JOB NO: 23 202 September 2023

Structural Assessment of Existing Fuel Jetty (Based on Inspection dated 31/08/2023)

346B Opito Bay Road, Kerikeri

For Kerikeri Cruising Club

Haigh workman Reference: 23 202

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Contents

1. Executive Summary

Haigh Workman Ltd was commissioned by Kerikeri Cruising Club to undertake a site inspection and measure of the timber fuel jetty structure at 346B Opito Bay Road, Kerikeri (Lot 1 DP 494144). It is understood that the client's intention is to clarify scope and scale of the jetty condition, health and safety responsibility and remedial works options.

No information was provided with regard to the age of this structure. We assume that the first time the structure was built dates back to 1990's. There have been some modifications to the structure since that time with addition of few new piles and braces in 2010.

The visual appraisal was conducted on 31st August 2023 and comprised detailed site inspection of the existing fuel jetty structure.

Following interpretation of field data and consideration of the public use of the structure it is concluded and recommended that:

- The timber fuel jetty is not considered safe for public access and needs to be replaced.
    - The structure is very aged with some worm damaged piles, heavily corroded fixtures, poorly supported bearers, over-span joists and decking.
    - Some of the piles may be suitable for re-use for a new structure, but essentially a full re-build appears to be required.
    - As a minimum, Warning sign are erected at access points to the jetty and posted with a load rating limitation.
    - With a re-build of the structure, we recommend a safety barrier is fitted to the eastern side, being the side that is not used for berthing. A replacement structure is required to comply with the Building Act and subject to the building consent process and should undergo engineering investigation and design as part of this process. If the structural strengthening / modification require additional piles it may trigger resource consent.
    - Pontoon and gangway (circa 2010) are O.K.

It would be prudent to note that this condition assessment is a visual appraisal only from walking along the jetty. Further engineering work is required for remedial repairs in consultation with the various consent authorities.

2. Introduction

1.1. Inspection / Assessment Objective

The objective of the timber jetty inspection is to assess the condition and structural integrity of the jetty to ensure its safe operation, longevity, and compliance with general council requirements.

The inspection aims to identify any signs of deterioration, damage, or potential hazards that may compromise the structural stability or pose risks to users.

