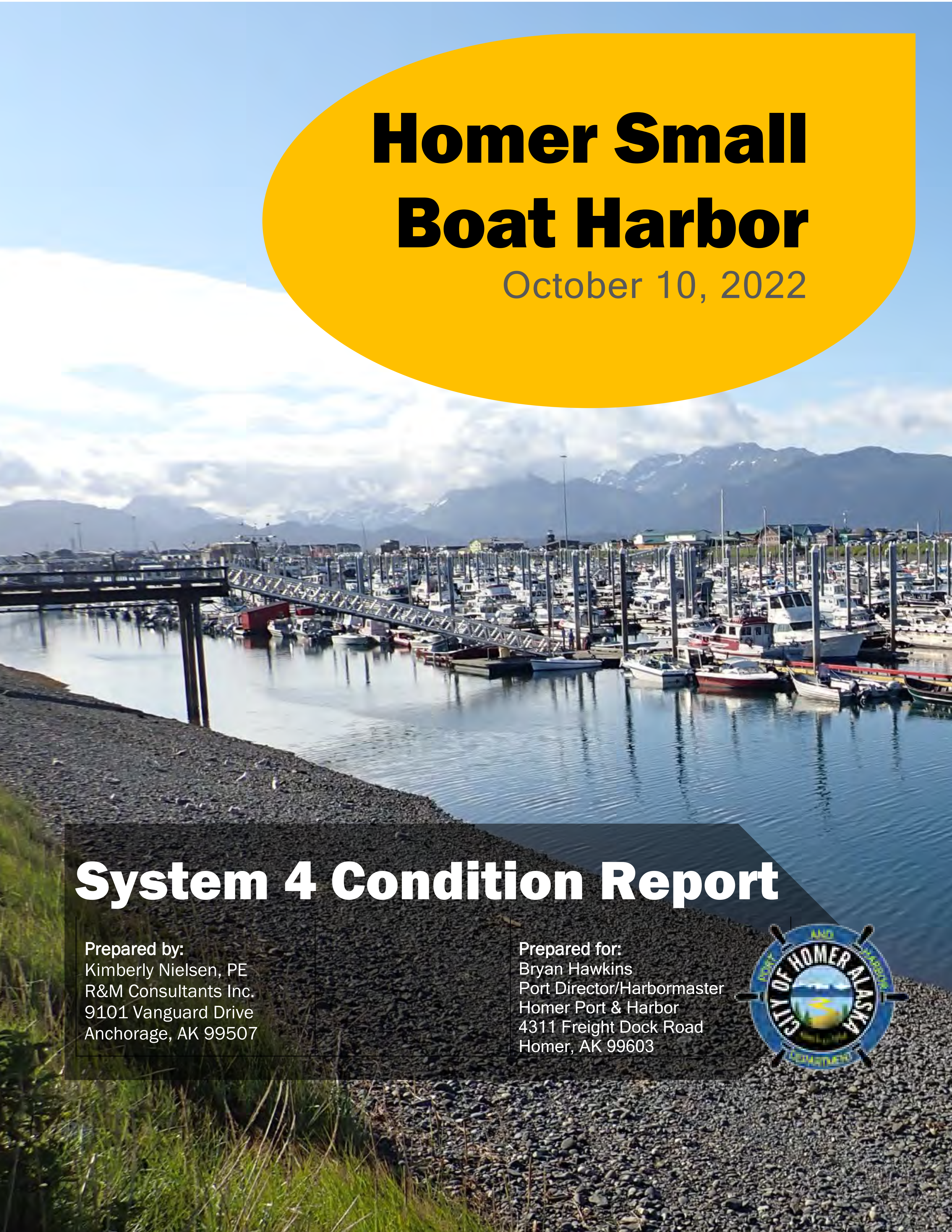

Homer Small Boat Harbor

October 10, 2022

System 4 Condition Report

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2.3 System 4

The Ramp 6 and Ramp 7 approach trestles and gangways appeared to have no major damage or defects visible. The gangway at Ramp 7 provides ADA-access to System 4, therefore the shorter gangway at Ramp 6 is acceptable.

1964 Timber Floats

The timber floats of Floats CC, DD, EE, and GG are the oldest in the harbor and are likely about 20 or 30 years beyond the original design life. Major maintenance such as adding flotation to the end of main floats (GG) as well as replacing timber piles (with timber and/or steel piles), decking, and stall floats is evident and have allowed continued use of these floats. Despite this, many bullrails, used for securing mooring lines, are cracked or deteriorated (Figure 2.44), resulting in loss of structural capacity in some locations. Some older timber piles have areas of rot (Figure 2.45). Some newer timber piles show evidence of section loss due to wear (Figure 2.46). Flotation foam has disintegrated in large areas throughout these main and stall floats (Figures 2.47 and 2.48 This causes all floats to have reduced freeboard, which ultimately reduces load capacity, and causes increased rate of corrosion on hinges, bolts, and pile collars. Float DD appeared to have notably low freeboard—as low as 4 to 6 inches in places—with some pile collars submerged (Figure 2.49). The entire main float appears to list to one side. The harbor staff indicated that they have to come shovel these floats at every snowfall to prevent them from sinking. The lack of flotation and deteriorated structural members throughout these four main floats (CC, DD, EE, GG) can cause the stall floats to twist or list to one side (Figure 2.50). Lack of flotation also causes the stall floats to be unstable or bouncy when walking on them, resulting in a potential safety hazard.

The headwalk Float AAA between Float EE and Float GG appears to be warped, suggesting a possible failure in structural members below the deck or lack of flotation or both (Figure 2.51). There are notably fewer piles on this section of Float AAA, which has contributed to this section of the float being overloaded.

Concrete float modules located at the end of EE Float have spalled concrete, exposing the foam flotation and what may be a steel reinforcing mesh (Figure 2.52).

Figure 2.43: Stall Float on CC Float with damaged timber waler, rubboard, and decking.

Figure 2.44: Cracked and deteriorated bullrail

Figure 2.45: Timber pile with advanced deterioration/rot

Figure 2.46: Moderate wear on timber piles.

Figure 2.48: View between deck boards of deteriorated flotation foam.

