ATLANTIS YACHT CLUB RULES AND REGULATIONS FOR COMPLIANT MOORING OF ALL VESSELS IN OUR MARINA, FROM 31ST MARCH 2020

Absolutely necessary for the safety of marina personnel, correct mooring of vessels, and maintain the ONGOING structural preservation of our Marina.

AYC Mooring Compliance with helpful instructions and illustrations on the following pages, simply explain the mooring procedure, and compliance is not difficult

>>>>>>>IF IN DOUBT PLEASE ASK<<<<<<<<<

Contents

John Cillekens
Principal Structural Engineer

ADG Engineers (Aust) Pty Ltd

T: 1300 657 402 F: 07 5552 4732 M: 0419 769 676
E: jcillekens@adg.com.au
A: Suite 201/Level 1, 1 Short Street Southport QLD 4215
P: PO Box 208 Southport QLD 4215

1 Background

Atlantis Yacht Club Pty Ltd operates a significant marina with six floating arms and each arm containing several finger berths. The marina was constructed after the buildings were initially built, during the late 1980's and re-constructed from a 60 berth to a 29 berth facility in the year 2000. The marinas are constructed using reinforced concrete pylons with reinforced concrete floating walkway section fixed to each other by timber perimeter members. The finger docks are cantilevered from the main walkway and stabilised by reinforced 45° buttress sections, some of which also contain the pylon rollers which stabilise the marina structure.

Since construction the marina has had maintenance at specific times to rectify damage and wear and tear.

2 Purpose of this Report

This report is intended to provide advice only on the proper fixing of vessels to the floating marina. The brief from the Atlantis Yacht Club Pty Ltd stated that we require *"professional services to inspect, report and recommend necessary changes, to ensure each currently moored vessels in our marina, are in future moored correctly and compliantly, to ensure, minimise and reduce the current future potential damage to our marina.*

3 Observations

A representative of ADG and a 30-year experienced marine expert inspected all the marina walkway and fingers to review the type of damage currently in evidence at the facility. Whilst this inspection recorded the areas of the marinas that would be subject to maintenance and repair these aspects are not recorded in this report. During the inspection it was noted that some of the maintenance issues occurring with the marina facility are due directly to incorrectly moored vessels. These incorrectly moored vessels add magnified loads to the marina structures and can be summarised as follows:-

No	Vessel Type	Issue description	Effect of the Issue	Remedial action
3.1	Floating vessel	No springers attached to vessel	Tidal flow, wash and wind loads in bow and stern lines inducing impact and magnification of loads imparted to the marina due to the sharp angle of the lines and marina edge.	Attach springer lines to the vessel to maintain approximately 5m springer line length and using a flexible rope and adequate protective fenders to reduce impact. A braided nylon rope is suggested.
3.2	Floating vessel	Loose attachment lines	Tidal flow, wash and wind loads inducing impact magnification of loads imparted to the marina.	Tighten lines so that movements are minimised to 200mm.

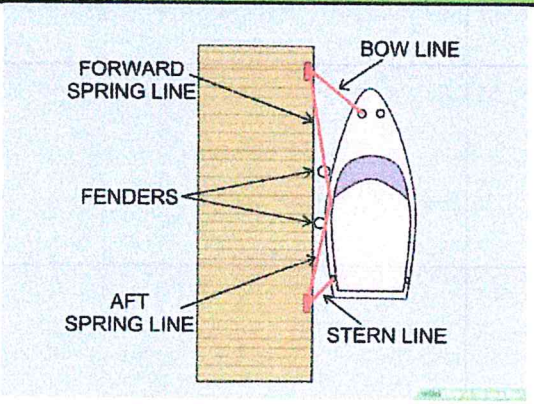
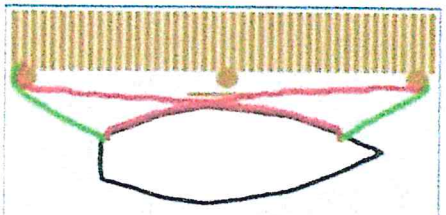
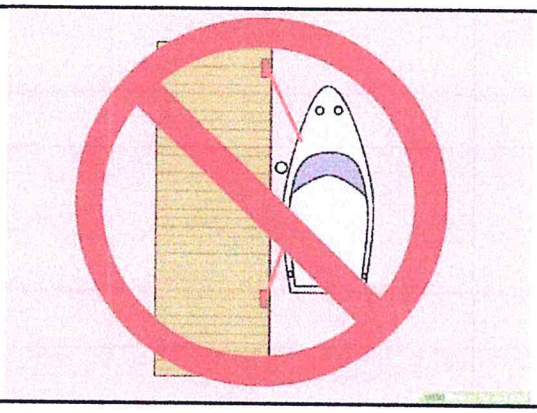
No	Vessel Type	Issue description	Effect of the Issue	Remedial action
3.3	Floating vessel	Berthed vessel touching marina structure	Tidal flow, wash and wind loads induces vessel movements causing the vessel to directly contact and impact the marina structure causing damage to timber edges.	Locate vessel such that a clearance gap is provided to the marina structure with the lines fully extended in that direction causing the smallest gap with adequate protective fenders.
3.4	Floating vessel	Vessel too large for finger dock	Vessels projecting too far beyond the finger dock causing magnified tidal flow, wash and wind loads to be imparted to the ends of the finger docks. This loading causes significant strain at the fixing of the finger docks to the main walkway.	Move larger vessels to a finger dock having adequate length and preferably a pile located at the end of the finger dock. The vessel should not extend past the end of the finger dock by more than 2m.
3.5*	Lift dock facilities such as "Air docks"	Lift dock support lines tied up to short to the finger docks	This causes twisting strain and magnified loading on launching of the vessel. The twisting caused significant strain at the fixing of the finger docks to the main walkway.	**Loosen the lift dock lines before launching the vessel.** Alternatively have the lift dock tied loosely and vessel tied to the marina via bow, stern and springer lines.
3.6*	Floating Dock	Permanent vertical movement systems not well spaced.	Where used these systems are not located at maximum lever-arm and placed such that tidal flow, wash and wind loads are magnified on the marina structure.	Move the permanent fixing locations so that the distance between them (lever-arm) is maximised.
3.7*	Sea pens	Sea Pen support lines tied up to short to the finger docks	As lift docks 3.5.	As lift docks 3.5.