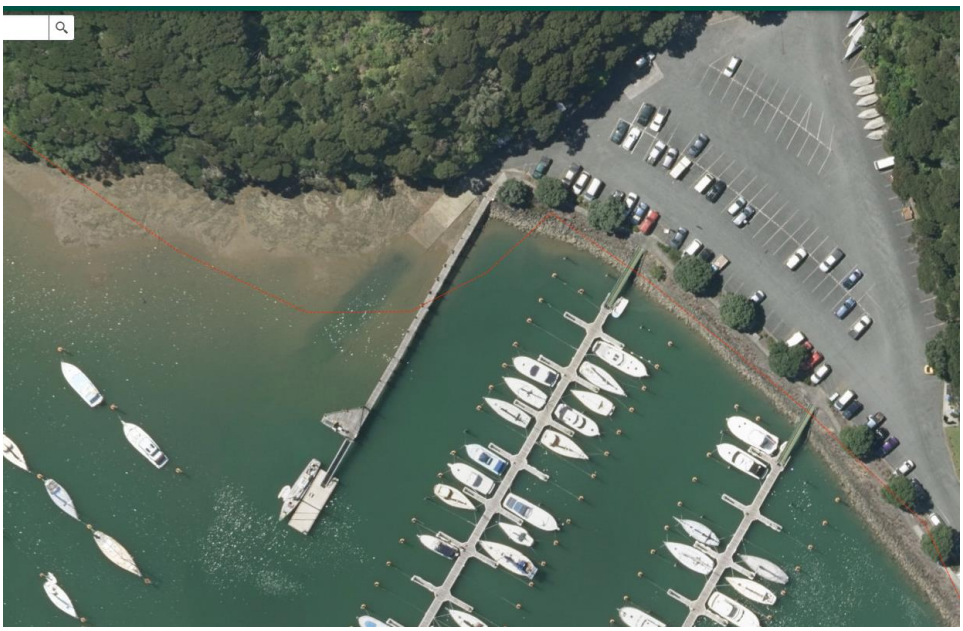
1.2. Applicability

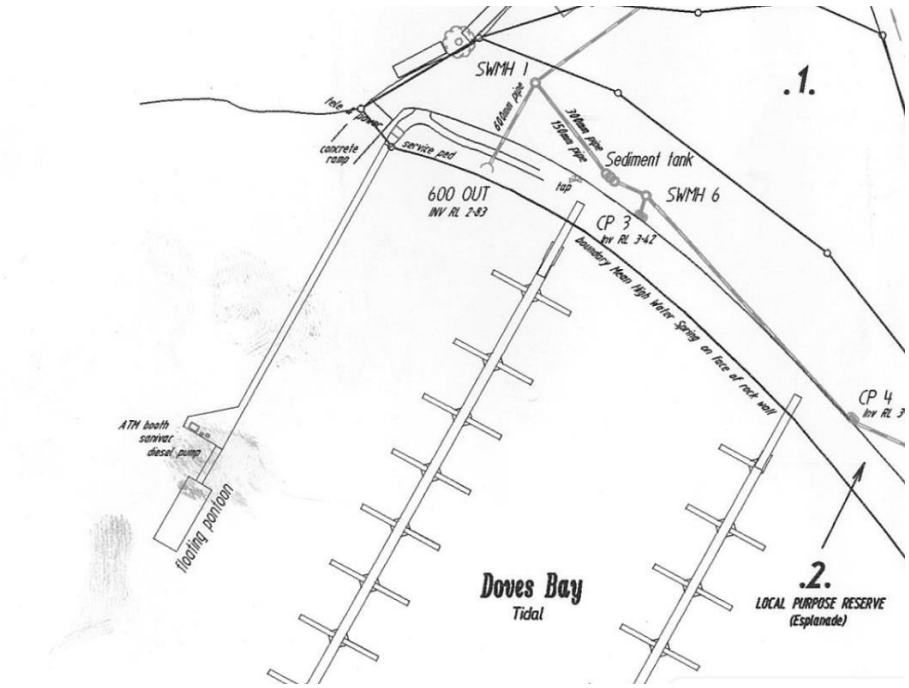
This report has been prepared for the use of Kerikeri Cruising Club with respect to the particular brief outlined to us. This report is to be used by our Client, their Consultants and may be relied upon by Northland Regional Council when considering Resource Consent Compliance.

Furthermore, this report may be utilised in discussion with any local authorities with regard to the safety issues and urgent repairs required. The information and opinions contained within this report shall not be used in other context for any other purpose without prior review and agreement by Haigh Workman Ltd.

1.3. Site and Structural Description

Site of doves Bay Marina is located at the eastern end of Kerikeri Inlet, on the south side of the Peninsula which extends out to Opito Bay. Topographically the site is located in an enclosed bay (Doves bay), which provides relative shelter to the open water of the Bay of Islands.





Jetty Location / Terminology

The main components of a timber jetty structure are noted below

- Piles: Piles are treated timber poles submerged in water to provide support for the jetty.
- Cross Bracing: few cross bracings are present in transverse direction, assumed some piles are Cantilevers which are taking the lateral load of the system.
- Decking: Typically consisting of timber planks or boards.
- Joists and Bearers: Timber members support the decking and transfer the load to the piles. Joists running parallel to the length of the jetty, while bearers running perpendicular, connecting the joists to the piles.

1.4. Methodology Adopted for This Report

The following methodology is adopted to assess the existing jetty due to the unavailability of existing design documents and drawings.

- To Conduct a thorough visual examination of the jetty structure components, including piles, bearer, joist, deck & Connections.

- To Look for signs of deterioration, cracks, corrosion, deformation or any visible damage.

