority before any works in the waterway can commence.

3. A vessel berthed at a position must not at any time extend within 10 metres of the side boundaries of the designated Mooring Allocation as shown herein.

4. Restrictions to the height and beam of vessels may apply due to The Muldoon Way bridge.

5. The mooring allocations shown on this plan are for the potential use of lot 500 as shown on this plan.

6. Underwater stormwater outlets into the waterway may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter.

7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring.
NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Pierwarr Lake). No structures can be erected in Pierwarr Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Pierwarr Lake Management Plan.

2. A vessel berthed at a pontoon must not at any time extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Pierwarr Lake Management Plan.

3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way, Kienene Island Boulevard bridges and the width of the lock.

4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and surrounds is subject to control by local laws.

5. The mooring allocations shown on this plan are only for the potential use of lots 548-550 and 718 as shown on this plan.

6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter.

7. The easement shown across the park from lot 548 to a quay line allocation is for the purpose of an underground extension of the water and electricity services from that lot to the mooring.

Scale 1:400 Lengths are in Metres

J.B. Goodwin, Midson & Partners

LENSWORTH KAWANA WATERS PTY LTD
Quay Line Plan
Lots 548-550 and 718
Stage 7 Kawana Island
scale: 1:400 ref no: P-2780-527-2
NOTES
1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.

2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.

3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way, Kawana Island Boulevard bridges and the width of the lock.

4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and waters is subject to control by local laws.

5. The mooring allocations shown on this plan are only for the potential use of lots 565-568 as shown on this plan.

6. Underwater stormwater outfalls into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter.

7. The easement shown across the park from a lot to a quay line allocation is for the purpose of an underground extension of the water and electricity services from that lot to the mooring.
NOTES

1. Caloundra City Council is the Trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1989. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.

2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the site boundaries of the designated Eddy Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.

3. Restrictions on the height and beam of vessels may apply due to the height of the key bridges and the width of the lane.

4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and its environs is subject to control by local laws.

5. The mooring allocations shown on this plan are only for the potential use of lots 577-580 as shown on this plan.

6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter.

7. The easement shown across the park from a lot to a quay line is for the purpose of an underground extension of the water and electricity services from that lot to the mooring line.
NOTES

1. Coolumbe City Council is the trustee of the Sport and Recreation Reserve (Parreara Lake). No structures can be erected in Parreara Lake before entering into a lease under Section 57 of the Local Act, 1992. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parreara Lake Management Plan.

2. A vessel berthed at a pontoon must not at any time extend within 5 metres of the side boundary of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parreara Lake Management Plan.

3. Restrictions to the height and beam of vessels may apply due to the Nickel Way, Kawana Island Boulevard bridges and the width of the lock.

4. The lake area is a Sport and Recreation Reserve under the control of the Coolumbe City Council and the use of the lake and environs is subject to control by local laws.

5. The mooring allocations shown on this plan are only for the potential use of lot 586 as shown on this plan.

6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter.

7. The easement shown across the park from a lot to a quay line allocation is for the purpose of an underground extension of the water and electricity services from that lot to the mooring.

Scale 1:500 Lengths are in Metres
Appendix B: Design Standards for Pontoons, Ramps and Decks
GENERAL NOTES:
1. All structures shall be designed for sufficient hydraulic loads for a channel velocity of 0.75m/s. No loads are to be imposed at revetment wall by deck.
2. Design live loads for decks (strictly use only):
   - single user residential site: 1.5kPa
   - multi-user residential site: 2.0kPa
3. No fixing or deck support shall be made onto the existing revetment wall.
4. Maximum deck level to be R.L. 3.0m AHD at the revetment wall.
5. No vessels are to be moored to deck.
Appendix C: Parrearra Navigation Lock and Weir Maintenance Procedures
PARREARRA LOCK
MAINTENANCE PROCEDURES

1.0 INTRODUCTION

1.1 The following sections set out suggested maintenance and inspection procedures for the Parrearrra navigation lock.

Due to unforeseen circumstances, variations to the suggested procedures or additional procedures may be required.

