

Moreton Bay Regional Council
**Canal Estates Portfolio
Asset Management Plan**

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1	PURPOSE	1
2	ASSET INFORMATION	2
2.1	Canal Estate Components	2
2.1.1	<i>Canal Estate Asset Component Attributes</i>	3
2.1.2	<i>Canal Estate Dimensions</i>	3
2.1.3	<i>Canal Estate Design Depths</i>	4
3	LEVELS OF SERVICE	6
3.1	Community Levels of Service	6
3.2	Technical Levels of Service	7
4	FUTURE DEMAND	9
5	ASSET LIFECYCLE MANAGEMENT	9
5.1	Asset Capacity and Performance	9
5.2	Condition and Profile	9
5.2.1	<i>Recommended Canal Condition Inspections</i>	9
5.2.2	<i>Defects</i>	12
5.2.3	<i>Modelling and Monitoring</i>	12
5.2.4	<i>Resourcing</i>	12
5.2.5	<i>Recommended Resourcing</i>	12
5.3	Risk Management Plan	13
5.4	Routine Maintenance Plan	13
5.4.1	<i>Current Maintenance Plan</i>	13
5.4.2	<i>Recommended Maintenance Plan</i>	13
5.5	Renewal/ Replacement Plan	15
5.5.1	<i>Current Renewal/ Replacement Plan</i>	15
5.5.2	<i>Recommended Renewal / Replacement Plan</i>	15
5.5.3	<i>Creation/ Acquisition/ Upgrade</i>	15
5.5.4	<i>Disposal Plan</i>	15
6	SYSTEMS	15
7	FINANCIAL SUMMARY	16
7.1	Useful life	16
7.1.1	<i>Current Useful Lives for Canal Assets</i>	16
7.1.2	<i>Estimated Remaining Useful Life for Canal Assets</i>	16
7.2	Financial Statements and Projections	16
7.2.1	<i>Valuations</i>	16
7.2.2	<i>Annual Depreciation Expense for Canal Assets</i>	17
7.2.3	<i>Maintenance Expense for Canal Assets</i>	17
7.2.4	<i>Capital Expenditure for Canal Assets</i>	18
7.2.5	<i>Date of Valuation and Valuation Methodology</i>	18
8	IMPROVEMENT AND MONITORING	19

9	APPENDICES	21
	Appendix A - Canal Estates Aerial View (Pacific Harbour, Bribie Gardens, Newport Waterways)	22
	Appendix B - Canal Revetment Wall Summary, Design and Locations	26
	Appendix C - Griffith Road, Newport Spoil Pond Schematic and Aerial Imagery	30
	Appendix D - Design Depths for each Canal System	31
	Appendix E - Additional Legislative Policies and Guidelines	34
	Appendix F - Canal Long Term Maintenance Plans	35

Definitions for Abbreviations

<i>Term</i>	<i>Definition</i>
ACR	Asset Consumption Ratio
AI	Action Item
AM	Asset Maintenance (department within ECM)
AMT	Asset Management Team (within ECM Infrastructure Planning)
ACR	Asset Consumption Ratio
ASR	Asset Sustainability Ratio
BGCA	Bribie Gardens Canal Association
CCTV	Closed Circuit Television
CSR	Customer Service Request
CEPAMP	Canal Estates Portfolio Asset Management Plan
PHCPOA	Pacific Harbour Canal Property Owners Association
CPMA	Coastal Protection Management Act
CIA	Coastal Investigation Area
DTMR	Department of Transport and Main Roads
DWCP	Drainage, Waterways and Coastal Planning (within ECM Infrastructure Planning)
ECM	Engineering Construction and Maintenance Division
Embarc	Moreton Bay Regional Council Intranet
ePID	Electronic Project Identification Document
F&PS	Financial and Project Services
GIS	Geographical Information System
GPS	Global Positioning System
IP	Infrastructure Planning (department within ECM)
LGA	Local Government Area
LGIP	Local Government Infrastructure Plan
LoS	Level of Service
LTFF	Long term financial forecast
LTMPs	Long Term Management Plans
MDMIP	Mud Island Dredged Material Placement Area
MBRC	Moreton Bay Regional Council
MSQ	Marine Safety Queensland
NWPOA	Newport Waterways Property Owners Association
PED	Planning and Economic Development Division
PAMP	Portfolio Asset Management Plan
PIP	Priority Infrastructure Plan
PMC	Project Management and Construction (department within ECM)
PSP	Planning Scheme Policy

RIO	MBRC acronym for MBRC's record management system
SAMP	Strategic Asset Management Plan
TOMAS	MBRC acronym for MBRC's asset management system
WQO	Water Quality Objectives
WSCAM	Wharf Structure Condition Assessment Manual

1 Purpose

The purpose of the Canal Estates Portfolio Asset Management Plan (CEPAMP) is to outline Moreton Bay Regional Council's (MBRC) approach to the management of canal related assets under its control. This asset management plan serves:

- to demonstrate responsible and sustainable management of the assets
- to communicate and justify funding requirements, and
- to ensure compliance with regulatory requirements

2 Asset Information

MBRC has three canal estates located at Newport Waterways, Scarborough, Bribie Gardens, Bellara and Pacific Harbour, Banksia Beach. Appendix A shows aerial images for the three canal estates.

The primary function of a canal is to provide navigable access and safe mooring within a waterfront residential estate. Canals are artificial waterways and are managed differently to natural waterways.

Canal estate assets are managed in accordance with MBRC Canal Long Term Maintenance Plans (LTMPs) and guidelines as published on Council's website.

The CEPAMP considers public assets only. The CEPAMP does not include private assets such as revetment walls fronting private properties, private gangways and pontoons as these assets are the responsibility of the relevant private property owner.

Public assets such as public jetties and boat ramps that occur within canal estates will be covered in the Coastal Facilities AMP. Stormwater outlets that discharge into the canals are covered under the Drainage Portfolio AMP.

2.1 Canal Estate Components

The canal estate is categorised into the following asset groups:

- **Navigable channel** - The navigable channel is the maintained artificial waterway constructed to allow the passage of marine craft. The navigable channel will typically include areas where vessels are moored alongside private pontoons.
- **Canal batters** - The batter refers to the sloping section of canal extending from the navigable channel to the revetment. In some canal areas, the batter is covered with rock armour to prevent erosion at the toe of the revetments. In Newport Waterways, there are sections of the intertidal canal batter surfaced with gravel.
- **Revetments** - Revetments are retaining structures, constructed of rock or concrete and designed to protect the area adjacent to the canal from erosion.
- **Marine Signage** - Marine signage includes the directional, information, regulatory and warning signs.
- **Navigational Aids** - Sea or land-based navigational aids assist with safe navigation of vessels into and out of the canal estate.