Figure 2.47: View under deck at a pile location. The odd shaped grey item floating between the pile and persons foot is very deteriorated flotation foam that is loose.

Figure 2.49: Low freeboard resulting in submerged pile collar. Also note hardware connections protruding through decking.

Figure 2.50: Example of a listing stall float (GG Float). Also note advanced rot/deterioration of below-deck timber.

Figure 2.51: Headwalk Float AAA between EE and GG Floats.

Figure 2.52: Spalled/missing concrete below deck with exposed foam and reinforcing.

2002 and 2015 Timber Floats

The FF Float system timber elements and steel piles and hardware show evidence of wear that is normal for a 20-year old facility with good maintenance. HH Floats and JJ Floats, along with the connecting AAA headwalk float were constructed in 2015 and appear to be good condition, with the exception of several bullrails, which appear to be overstressed. Several bullrails are damaged and bent at their mountings (Figure 2.53). Repairs might include more robust bullrail connections that are more suitable for the vessels utilizing this float, possibly mounted to interior structural members offset from the edge of the float.

Figure 2.53: Example of several bullrails that have been damaged on JJ Float.

Water service is provided to the System 4 by means of a seasonal HDPE pipe that runs under the gravel harbor slope and underwater to hose bib risers on the headwalk float (Figure 2.54). It appears the main floats and slips are serviced from the headwalk float hose bibs by a system of garden hoses to the older main floats. The newer main floats appear to have in-float piping distribution to hose bibs located in the power pedestals (HH and JJ Floats).

Note that the garden hoses are typically not NSF-approved materials and so would not satisfy the requirements of a public water system for potable water use. Given the various hose connections, backflow contamination is possible. Signs should be posted immediately to indicate the water is non-potable. When new floats are installed, the new water system should be constructed of materials suitable for drinking water and include proper backflow prevention, as regulated/permitted by ADEC.

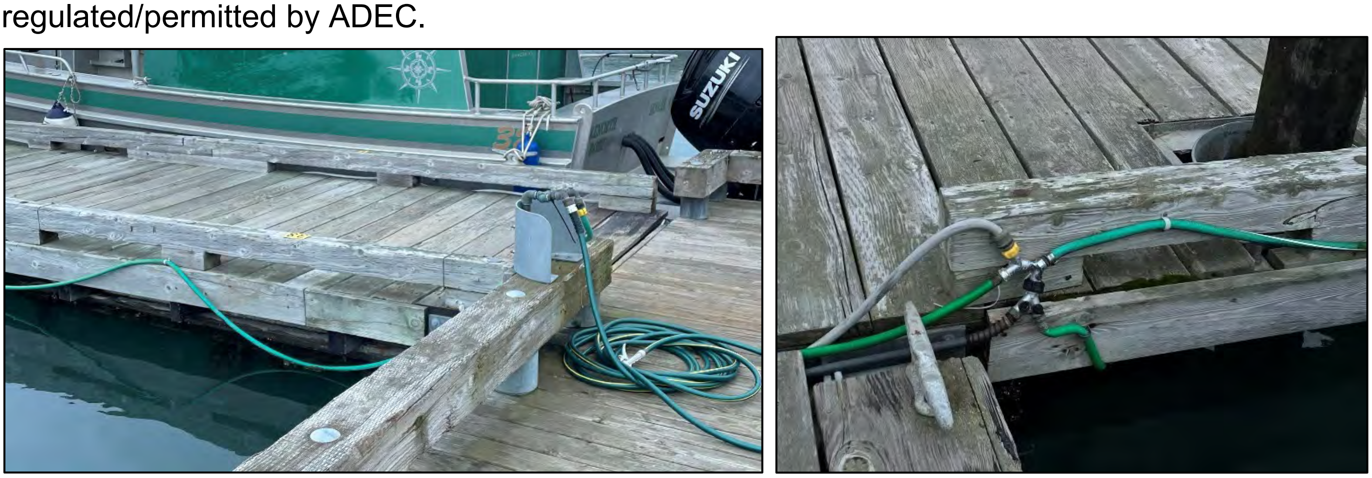


Figure 2.54: Typical water service to main floats provided from headwalk float by various hoses/connections.

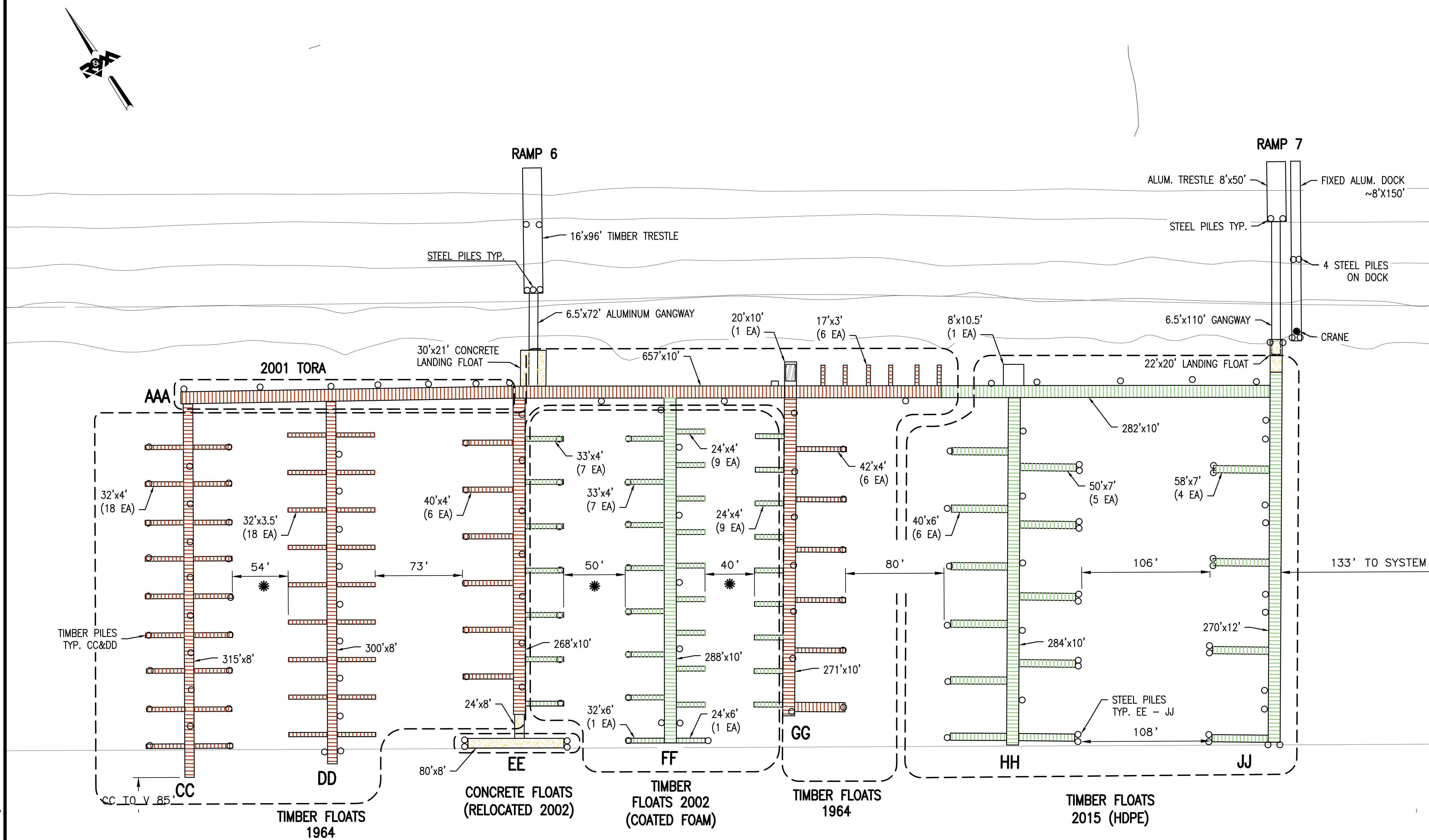
Figure 2.55: Electrical power service pedestals on EE Float (left) and typical of HH & JJ Floats (right). Note that the newer pedestal also incorporates water hose bibs.

