

COLERAINE MARINA GANGWAY REPLACEMENT, DREDGING & SERVICES UPGRADE	3rd May 2016
ENVIRONMENTAL SERVICES COMMITTEE REPORT	
FOR DECISION	

Linkage to Council Strategy (2015-19)	
Strategic Theme	Protecting and Enhancing Our Environments and Assets
Outcome	Protect, enhance and promote opportunities for greater enjoyment of our natural environment
Lead Officer	John Richardson
Cost: (If applicable)	Provision in Capital Programme - £80,000.00

The purpose of this Report is to request permission to progress this project to Stage 2 of the Capital Programme Management System (Procurement of a contractor)

Background

Further to a condition survey inspection at Coleraine Marina, the following defects have been identified which give rise to health and safety concerns in relation to patrons' use of the Marina Facilities;

- Intermediate gangway landing is not operating correctly due to a number of defects in the concrete deck and existing flotation blocks causing it to skew off level with the tidal rise and fall.
- Foundation supports have settled since first installed with the result that the top slab sits off level.
- pontoons are bottoming out at low tide resulting in areas of the marina being unsuitable for berthing
- Electrical faults detected at pontoon service points
- Water supply to the pontoon requires upgrading to comply with Water Regulations

A series of preliminary design options have been developed to address the above defects and estimate anticipated repair costs. (Refer to Appendix III)

A full tender report will be brought to Members in due course to allow a further investment decision to be made.

Recommendation

It is recommended the Environmental Services Committee approve:

- Progression of this project to Stage 2 of the Capital Programme Management System (Procurement of a contractor) and the preparation of Final Business Case.

Replacement of Gangways, Pontoons and Upgrades to Services

At Coleraine Marina

**Causeway Coast & Glens
Borough Council**

**N15/341
April 2016**

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1.0 Report

Background Project Information

Ivan Scott Associates Ltd. was instructed by Causeway Coast & Glens Borough Council to assess the existing defective half-landing and associated pontoon gangways at Coleraine Marina and to examine suitable alternative solutions to address the problems encountered.

Gillespie & Cummings was also appointed by the Client to provide a Condition Report assessing the Engineering Services Installations at the Marina and to identify any elements in need of repair, replacement or upgrading.

A copy of these reports is included in Appendix A and Appendix B.



Figure 1 - Coleraine Marine (Source: Google)

2.0 Assessment of Existing Marina Gangways and pontoons

At present the gangways and landing pontoons are in a defective state. The following issues were identified:

- Siltation of river bed – main pontoons ground on river bed and rotate in extreme low water due to silted bed profile.
- Broken floatation blocks – damaged concrete surround and shear failure of connections to slab deck.
- Gabion failure and slab settlement – deformation likely due to degradation of foundation.
- Trapped debris under half-landing
- Fixed hinges at ends of gangways inducing additional stresses
- Rotation of landing restraint due to rise and fall of river level inducing additional rotation (~3 to 3.5m tidal range)
- Lateral movement on hinges – lower landing pontoon restraint resulting in pull forces transferred in the half landing.

Photographs of the existing half-landing arrangement are included in Appendix A.

The current arrangement has not performed as intended and poses as a Health and Safety hazard to marina users. The existing defective half-landing must be repaired as soon as possible as its condition will progressively worsen, potentially complete failure, hence doing nothing is not an acceptable option for the Client.

Reasons for Failure

- Primarily due to service restraint at hinges and sliding connections.
- Floatation blocks are inadequately secured and are vulnerable to rotation.
- The floatation block connections must be more robust to prevent shear failure; a new floating half landing solution could be considered.
- The existing gangway-pontoon connections are subject to locking in service generating increased stresses and subsequent damage to floatation blocks.
- Existing hinge-hinge connections should be modified to a hinge-roller connection.
- The river bed around the pontoons has silted up. Dredging will be required to correct the bed profile.

Based on this investigative information a number of options were proposed and discussed with the Client in order to overcome the existing site problems. The solutions are shown in diagrammatic form in Appendix A.

3.0 Preferred Remedial Gangway and Pontoon Option

Three different options were discussed with the Client - Details of these design options can be found in Appendix A.