The canal estates may also include unique assets that are required to maintain or assist in the function / operation of the main canal assets. These secondary assets can include:

- **Lock and Weir** - A lock is a device used for raising and lowering marine craft between stretches of water of different levels. A weir is a low dam structure built across the canal to artificially maintain a minimum water level. The lock and weir operate in conjunction with each other.
- **Dredge Spoil Drying Pond** - Dredge spoil drying ponds can be used to assist in dredge spoil management. They are used to temporarily store wet spoil from dredging activities until the moisture content is sufficiently reduced, resulting in a dry waste product for disposal.

Appendix B provides a summary of the various revetment wall designs associated with the 3 canal estates. Appendix C includes aerial imagery of the Newport Dredge Spoil Pond.

2.1.1 Canal Estate Asset Component Attributes

The basic attributes or characteristics assigned to the canal estate components include:

- Material
- Dimensions
- Canal Subtype - entrance, marina or residential
- Dates – install, last inspected, commissioned

More specific canal estate component attributes to be captured include:

- **Canal channel** - design bed elevation, dredge trigger depth, canal zone number, date last surveyed and date last dredged.
- **Canal batter** – material type, size and thickness, slope, top of slope RL
- **Canal revetment wall** - material type, size and thickness, slope, top of slope RL
- **Lock and weir** – design bed level, design depth, design base length and width
- **Spoil pond** - full storage volume, capacity, spoil drying area
- **Marine signs** – to be developed but may include: type, speed zone, direction (left, right, bidirectional), size, code and text, and
- **Navigation aids** – to be developed but may include: type, speed zone, direction (left, right, bidirectional), size, code and text.

AI-CE001 - Develop and implement a plan to capture and update canal assets, attributes and MBRC Asset Capture Guidelines.

2.1.2 Canal Estate Dimensions

Canal Estate	Canal Frontage Total Length (km)	Private Waterfront Property Count	Minimum Design Canal Depth (m)	Approximate Width Wall to Wall (m)
Newport Waterways <i>(Scarborough)</i>	15	620 private lots 205 berths 2 marinas	1.85	Channels - 58-95
	2.4	-	2.4	Entrance - 30
Bribie Gardens <i>(Bongaree)</i>	7	320 private lots	1.9	Entrance and Channels - 50-60
Pacific Harbour <i>(Banksia Beach)</i>	22	840 85 berths 1 marina	2.15	Entrance-130 Channels - 55-60

Table 2.1: MBRC canal estate dimensions

While each canal system provides the same primary function, the design of each canal system is unique requiring specific monitoring and maintenance responsibilities.

2.1.3 Canal Estate Design Depths

A key attribute of the canals is the design depth, providing safe mooring and navigable access. The design depth represents the depth of water available in the channel at Lowest Astronomical Tide (LAT), the lowest tide that can occur excluding atmospheric influences. At LAT, the design depth, together with underkeel clearance requirements, determines the size of vessel that can safely navigate the channel. Vessels larger than the “design vessel” may utilise the canal system, but may not be able to navigate safely during all tidal conditions.

Historically, the depth of many of the canals within each of the estates has been an outcome of the cut and fill balance required to create the adjoining lots and the depth achieved in some parts of the system is well in excess of that required to maintain safe navigation for the design vessel.

Future dredging campaigns have been developed with a view to returning the system to its design depth by removing accumulated sediments. As noted above, the design depth is related to the design vessel, in particular the draft of the design vessel. Table 2.2 below summarises the design depth and design vessel for each canal system.

Table 2.2 Design Draft for each Canal System

	Canal System and Zone	Design Depth (mLAT)	Design vessel (m)* Length	Draught
	1 Bribie Gardens			
1.1	Canals	-2.00**	10.00	1.00
1.2	Entrance Channel	-2.00		
	2 Pacific Harbour			
2.1	Lower Pacific Harbour	-2.15	15.00	1.20
2.2	Upper Pacific Harbour	-1.80		
2.3	Marina	-2.90		
	3 Newport			
3.1	Canals	-1.85	15.00	1.20
3.1	Entrance Channel	-2.40		
3.2	Marina North	-3.00		
3.3	Marina South	-2.40		
	* Design vessel draughts are derived from each LTMP			
	** Bribie Gardens Design Depth is not a "mLAT" depth, since the canal system is within an enclosed and artificially raised lake system. Depths should be read as RL.			

Appendix D attaches maps of each of the canal systems, identifying the design depth for each of the canal zones. Periodic hydrographic surveys will identify channels where siltation above or approaching a trigger level has occurred, requiring dredging. For the purposes of estimating future dredging needs and costs, the Long Term Maintenance Plans have forecast channel siltation based on historic hydrographic surveys and dredging records.

The design vessel draft dictates the design depth in the majority of the channels at Newport and Pacific Harbour. However, in the marinas within those systems, a deeper design depth is maintained, such that vessels larger than the design vessel (both in terms of length and draft) can be safely moored for all tides. As noted previously, such larger vessels may not be able to safely navigate during all tides and it is the responsibility of the vessel skipper to ensure there is sufficient tide to permit safe passage.

3 Levels of Service

The service level definitions are contained in Appendix B Table 3.1 of Council's adopted Strategic Asset Management Plan.

Legislative Requirements

The following legislative requirements have been considered in conjunction with the community and technical service levels, policies, standards and guidelines listed in Appendix E.

Table 3.1 Relevant Legislation

<i>Legislation</i>	<i>Requirement</i>
Local Government Act 2009	Sets out role, purpose, responsibilities and powers of local governments including the preparation of a long term financial plan supported by asset management plans for sustainable service delivery.
Australian Accounting Standards	Sets out the financial reporting standards relating to the valuation and depreciation of Councils infrastructure assets
Commonwealth Environment Protection and Biodiversity Act 1999	Sets out the requirements to sustainably protect the environment and biodiversity during both the construction and life of the asset.
Disaster Management Act 2003	Requires MBRC to plan for mitigation of the impacts of natural disasters.
Planning Act 2016 (previously Sustainable Planning Act 2009)	Sets out the requirements to plan for trunk infrastructure to support development.
Land Act 1994	Sets the requirements for physical land management and protection during development.
Coastal Protection and Management Act 1995	To provide the protection, conservation, rehabilitation and management of the coast, including its resources and biological diversity during development or maintenance of the assets
Fisheries Management Act 1994	Aims to protect Queensland's Fisheries
Vegetation Management Act 1999 and regulations	To regulate the clearing of vegetation to prevent biodiversity loss across the region
Water Act 2000	To advance sustainable management and efficient use of water.
Transport Operation (Maritime Safety) Act 1994 and 2016 Regulation	Ensuring marine safety across the region through the application of minimum navigation standards for assets and maintenance

3.1 Community Levels of Service

<i>Service Attribute</i>	<i>Service Objective</i>	<i>Performance Measure Process</i>	<i>Current Performance</i>	<i>Expected performance in 10 years (LTFF)</i>
Quality	Canal estate assets in good condition and provide a high degree of amenity.	Number of CSRs / WOs / issues relating to the amenity of MBRC maintained assets.	Remedial (cleaning / debris removal) works performed during AMT inspections. Weekly Newport. Fortnightly Bribie Gardens & Pacific Harbour.	MBRC maintains the level of service aligned to the LTMPs.
	MBRC maintained canal estate assets are maintained to the required safety standards.	Number of safety incidents related to MBRC owned canal assets.	Incidents report through canal advisory groups relating to MBRC maintained assets.	Zero safety incidents relating to canal design or maintenance works.