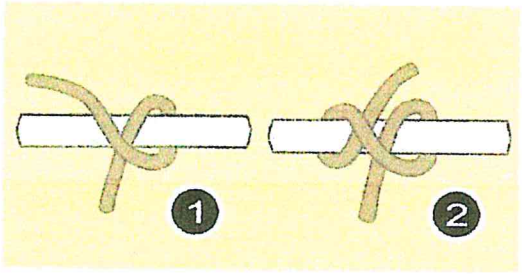
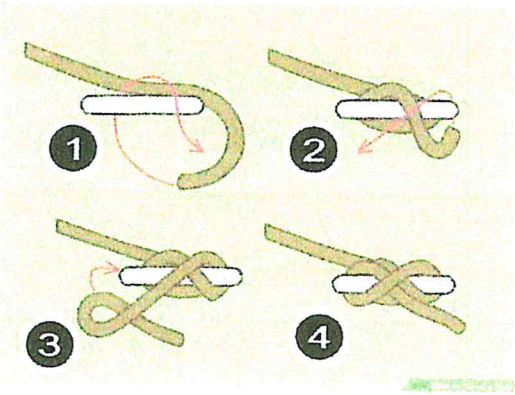
* These structures are proprietary items and as such the manufactures recommendations for mooring should also be sought, however the underlying requirements would be that during operation there are no abnormal or magnified forces are to be applied to the marina structure.

Note:-Of the above items 3.1 to 3.7 inclusive are major contributors to damaging loads applied to the marina structure. These should be rectified immediately to protect the existing fragile state of the marina. Other issues can be addressed in due course as the marina is being refurbished.

4 Recommendations

The above comments regarding adequate mooring, which is correct and compliant, could be misinterpreted by some readers so to make clear the correct manner in which a vessel the following recommendations are added to this report:-

No	Item	Description	Comment
4.1	Compliant permanent vessel mooring		Bow and stern lines may angle at or near 90° to the marina. The springers should be a minimum of 5m long. The line on the floating marina should not be too loose such that the vessel can move more than 200mm when pushed by hand. On a floating marina the objective is to provide articulation between the moored vessel and the floating marina to allow for wave action and live loading of the vessel. Three fenders are recommended with those as noted on the sketch plus a stern fender ie a minimum of 3 fenders are required. NOTE:- Full length crossed springers can be deployed if the vessel does not have a central cleat or the marina does not have suitable cleat locations to maintain 5 m minimum length of springer. 
4.2	Non-compliant permanent vessel mooring		This mooring arrangement is non-compliant for permanent mooring. The spring line or lines must be deployed for permanent mooring.

No	Item	Description	Comment
4.3	Bow and stern lines		Recommended cleat tie
4.4	Springer line		Recommended cleat tie

5 Discussion and Recommendations

There are many other aspects that are important as guidelines for operation of a marina facility that are not touched on in the above report. In assessing the above recommendations, the author did contact well established Gold Coast Marinas to request any documentation they had available and may be used a guide for The Atlantis Yacht Club but unfortunately none where available. These other facilities being commercial establishments have staff on hand to assist the vessel owners when mooring. It is also of interest that the commercial marinas do not allow lift docks of any description for the obvious reason described above.

It is also recommended that the berth occupiers seek professional advice from mooring experts, such as the Southport Yacht Club, if required.

The author recommends that a document be drawn up so that compliance and guidance in many areas can be encouraged. These areas would include behaviour, mooring, size of vessels, recommended rope types etc.

AYC References:

Mooring Compliance Locations AYC Marina, dated 30/01/2020. [2pages]

Atlantis Yacht Club "Quick Reference Rules and Regulations", dated 30/01/2020. [2 pages]