

Appendix A

Preliminary Pier Assessment Report

Mr. Christopher Mayo
Harbormaster
Town of Wells
208 Sanford Road
Wells, Maine 04090

Subject: **Preliminary Inspection Report, Town Piers located at Wells Harbor, Maine**

Dear Mr. Mayo:

In accordance with our efforts associated with the update to the Wells Harbor Plan, the two Town-owned timber piers were visually inspected on August 14, 2012 as a routine inspection to observe apparent condition and deterioration. The inspection included both underdeck and deck level observations. No underwater inspections were performed as a part of this assessment.

Background

For the purposes of this assessment report, we will refer to the pier (and associated appurtenances) on the west side of the Harbor as the “West Side Pier” and the pier (and associated appurtenances) on the east side of the Harbor as the “East Side Pier”. The general locations and layouts are as indicated on Figure 1 (attached). A review of anecdotal information suggests that both piers were initially constructed in the early 1960’s, following the initial major harbor dredging. Portions of the piers, and much of the floating dock systems were installed following the second major dredge in 2001. Earlier timber piers have existed at various locations within the harbor for much of the past 200 years.

West Side Pier and Floats

The current configuration of the pier is generally a “Tee” form, extending to a length of about 90 feet from shore and leading to a widened end, approximately 115 feet wide (see figure 2 attached). A series of floating docks (“floats”) provide water-level access to pleasure craft, charter fishing vessels and commercial fishing boats. In addition, there is a designated area for dinghies. Portions of the pier have been rehabilitated/replaced and the area presently used for storage of lobster bait, appears to have been added since construction of the original pier.

The main body of the Pier is of timber construction, supported primarily on driven timber piles with 12x12 pile caps, 4x12 cross bracing, 4x12 stringers (joists), 3.5 to 4 inch decking (varying widths). The run of pile bents supporting the main leg of the pier (perpendicular to the shore) consists of four piles each. These pile bents appear to be located approximately every 12 feet. Cross-bracing exists in between the piles comprising the individual bents, but portions of the cross-bracing that formerly existed between the bents appears to have been removed between several of the bents. The pile caps terminate flush with the outermost piles.

The two pier extensions comprising the widened end are similar in construction to the main body of the Pier with 12x12 pile caps, 4x12 stringers at about 2 to 3 feet on center (varies), 3.5 inch decking (of



varying widths). Cross-bracing exists in some locations between the piles comprising the bents, but the cross-bracing that formerly existed between the bents appears to have been removed.

The railing on the main pier is comprised of chain link fence with a 6-foot post spacing. Fixed seating is located on each of the two “tees”, as well as monitoring equipment that is maintained by area environmental organizations, such as the Wells National Estuarine Research Reserve (NERR).

The Bait Pier appears to have been constructed separately from the primary parts of the pier. It consists of several timber piles, pile caps, one area of cross-bracing, and 2x12 joists with apparently random spacing and orientation. Access between the Bait Pier and vessels using the pier/monorail hoist is via a fixed aluminum ladder at this location. The Town has recently been awarded a grant from the Maine Department of Transportation (MEDOT) under the Small Harbor Improvement Program (SHIP) and anticipates replacing the Bait Pier within the next year.

The widened portion of the Main Pier adjacent to the Bait Pier provides space for two refrigerator units, which are used for bait storage. Adjacent to both the refrigerators and the Bait Pier is a monorail hoist, with a listed capacity of 1 ton. The area under the hoist and supporting the freezers has been recently constructed and appears to be in excellent condition. There are wooden railings (with either wooden pales or intermediate ropes) in the vicinity of the Bait Pier.

The floating docks wrap around several sides of the pier as shown on the enclosed plan. The floats are constructed of wood with metal connections. Segments of steel railroad track have been installed vertically at the piles on the faces of the pier and these function as rails to allow the floats to rise and fall with the tides. There is no readily available information regarding the depth of embedment (and hence stability of the lower ends) but no problems have been observed thus far that would indicate insufficient stability.

There is a series of short pilings along the shoreline, visible at low tide, which helps to retain the riprap slope.

Piles: The piles appear to have originally been creosote preservative treated oak, however much of the surficial creosote has leached out and they have started accumulating limited marine growth (barnacles and weed). We observed no obvious signs of marine borer damage in the intertidal zone.