<i>Service Attribute</i>	<i>Service Objective</i>	<i>Performance Measure Process</i>	<i>Current Performance</i>	<i>Expected performance in 10 years (LTFF)</i>
Function	Canals facilitate safe navigation to / from berthing facilities.	Number of marine craft groundings.	Dredging activities performed based on trigger levels within LTMPs.	Zero marine craft groundings for vessels up to the design vessel dimensions. Dredging activities completed based on LTMPs.
	Canal facilities meet standards required for effective erosion protection.	Number of projects to reinstate erosion protection.	Canal estate erosion protection reinstated on a reactive basis.	Erosion protection managed / reinstated based on priority and LTMPs to maintain safety and operation.

3.2 Technical Levels of Service

<i>Service Attribute</i>	<i>Service Objective</i>	<i>Activity Measure Process</i>	<i>Current Performance</i>	<i>Desired Optimum Lifecycle Target</i>	<i>Agreed Sustainable Solution</i>
Maintenance	Adequate toe protection of revetments.	Annual inspection (where visible) of revetment condition.	Revetment toe protection is reinstated to design levels when erosion issues are identified.	Revetment toe protection managed to condition state 2 or better.	Revetment toe protection managed to condition state 2 or better
	Canals are maintained to the agreed depths as outlined in the LTMPs.	Canal dredging program aligns with the trigger points as outlined in the LTMPs.	Canals are dredged as per the LTMPs depth trigger levels.	Canal dredging performed in accordance with the LTMP levels.	Canal dredging performed in accordance with the LTMP levels.
	Canal lock to be available & operational (except when shut down for planned maintenance activities)	Number of requests / WOs / issues raised to reinstate the operation of the canal lock. Number of hours canal lock is not operational (excluding planned maintenance activities).	Canal lock returned to operational state within 4 hrs (excluding planned maintenance activities). Lock shutdowns are planned with adequate notifications to canal associations.	Zero canal lock shutdowns due to ad-hoc maintenance. Canal lock only shut down for planned maintenance activities. Routine inspection identify issues before they become failures and works are planned for adequate shut down notifications.	4 hr response time to action canal lock failures. Canal lock only shut down for planned maintenance activities.
	Rectifications are planned and actioned	Number of CSRs with records of response time.	Number of CSRs with records of	CSRs are actioned and issues / damage are rectified /	CSRs are managed in accordance with MBRC priority

MBRC Canal Estates Portfolio Asset Management Plan (A15445112)

	on a priority basis.		response time to action.	completed within 4 hrs. LTMPs are updated to show changes in renewals priority.	levels. Rectifications are planned and actioned on a priority basis.
Asset condition / inspections	MBRC controlled assets are condition assessed on an annual basis	Condition inspection schedule created in Tomas. Condition rating recorded against each MBRC maintained asset	Inspection conducted annually. Condition data currently captured for canal depths and batters	Annual condition assessment of MBRC maintained canal estate assets. Condition rating on every MBRC maintained asset. LTMPs are updated to show changes in renewals priority.	Condition assessment timeframes in accordance with LTMP. Condition rating is recorded on every MBRC maintained asset. LTMPs are updated to show changes in renewals priority.
Capital programming - renewals / replacement	MBRC maintained Canal estate components are in condition state 1 & 2 (refer Section 5.2)	MBRC maintained canal estate condition profile.	Renewal project currently identified in the LTMPs.	MBRC maintained canal estate asset are in condition state 1 & 2	MBRC maintained canal estate asset are in condition state 1 & 2
	Canal estate renewals projects are as per LTMPs and the asset's optimal life cycle	Canal estate renewal projects as identified in the LTMPs are programmed into the budget	Renewal project currently sit in the LTMPs.	Renewal projects identified in the LTMPs or through inspection programs are programmed into the budget	Renewal projects identified in the LTMPs or through inspection programs are programmed into the budget

AI-CE002 - Perform annual review including prioritisation of activities listed within the Canal Long Term Management Plans (LTMP) as per Appendix F

AI-CE003 - For maintenance activities, undertake an annual review of the Technical Levels of Service (LoS) and associated Performance Measures in conjunction with the annual review of the Canal LTMPs

4 Future Demand

Refer to section 4 of Appendix B of Council's Strategic Asset Management Plan for further information on the key demand drivers to be considered.

Assets within Canal Estates may be impacted by climate change impacts including rising sea levels and increased storm intensity. The Coastal Hazard Adaptation Strategy (CHAS), currently being developed by Council, will provide guidance on how MBRC and the community can respond and adapt to climate change impacts in the coastal zone.

5 Asset Lifecycle Management

Best practice for asset management requires the consideration of whole of life assets costings and activities.

5.1 Asset Capacity and Performance

One of the key performance indicators for MBRC's canal network is its condition. Canals are considered dynamic systems susceptible to issues caused by frequent change in marine environmental conditions. In response, canal assets are assessed using the following criteria:

- **Serviceability:** the extent and significance of serviceability defects that affect lock operation; channel navigable access; erosion and slumping of canal batter or beaches, revetment wall stability and vegetation build-up.

5.2 Condition and Profile

Canal estate assets are managed in accordance to MBRC Canal Long Term Maintenance Plans (LTMPs) and guidelines as published on Council's website (Refer to Appendix F for website links). Deterioration factors that affect asset condition are listed in the section 5.3 Risk Management.

MBRC currently utilise two sources to assist assigning an overall asset condition rating for each canal type or component. Ratings start from 1 being very good or new, to 5 being very poor. The other source utilised for condition rating purposes is the Wharf Structure Condition Assessment Manual (WSCAM) 2014 specific to marine structures.

AI-CE004 - Assign and implement a consistent condition rating score to all canal estate components.

5.2.1 Recommended Canal Condition Inspections

It's recommended that canal estate assets be inspected using a 3-level program shown below:

- **Level 1 Visual inspection** - inspection by Asset Maintenance of the canal estate components for condition, maintenance defects, or assets requiring monitoring that will trigger level 2 detailed inspection.