Float EE has electrical power pedestals that are older generation, while the power service on HH and JJ Floats is modern (Figure 2.55). Note that a specific electrical inspection was not conducted to check for code/safety issues.

System 4 did not appear to have a modern dry standpipe fire suppression system. Fire extinguishers are provided throughout the float system and a red shed has additional fire fighting equipment. However, modern systems with a dry standpipe suppression system capable of providing sufficient water flow and pressure to fight a large vessel fire is recommended. The following table provides a summary of the condition ratings assigned to System 4.

Table 2.4 System 4 Condition Summary

ITEM	RATING		DESCRIPTION
Floating Docks (CC, EE, GG)	2	Serious	Low freeboard, lack of reserve flotation. Deteriorated, broken timbers, listing stall floats.
Floating Docks (DD)	1	Critical	Very low freeboard. Lack of flotation. Load restrictions are in place (immediate snow removal).
Floating Docks (FF)	5	Satisfactory	
Floating Docks AAA between EE & HH.	2	Serious	Advanced deterioration of structural elements and/or flotation has affected float performance.
Floating Docks (HH, JJ, and connecting AAA)	4	Fair	Float modules are satisfactory; however, bullrails on JJ appear overstressed and damaged, reducing load capacity for moorage.
Float Piling (timber)	3.5	Fair to Poor	Some timber piles have areas of rot. Some piles are relatively sound, with moderate section loss.
Float Piling (steel)	5	Satisfactory	Reduced galvanizing observed in tidal zone. Anode installation project is underway.
Trestles (R6)	5	Satisfactory	
Trestles (R7)	6	Good	
Gangways (R6, R7)	6	Good	
Water System	3	Poor	Non-NSF materials (garden hose) distribution system. Inadequate backflow prevention.
Fire Suppression System	3	Poor	Does not meet NFPA, lacks dry standpipe fire suppression system.



1 **SYSTEM 4 SITE PLAN**
Scale: NTS

NOTES:

✱✱ DENOTES FAIRWAY WIDTH IS LESS THAN THE MINIMUM REQUIRED PER STANDARD (1.5 X LONGEST SLIP LENGTH).

✱ DENOTES FAIRWAY WIDTH IS LESS THAN IDEAL PER STANDARD (1.75 X LONGEST SLIP LENGTH).