The fender piles around the pier end appear to be untreated oak piles and these piles have significant deterioration.

Pile Caps: The pile caps were observed to be in satisfactory condition, apart from minor rot apparent in the exposed end grain of the caps in several locations. The cap timbers are weathered and observation suggests that they have lost much of their creosote preservative treatment, however there were no signs of overload, breakage, crushing or other signs of advanced deterioration or loss of function. It should be noted that heavy timbers with exterior preservative treatment do occasionally decay from the inside, often starting at fastener penetrations, so some internal decay should be anticipated within timbers of this age.

Cross Bracing: The cross bracing is generally in poor condition, presumably due in large part to severe bolt corrosion, as it appears that the lower connections are generally the ones that have failed.



Stringers: The stringers were generally observed to be in fair condition, however limited probing in between deck planks did identify localized minor stringer decay on the pier. Whenever decking is removed for replacement it is prudent to conduct a closer inspection.

Decking: The decking appears to be a mix of original and replacement timber, in many cases untreated hemlock, with certain newer areas of pressure treated southern yellow pine (PT SYP). Localized decay and section loss were observed and should be monitored with decking replacement as necessary. A number of the deck planks have reached a point where they should be replaced. The deck plank gaps vary, with occasional locations of up to 1" wide. We noted few, if any raised deck spikes which suggests that the Town is monitoring and addressing these on a periodic basis. Of note, in some areas the existing deck plank gaps are not consistent with ADA accessibility standards and are a risk for bicycle wheels when parallel to the decking.

Curbing: Timber curbing was only noted in the area of new construction adjacent to the bait pier.

Abutment: The concrete abutment exhibits some cracking, however there are no indications of abutment movement, or degradation that would result in dangerous conditions. Areas of cracking should be monitored to ensure that tripping hazards do not arise.

Floats and Gangways: The pier is equipped with a number of floating docks ("floats") to provide access to vessels and to accommodate dinghy tie up. The floats are constructed of wood. The gangway is of aluminum, with slip resistance treatment.

Boat Ramp Floats: There is a separate series of wooden floats associated with the boat launching ramp. These floats are generally intended to support launching and haul-out activities, although there is some room for dinghy tie-up along the south side of these floats. The landside end of the floats is anchored to a concrete monolith adjacent to the ramp, and timber piles hold the outer floats in place.

Pumpout Station: The pier is equipped with a pumpout station, however this unit is slated for replacement within the near future.

ADA Compliance: The existing facilities were planned and constructed before the current requirements associated with the Americans with Disabilities Act (ADA) was in place, hence the facilities are generally "grandfathered". Any plans for upgrade or replacement of the facilities should consider the requirements of ADA Section 1003, which address accessibility issues for recreational boating facilities.

Recommendations

Piles: The pier piles appear to be in satisfactory condition; however loss of preservative treatment over the years has reached a point where marine borers may start attacking the piles, primarily in the intertidal zone and at bolt holes. The intertidal and subtidal zone marine borer deterioration is likely to accelerate as preservative retention decreases, and the pile heads may also experience decay, particularly inside the pile, if wet and at reduced preservative levels. Depending on what is proposed for repairs and reconstruction, the piles could be jacketed to extend the pile life, or be monitored and replaced/repared as necessary. The flexible wrap-type marine borer protection jackets often do not work in areas with significant tidal range and/or wave action and may just hide the deterioration. Tightly adhering rigid pile jackets may be suitable at this site, but should be reviewed for life cycle cost-effectiveness before being



widely used on the pier. As pile jacket installation does require cross bracing removal, the pile jacketing may be most cost-effectively combined with bracing replacement. The existing piles are probably adequate for existing pedestrian loadings. The piles should be monitored for signs of possible overload or post-storm damage.

Pile Caps: The pile caps were observed to be in generally satisfactory condition, apart from early signs of rot at some of the exposed ends. There were no signs of overload, breakage, crushing or other signs of advanced deterioration or loss of function. It should be noted that heavy timbers with exterior preservative treatment do normally decay from the inside, often starting at fastener penetrations, so some internal decay should be anticipated on a timber pier of this age. It should be noted however that this was not a more detailed damage inspection and that the reduced creosote treatment levels may be allowing decay in some areas presently hidden from view.