- **Level 2 detail inspection** - investigation by qualified persons concerning matters of structural integrity and safety, identified through level 1 inspections. A prioritised scope of works and costing estimate to rectify defects and / or remedial repairs.
- **Level 3 engineering inspection** - as required based on the recommendations of the level 2 engineering inspection. The outcome of level 3 inspections include the preparation of detailed, costed, RPEQ approved designs for renewals / upgrades / replacement projects, associated with the particular asset.

Table 5.2.1a outlines the maintenance activities that are required to be performed as part of the recommended inspection program

Table 5.2.1a Proposed condition inspection program activities

<i>Canal Component</i>	<i>Components</i>	<i>Inspection Level</i>	<i>Recommended Schedule</i>	<i>Estimated Cost</i>	<i>Internal or External Resources</i>
Canal	Batters / Beaches Revetment Walls (MBRC) Fence at easement ends	Level 1 - Visual Inspection	Annual	\$1,200	Internal - AM
	Batters (MBRC) Revetment Wall (MBRC) Fence at easement ends	Level 2 - Engineering Inspection	5 yearly pre & post dredging (Dredge area only)	\$2,500	Internal - DWCP
Lock and Weir (facility / complex)	Security fencing Lighting Traffic light Ladders Lock bay / shell Walkways Gates Gearbox / motors	Level 1 - Visual Inspection & operational test	Annual	\$250	Internal - AM
	Card Reader Access System: • Swipe card controller • Switchboard • Residual Current Device (RCD)	Level 1 - Visual Inspection & operational test	Annual (6 months for RCD's)	\$120	Internal - AM
	Lock bay / shell Walkways Gates Gearbox / motors	Level 2 - Engineering Inspection (Note: includes draining lock bay)	5 years	\$1,500	Internal - DWCP
	Steel shutters (stored at depot)	Level 1 - visual inspection	Annual & Pre-works inspection	\$250	Internal - AM
Spoil Pond	Pond channel and batters	Visual Inspection	Aligned with dredging program LTMPs	\$250	Internal - AM
	Outlet flow control structures				
Marine Signage	Sign Post Connection	Level 1 - Visual Inspection	2 years	\$250	Internal - AM

Navigation Aids	Mains or Solar Power lights / leads Depth Markers Signage (speed & other)	Level 1 - Visual Inspection	Annual (buoys & fixed signage) 2 years (beacons / leads & fixed signage)	\$1,000	Internal - AM
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AI-CE005 - Develop and implement MBRC Level 1 and 2 canal asset inspection specification.

5.2.1.1 Navigable Channels

Hydrographic surveys of the navigable channel are used to identify the dredging zones and forward plan dredging campaigns for the canal estate. These zones are reflective of improved canal management practice as detailed in the LTMPs – refer to MBRC website: (<https://www.moretonbay.qld.gov.au/waterways/canals/>).

5.2.1.2 Canal Batter Condition

Figure 5.3.1a lists the condition states at selected inspection points locations at the 3 canal estates.

Figure 5.2.1.2a Canal estates condition state at identified locations

Condition State	Count (and %) of Assets			
	<i>Bribie Gardens Mar 2017</i>	<i>Newport Waterways 2015</i>		<i>Pacific Harbour 2015</i>
	<i>Batter</i>	<i>Erosion</i>	<i>Beach Depletion</i>	<i>Rock Batter</i>
1	170 (58%)	321 (87%)	177 (48.1%)	159 (69.8%)
2	81 (27%)	39 (11%)	153 (41.6%)	55 (24.1%)
3	26 (9%)	-	37 (10.1%)	14 (6.1%)
4	14 (5%)	8 (2%)	1 (0.3%)	-
5	4 (1%)	-	-	-
Total	295 (100%)	368 (100%)	368 (100%)	228 (100%)

Overall, most canal estate assets inspected are rated as good or fair (condition states 1 or 2 respectively).

AI-CE006 - Collect and import canal batter data against created assets into Tomas Asset Register with spatial GIS representation. Condition to continue to be monitored.
AI-CE007 - Implement a process to record defects above MBRC intervention levels based on hydrographic survey data

5.2.1.3 Lock and Weir

A level 2 engineering inspection was completed August 2016 as part of Bribie Gardens Residual Life Assessment Report documenting its overall condition rating as good to average. Key findings included low concrete reinforcement cover, corrosion and wear of the lock gates and small repair defects.

The Wharf Structure Condition Assessment Manual (WSCAM) 2014 is used as best practice in regard to the visual inspection criteria in contrast to the inspection method criteria used for other MBRC marine assets. It is recommended that MBRC use the WSCAM manual for reference in understanding the detail or methodologies consultants use and for comparison against current customised condition criteria.

AI-CE008 - Create and implement a routine lock facility inspections and condition program to be scheduled into MBRCs asset management system.
AI-CE009 - Use WSCAM to investigate / unify the visual inspection condition state criteria (WSCAM or DTMR) across all marine assets.
AI-CE010 - Condition score lock and weir structure and components in accordance NAMS condition rating scale

5.2.1.4 Dredge Pond

The dredge pond is inspected pre and post dredging activities and is the responsibility of the contractor conducting dredging activities.

5.2.1.5 Marine Signage and Navigation Aids

Marine Safety Queensland (MSQ) inspect and maintain the navigation aids and marine signage at canal entrances and within channels, exclusive of signage on bridges and Newport fingerboard signage. MBRC receive the invoice for all rectification works from inspection findings.

5.2.2 Defects

Defects allow MBRC to record identified issues that do not represent a safety or operation risk to MBRC that can be managed at a later time or as a flag for further monitoring through the inspection program.

AI-CE011 - Develop and implement a defect identification process as part of the canal condition inspections and a risk based prioritisation process.

5.2.3 Modelling and Monitoring

The performance and maintenance of the canal estate is defined in the Canals LTMP.

5.2.4 Resourcing

Canal asset condition inspection and management has been shared and organised by DWCP. Resources currently allocated to the canal asset categories include:

- Level 1 visual condition inspections organised and completed by AM and reviewed by DWCP.
- Level 2 inspections are organised by DWCP
- AM for reactive maintenance and planned maintenance in accordance to the LTMP budgets
- PMC for dredging works or major repair projects
- MSQ inspectors for marine safety or navigation aids.