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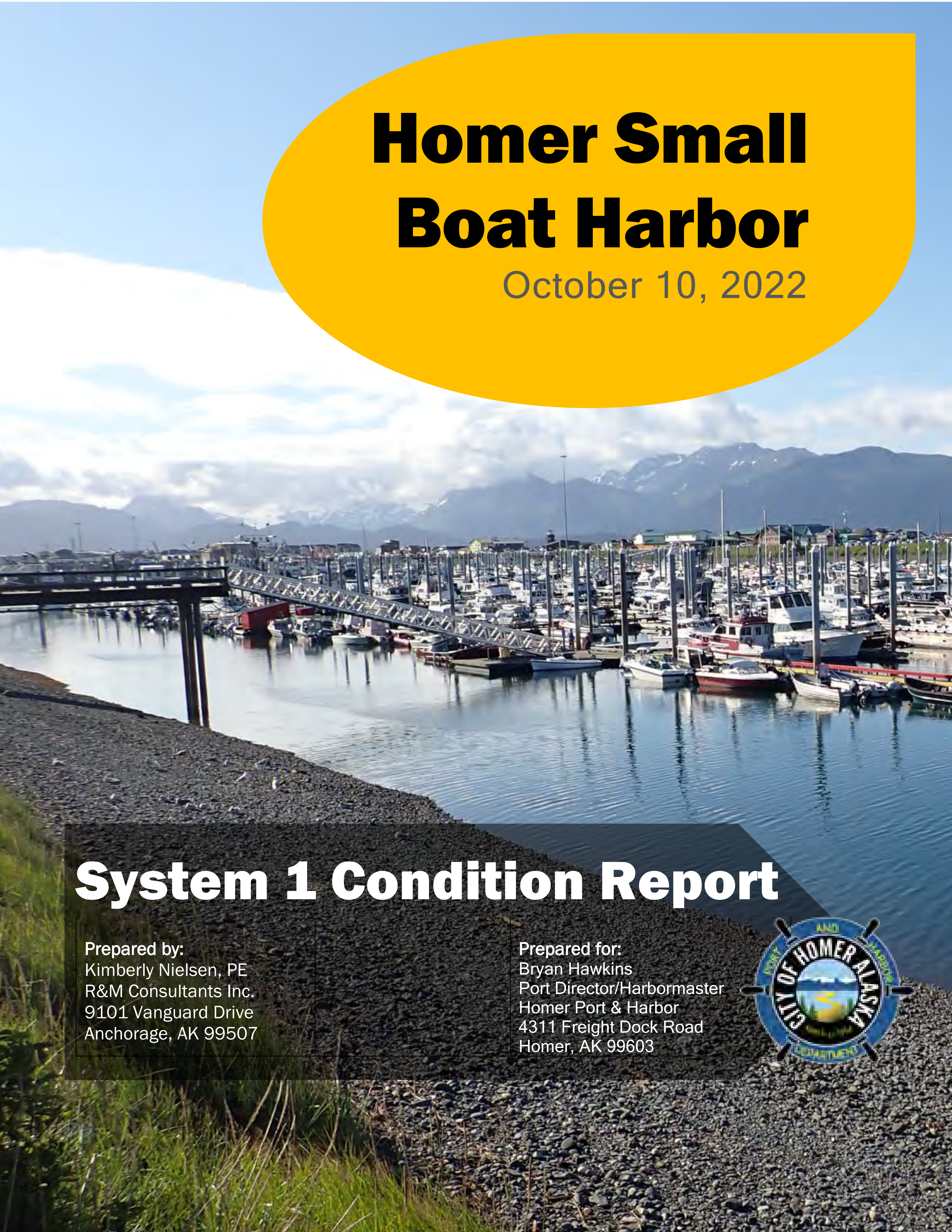
City of Homer
Homer Small Boat Harbor
Float Condition Assessment

No.	Description	Date

Drawn By: RG/CH
Checked By: XX
Date: OCTOBER 27, 2022
Phase:
Project No: 3002.01
SHEET TITLE: SYSTEM 4 SITE PLAN
SHEET NO: 5 OF 6
G5



Homer Small Boat Harbor

October 10, 2022

System 1 Condition Report

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2. FINDINGS

The floating dock systems in Homer Boat Harbor are of various ages and conditions. As would be expected, the original floats built by DOT in 1964 through 1992 are in the poorest condition, while the newer floats that have been installed to replace the DOT floats in other portions of the harbor are in satisfactory to good condition. In general, a key finding for floats that require major repairs or replacement is the low freeboard and lack of reserve flotation. ASCE Manual of Practice 30, *Planning and Design Guidelines for Small Craft Harbors* lists the following live load design criteria for floating docks.

Table 2.1: Design Live Loads

Condition	Uniform Live Load
Restricted access - pedestrian use only	30 pounds per square foot
Unrestricted access - pedestrian use only	40 pounds per square foot
Unrestricted access - golf carts	50 pounds per square foot

Preliminary calculations show that the older floats will be approximately awash at 30 pounds per square foot live load and will be submerged at 40 pounds per square foot or larger live loads. It should be noted that Homer has an ASCE 7-16 (code) specified 40 pounds per square foot ground snow load, which would sink some of the original generation of floats. This section describes all condition findings in detail and provides a summary rating of the various elements in each System.

2.1 System 1

The System 1 float system is the largest inter-connected float system in the harbor, comprising B Float through S Float. It has four primary "sub-systems" that are grouped based on their age and construction type (Refer to Drawings G2 and G3 in Appendix A). This section discusses the floating docks based on these groupings. The pedestrian access to System 1 is by four access Ramps: Ramp 1 and Ramp 2 located near C Float and E Float, respectively are similar and discussed together. Ramp 3 is located near G Float and Ramp 4 is located near N Float.

Access Ramps

Ramp 1 and Ramp 2 trestles are constructed of creosote-treated timber, with timber support piles and timber cross bracing. Steel piles have been installed at the end of the trestle to support a 74-ft long aluminum gangway ramp. The steel piles and steel floor grating and landing tracks on the gangway have evidence of corrosion but otherwise only minor damage was found (Figure 2.1). In general, the steel grating on the gangways does not meet ADA-accessibility guidelines. Gangways must be at least 80-ft long to meet current ADA requirements and there must be at least one ADA-accessible route for each size slip in a public harbor (the quantity of ADA-accessible slips required varies depending on the size of the harbor). Ramp 3 was rebuilt in 2013 and includes steel pile and treated timber trestle and a covered gangway that is 100-ft long and provides access to all the various slip sizes available throughout Homer Harbor. Because of this, an

Figure 2.1: aluminum gangway with steel floor grating and landing tracks

ADA gangway is not required at some of the other locations. However, we recommend that any new project that replaces a trestle, should consider providing a new 80-ft or longer covered gangway with flooring that meets ADA.

The decking and bullrails on the two trestles have evidence of deterioration due to wear. The timber support piles have moderate section loss and minor splits and gouges. Timber support piles have timber cross bracing (Figures 2.2 and 2.3. Some of the cross bracing has major deterioration, some boards are missing, and hardware located in the tidal zone is partially corroded (Figures 2.2 through 2.5). Note that the trestle decks on both Ramp 1 at Ramp 2 appear to have a dip—where it changes from a sloped deck to a level deck. Handrails appear to be a later addition to these trestles. Embedment depths on the timber piles is not evident, but timber harbor piles of this time period in Alaska were not typically driven to depths sufficient to withstand heavy axial or seismic/lateral loads, especially without relying on the cross bracing. If not already, vehicle access to these trestles should be restricted.

Figure 2.2: Ramp 1 timber pile supported trestle.

Figure 2.3: lower hardware connections appear corroded.

Figure 2.4: Ramp 2 timber pile supported trestle.

Figure 2.5: cross bracing connections corroded and in split timber

Figure 2.6: Ramp 3 trestle.