- To provide recommendations for repairs, and strengthening measures based on the observed defects and industry best practices.

3. Timber Fuel Jetty

Table 4.4 – Timber Fuel Jetty Condition Assessment

Structure	Condition	Details
Piles	Poor	The age of the timber piles dates back to 1990's, with some of the original piles showing clear signs of severe worm damage. It appears that some of the piles have been replaced during the jetty's lifespan. We noticed that the newly installed piles also exhibit signs of worm damage, and a few of the original piles are further worm damage. Additionally, some piles are swaying.
Bearers	Poor	The timber bearers comprise some new members sitting on top of the older members. The older members are bolted onto the piles with heavily corroded bolts, The newer members do not appear to be properly attached to the piles
Joists	Poor	The joists are typically 2/250x100 members at 1.05 m centres spanning up to 6 m between headstocks at few locations. The joists are excessively over span for public access causing the vibration when people walk on it.
Decking	Poor	140x45 decking x 1.3 m long spanning between the joists as above. The decking is also over-span for public access loads. Most of the nails are corroded and some deck planks are decayed.
Gangway	Good	Manson Marine typical aluminium gangway construction with galvanised steel abutment completes with bushes and safety chains, all appear to be in good condition
Pontoon	Good	Unitfloat typical concrete pontoon construction with 4 m wide x 3 m long floats x 12 m long total. Typical timber walers and galvanised through rods and metal work, all ca. 22 years old. No details on the structure are available.
Comments	The walkway of the timber jetty is out of alignment horizontally and there is some vertical variation towards the fuel bowsers. The timber jetty is clearly due for replacement. A comprehensive review of each part of the structure is not included in the scope of this assessment; it must be appreciated that a more thorough inspection by boat may reveal more or less issues with the structure. A new jetty structure should include a barrier against falling along the side not used for berthing.	

