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Port Pier Inver

Condition Assessment Report

Donegal County Council

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Disclaimer: Please note that this report is based on specific information, instructions, and information from our Client and should not be relied upon by third parties.

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1 Introduction

1.1 Overview

Following the instruction of Donegal County Council (DCC), ByrneLooby (BL) representative Mr Shane Mulvey CEng carried out a Condition Assessment Survey on the existing pier and slipway situated at Port Pier, Inver, Co Donegal.

The purpose of the survey was to provide an overall visual inspection of all structural elements along the full length of the existing slipway and pier and to record any observed defects. Port Pier is a masonry/concrete pier with an east west alignment with a small concrete slipway on the same alignment. The harbour is in a sheltered location on the western side of the Inver Bay where it is protected against offshore waves generated in the Atlantic Ocean. The Pier and slipway dries out at Lowest Astronomical Tides (LAT). During the rise of the tidal cycle (flood), the foreshore around the small inlet adjacent to the pier is submerged, providing good vessel access to the slipway and berthing on the pier.

The survey was carried out on 13th September 2022 at low tide and findings relate to this particular time. The observations relate to the condition of the pier and slipway prior to commencement of the works associated with the proposed Pier.

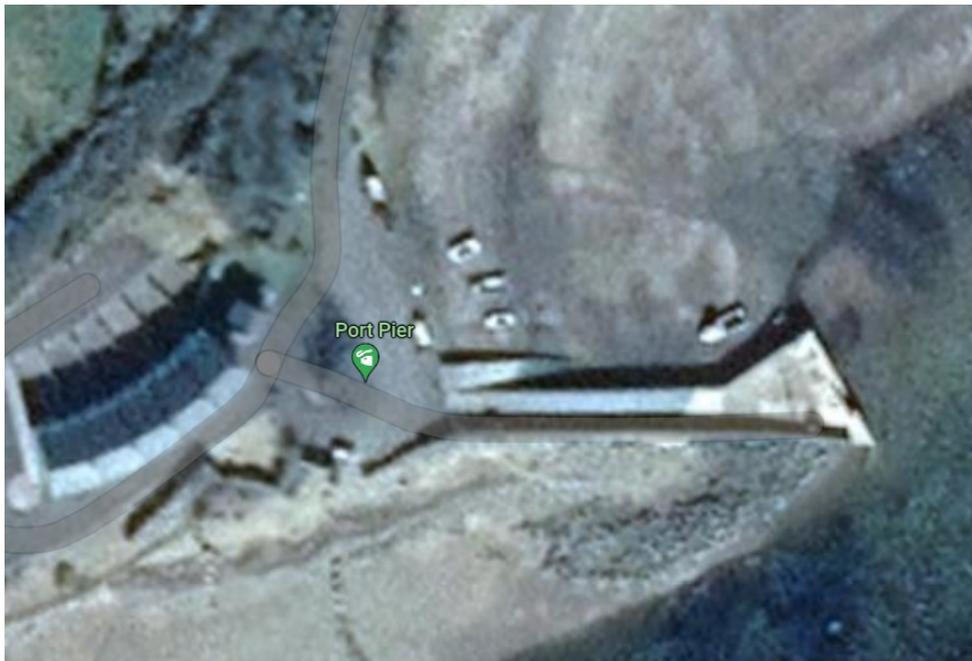


Figure 1: Plan view of the pier (image courtesy of Google maps)

The date at which the existing pier and slipway was constructed is unknown but the following guidelines have been provided by DCC:

- Original pier - 200+ years ago
- Pier extension – 1970's to 1980's
- Slipway - ~1980's
- Raising of a section of the concrete deck at the head of the pier ~ 2017

No detailed drawings have been provided of the structure.

The walk-through visual survey did not entail any opening up of the structure and no in-situ testing of the structure was undertaken.

2 Limitations

This report has been prepared on the basis of visual review of existing conditions only. Parts of the structures under consideration were not fully visible on the day of our inspection. Accordingly, this report constitutes an opinion only and is based on observations and assumptions arrived at during the course of the site visit.

The following qualifications apply to this report:

- No opening up of the structure and only elements of the structure that were visible and accessible were photographed for record purposes.
- No attempt is made to interpret the cause of any defects noted.
- It should be noted that not all defects can be observed during the inspection process and that BL take no responsibility for existing defects hidden within the structure fabric.
- No testing of any structural elements was carried out.
- Existing foundations were not inspected.

The report is intended to provide evidence of the existing condition of the pier and slipway only. This survey is to be used as a record of conditions of the pier & slipway at the time of issuing this report and should be used as a basis to make assessments of any further deteriorations should they occur for whatever reason.