Ramp 3 has a timber trestle with steel piles and a 100-ft long roofed/sided gangway that was installed in 2015 (Figure 1.3). As noted, Ramp 3 is in good condition and provides ADA-access to Homer Harbor. The Ramp 3 timber trestle structure appears to be securely attached to the pile caps with steel plates (Figure 2.6). The seaward-most four piles have evidence of corrosion below tide line.

Ramp 4 consists of a relatively wide timber trestle (about 25' wide) with steel piles and an approximately 70-ft long aluminum gangway. Similar to the other gangways, this gangway has steel floor grating and landing tracks which have evidence of corrosion.

The Ramp 4 trestle has evidence of minor to moderate wear in decking as well as evidence of fungal decay and minor checks/splits in bullrails and handrails (Figure 2.7). The trestle appears to have had some modifications, with the shoreward end appearing older, more deteriorated than the seaward end. The steel piles at the seaward end are secured into the timber beams with steel plates and bolts, while the shoreward end of the timber structure appears to rest on the steel piles (Figure 2.8). Also noted, although not part of the harbor facilities being inspected, the adjacent timber retaining wall and steel piles that support the adjacent boardwalk appeared to be displaced and broken.

Figure 2.7: Ramp 4 trestle

Figure 2.8: Ramp 4 trestle, noting newer/older portions of timber trestle and pile-to-beam attachments.

2015 Timber Floats

Main Floats R, S, and J as well as headwalk Float A from E Float to K Float were installed in 2015 and are constructed of timber frame with HDPE encased flotation tubs, such that there is no timber submerged in the water. Float modules are connected by steel hinges. The floats are secured in place with galvanized steel piling. The floats and piles were found to be in good condition: there was adequate reserve flotation (Figure 2.9) and only minor checks and splits in timber, worn non-skid coating on steel hinges, and evidence of early fungal growth in some areas of decking (Figure 2.10). Many of the piles, in deeper water, have had new anodes installed in 2018 or are included in an anode installation project currently underway which will help to ensure the piles to not prematurely corrode.

Potable water is piped within or under the floats and hose bibs are located periodically on the edge of the floats (Figure 2.10). J Float is equipped with power (combined water/power pedestals) at each stall as shown in Figure 2.11. There is no power service available on R Float or S Float.

Fire suppression systems include fire extinguishers placed on the floats as well as a dry standpipe fire suppression system with an upland charging station for Fire Department use. According to the National Fire Protection Association (NFPA) 303 "*Fire Protection for Marinas and Boatyards*", the fire suppression system appears to be inadequate because the above-water piping is HDPE which is not fire-resistant (Figures 2.12 and 2.13). A failure in part of the piping system due to melting during a fire could render the system useless or worse cause delay in fighting a fire. The above-water HDPE pipe should be replaced with metal pipe or it may be possible to install a suitable fireproof cover sleeve.

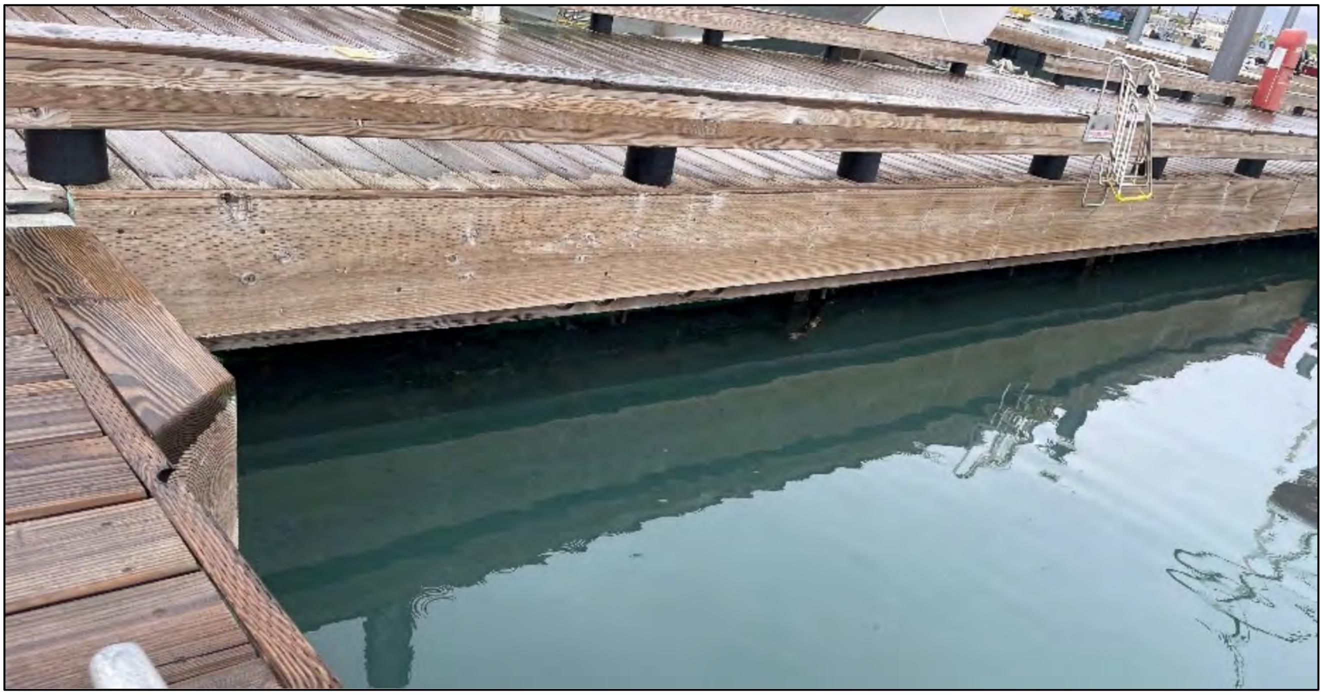


Figure 2.9: Timber floats have sufficient freeboard and reserve flotation.

