

City of Brisbane

Agenda Report

TO: City Council via City Manager
FROM: Director of Marina and Aquatic Services
SUBJECT: Marina Infrastructure Maintenance Plan
DATE: Meeting of September 12, 2012

CITY COUNCIL GOALS:

3. To maintain and improve infrastructure.

PURPOSE:

To provide the City Council with an assessment of the resources needed to maintain the floating docks.

RECOMMENDATION:

To accept the report.

BACKGROUND:

The Marina is approaching 30 years of age and has suffered more imminent dock repairs recently due to age and harsh weather.

During last spring's budget review several Council members toured the facility. Based upon these tours and ensuing discussions, City Council directed staff to develop a plan which would address the long-term maintenance needs of the Marina.

DISCUSSION:

The basic components of our floating dock system are simple and straightforward. The concrete floating dock sections are held together with pressure treated lumber. After years in the harsh wet marine environment, that lumber begins to wear and fail under the loads of the dock movement, the vessels tied to it, and the movement of tidal surge and wind. As the wood fails, the floats begin to sag and become uneven. The remedy for this condition is to unbolt the thru-bolts holding the floats together, remove and replace the wood and rusty or bent thru-bolts with new wood and hardware. Then, before tightening everything down, the work crew can align the dock using barrels filled with water, and with the dock properly aligned with carpenter levels, tighten down all of the thru-bolts. Then they simply move on to the next section needed. The work requires strength and endurance to deal with large rusty hardware, maneuvering large pieces of lumber into place, handling large power tools, drills and sometimes a torch,

and a minimum of two workers working in concert with one another. A sample of the dock diagram plans have been included to illustrate. The areas of the Marina requiring this immediate work have been identified. The work described here has been characterized as Phase I.

The remaining floating infrastructure maintenance plan as Phase II is the replacement of 55 piling guides. That is the systems construction of plywood, steel rings and rollers that hold the floating docks in alignment with the pilings.

The piling rollers wear like tires when in contact with the piling and require replacement at various locations along with the cars that hold them that can be adjusted. The piling gussets are simply triangular and square sheets of marine grade plywood that span the walking surface from one concrete float section to another, such as a main body, onto a floating finger. They are also the bases for the dock boxes.

The typical worker task for replacement maintenance of these components is described in the Phase I and Phase II plans, along with estimated working days that take into consideration the weather factor.

FISCAL IMPACT:

The cost of hiring a Marina Maintenance Worker II including benefits is about \$106,000 a year. Phase 1 of the plan needs two workers working together, therefore the annual cost of labor for Phase 1 is \$212,000. Phase 1 would take approximately two years to complete. Phase 2 of the plan could be completed by two workers in an additional year. At the end of the three years City Council and staff would evaluate the continued need for these employees.

There would be an additional cost of supplies and materials to complete Phases 1 and 2. This cost would be about \$40,000 not including taxes and shipping costs.

These costs are not included in the current budget. However, the staff report concerning separating the Marina from Parks and Recreation addresses this issue.

MEASURE OF SUCCESS:

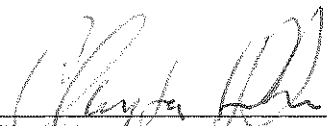
A more stable, attractive floating infrastructure that maintains and/or attracts new berth renters.

ATTACHMENTS:

Phase I Waler Replacement Realignment Project
Phase II Dock Component Replacement Maintenance
Dock Construction Diagram Samples



Director of Marina and Aquatic Services



City Manager

Phase 1

Waler Replacement/Realignment Project

Dock 1	2291' x \$2.58 (3x8)	=	\$	5,910.76
	2291' x \$1.27 (2x8)	=	\$	2,909.57
	8 Dawson Bullnose Cleats		\$	275.68
	114 Bob 12" Cleats		\$	1,192.44
	6 Through Rods with hardware		\$	300.00
	Total Materials		\$	<u>10,588.45</u>
Dock 2	1040' x \$2.54 (2 2 x 8)	=	\$	2,641.60
	46' x 2.58 (3 x 8)	=	\$	118.68
	3 Dawson Bullnose Cleats		\$	103.38
	63 Bob 12" Cleats		\$	658.98
	3 Through Rods with hardware		\$	150.00
	Total Materials		\$	<u>3,672.64</u>
Dock 3	266' x \$2.54 (2 2 x 8)		\$	675.64
	24 Bob 12" Cleats		\$	251.04
	Total Materials		\$	<u>926.68</u>
Dock 4	360' (Mainwalk) \$2.58 (3 x 8)		\$	928.80
	360' (Mainwalk) \$1.27 (2 x 8)		\$	457.20
	144' (Fingers) 2 (2 x 8)		\$	365.76
	12 Bob 12" Cleats		\$	125.52
	12 Through Rods with hardware		\$	600.00
	Total Materials		\$	<u>2,477.28</u>
Dock 5	341' (3 x 8)		\$	879.78
	717' (2 x 8)		\$	910.59
	2 Dawson Bullnose Cleats		\$	68.92
	36 Max 10" Cleats		\$	229.68
	10' Threaded Through Rods		\$	500.00
	Total Materials		\$	<u>2,588.97</u>
Dock 6	226' x \$2.54 (2 2 x 8)		\$	574.04
	18 Max 10" Cleats		\$	114.84
	2 Through Rods		\$	100.00
	Total Materials		\$	<u>788.88</u>