Cross Bracing: As noted, the cross-bracing is generally in fair condition above the tidal zone, but is largely failed in the tidal zone due to severe bolt corrosion and marine borer damage to the timber. In addition, it appears that portions of the cross-bracing have been removed, particularly within the area of the “tees”. The cross-bracing at this pier primarily provides lateral stability for the pier and should be replaced in some areas, possibly in conjunction with jacketing of piles.

Stringers: The stringers and rangers were generally observed to be in fair condition, however limited probing in between deck planks did identify localized internal stringer decay. It should be noted that this was a routine inspection and not a more detailed damage inspection and that the reduced creosote treatment levels may be allowing decay in additional areas presently hidden from view.

Decking: The decking appears to be a mix of original and replacement timber, likely untreated hemlock. Localized decay and section loss were observed in a number of areas and a number of the planks are due for replacement. New decking should be of pressure treated southern yellow pine for durability.

Curbing: The curbing does not meet current OSHA standards for vehicle use of the pier and should be reviewed with the code enforcement authority having jurisdiction.

Railings: While most of the railings appear to meet code or the Maine State Fire Marshall’s Office standards for piers, there are some areas in the vicinity of the bait pier which may require improvement. Life safety issues, including the curbs which support the railing posts, the railings, ladders, life rings, etc. should be reviewed with the code enforcement authority having jurisdiction. Presently there are life rings in place on the western side pier.

Floats: While the floats currently appear to be in generally serviceable condition, they are showing signs of deterioration and the community should start planning for their replacement in the near future. It will probably be desirable to upgrade the fastening mechanisms at that time.

[East Side Pier and Floats](#)

The East Side Pier extends to a length of about 45 feet from shore and terminates in an aluminum gangway leading to an extended series of floating docks (floats) as indicated on figure 2, attached. The series of floats provides water-level access and mooring locations for primarily recreational vessels. Amenities are



limited tom provision of (seasonally) fresh water via a hose system in the vicinity of the base of the gangway.

The Pier is of timber construction, supported primarily on driven timber piles with 12x12 pile caps, 4x12 stringers (joists), 3.5 to 4 inch decking (varying widths). There are three bents of two piles each supporting the pier. There is a step down approximately 6 feet from the upper terminus of the gangway. Cross-bracing exists in both directions among the four pilings supporting the upper landing from the gangway, and these is cross-bracing between the two pilings that exist approximately 6 to 8 feet back from the landing.

The railing on the main pier is comprised of 6 foot high chain link fence with a 6-foot post spacing. Access to the floats is restricted by a locking chain link gate with barbed wire.

The floating dock comprising the lower terminus of the gangway is anchored in place by four timber piles. The anchoring mechanisms are sections of galvanized steel chain with plastic rollers. The extensive floating docks extend both to the north and south of this location.

Piles: The piles appear to have originally been creosote preservative treated oak, however much of the surficial creosote has leached out and they have started accumulating limited marine growth (barnacles and weed). We observed no obvious signs of marine borer damage in the intertidal zone.

Pile Caps: The pile caps were observed to be in satisfactory condition, apart from minor rot apparent in the exposed end grain of the caps in several locations. The cap timbers are weathered and observation suggests that they have lost much of their creosote preservative treatment, however there were no signs of overload, breakage, crushing or other signs of advanced deterioration or loss of function. It should be noted that heavy timbers with exterior preservative treatment do occasionally decay from the inside, often starting at fastener penetrations, so some internal decay should be anticipated within timbers of this age.

Cross Bracing: The cross bracing is generally in fair to good condition.

Stringers: The stringers were generally observed to be in fair condition, however whenever decking is removed for replacement it is prudent to conduct a closer inspection.

Decking: The decking appears to be a mix of original and replacement timber, in many cases untreated hemlock. Localized decay was observed and should be monitored with decking replacement as necessary. Some of the deck planks have reached a point where they should be replaced

Abutment: The concrete abutment appears to be in sound condition, however we noted that a significant void has developed under the lower edges of the concrete where it meets the riprap that was used to stabilize the adjacent slope.