5.2.5 Recommended Resourcing

The following is the recommended resourcing to be allocated and budgeted for the management of canal estate assets:

- Level 1 visual inspector/s performed by AM to accommodate the inspection frequencies
- Level 2 detail inspections - suitable resources from DWCP to complete assessments.
- Level 3 engineering assessment - As determined by the level 2 detail inspection

- AM mechanical and electrical contractors assigned to lock facility cyclic maintenance

AI-CE012 - AM team to allocate resources to complete level 1 inspections and DWCP to allocate resources to complete level 2 inspections

5.3 Risk Management Plan

The following factors are major contributors to canal deterioration or performance and are key considerations in the canal network assessing the risk of the canal network:

- Weather conditions and climate change
- Sedimentation build-up in channels
- Lack of maintenance
- Unlawful construction
- Marine fauna and vegetation

5.4 Routine Maintenance Plan

The Canal Estates Long Term Maintenance Plans are available on the MBRC website which detail the maintenance strategies. They have been listed in Appendix F. In accordance with these approved plans, the regime of maintenance activities is applied across the network. This includes maintenance tasks specifically attributed to each canal asset category. Any maintenance works in the entrance channel or canals require marine safety and environmental approvals prior to commencement.

5.4.1 Current Maintenance Plan

Overall canal maintenance performance is reviewed by each canal estate advisory group and their activities undertaken in accordance to their respective Terms of Reference Document. Maintenance priority is focused on ensuring the integrity of each canal estate component.

Maintenance Standards and Specifications

Maintenance work is carried out in accordance with the following minimum standards, specifications and procedures:

- Canal Group: Terms of Reference (Pacific Harbour, Bribie Gardens, Newport Waterways)
- Bribie Gardens, Newport Waterways and Pacific Harbour Canal LTMPs
- MRBC Website Fact Sheets
- MBRC Local Law 1 (Administration) 2011
- MBRC Website Newport Canal System - Pontoon Envelope Guideline
- Pacific Harbour Draft Canals Cleaning Operational Instruction

5.4.2 Recommended Maintenance Plan

The optimal approach for managing canal assets is a routine inspection and maintenance program to ensure the assets meet their design intent and does not disrupt or negatively impact customer LoS.

The recommended planned maintenance schedule is provided in Table 5.5.2a as a proactive approach to be delivered in alignment with the approved canal LTMP budgets.

Table 5.4.2a - Recommended Planned Maintenance Schedule

<i>Canal Component</i>	<i>Components</i>	<i>Maintenance Task</i>	<i>Minimum Recommended Schedule</i>
Canal	Batter Beaches Revetment wall	Litter removal on batters	Weekly - Newport Fortnightly - Pacific Harbour & Bribie Gardens
		Floating litter removal	Weekly - Newport Fortnightly - Pacific Harbour & Bribie Gardens
		Wall drainage (weephole) blockage clearing	Annual on MBRC owned walls. Note: Property owners are responsible for inspections associated with their private property revetment walls.
		Refill of sink holes behind public walls	Based on level 1 inspection
		Dry excavation for batter siltation	Based on level 1 inspection
		Vegetation	Annual (Newport) As required (Bribie Gardens & Pacific Harbour) Post storm as required
		Channel (entrance or main channel)	Localised dredging around pontoons, mid-channel
	Navigational hazards (trees, logs, drums etc.)		Refer to Maritime Safety Queensland (MSQ)
	Beach erosion and slumping rectification		As required
	Weir Components	Grill	Rubbish and debris removal
Fencing		Corrosion or damage repairs	Fortnightly
Landing		Wear or damage repairs	Fortnightly
Lock Components	<ul style="list-style-type: none"> • Card Reader Access System: Swipe card • Switchboard • Residual Current Device (RCD) • Emergency gate stop 	Test	Annual 6 monthly for RCD's
	Lock Bay: <ul style="list-style-type: none"> • Fenders and cables • Gates • Gates, gate seals and coating • Ladders 	Test operation Desilting Corrosion or damage repairs	Annual (above water level) As required (with draining of lock bay)
	Lighting	Test Repair	Annual and repair as required
	Fencing	Corrosion or damage repairs	As required
Dredge Pond	Pre & post dredging activity		
Marine Signage	Directional Informative (Depth Markers)	Compliance Wear	As required

	Safety (speed & other)		
Navigational Aids	Mains or Solar Power lights / leads	Wear Test Operation	Refer to Maritime Safety Queensland (MSQ)

AI-CE013 - Review and implement current maintenance schedules. Implement or update to include defects, condition inspections data and costings.

Improvements or proactive approaches to the following key areas will assist in improving canal maintenance on top of the cyclic planned maintenance schedule described above:

- **Lock facility usage data** – monitoring of lock usage to gain a better understanding of how and when the lock facility is utilised. This data can be used for future maintenance activities where the lock facility need to be shut down for an extended period.
- **Limited budget** – MBRC to look at new innovations and technology to improve the whole of life costs of the canal estate assets.

AI-CE014 - Investigate the ability to track usage of lock facility
 AI-CE015 - Investigate innovation and technology applications

5.5 Renewal/ Replacement Plan

5.5.1 Current Renewal/ Replacement Plan

There are currently no renewal projects for Council controlled canal revetment walls within the 10-year budget.

5.5.2 Recommended Renewal / Replacement Plan

There are no recommended renewal / replacement plans for Council controlled canal estate assets.

5.5.3 Creation/ Acquisition/ Upgrade

There are currently no expansion plans for creation, acquisition or upgrade of council controlled canal estates. Private canal property subdivision continues and may impact maintenance financial figures.

5.5.4 Disposal Plan

Canals as whole assets are not disposed; however, a disposal plan may be required for the canal infrastructure components including lock facility equipment, revetment walls, signage and other assets.

6 Systems

Refer to Section 6 of Appendix B of Council's adopted Strategic Asset Management Plan for a list of corporate systems used to manage canal estate assets.

7 Financial Summary

7.1 Useful life

When assets are recognised, each asset is attributed with an estimated useful life, which is used as a basis for determining depreciation and long-term financial forecasting requirements.

7.1.1 Current Useful Lives for Canal Assets

MBRC have recorded the useful life for each canal asset in the financial register as follows:

- Lock facility - 75 years
- Revetment walls - 50 years

As a general rule, the engineered design life for marine structures is 50 years.

7.1.2 Estimated Remaining Useful Life for Canal Assets

The estimated remaining useful life varies depending on the construction, material and condition of the assets. These factors are required to calculate the estimated remaining useful life (ERUL) for each asset.

As future condition assessments are completed, the estimated remaining useful life of each asset can be updated in the financial asset register.

7.2 Financial Statements and Projections

The following financial figures are for the three canal estate assets currently listed in Council's financial register.