Option 1 - Like for like replacement of existing gangways, half and lower landing pontoons

Option 2 - New single run gangway and landing pontoon

Option 3 - New access gangway from existing gateway

Each of these options had their own advantages and disadvantages but ultimately Option 2 was decided as the most practical and economical remedial option.

Option 2 Proposals

Foundation Proposal

- Dredging of river bed around pontoons.
- New temporary sandbag cofferdam surround to be installed as per Option 1 (if required) to facilitate installations – may depend on Contractor's preference of working methods e.g. crane, barge, cofferdam)
- New dolphin/pile installed and toed into bedrock.*

There is currently an unused dolphin at the marina, which was not installed during the original works. This should be suitable for the new foundation. Rock-breaking may be required to install pile into bedrock.*

Gangway and Landing Proposal

- Existing pontoon gangways and half-landing to be removed.
- New 24m single-run gangway – hinge connection at top, roller connection to landing.
- New landing pontoon connected to existing main pontoons – landing pontoon to manufacturers' design. Type of decking to Client's preference e.g. plastic/timber composite or concrete decking as per existing.

Advantages

- Altered marina layout – area reclaimed for mooring additional small boats.
- Speed of construction in comparison to Option 1
- Foundation installations more straight forward - single pile and dredging.
- Less reliance on foundations.
- Predictable and reliable gangway system.
- Easier access to and from pontoons & shallower gangway gradients
- Easier long term maintenance.
- Neater layout of services
- Less disruption / closure time than Option 1.

Disadvantages

- Temporary closure of marina to install gangway and services – temporary access may be required if necessary.
- Existing marina gangways redundant – to be removed, however the Client may wish to retain these for any future needs.
- Services to boats to be removed and re-routed along new gangway layout - new services may be requested by the Client as part of any M&E upgrade works.

4.0 Assessment of Marina M&E Services

Engineers from Gillespie & Cummings assessed the Engineering Services Installations at Coleraine Marina. Their report is split into two section - Gangway Services and Pontoon Service which outline a number of issues which should be addressed by the Client during the proposed marina upgrade works. The report can be found in Appendix B.

Gangway Services

Existing Water Supply

- The existing water supply line is routed via a blue MDPE supply line which is not securely fixed to the underside of the gangways and landing pontoons.
- The supply line is frequently covered by the river as the level rises, however MDPE is not resistant to the ingress of contaminants.
- The supply line is exposed to sunlight however, blue MDPE is not UV stable and the material is at risk of degradation, failure and susceptible to contamination.
- No backflow contamination prevention.

Water Research Council Guidance Note 9-06-02:

"Water supply pipes must not be installed where they could be immersed in seawater or river water or exposed to sunlight."

Under Health and Safety Regulations there is a legal obligation for the marina operators i.e. the Client to ensure that all employees and visitors are not at risk from contaminated water. All water supplies, including the installation and maintenance of fittings, must be adequately safeguarded. Failing to comply with regulations can result in prosecution.

Existing Electricity Supply

- The electricity supply to the gangway area is via a ducted service from the boatyard to a closed cabinet at the marina access gate.
- Safety hazard due to exposed terminal connectors with no physical protection of local isolation. Signage labelled "Danger 415 Volts".
- Electrical supply and earth cables are loosely tied under the gangway and landing pontoons and pose as a potential risk to person working in the vicinity.
- Loose cables also a risk to users or animals which may stray under the gangway.
- Service duct under gateway is open and at risk to the ingress of vermin and water.

Pontoon Services

Existing Water and Power Bollards

- Bollards and Distribution Boards are generally in a good condition
- Lighting is generally in good working order.
- Electrical installations are compliant with current regulations
- Water service supplies are not compliant with WRC guidance - No protection from backflow contamination e.g. double-check backflow prevention devices or drain cocks
- Blue MDPE loosely fixed and exposed to sunlight along the underside of the Pontoon.
- Electric cables loosely and untidily fixed under pontoons - cables dip into the river in some locations.
- Damage to armoured electrical cable at Northern end of pontoons.

5.0 M&E Upgrade Options

Based on the investigative works by Gillespie & Cummings a number of elements have been highlighted below which the Client should consider repair, replacement and or upgrading.