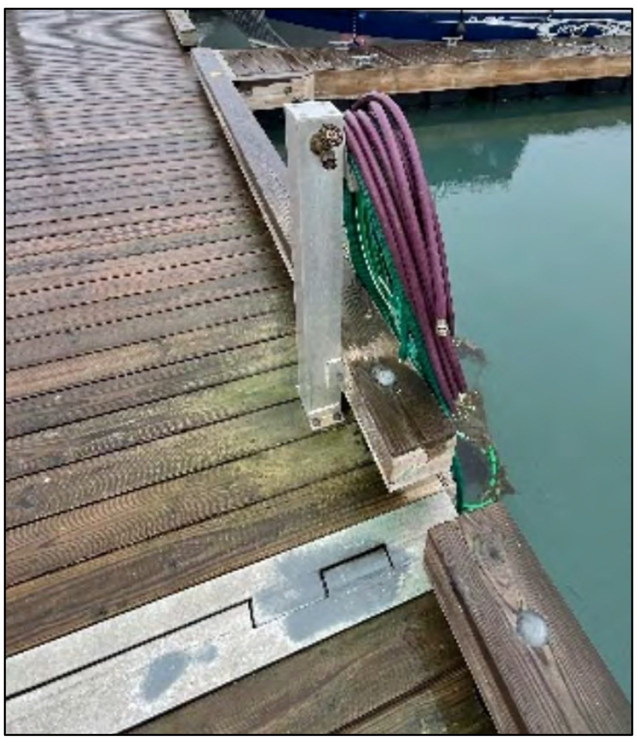


Figure 2.10: Hose bib riser, typical on R & S Floats. Note fungal growth on timber and partially worn anti-skid on steel hinge connections.

Figure 2.11: Typical combined power and water pedestal (J Float).

Figure 2.12: Fire suppression system standpipe/hydrant near J Float

Figure 2.13: Fire system HDPE piping on Ramp 4.

2002 Timber Floats

Main Floats E, F, G, and H were installed in 2002 and are constructed of timber with polystyrene flotation (framed in timber). Float modules are connected by steel hinges and are anchored with galvanized steel piling. The floats were found to be in satisfactory condition: there was adequate reserve flotation; minor to moderate checks, splits and damage to some timber elements, minor to moderate wear in decking (Figure 2.14), a few worn and broken bullrails (Figure 2.15), worn non-skid coating on steel hinges (Figure 2.16), and evidence of fungal growth in some areas. Areas of consumed galvanizing was observed within the tidal zone on steel piles. Piles on E and F Float had new anodes installed in 2018 and G and H Float are included in an anode installation project currently underway. This will help to ensure the piles to not prematurely corrode.

Figure 2.14: Typical decking wear at high traffic areas (float intersections)

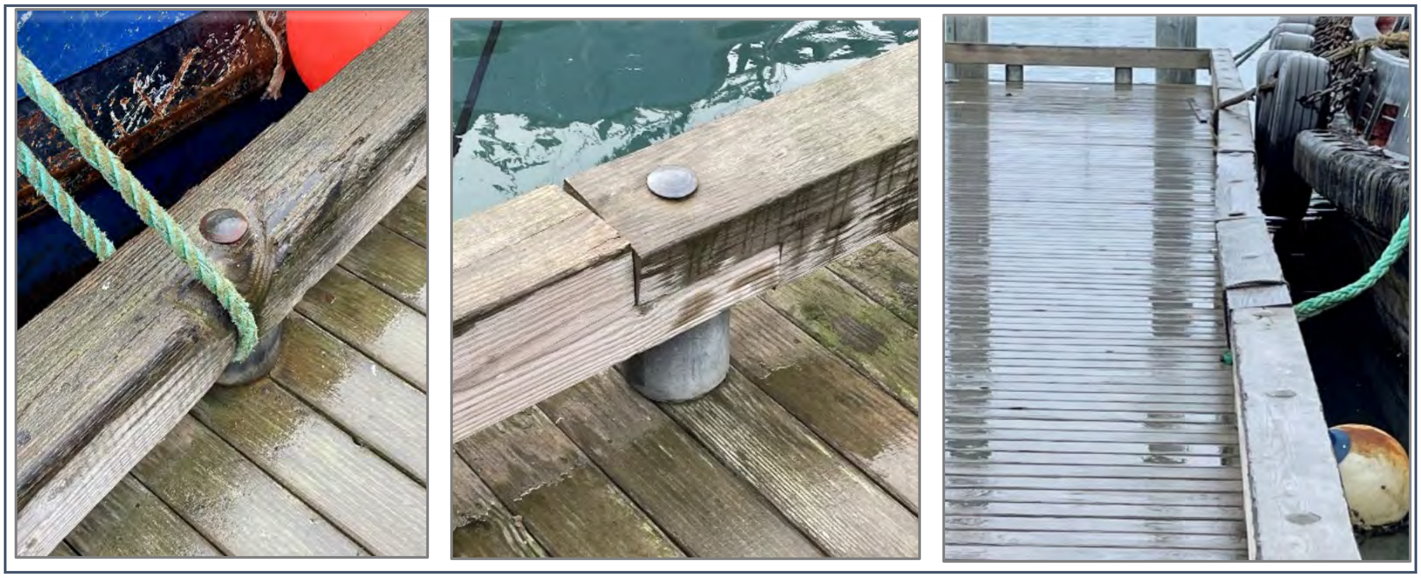


Figure 2.15: Bullrails worn, twisted out of position, and broken from supports.

Figure 2.16: Worn non-skid coating at hinges.

Potable water is piped within or under the floats and hose bibs are provided at each stall, along with power service in a combined pedestal, similar to that on J Float (Figure 2.3). However, the pedestals on these floats appeared to have a coating issue. The paint appeared bubbled and peeled in places, exposing the metal housing to corrosion (Figure 2.18).

Fire suppression systems include fire extinguishers placed on the floats as well as a dry standpipe fire suppression system. The fire suppression system for these floats is supplied from Ramp 2 (Figure 2.17). The above-water piping for the fire suppression system is HDPE which is not a fire resistant material. The above-water HDPE pipe should be replaced with metal pipe or it may be possible to install a suitable fire resistant sleeve.

Figure 2.18: Power/water pedestal coating damage

Figure 2.17: HDPE fire suppression piping at Ramp 2

1992 Concrete Floats

The 1992 Concrete Floats include Main Floats B, C, D and connecting headwalk Float A from B to and including Ramp 2 landing float. These floats are constructed of concrete with steel through rods and a timber waler system. The floatation is concrete-encased polystyrene foam. The floats are secured in place with galvanized steel piling.