7.2.1 Valuations

As at 2014 and estimated future year valuations (\$) for the canal network are as follows:

Table 7.2.1.1 Canal Network Future Year Valuations

<i>Description</i>	<i>2018/19</i>	<i>2019/20</i>	<i>2020/21</i>	<i>2021/22</i>	<i>2022/23</i>
Total Replacement Value (TRV)	195,418,297	195,418,297	195,418,297	195,418,297	195,418,297
Written Down Value (WDV)	193,246,899	193,170,755	193,094,820	193,018,885	192,942,950
<i>Description</i>	<i>2023/24</i>	<i>2024/25</i>	<i>2025/26</i>	<i>2026/27</i>	<i>2027/28</i>
Total Replacement Value (TRV)	195,418,297	195,418,297	195,418,297	195,418,297	195,418,297
Written Down Value (WDV)	192,866,806	192,790,871	192,714,936	192,639,001	192,562,857

7.2.2 Annual Depreciation Expense for Canal Assets

Table 7.2.2.1 lists the depreciation figures for the canal estate assets, the final total annual depreciation expense (all figures in \$):

Table 7.2.2.1 10-YR Annual Depreciation Expense Projection using Straight-Line Method (all figures in \$)

<i>Description</i>	<i>2018/19</i>	<i>2019/20</i>	<i>2020/21</i>	<i>2021/22</i>	<i>2022/23</i>
Depreciation Expense	75,935	76,144	75,935	75,935	75,935
<i>Description</i>	<i>2023/24</i>	<i>2024/25</i>	<i>2025/26</i>	<i>2026/27</i>	<i>2027/28</i>
Depreciation Expense	76,144	75,935	75,935	75,935	76,144

The depreciation values show in table 7.2.2.1 only considers MBRC owned revetment walls and the lock and weir.

7.2.3 Maintenance Expense for Canal Assets

Budget for canals maintenance is allocated from capital/operational or reactive maintenance budgets.

Proposed Budget

The projected 10-year canal maintenance budget (\$) for canals is shown in Table 7.2.3a

Table 7.2.3a Proposed 10YR Maintenance Budget (all figures in \$)

<i>Description</i>	<i>2018/19</i>	<i>2019/20</i>	<i>2020/21</i>	<i>2021/22</i>	<i>2022/23</i>
Newport Waterways Maintenance	59,000	3,566,350	119,000	119,000	3,043,200
Bribie Gardens Maintenance	211,200	146,200	86,200	186,200	126,200
Pacific Harbour Maintenance	63,700	57,200	6,028,200	5,669,200	147,200
<i>Total</i>	333,900	3,769,750	6,233,400	5,974,400	3,316,600
<i>Description</i>	<i>2023/24</i>	<i>2024/25</i>	<i>2025/26</i>	<i>2026/27</i>	<i>2027/28</i>
Newport Waterways Maintenance	214,000	119,000	3,374,550	119,000	154,000
Bribie Gardens Maintenance	824,200	86,200	211,200	111,200	116,200
Pacific Harbour Maintenance	57,200	92,200	22,200	92,200	77,200
<i>Total</i>	1,095,400	297,400	4,212,500	322,400	347,400

Maintenance Budget

The funding to support the delivery of the maintenance activities is generated through a special charge paid by waterfront residential properties and commercial entities, together with a contribution from MBRC's general maintenance budget. The special charge amounts are calculated based on long-term maintenance models applicable for each Canal estate.

7.2.4 Capital Expenditure for Canal Assets

Currently, MBRC assigns no capital expenditure to canal estate assets. In future, as condition data for Council's canal estate assets is captured and monitored, renewal expenditure will be derived from this condition information and will influence future budgets.

7.2.5 Date of Valuation and Valuation Methodology

The last canal asset revaluation took effect as at March 2018.

8 Improvement and Monitoring

During the preparation of the Canal Estate Portfolio Asset Management Plan, a number of issues and improvement items have been identified and are set out in the table below.

Table 8a Action Plan

<i>Action No.</i>	<i>Detail</i>	<i>Responsibility</i>	<i>Due date</i>
AI-CE001	Develop and implement a plan to capture and update canal assets, attributes and MBRC Asset Capture Guidelines.	AMT & DWCP	Q4 2018/19
AI-CE002	Perform annual review on Canal Long Term Management Plans	DWCP	Ongoing
AI-CE003	Review LoS performance measures in conjunction with the annual review of the LTMPs	DWCP	Ongoing
AI-CE004	Assign and implement a condition rating to all canal estate components.	AMT & DWCP	Q4 2018/19
AI-CE005	Develop and implement MBRC Level 1 & 2 canal asset inspection criteria.	DWCP	Q3 2018/19
AI-CE006	Collect and import canal batter data against created assets into Tomas Asset Register with spatial GIS representation. Condition to continue to be monitored.	AMT & DWCP	Q1 2019/20
AI-CE007	Assign a condition or state to navigable channels based on hydrographic survey data	DWCP	Q4 2018/19
AI-CE008	Create and implement a routine lock facility inspections and condition program to be scheduled into MBRCs asset management system.	DWCP	Q3 2018/19
AI-CE009	Use WSCAM to investigate / unify the visual inspection condition state criteria (WSCAM or DTMR) across all marine assets	DWCP & AMT	Q2 2020/21
AI-CE010	Condition score Lock and Weir structure and components in accordance NAMS condition rating scale	DWCP & AMT	Q3 2018/19
AI-CE011	Develop a defect identification process as part of the canal condition inspections and a risk based prioritisation process.	DWCP, AMT & AM	Q3 2018/19
AI-CE012	AM team to allocate resources to complete level 1 inspections and	DWCP & AM	Q3 2018/19

<i>Action No.</i>	<i>Detail</i>	<i>Responsibility</i>	<i>Due date</i>
	DWCP to allocate resources to complete level 2 inspections		
AI-CE013	Review and implement current maintenance schedules. Implement or update to included defects, condition inspections data and costing	AMT, DWCP & AM	Q4 2018/19
AI-CE014	Investigate the ability to track usage of lock facility	DWCP	Q4 2018/19
AI-CE015	Investigate innovation and technology applications	DWCP	Q3 2020/21

9 Appendices

<i>Appendix no.</i>	<i>Title</i>	<i>Referenced Section</i>
Appendix A	Canal Estates Aerial View	2.1
Appendix B	Typical Canal Profiles and Responsibilities	2.1
Appendix B	Canal Revetment Wall Summary, Design and Locations	2.1
Appendix C	Griffith Road, Newport Spoil Pond Schematic and Aerial Imagery	2.1
Appendix D	Design Depths for Newport Canal Zones	2.1
Appendix E	Additional Legislation and Guidelines	3
Appendix F	Canal Long Term Maintenance Plans (LTMP)	3

Appendix A - Canal Estates Aerial View (Pacific Harbour, Bribe Gardens, Newport Waterways)