3 Survey Observations

The photographic records in Appendix A form the principal record of the condition of the existing pier and slipway. The photographs are numbered and during the site inspection the following observations were made:

Sea wall

- The existing seawall is constructed from a variety of materials. It appears it was originally built from large stone blocks circa 1m wide. It has been extended using a nominally reinforced concrete core with a concrete block facing capped with a layer of mortar. Cracking to the existing masonry/concrete block seawalls was evident. It is our opinion that the cracks observed are generally hairline to fine cracks (ranging between Category 0 and Category 1 – Table 1). There is also a loss of mortar between joints which would require repointing.

Concrete Pavement

Deck adjacent the existing slipway

- There are signs of wear and tear to the concrete surface particularly near the of start of the pier which shows localised failure, likely to be between the transition between approach slab and concrete pavement. Vegetation is present between concrete joints at various locations throughout which would require removal and repairing. Various sizes of cracking is also present.

New Pavement at the head of the Pier

- Cracking to the top surface of the concrete pavement was evident with cracks generally emanating from corners of concrete joints. It is our opinion that the cracks observed are generally hairline to fine cracks (ranging between Category 0 and Category 1 – Table 1). While the existing pavement does not show any significant signs of failure, we do not know why the deck was raised, or what the condition of the old slab was (i.e. had the old slab reached its end of design life and in need of repair, or showing signs of failure / cracking around the head of the pier)

Cope Beam

- The cope beam that is closest to the existing slipway has shown signs of wear, evident by the localised spalling of the edge of the concrete. The joint between the cope and pavement is largely filled with vegetation which would require removal and repairing. The alignment of the cope appears okay considering the age of the structure. There are some cracks present and it is our opinion that the cracks observed are generally hairline to fine cracks (ranging between Category 0 and Category 1 – Table 1). The new cope beam that was constructed in 2017 appears in good condition.

Slipway

- The surface of the concrete slipway is in reasonable structural condition. There are signs of wear to the surface and localised cracking. Corrosion is present at localised locations near embedded steel at the surface. The joint between cope and slipway requires repair. The cope at the slipway has similar defects as per the main pier cope beam.

Pier Wall

- The pier wall is in reasonable structural condition, given the age of the structure. In areas where there is a concrete surface, honeycombing and spalling is present. The junction between the existing slipway and wall shows localised undermining and would require addressing to prevent further deterioration. Furthermore, this undermining is also evident at the location between the new slipway and pier wall. Generally, the base of the wall is covered with marine growth which obscures the wall and therefore could not be inspected in detail. The head of the pier wall is faced with large stone blocks of varying size. The mortar between some joints in the old stone wall has been removed and would require replacing to prevent further deterioration. The east facing elevation is largely covered with marine growth and could not be fully inspected. Overall, the vertically of the pier is reasonable given the age of the structure and the wall shows no signs of significance stress.

3.1 Crack Classification

Table 1 – Extract from BRE Digest 254 “Assessment of Damage in Low-Rise Buildings”

Category of damage	Approximate crack width (mm)	Classification of visible damage to walls, with particular reference to the potential serviceability/seriousness	Classification of visible damage to walls with particular reference to type of repair and rectification
		Definition of cracks and description of damage	Definition of cracks and repair types/considerations
0	Up to 0.1	Cracks defined as HAIRLINE ; generally considered to have negligible structural implications and can be expected to occur in almost all buildings at any location. They are not generally related to subsidence / foundation movement.	HAIRLINE – Internally cracks can be filled or covered by wall covering and redecorated. Externally, cracks rarely visible and remedial works are rarely justified.
1	0.2 to 2	Cracks defined as FINE . These cracks may occasionally have some structural significance, but are not usually deemed serious. Often these cracks are more visible inside buildings than in external brickwork. Would generally be located at points of structural weakness in a building e.g. window/door openings. Indicates slight foundation movement, particularly if isolated. An array/series or large number of closely located fine cracks is unusual, but could signify more substantial foundation movement.	FINE – Internally cracks can be filled or covered by wall covering and redecorated. Externally, cracks may be visible, sometimes repairs required for weather tightness or aesthetics. Note: Plaster cracks may, in time, become visible again if not covered by a wall covering.
2	2 to 5	Cracks defined as MODERATE . These cracks are likely to have some structural significance and will almost always occur at points of weakness or hinge points. Generally cracks will be visible internally and externally and will indicate foundation or other structural movement enough to distort door and window frames and make doors and windows stick. Weather tightness may be an issue that needs to be investigated as may the structural integrity of the building.	MODERATE – Internal cracks are likely to need raking out and repairing to a recognised specification. May need to be chopped back, and repaired with expanded metal/plaster, then redecorated. The crack will inevitably become visible again in time if these measures are not carried out. External cracks will require raking out and repointing, cracked bricks may require replacement.
3	5 to 15	Cracks defined as SERIOUS . There will almost certainly be some compromise of the integrity of the structure and weather tightness may be impaired. Serious distortion may be occasioned to door and window frames, and glass fracturing is possible, as could be service fractures and strains.	SERIOUS – Internal cracks repaired as for MODERATE , plus perhaps reconstruction if seriously cracked. Rebonding will be required. External cracks may require reconstruction perhaps of panels of brickwork. Alternatively, specialist resin bonding techniques may need to be employed and/or joint reinforcement.
4	15 to 25	Cracks defined as SEVERE . Structural integrity severely compromised – floors, sloping walls leaning or bulging, bearings of beams, lintels suspect. Pipe fractures and straining likely – windows broken.	SEVERE – major reconstruction works to both internal and external wall skins are likely to be required. Realignment of windows and doors may be necessary.
5	Greater than 25	Cracks defined as VERY SEVERE . Potential danger from failed or fractured structural elements and for instability. Safety issues must be considered.	VERY SEVERE – Major reconstruction works, plus possibly structural lifting or sectional demolition and rebuild may need to be considered. Replacement of windows and doors, plus other structural elements, possibly necessary. Safety issues must be considered.