Only suitably qualified and experienced personnel should undertake the inspection and maintenance procedures. It is recommended that the contractors and sub-contractors involved in the original construction are used wherever possible. All relevant safety regulations should be observed when undertaking this work.

In addition to the following procedures, reference should be made to the Installation, Technical, Operating and Maintenance Manual before undertaking any maintenance or inspections.
2.0 WEEKLY MAINTENANCE INSPECTIONS

2.1 Caloundra City Council shall establish a service agreement with a maintenance provider (MP) to undertake regular inspections and operational checks of the navigation lock. These inspections were previously undertaken on a fortnightly basis for Lensworth Kawana Waters Pty Ltd by Whelan Electrical Services Pty Ltd.

2.2 The inspections involved the following:
- Check operation of lock gates and load on each actuator
- Testing of trip wires
- Check operation of traffic lights
- Lubrication of lock gate seals above waterline
- Testing of emergency phone
- Testing of emergency stops
- Check penstock operation
- Provision of report sheet (Refer to Appendix A)

2.3 The inspection should also include a general inspection of the lock, weir, jetty and pontoon for vandalism or other damage. Items to be checked include:
- Condition of timber work
- Security fences and gates
- Pontoon gangway
- Pontoon pile oyster encrustation and condition of rollers
- Local area lighting
- Landscaping

Items requiring attention should be noted in the report and appropriate maintenance scheduled.
2.4 Using the services of a maintenance provider or its own staff, Council should log on to the remote computer at the lock and download the logged data. This data includes water levels, pH and lock usage.

The data should be reviewed for anomalous values or for error messages. Whilst connected to the remote computer the status of the penstock should be checked to ensure that it is operating in accordance with the programmed parameters.

It is particularly important that the penstocks are operating correctly during periods when the tides are expected to overtop the weir (Structure Z) adjacent to the navigation lock. This will occur for predicted tides above 1.9m at Mooloolaba.

When the weir is overtopped, the lake level will rise fairly rapidly by up to 0.5m. If the penstocks are not operating correctly to lower the lake level prior to the arrival of the next high tide, the revetment walls surrounding the lake will be overtopped.

The available hard drive space on the remote computer should regularly be reviewed and unnecessary data files deleted as required after they have been downloaded.

Regular backups of the lock access card user data base should be undertaken to enable rapid system recovery in the event of a failure of the remote computer. It is recommended that this function is performed by the maintenance provider responsible for the maintenance of the user database.
3.0 ONE YEAR MAINTENANCE PROCEDURES

3.1 Caloundra City Council shall confirm time frame with maintenance provider (MP). Allow 3 days for shut down and 2 days for contingency.

3.2 Caloundra City Council to arrange for letter drop to card holders and residents in Parrearra lake area (Refer to Appendix B).

3.3 MP to subcontract the following works to undertake the one year maintenance program.

- Diving contractor.
- Crane contractor.
- General maintenance contractor.
- Cathodic protection consultant.
- Bowler Geotechnical.
- Naskam security.
- Cardno MBK to check report after completion.

3.4 Crane contractor (arranged and co-ordinated by the MP)

- Arrange for 20 tonne all terrain or 30 tonne or greater crane to lift and remove the bulkhead storage bay cover.
- Crane contractor to remove screens from each end of tidal exchange conduit.
- Crane contractor to install bulkhead gates to each end of lock chamber and to each end of tidal exchange conduit.
- Crane contractor to locate and remove the dewatering pump to the edge of the lock.
- Crane contractor to have dogman and associated lifting eyes and slings for all lifting operations.
3.5 Diving contractor (arranged and co-ordinated by the MP)

- Divers to inspect and clean all marine growth from bulkhead guide slots for lock chamber and tidal exchange conduit.
- Divers to check the seating of the bulkheads prior to pump out.
- Divers to inspect and clean weep holes of weir.
- Divers to connect slings and shackles when removing tidal exchange conduit.
- Advise in writing the results of all tests and inspections.