Appendix B - Canal Revetment Wall Summary, Design and Locations

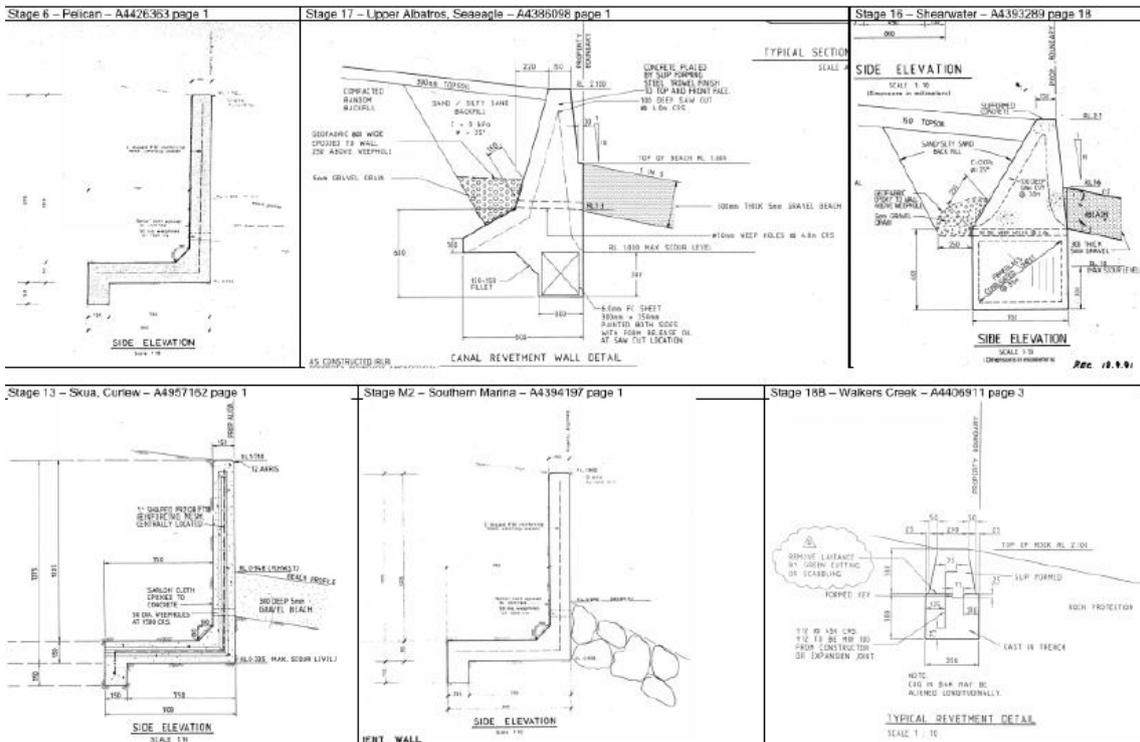
Table 1: CANAL WALL SUMMARY

Location	Wall Length Totals (m)	Number of properties	Average length/property
BANKSIA BEACH - Pacific Harbour	21865.19	889	24.60
Council controlled land	1077.78	76	14.18
Reinforced Concrete	1077.78	76	
2.29m wall height	1069.78	74	
1.22m wall height	8.00	2	
Private property	20787.41	813	25.57
Reinforced Concrete	20787.41	813	
2.29m wall height	19876.55	785	
1.22m wall height	910.86	28	
BONGAREE - Bribe Gardens	7175.32	312	23.00
Council controlled land	820.09	23	
Mass Concrete	820.09	23	
0.5m wall height	146.59	3	
0.9m wall height	512.49	19	
unknown	161.01	1	
Private property	6355.23	289	21.99
Mass Concrete	6355.23	289	
0.5m wall height	196.50	8	
0.9m wall height	6158.74	281	
NEWPORT - Newport Waterways	14698.37	554	26.53
Council controlled land	1130.37	29	38.98
Concrete Flush Strip	394.24	7	
0m wall height	394.24	7	
Mass Concrete	251.01	9	
0.5m wall height	251.01	9	
Reinforced Concrete	485.12	13	
0.76m wall height	213.06	7	
0.61m wall height	121.78	2	
0.91m wall height	150.28	4	
Private property	13568.00	525	25.84
Concrete Flush Strip	3063.64	89	
0m wall height	3063.64	89	
Mass Concrete	2239.47	89	
0.5m wall height	2239.47	89	
Reinforced Concrete	8264.89	347	
0.76m wall height	2327.48	105	
0.952m wall height	450.11	3	
0.61m wall height	2272.32	108	
0.91m wall height	3214.99	131	
Grand Total	43738.88	1755	24.92