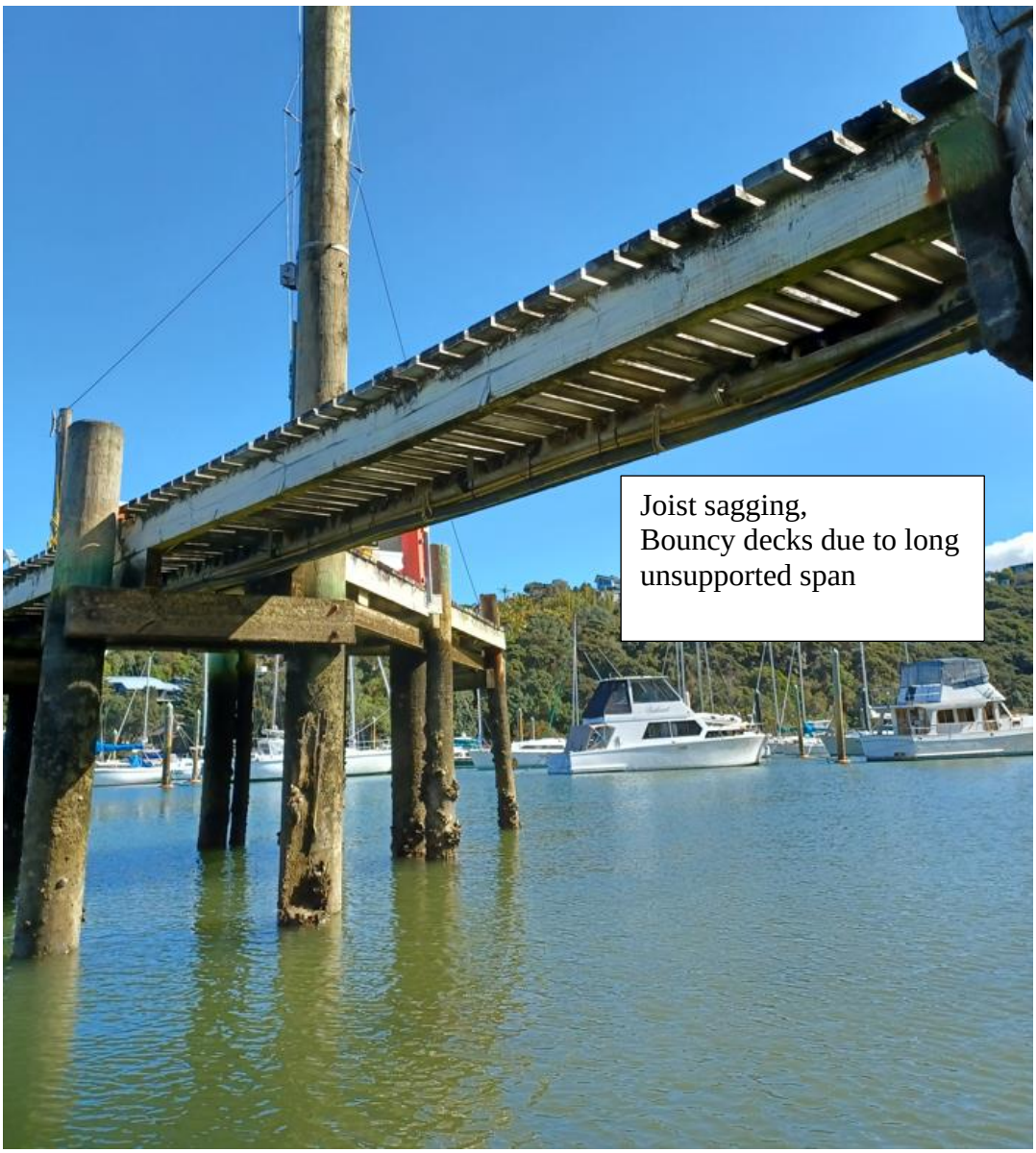
4. Inspection/Observation Findings

2.1. Bolts, nuts & Joist hangers

Structural bolts, washers and joist hangers connecting timber pile, bearer and joists are undergoing corrosion at present they are displaying a reddish-brown or orange discoloration on their exposed surfaces. The corrosion weakens the bolt, leading to reduced load-bearing capacity and compromise the structural integrity.

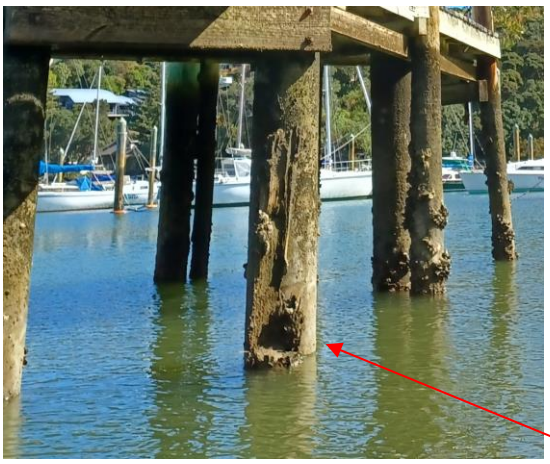
2.2 . Timber Decking , Bearer and Joists

The deck nails are corroded. Deck planks are sagging at few locations.