4 Recommendations

There are generally no areas of particular structural concern on the existing pier and slipway as any identified cracks can be classified between hairline and fine cracks. Refer to Table 2 for individual element summary.

There are however some locations which would require attention to prevent further deterioration such as the undermining of the pier wall near both slipways and the steps.



Figure 2: Undermining of the pier wall near both slipways

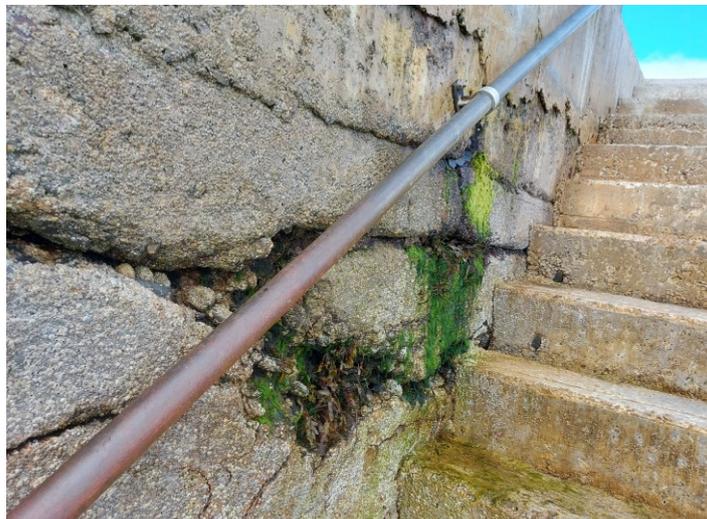


Figure 3: Grout loss/Undermining of the pier wall near the concrete steps

Table 2: Pier Condition Summary

Element	Comment
Seawall	The seawall is in fair structural condition with a number of cracks noted. The cracks in the wall can be categorised as between hairline and fine cracks. There is also a loss of mortar between joints which would require repointing.
Concrete Pavement	The concrete pavement is in fair structural condition with a number of cracks noted which would require repair. Vegetation is present between concrete joints at various locations throughout which would require removal and repairing to avoid any further deterioration.
Cope Beam	The cope beam can be split into two types – 1 - Cope beam that was newly constructed and 2 Cope beam that was built in the 1970’s. The cope beam that was built in the 1970’s has shown signs of wear, evident by the localised spalling of the edge of the concrete. The joint between the cope and pavement is largely filled with vegetation which would require removal and repairing.
Slipway	The slipway is in reasonable structural condition with some cracks noted. Corrosion is present at localised locations near embedded steel at the surface and would require repair. The joint between cope and slipway requires repair.
Pier Wall	<p>The pier wall is in reasonable structural condition, given the age of the structure. In areas where there is a concrete surface, honeycombing and spalling is present. The junction between the existing slipway and wall shows localised undermining and would require addressing to prevent further deterioration. Furthermore, this undermining is also evident at the location between the new slipway and pier wall.</p> <p>The mortar between some joints in the old stone wall has been removed and would require replacing to prevent further deterioration.</p> <p>Overall, the vertically of the pier is reasonable given the age of the structure and the wall shows no signs of significant stress or stability issues.</p>