4,946' of Rubrail x \$2.07	\$	10,238.22
1 1/4 Galvanized Nails (20 lbs)	\$	209.20
Corner Bumpers 118 x \$11.94	\$	<u>1,408.92</u>
Total Finish Materials	\$	11,856.34

Total Materials All Docks \$ 32,899.24

Water Replacement/Realignment Project
Estimated Working Days

- Typical Tasks:
- Moving boats
 - Mobilize equipment to docks
 - Removing stubborn through rods & bolts
 - Sawzall cut old dock
 - Re-cut new wood
 - Drill holes in new wood
 - Replace through rods
 - Align & stabilize dock floats
 - Tighten through rods
 - Measure and cut rubrail
 - Nail rubrail
 - Attach rubrail corner
 - Demobilize/clean up
 - Move boats back

	2 FTE	Max. Est. Time	Min Est. time
Dock 1		90 Days	60 Days
Dock 2		60 Days	45 Days
Dock 3		14 Days	10 Days
Dock 4		30 Days	15 Days
Dock 5		60 Days	45 Days
Dock 6		<u>10 Days</u>	<u>8 Days</u>
		264 Days	183 Days
Weather Factor		2 Years	1.5 Years

Phase 2

Dock Component Replacement Maintenance

55 Piling Keepers @ \$39.96	\$	2,197.80
100 Piling Rollers @ \$9.56	\$	956.00
55 Piling Gussets (30 Sheets)	\$	1,704.00
77 Gussets (39 Sheets)	\$	2,215.20
Hardware: washers, nuts	\$	500.00
Roller Axle @ \$16 each		
Total Materials	\$	7,573.00

1 1/8 4' x 8' Marine Grade Sheet Ply \$56.80

1 sheet usually equals 2 at most gussets

Dock Component Replacement Maintenance

Piling Keeper

Typical Task:

- Relocate boat or re-tie
- Remove rollers & axle
- Remove stubborn attachment points
- Dig out gusset wood
- Remove keeper over pile
- Prep keeper bed
- Measure and cut new wood
- Paint and coat all surfaces
- Put new wood in place
- Place new keeper over pile
- Drill new keeper holes
- Bolt down keeper
- Screw in new gusset
- Nail in rubrail
- Attach rubrail corner
- Replace or re-tie boat

1 FTE 3-4 days

165 days - 220 days

Dock Component Replacement Maintenance

Gusset Replacement with Dock Box (40)

Typical Task:

- Remove & store contents of dock box
- Disconnect water/electrical box
- Unbolt dock box and remove it
- Unattach utilities & tie off
- Dig out & remove stubborn screws & nails
- Dig out old wood
- Measure angle iron for re-fabrication if corroded or failed
- Prep site bed
- Cut wood & drill holes for utilities
- Paint/Coat all surfaces
- Place in bed & drill for screws
- Place utilities
- Screw gusset into place
- Put dock box in place
- Bolt down dock box
- Re-attach hose bib
- Re-attach utility box
- Place content back into dock box

1 FTE

3-5 days

120-200 days

Dock Component Replacement Maintenance

Simple Gusset Replacement (37)

Typical Tasks:

- Remove stubborn screws & nails
- Dig out old wood
- Measure angle iron for refabrication if corroded or failed
- Prep site bed
- Cut wood
- Paint and coat all sides
- Drill holes
- Screws into place

1 FTE

1-2 days

37-74 days

Dock Component Replacement Maintenance

Replace 100 Piling Rollers

Typical Tasks:

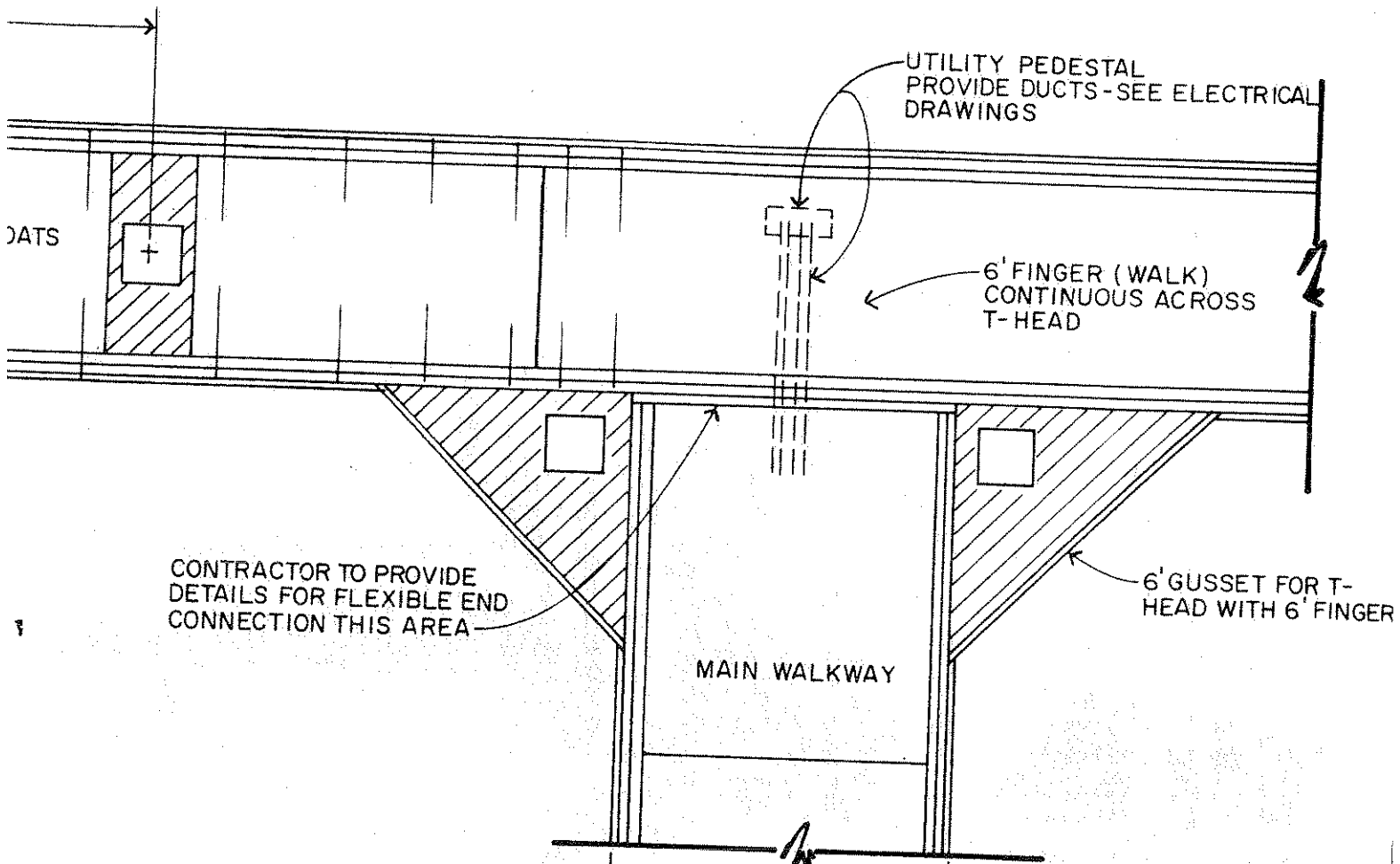
- Remove stubborn cotter pins on axle
- Loosen car nuts
- Replace roller
- Attach new pins
- Realign car with hammer or pry bar
- Bolt car down