Railings: The railings appear to meet or exceed code or the Maine State Fire Marshall's Office standards for pier. Presently there are no life rings in place on the eastern side pier, although we understand that is due to theft and that new rings will be provided.

Floats and Gangway: The pier is equipped with a number of floating docks ("floats") to provide access and mooring facilities for a number of watercraft. The floats are constructed of wood. The gangway is of



aluminum, with slip resistant treatment. The floats are anchored to helical anchors in the floor of the harbor, as well as by a series of four timber piles in the vicinity of the gangway from the pier.

Recommendations

Piles: The pier piles appear to be in satisfactory condition; however loss of preservative treatment over the years has reached a point where marine borers may start attacking the piles, primarily in the intertidal zone and at bolt holes. The intertidal and subtidal zone marine borer deterioration is likely to accelerate as preservative retention decreases, and the pile heads may also experience decay, particularly inside the pile, if wet and at reduced preservative levels. Depending on what is proposed for repairs and reconstruction, the piles could be jacketed to extend the pile life, or be monitored and replaced/repared as necessary. The flexible wrap-type marine borer protection jackets often do not work in areas with significant tidal range and/or wave action and may just hide the deterioration. Tightly adhering rigid pile jackets may be suitable at this site, but should be reviewed for life cycle cost-effectiveness before being widely used on the pier. As pile jacket installation does require cross bracing removal, the pile jacketing may be most cost-effectively combined with bracing replacement. The existing piles are probably adequate for existing pedestrian loadings. The piles should be monitored for signs of possible overload or post-storm damage.

As noted, the float at the lower terminus of the gangway is held in place by four timber piles. These piles provide resistance to the main line of floats against the ebb and flow of the tide. Since the parallel series of floats located to the south of the pier and east of the main floats are not presently anchored by any piles they shift with the tides, which creates significant torsion at the connecting floats, and has resulted in damage. It is proposed to provide a single timber pile at the north end of this series of floats to address this issue. Based on observations following installation of that pile others may be needed.

Pile Caps: The pile caps were observed to be in generally satisfactory condition, apart from early signs of rot at some of the exposed ends. There were no signs of overload, breakage, crushing or other signs of advanced deterioration or loss of function. It should be noted that heavy timbers with exterior preservative treatment do normally decay from the inside, often starting at fastener penetrations, so some internal decay should be anticipated on a timber pier of this age. It should be noted however that this was not a more detailed damage inspection and that the reduced creosote treatment levels may be allowing decay in some areas presently hidden from view.

Cross Bracing: As noted, the cross-bracing is generally in fair to good condition, and does not appear to warrant replacement at this time.

Stringers: The stringers were generally observed to be in fair condition, however it should be noted that this was a routine inspection and not a more detailed damage inspection and that the reduced creosote treatment levels may be allowing decay in additional areas presently hidden from view.

Decking: Localized decay and section loss were observed in a number of areas and a number of the planks are due for replacement. New decking should be of pressure treated southern yellow pine for durability.

Abutment: The Town should plan on addressing the significant void that has developed under the lower edges of the concrete where it meets the riprap that was used to stabilize the adjacent slope.