a) Newport Waterways Public Revetment Wall Locations



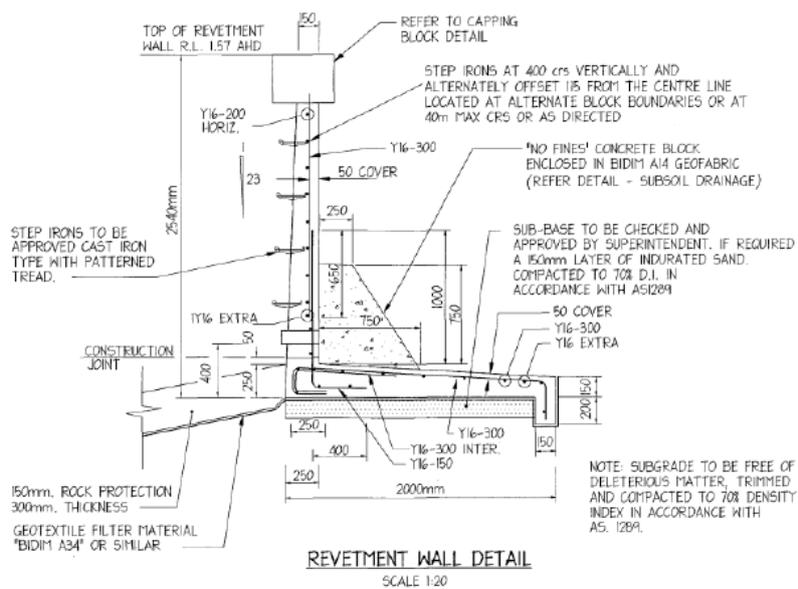
b) Newport Revetment Wall Design



c) Pacific Harbour Public Revetment Wall Locations



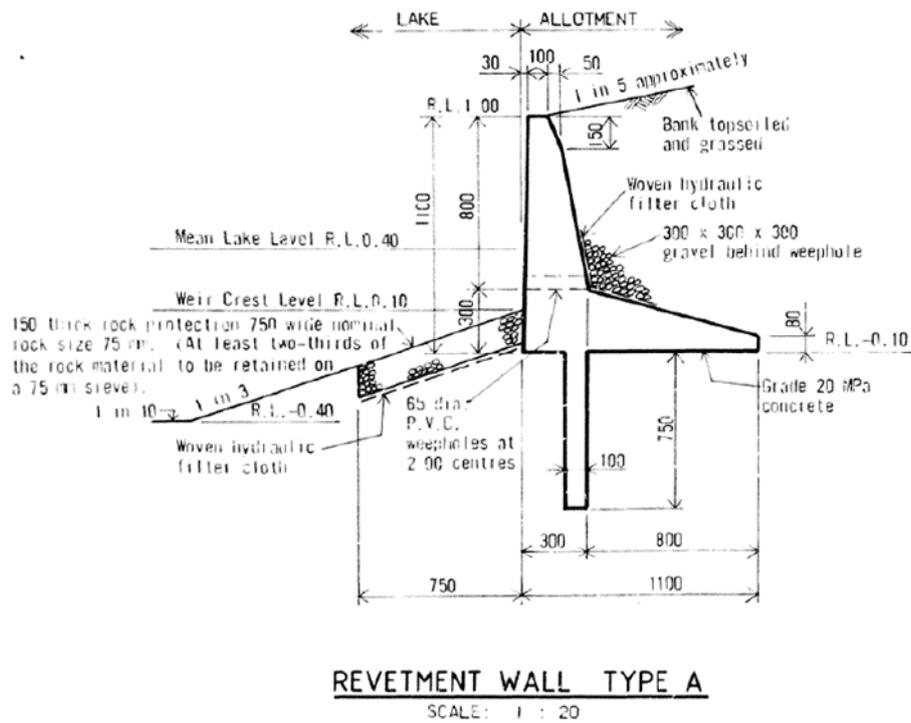
d) Pacific Harbour Revetment Wall Design (example)



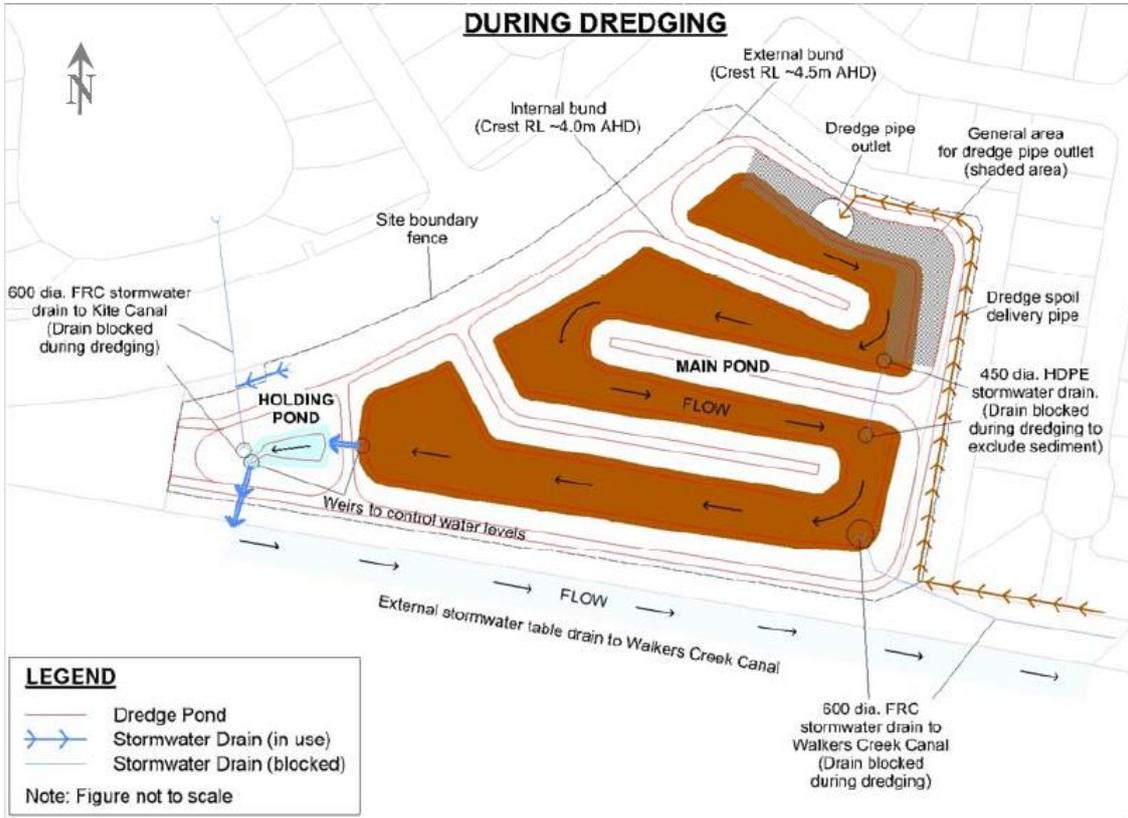
e) Bribe Gardens Public Revetment Wall Locations



f) Bribe Gardens Public Revetment Wall Design (example)



Appendix C - Griffith Road, Newport Spoil Pond Schematic and Aerial Imagery



Appendix D - Design Depths for each Canal System

Newport



Bribie Gardens



Pacific Harbour (North)



Pacific Harbour (South)



Appendix E - Additional Legislative Policies and Guidelines

- Environment and Heritage Floodplain Management Plans
- Climate change - Council endorsed a Climate Change Policy (No.14-2150-075) to raise awareness of climate change and to better manage local greenhouse emissions.
- Australian Rainfall and Runoff 1987 (Format and Presentation update only for 2000)
- Civil Liability Act 2002 and Civil Liability Amendment (Personal Responsibility) Act 2002
- Environmental Protection Act 1993
- Water Management Act 2000
- Marine Parks (Moreton Bay) Zoning Plan 2008
- Marine Parks Act 2004
- Transport Operation (Marine Pollution) Regulation 2008
- Canal Act 1958/79 and amendment
- Planning Regulation 2017
- Enterprise Risk Management (ERM) Policy (No. 10-2150-020) and Policy Directive (No.: 10-2160-004)
- Environmental Protection Water Policy 2009
- Healthy Waterways
- State Planning Policy 2014
- MBRC Planning Scheme and Planning Scheme Policies.
- AS 3962-2001 (Guidelines for Design of Marinas)
- National Assessment Guidelines for Dredging (NAGD) 2009
- Workplace Health and Safety Act 1995
- Maritime Safety Queensland Beacon to Beacon Guide - Moreton Bay 2017

Appendix F - Canal Long Term Maintenance Plans

Newport Waterways - Long Term Maintenance Plan:

<https://www.moretonbay.qld.gov.au/uploadedFiles/common/publications/Newport-waterways-long-term-maintenance-plan.compressed.pdf>

Bribie Gardens - Long Term Maintenance Plan:

<https://www.moretonbay.qld.gov.au/uploadedFiles/common/publications/bribie-gardens-long-term-manitenance-plan.compressed.pdf>

Pacific Harbour - Long Term Maintenance Plan:

<https://www.moretonbay.qld.gov.au/uploadedFiles/common/publications/Pacific-Harbour-Long-Term-Maintenance-Plan.compressed.pdf>