1 FTE

5 - 17 days

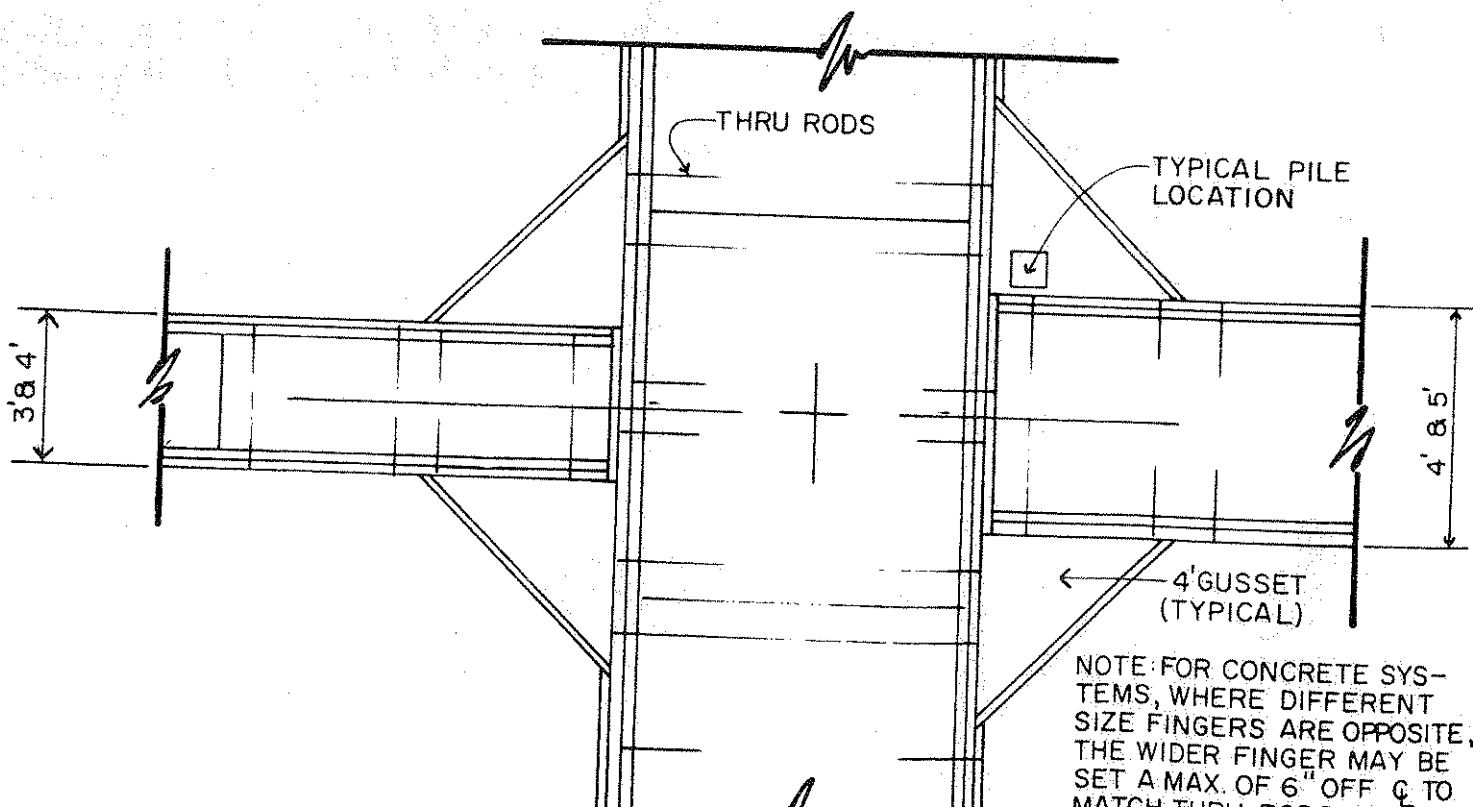
Dock Component Replacement Maintenance
Days to Complete

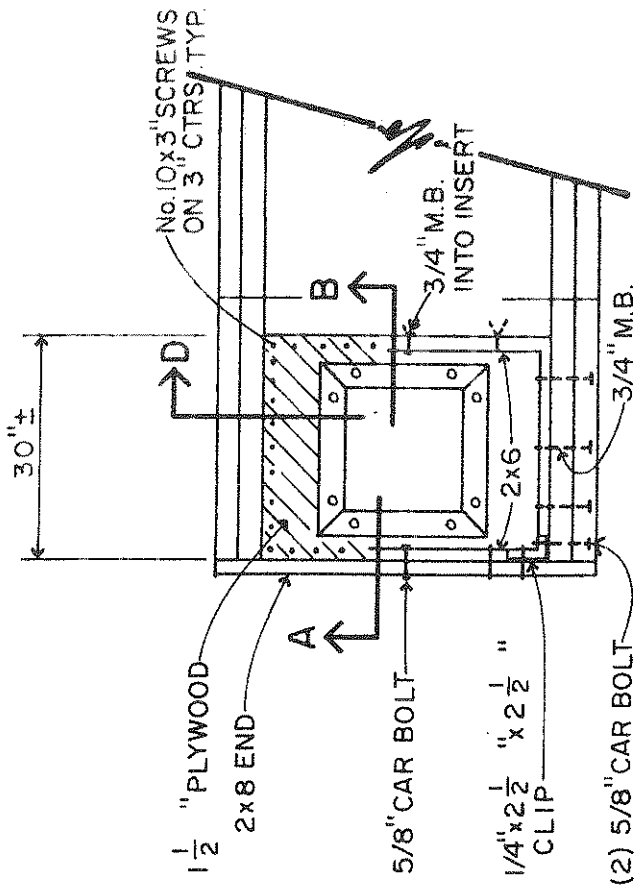
	1 FTE Max. Est. time	Min. Est. Time
Pile Keeper Replacement	220	165
Gusset Replacement Dock Box	200	120
Simple Gusset Replacement	74	37
Replace 100 Piling Rollers	<u>17</u>	<u>5</u>
FTE to Complete	511	327