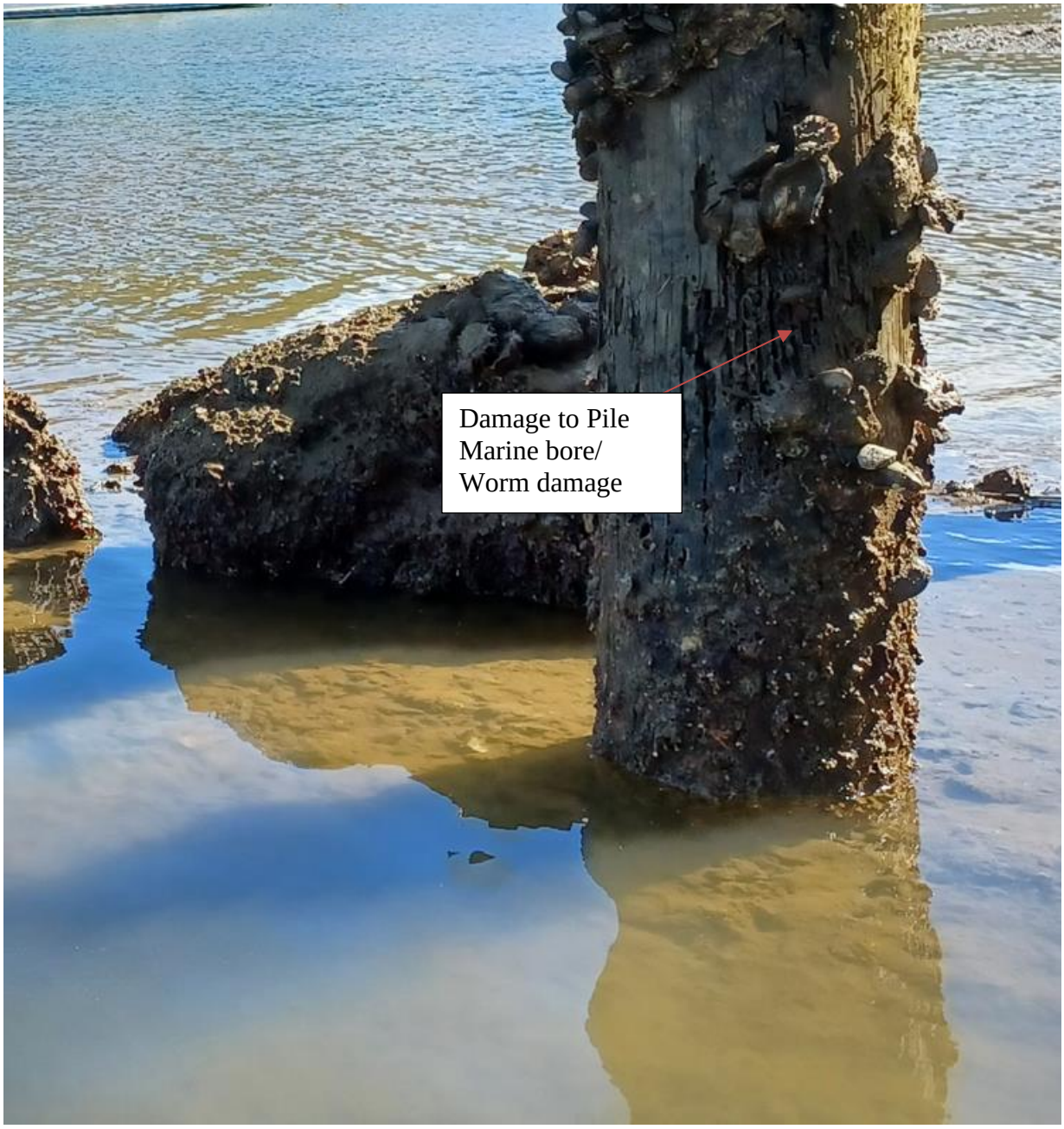


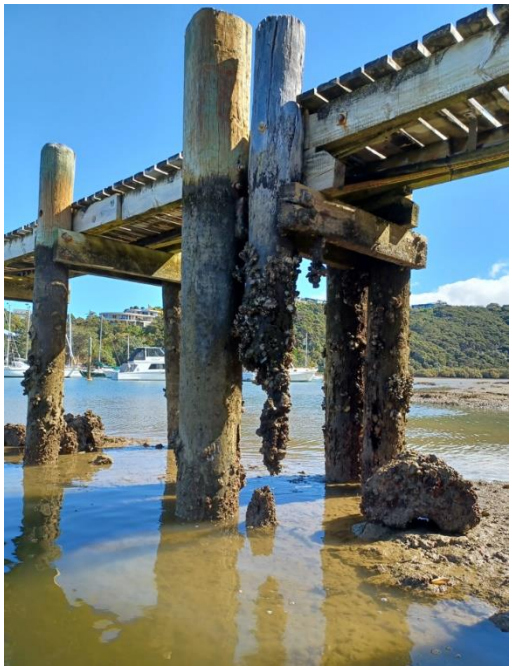
2.3. Timber Piles and Braces

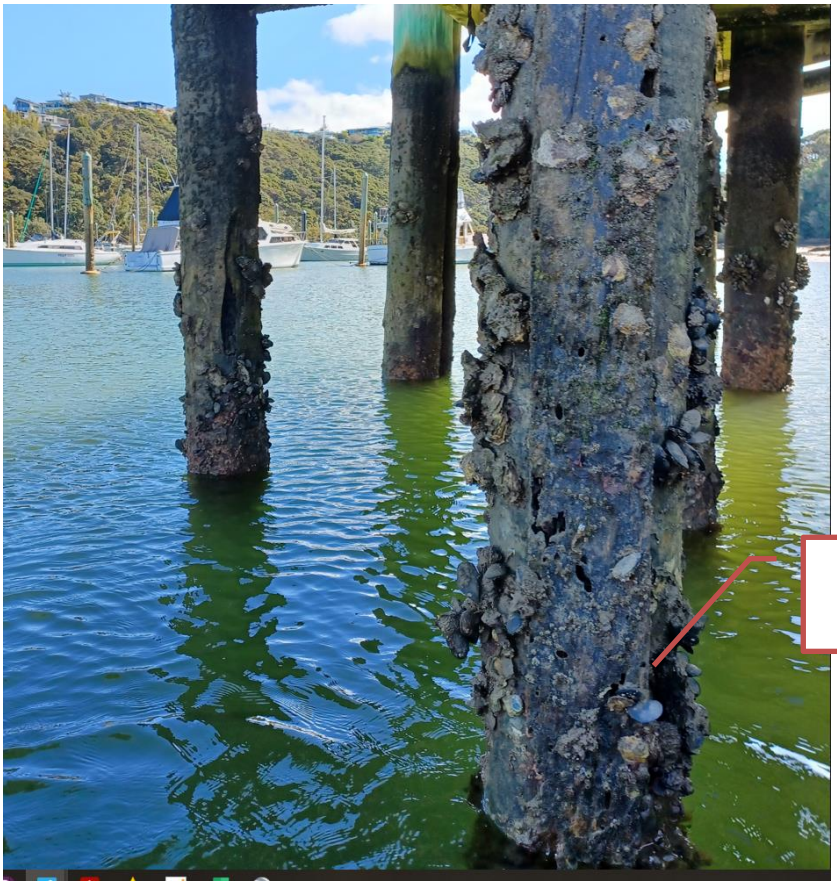
One pile beneath the jetty platform is experiencing decay. The surface of the pile has deteriorated, with the outer layer peeling off, and as a result, the section of the pile has been reduced. The reduction in the section area of the pile can severely impact the integrity of structure.



Pile displaying severe worm / Bore damage


Damage to Pile
Marine bore/
Worm damage




Severe Pile
worm/bore damage

2.4. Existing Jetty – Safety

The timber fuel jetty is not considered safe for public access and needs to be replaced.

5. SUMMARY / CONCLUSION / MAINTAINANCE PRIORITY

The structure is displaying multiple issues such as piles damaged by worms, fixtures that are heavily corroded, inadequately supported bearers, over-spanned joists, and decking. While some of the piles might be suitable for reuse in a new structure, we consider that a complete rebuild is necessary.

If the structure is rebuilt, we recommend installing a safety barrier on the eastern side, which is not used for berthing. Building a new structure will need to comply with the Building Act and go through the building consent process. It should also undergo a specific engineering design as part of this process. It's likely that additional piles will be required for the new structure to reduce excessive spans.

With design of a new timber jetty, we recommend consideration of the increased durability by using HDPE sleeves over piles to protect from marine borer / worm damage, and SS 316 Stainless steel fixing to protect from corrosion.