The floats were found to be in serious condition. The headwalk float A between B and D Floats appeared as well as the end of main Float C appeared to have a twist in the float suggesting possible broken concrete and/or through rods. In general, the freeboard was low throughout the facility indicating inadequate reserve flotation (Figure 2.19); moderate to major checks, splits, breaks and other damage to timber walers and rubboards (Figures 2.20 and 2.21), and corroded and missing through rods (Figure 2.22). Steel bullrails have been installed by mounting through damaged timber walers, which may result in loss of mooring.

Replacement rubboards have been added in some areas. The concrete surface of the floats had some areas of relatively minor cracking most of which has been repaired.

Piles generally had areas of consumed galvanizing within the tidal zone, and active corrosion was observed on some of the piles (Figure 2.23). The piles had new anodes installed in 2018.

Figure 2.19: Concrete stall float with low freeboard, and in the water at the end.

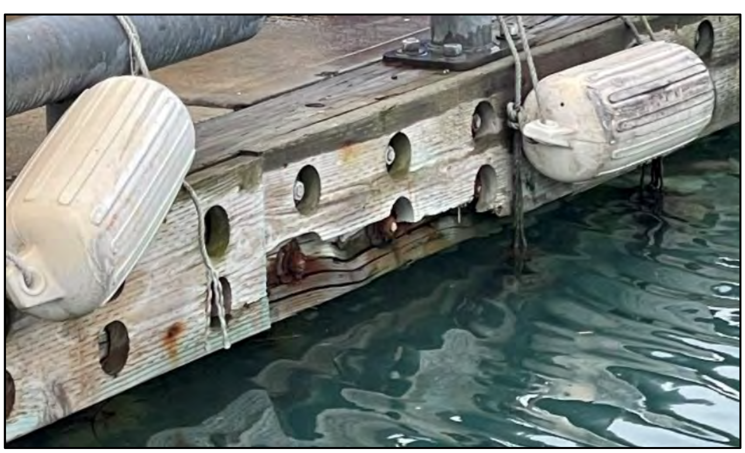


Figure 2.20: Broken rubboard and corroded through rods

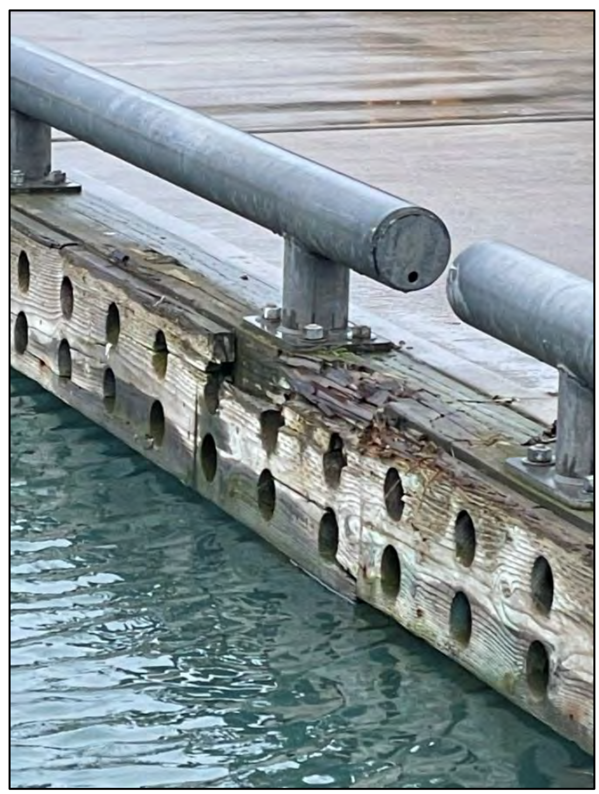


Figure 2.21: Deteriorated timber rubboard and waler. Steel bullrail mounted in waler.

Figure 2.22: Missing through rods.

Figure 2.23: Pit corrosion and other areas of active corrosion is evident on some piles

The water distribution system appears to be a piped system from the gangway ramp to the headwalk float, where a single riser with multiple hose bibs is provided near the intersection with each of the three main floats (Figure 2.24). In some locations hoses were attached to the outside of the main float to individual vessel slips. Garden hoses are typically not NSF-approved for potable water distribution and hence should not be used as part of a public water distribution system. Multiple hose connections indicate inadequate backflow protection (Figure 2.24).

Fire suppression systems include fire extinguishers placed on the floats. Like the other floats in System 1, a dry standpipe fire suppression system exists in this area. For these floats it appears to be supplied from Ramp 2 and made of HDPE which is not a fire-resistant material. The above-water HDPE pipe should be replaced with metal, or it may be possible to install a fire rated sleeve.

Power service is provided to B, C and D Floats. Many power pedestals have broken or loose mounts (Figure 2.25).

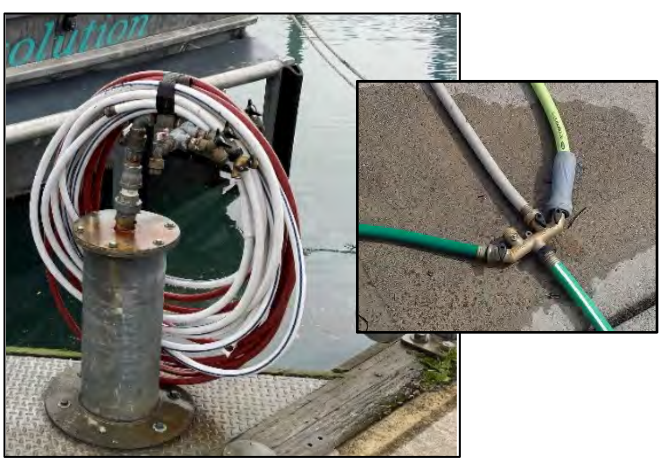


Figure 2.25: Water service riser at the head of each main float (left) and multiple hose connections.

Figure 2.24: Typical power pedestal, many with damaged mounts. Note also typical minor crack in concrete.