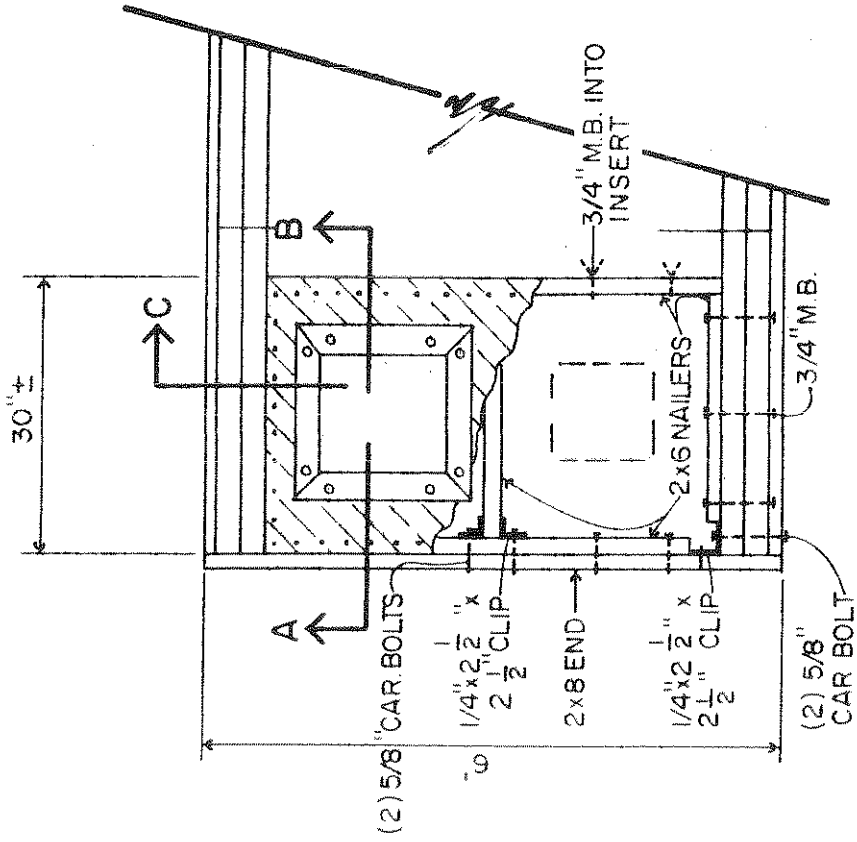
VARIES 7' OR 8'

DETAIL
6' T-HEAD AT MAIN WALKWAY

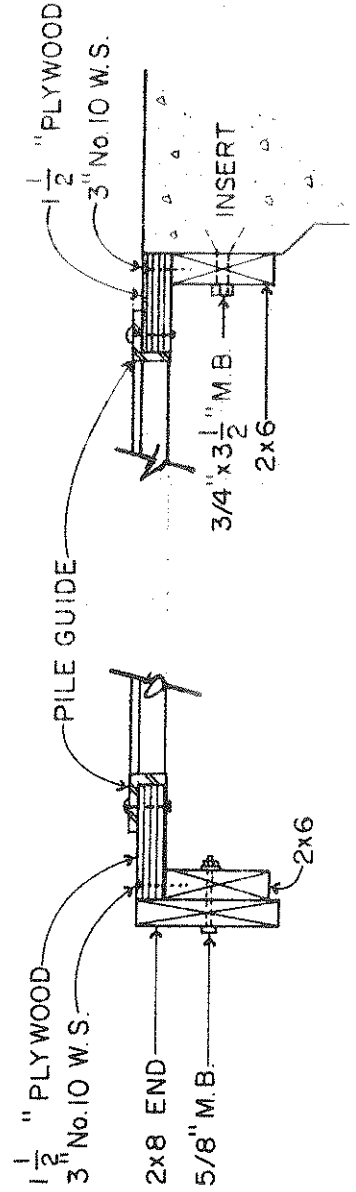




TYPICAL FINGER END WITH PILING



FINGER END WITH 2 PILES



PILING