3.6 General Maintenance (arranged and co-ordinated by the MP)

- To supervise the pump out of the lock chamber and gate recesses.
- To remove all marine life caught in the process and release back into lake system. To include specimen for testing (co-ordinate with Bowler Geotechnical).
- Remove all marine growth from the rubber fenders within lock chamber.
- Remove significant marine growth from the aluminium ladders.
- Inspect and repair any areas (apart from the structural steel elements of the lock) that are affected by rust.
- Check and lubricate all locks.
- Inspect and clean the inlet screen to the water level sensor stilling well within the lock chamber.
- Inspect and clean the sump of the lock.
- Inspect, clean and repaint the red markers to the concrete walls.
- Inspect and clean the depth marker. Repaint as required.
- Re oil the timber cover to the bulkhead storage bay.
- Inspect and clean all manhole and pit covers.
- Advise the MP and Caloundra City Council of any works that require approval whilst lock is dry and undertake those works.
- Advise in writing the results of all tests and inspections.
PARREARRA LOCK
MAINTENANCE PROCEDURES

3.7 Steel work contractor (arranged and co-ordinated by the MP)
- Inspect all steel work for damage.
- Inspect all steelwork for signs of rust. Clean and repair as necessary.
- Remove any marine growth that may impede the operation of the lock gates.
- Inspect and clean lubrication holes for lock gate lower polymer bearings.
- Inspect and clean penstock gate and guides.
- Inspect and clean the tidal exchange conduit screens. Repaint with anti fouling agent as required.
- Inspect all bolts and nuts for tightness. Retighten where required.
- Advise the MP and Caloundra City Council of any works that require approval whilst lock is dry and undertake those works.
- Advise in writing the results of all tests and inspections.

3.8 Cathodic Protection Consultant (arranged and co-ordinated by the MP)
- Inspect and check the zinc anodes to the gates and bulkheads.
- Check the anode potentials.
- Advise the MP and Caloundra City Council of any works that require approval whilst lock is dry and undertake those works.
- Advise in writing the results of all tests and inspections.

3.9 Bowler Geotechnical (arranged and co-ordinated by the MP)
- Undertake water quality samples at the beginning of the process within the lock area, lake and canal side of the lock. pH levels etc
- Analysis fish samples from the lock area.
- Advise the MP and Caloundra City Council of any works that require approval whilst lock is dry and undertake those works.
- Advise in writing the results of all tests and inspections.
PARREARRA LOCK
MAINTENANCE PROCEDURES

3.10 Whelan Electrical to check electrical/data process and equipment.

- Supervise and co-ordinate the whole shutdown and cleaning process and re-commission the lock including full operational checks.
- Confirm with the Caloundra City Council that the letter drop has been undertaken.
- Check tides to ensure the high tide will not be higher than the level of the lock weir. If expected to be higher, ensure penstock is operational to control lake water level. Co-ordination with Cardno MBK maybe required.
- Shut down the lock from operating.
- Check lock operation in all operating modes.
- Inspect, check and clean the switchboard cubicle.
- Check alarm system to cabinet.
- Inspect clean and repair all lighting.
- Advise the Caloundra City Council of any works that require approval whilst lock is dry and undertake those works.
- Advise in writing the results of all tests and inspections to the Facility Manager Caloundra City Council.

3.11 Naskam Security (arranged and co-ordinated by the MP)

- Check, clean and confirm operation of alarm system.
- Confirm with Whelan Electrical system alarms are working.
- Advise the MP and Caloundra City Council of any works that require approval whilst lock is dry and undertake those works.
- Advise in writing the results of all tests and inspections.

3.12 Cardno MBK (arranged by Caloundra City Council)

- Check results of all the reports from the various subcontractors and advise of the standard and condition of the lock and weir structure. Report findings to MP and the Caloundra City Council.
- Conduct independent inspections on behalf of the Caloundra City Council.
- Advise the MP and Caloundra City Council of any works that require approval whilst lock is dry.
PARREARRA LOCK
MAINTENANCE PROCEDURES

3.13 MP to assemble all reports from sub contractor and deliver a collated report of all results to Caloundra City Council Facility Manager and the nominated representative from Cardno MBK within 14 days of shut down.