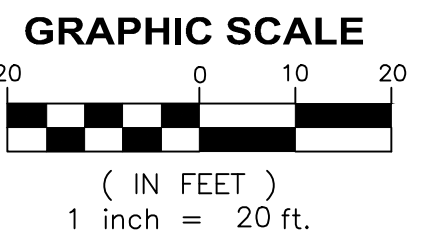
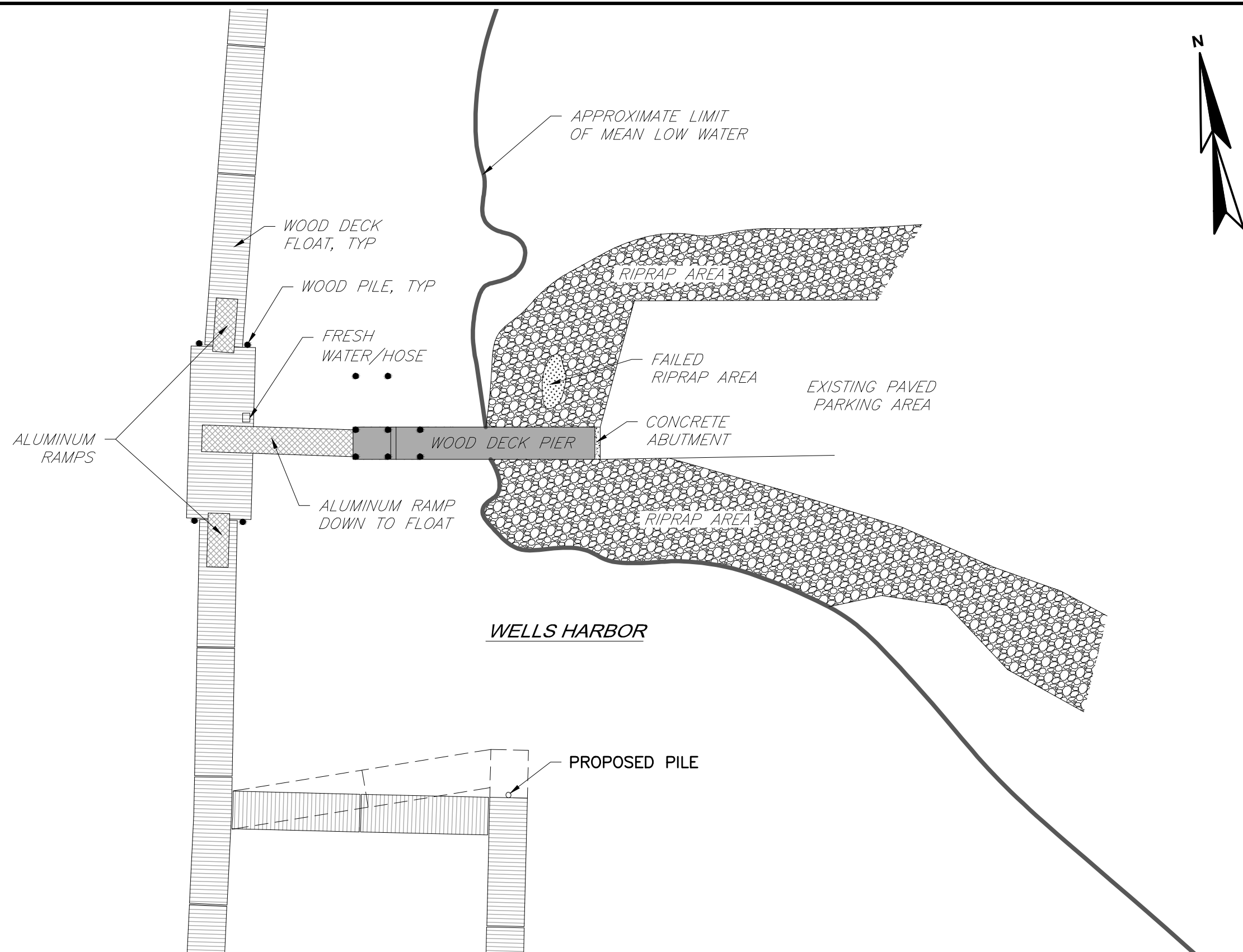


Railings: The railings do not appear to meet code or the Maine State Fire Marshall's Office standards for piers. Life safety issues, including the curbs which support the railing posts, the railings, ladders, life rings, etc. should be reviewed with the code enforcement authority having jurisdiction. Presently there are no ladders and no life rings were in place (park was closed) which may be of concern if someone fell or jumped into the water and could not swim to shore.