Appendix A – Photographs



Ref:001 Caption: General condition of masonry sea wall – north elevation



Ref:002 Caption: General condition of masonry sea wall– north elevation



Ref:003 Caption: General condition of masonry sea wall



Ref:004 Caption: General condition of concrete deck and slipway



Ref:005 Caption: General condition of slipway



Ref:006 Caption: General condition of concrete deck – localised failure & cracking of concrete surface at interchange zone



Ref:007 Caption: General condition of concrete deck – localised cracking of concrete surface & vegetation present in joint



Ref:008 Caption: General condition of concrete deck & cope beam – vegetation present in joint



Ref:009 Caption: General condition of concrete deck & cope beam – localised spalling & exposed rebar



Ref:010 Caption: General condition of concrete deck & cope beam – overview of alignment & vegetation present in joint



Ref:011 Caption: General condition of slipway



Ref:012 Caption: General condition of slipway



Ref:013 Caption: General condition of slipway & cope



Ref:014 Caption: General condition of masonry sea wall- north elevation - mortar missing from joints



Ref:015 Caption: General condition of masonry sea wall - north elevation



Ref:016 Caption: General condition of masonry sea wall- north elevation



Ref:017 Caption: General condition of masonry sea wall & deck – vegetation present



Ref:018 Caption: General condition of cope beam and slipway – vegetation present in joint



Ref:019 Caption: General condition of masonry sea wall at opening



Ref:020 Caption: General condition of masonry sea wall at opening



Ref:021 Caption: General condition of masonry sea wall at opening – build up of wall



Ref:022 Caption: General condition of cope beam & concrete deck



Ref:023 Caption: General condition of masonry sea wall



Ref:024 Caption: General condition of concrete deck



Ref:025 Caption: General condition of concrete deck



Ref:026 Caption: General condition of masonry sea wall - north elevation – cracking present



Ref:027 Caption: General condition of masonry sea wall– north elevation



Ref:028 Caption: General condition of concrete deck – cracking on top surface



Ref:029 Caption: General condition of masonry sea wall



Ref:030 Caption: General condition of concrete deck



Ref:031 Caption: General condition of concrete deck & stairs



Ref:032 Caption: New slipway adjacent the pier– south elevation



Ref:033 Caption: General condition of concrete steps – east elevation – undermining/grout loss present between junction of concrete pavement and old pier wall



Ref:034 Caption: General condition of concrete steps – east elevation – undermining/grout loss present between junction of concrete pavement and old pier wall



Ref:035 Caption: General condition of ladders



Ref:036 Caption: General condition of cope beam and concrete deck



Ref:037 Caption: General condition of pier wall



Ref:038 Caption: General condition of concrete deck – cracking evident on surface



Ref:039 Caption: General condition of concrete deck – cracking evident on surface



Ref:040 Caption: General condition of concrete deck – cracking evident on surface



Ref:041 Caption: General condition of pier



Ref:042 Caption: General condition of slipway surface



Ref:043 Caption: General condition of slipway surface – corrosion emanating from mooring ring & embedded steel on surface



Ref:044 Caption: General condition of slipway surface – localised undermining/washout



Ref:045 Caption: General condition of slipway surface – localised undermining



Ref:046 Caption: General condition of slipway surface – localised undermining



Ref:047 Caption: General condition of slipway



Ref:048 Caption: General condition of pier– north elevation – marine growth covering the base



Ref:049 Caption: General condition of pier– north elevation



Ref:050 Caption: General condition of pier– north elevation



Ref:051 Caption: General condition of pier– north elevation



Ref:052 Caption: General overview of masonry sea wall– south elevation



Ref:053 Caption: General overview of masonry sea wall



Ref:054 Caption: General condition of pier – local undermining adjacent new slipway– south elevation



Ref:055 Caption: General condition of pier – local undermining adjacent new slipway – south elevation



Ref:056 Caption: General condition of pier – local undermining adjacent new slipway- south elevation



Ref:057 Caption: General overview of Pier- north elevation



Ref:058 Caption: General overview of Pier- north elevation



Ref:059 Caption: General condition of pier - north elevation – void present between mass concrete and old stone pier



Ref:060 Caption: General condition of pier- north elevation - present between mass concrete and old stone pier



Ref:061 Caption: General condition of pier- north elevation – grout loss present



Ref:062 Caption: General condition of pier- north elevation – grout loss present



Ref:063 Caption: General condition of pier - north elevation – grout loss present



Ref:064 Caption: General condition of pier – east elevation – grout loss present



Ref:065 Caption: General condition of pier – east elevation



Ref:066 Caption: General condition of pier – east elevation



Ref:067 Caption: General condition of pier – east elevation



Ref:068 Caption: General condition of pier – east elevation



Ref:069 Caption: General condition of pier – east elevation



Ref:070 Caption: General condition of pier – east elevation

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