3.14 The Caloundra City Council Facility Manager will confirm with Cardno MBK the results and commence any rectification works.
4.0 PROCEDURES FOR BULKHEAD INSTALLATION AND REMOVAL AND LOCK DE-WATERING

4.1 Bulkhead Installation and Lock De-watering.

- Open security gates for access to site.
- Unlock all gates to lock safety fences.
- Remove fence panels and steel chequer cover plates to tidal exchange conduit screen/bulkhead guides.
- Shut down the lock operation. Ensure that penstocks at both weirs (Structures Y and Z) are closed.
- Ensure both pairs of lock gates are closed.
- Remove bulkhead storage bay cover and move to a position where it will not impede operation. Eye bolts are located in switchboard cubicle.
- Divers to clean out bulkhead guide slots to lock chamber and tidal exchange conduit.
- Position dewatering pump and connect all pipework.
- Divers to connect slings to lake side tidal exchange conduit screen and crane to remove.
- Position lake side tidal exchange conduit bulkhead into position using crane.
- Divers to connect slings to canal side tidal exchange conduit screen and crane to remove (note position of grate fins towards shore).
- Position canal side tidal exchange conduit bulkhead into position using crane.
- Install lake side lock chamber bulkhead using crane.
- Install canal side lock chamber bulkhead using crane.
- Commence pump out of lock (3-5 hours). Direct pump discharge to lake.
- When water depth is less than 1m open lock gates to release water from gate recesses.
- When water depth is about 300mm stop pumping and remove fish.
- Commence pumping with submersible pump until lock chamber is dry.
- Commence maintenance operations.
MAINTENANCE PROCEDURES

4.2 Bulkhead Removal Sequence.

- Ensure all maintenance works are completed and checked by MP.
- Ensure divers are on site to connect slings to tidal exchange conduit bulkheads.
- Close lake side lock gates.
- Ensure canal lock gates are left in the open position.
- Commence pumping operation to refill stilling well chambers between lake side lock gates and the bulkhead. Water maybe pumped from the penstock chamber via gatic lid or from lake or river.
- Equalise water levels on both sides of lake side bulkhead.
- Remove lake side bulkhead using crane and lower onto rubber tyres for protection of anodes.
- Wash down bulkhead with fresh water and remove anodes.
- Reposition lifting equipment to lower bulkhead into storage area.
- Open lake side lock gates to the cracked position, slowly filling lock to level of lake. Once water level has stabilised close lake side gates.
- Close canal side lock gates.
- Equalise water levels on both sides of canal bulkhead using pump if required.
- Remove river side bulkhead using crane and lower onto rubber tyres for protection of anodes.
- Wash down bulkhead with fresh water and remove anodes.
- Reposition lifting equipment to lower bulkhead into storage area.
- Connect slings to tidal exchange conduit lake side bulkhead and remove from position and lay flat on tyres.
- Reposition slings and move lake side bulkhead into storage bay and place on top of lock bulkheads.
- Lift lake side tidal exchange conduit screen into position and replace lake side cover plate and hand railing.
- Connect slings to tidal exchange conduit canal side bulkhead and remove from position and lay flat on tyres.
- Reposition slings and move canal side bulkhead into storage bay and place on top of lock bulkheads.
- Lift canal side tidal exchange conduit screen into position and replace canal cover plate and hand railing.
PARREARRA LOCK
MAINTENANCE PROCEDURES

♦ Replace timber cover to bulkhead storage bay noting correct orientation (markers on northern and southern sides).
♦ Remove eye bolts from cover and store in the switchboard cubicle.
♦ Check gate operations in all operating modes.
♦ Check all security locks are in place and secure.
♦ Recommission lock.
♦ Advise the Facility Manager of the Caloundra City Council that operation is complete.
♦ Advise Naskam security that lock is operational.
PARREARRA LOCK MAINTENANCE PROCEDURES

5.0 FIVE AND TEN YEAR MAINTENANCE INSPECTIONS

In addition to the procedures outlined in the preceding sections, it is recommended that the following inspection and maintenance operations are undertaken on the lock gate actuators and the penstock actuator. These operations would be arranged by the maintenance provider and would be undertaken by or in the presence of a representative of the actuator supplier.