Priority 1 - Emergency Works -

Require immediate attention for Health & safety and Compliance reasons

- Remove and replace water supply pipe work below Gangway and Pontoons, ensuring proper support and protection from sunlight.
- Removal of hoses & Installation of Notices
- Install lockable local Isolations Switch and perspex cover within Cabinet
- Replace damage Armoured Cable
- Secure and fix all cables under Gangway & Pontoon

Priority 2 - Essential Works -

Installations which should be upgraded for Compliance reasons and should be addressed within a two year period

- Upgrade water stand pipes to comply with backflow contamination protection
- Install WRAS (Water Regulation Advisory Scheme) approved drainage on up-stands
- Test Electrical installation and replace as necessary.

Priority 3 - Remedial/Project Works

Works which are necessary in respect of the proposed Gangway and Pontoon upgrades

- Installation of RPZ (Reduced Pressurized Zone) Mains Water Valve assembly
- Replace MDPE pipe work with WRAS approved pipe work to comply with WRC and Water Bylaw guidelines
- Replace Gate Access System with more modern unit.

6.0 Cost Estimate of Preferred Option

Option 2 – Installation of New Single Gangway and Landing Pontoon

Work Item		Estimated Costs	Comments	
Foundation Works	1. Dredging - Pontoon Foundation Works	£2,500		
	2. Dredging - Remainder of Marina	£20,000		
	3. Pile/Dolphin Installation	£5,000		
	4. Removal of Existing Gangways and Landing Pontoons	£3,700	Cost includes craneage	
	5. Removal of Existing Foundations	£1,500	(£32,700)	
Gangway & Landing	6. New 4m x 3m Landing Pontoon	£4,000		
	7. New 24m Gangway	£15,600		
	8. Installation of Gangway and Landing Pontoon	£3,650	Cost includes craneage	
	9. Supply of pile brackets	£365		
	10. Delivery of Materials	£1,500	(£25,115)	
M&E Works	11. Emergency Works	Replacement of Water Pipe Work	£3,700	
		Hose Removal & Notice Installations	£2,600	
		Local Isolation Switch & Perspex Cover to Electric Cabinet	£750	
		Replacement of Damaged Armoured Cable	£1,200	
		Fixing of Cables to Underside of Gangway	£1,800	(£10,050)
	12. Essential Works	Upgrade Water Stand Pipes	£1,950	
		Install WRAS Approved Drainage to Up-stand	£950	
		Testing of Installations	£800	(£3,700)
	13. Remedial Works	Installation of RPZ Mains Water Valve	£9,500	
		Replacement of MDPE Pipe Work	£2,600	
		Upgrade Gate Access System	£1,600	(£13,700)
	14. Risk / Contingency		£5,000	
	Estimated Total for Preferred Option 2 = <u>£90,265</u>			

Conclusions and Recommendations

The existing gangway and pontoon arrangement at Coleraine Marina is not fit for purpose and poses as a safety hazard for users of the facility.

A number of options for the gangway and landing pontoon arrangement were discussed. The most practical and economical option is to install a new single-run gangway and landing pontoon however the preferred solution will ultimately be decided by the Client.

- More straightforward layout than Option 1 – less variables, more predictability and reliability of performance
- Minimal foundation works required.
- Speed of construction, less connections required
- Reclaimed area of marina
- Easier to maintain.
- Cheaper solution.
- Less disruption to existing users & visitors.

Regardless of which gangway and pontoon system is installed Disabled Access Requirements must comply with regulations to provide users with a safe method of access to and from vessels. The following requirements must be met in the design:

- Gangways to have minimum width 1.2m and installation of handrails
- Gangways and pontoons to have a high friction non-slip surface
- Maximum gangway gradient shall not exceed a fall of 1:8 at low-tide (although this will not always be achieved on occasions of very high tide)

In terms of the Mechanical & Electrical Engineering Services at Coleraine Marina these are generally serviceable and in good condition however, the installations are untidy and potentially unsafe due to the loose fixing arrangement of cables. The Client should consider the following points:

- Tidy arrangement of services during Gangway and Pontoon installations.
- Replacement of Blue MDPE Water supply pipe work and incorporate backflow contamination prevention devices to comply with WRC regulations.
- Repair of damaged armoured cable.
- Upgrade of gate access system.