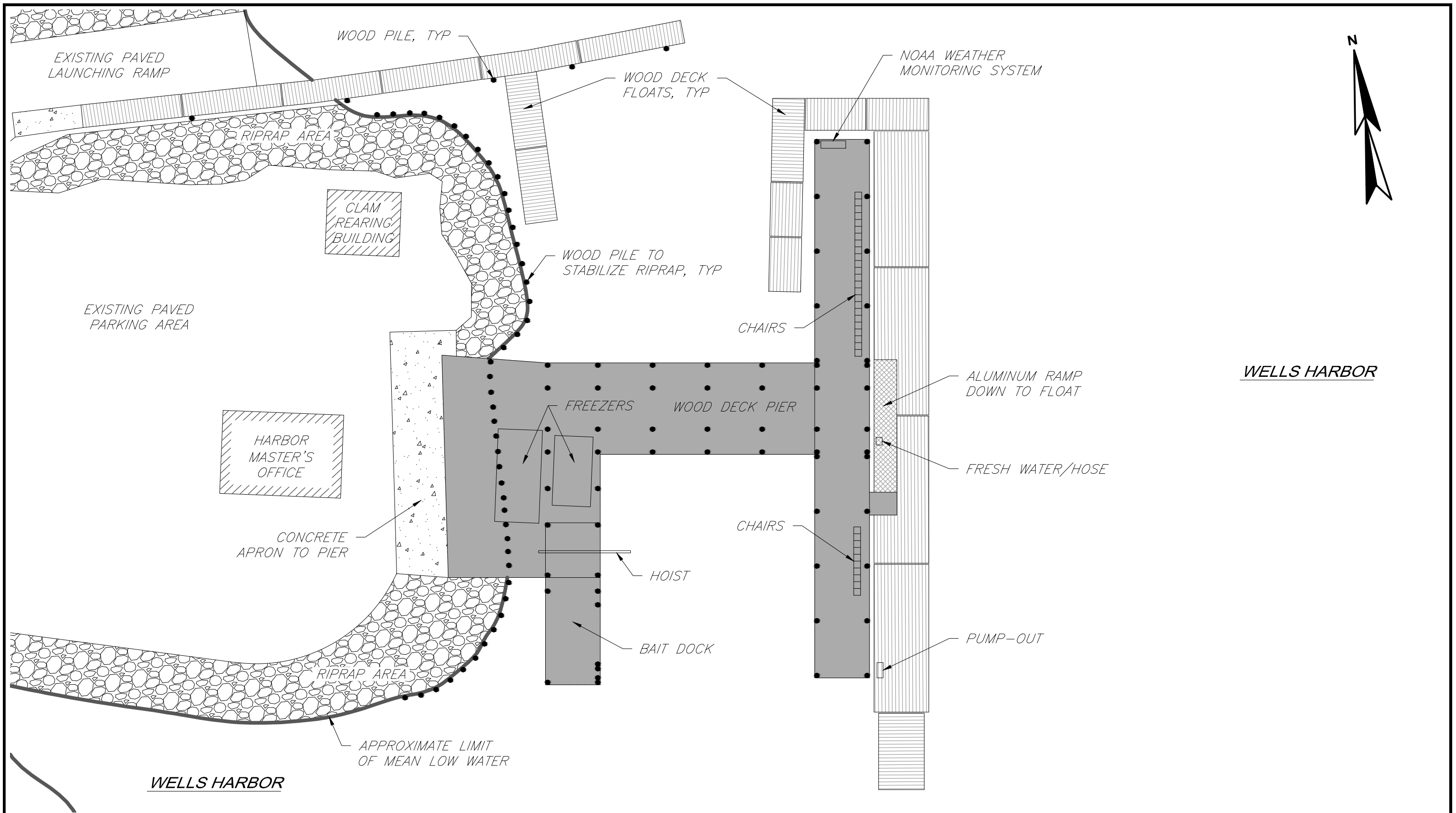
Floats: While the floats currently appear to be in generally serviceable condition, some are showing signs of deterioration and the community should start planning for their replacement in the near future. Based on observations, it will be desirable to alter and upgrade the fastening and anchoring mechanisms at that time.

Enclosures: Maps and Photographs

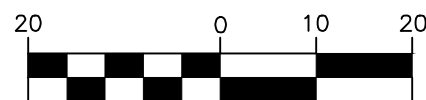
WELLS HARBOR



TOWN OF WELLS, ME		NO.	REVISIONS	APP'D
WELLS HARBOR				
PIER - EAST SIDE				
PROJ NO:	12504A	DATE:	AUGUST 2012	
		1		
		2		
		3		
			EAST SIDE PIER PLAN	
			FIGURE: 3	



GRAPHIC SCALE



(IN FEET)
1 inch = 20 ft.

TOWN OF WELLS, ME		NO.	REVISIONS	APP'D
WELLS HARBOR		1		
PIER - WEST SIDE		2		
PROJ NO: 12504A	DATE: AUGUST 2012	3		
			WEST SIDE PIER PLAN	FIGURE: 2