The actuators were supplied by: Barron GJM Pty Ltd
P O Box 792
ARTARMIN NSW 2064
Telephone: (02) 9436 1088
Fax: (02) 9439 3413

Unless major repairs are required, the following inspections should be able to be undertaken within the same timeframe as the annual inspections.

5.1 Five Yearly Procedures

Lock Gate Actuators:
♦ Remove one of the actuators, dismantle and check for wear.
♦ Inspect worm, worm wheel and motor coupling for wear, replace as necessary.
♦ Replace lubricant and all seals, reassemble actuator and test.
♦ Refit to gearbox and adjust switch operation.
♦ From knowledge gained, establish future maintenance plan.

Penstock Actuator:
♦ As for lock gate actuator

Penstock Linear Thruster Unit:
♦ The thruster was filled initially with 4 litres EP80 Gear Oil and one 250mm can of STP Oil Treatment.
♦ It is not intended that this lubricant be changed or topped up during the service life of the unit.
♦ It is recommended at 25,000 operations that the thruster be dismantled, checked for wear, reassembled and relubricated.
PARREARRA LOCK
MAINTENANCE PROCEDURES

♦ It is important that the oil mixture (EP80 and STP) be admitted very slowly through the side inspection hole with the thruster vertical. This is to ensure that it can run through the nut vents into the lower part of the tube without overflowing into the outer tube.

5.2 Ten Yearly Procedures

Lock Gate Actuators and Gearboxes:
♦ Remove gearboxes from one gate, dismantle and inspect for wear. Replace as necessary.
♦ Replace lubricant, all seals and reassemble and test.
♦ Refit to gate and test.
♦ From knowledge gained, establish future maintenance plan.
6.0 OTHER MAINTENANCE INSPECTIONS

6.1 Navigation Lights
   Caloundra City Council shall establish a service agreement with Queensland Transport for the maintenance of the navigation markers and beacons adjacent to the weir. The frequency of this maintenance shall be determined by Queensland Transport.
APPENDIX A

Weekly Maintenance Report
**LOCK MAINTENANCE CHECKLIST**

**NOTE:** Gates must be moved as a pair. Operating individually will damage Gates.

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**Site:** KAWANA  
**Date:** 16/7/02

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DONE</th>
<th>N/A</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check for vandalism</td>
<td>/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check for fault indicators and reset</td>
<td>/</td>
<td></td>
<td>Details below</td>
</tr>
<tr>
<td>Operate Gates from locations</td>
<td>/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check Traffic Lights</td>
<td>/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check Motor Current</td>
<td>/</td>
<td></td>
<td>1A...5Amps 1B...5Amps 2A...5Amps 2B...5Amps</td>
</tr>
<tr>
<td>Check Voltage</td>
<td>/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check inside Switchboard for over-heated damaged components/Dust</td>
<td>/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check Computer Operation</td>
<td>/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test Trip Wires</td>
<td>/</td>
<td></td>
<td>1A...5Amps 1B...5Amps 2A...5Amps 2B...5Amps</td>
</tr>
<tr>
<td>Lubricate Seals above Water Line</td>
<td>/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test Emergency Stops</td>
<td>/</td>
<td></td>
<td>East West</td>
</tr>
<tr>
<td>Test Emergency Phone to Naskam</td>
<td>/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test Penstock Manually</td>
<td>/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check Gates set to Auto</td>
<td>/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check security system set and Switchboard Locked</td>
<td>/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All entry gates locked</td>
<td>/</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Details -**

**Faults if any:** some conduit damage on low voltage cables

**Extra work required:** Recover with 20mm tube.