1986 Concrete Floats

The 1986 Concrete Floats in System 1 include Main Floats K, L, M, N, P, Q and connecting headwalk Float A from S Float (Drawing G2). The concrete floats in this portion of System 1 are generally in serious condition, with some specific areas in critical condition. There is very low freeboard throughout the float system (Figure 2.26). Concrete surfacing has widespread areas of patched concrete over patched concrete—showing many years of repairs (Figure 2.27). Some stall floats are listing to one side or have been refurbished by adding timber decking added over the top and lumber attached to the sides (Figure 2.27). The City has added floatation to some of the headwalk/utility floats to keep them from sinking. Many areas of fungal decay and vegetation were observed. Timber bullrails and walers have moderate to major checks and splits, some running through the full depth of the member as well as some that are partially broken from their mountings (Figure 2.28). Cleats mounted in decayed or broken walers also have reduced capacity.

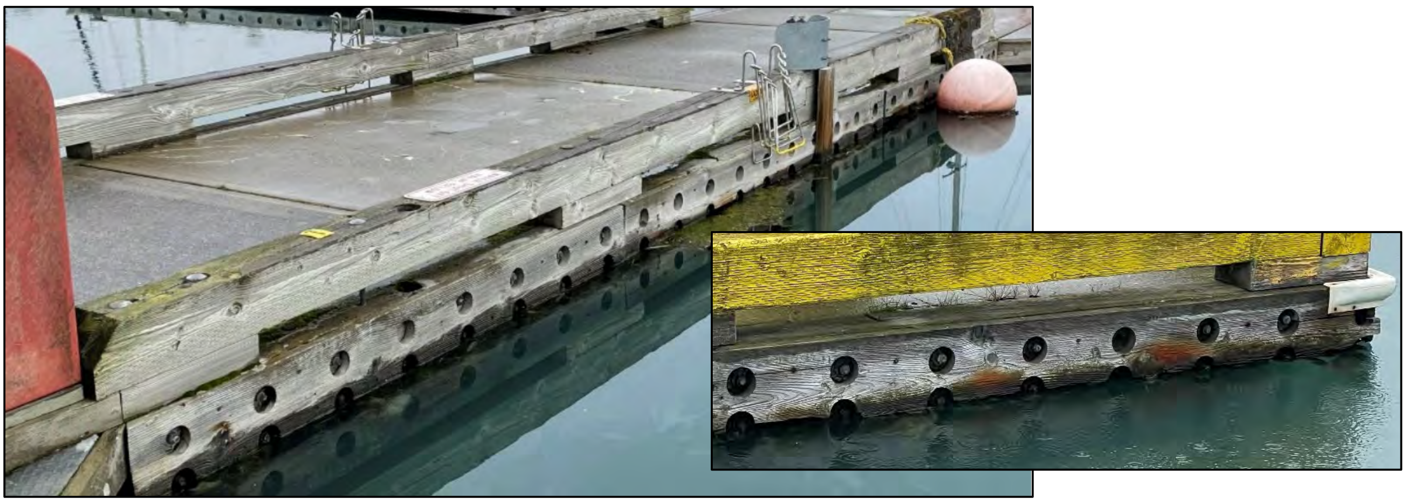


Figure 2.26: Concrete floats showing low freeboard and corroding and missing through rods.

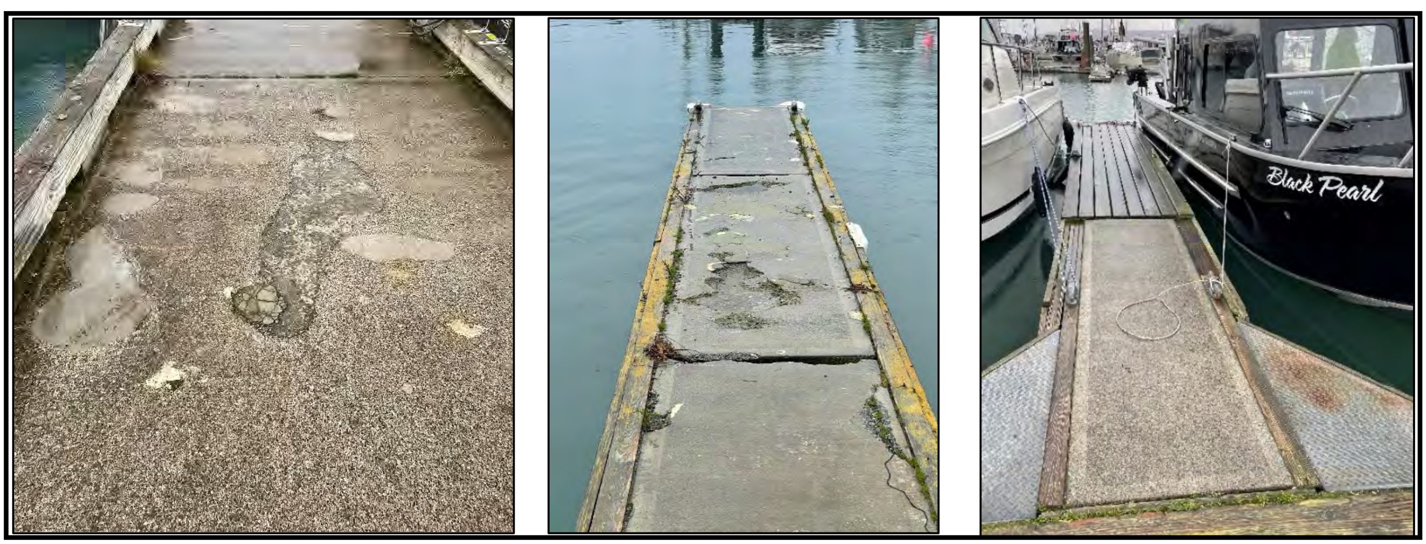


Figure 2.27: Deteriorated concrete surface and concrete repairs, including covering with timber decking.

Figure 2.28: Bullrails will major splits and missing section, and cleat mounted in damaged timber waler.

Stall flats on both sides of the Tee floats, at the end of each of the main float rows (Q, P, N, M, L, and K) nearest the main harbor navigation channel, are severely listing and broken loose from their connections to the main float (Figure 2.29). Walers on these floats have major deterioration. Modifications have been made to keep the floats from coming apart (Figure 2.30). It is thought that wave action in the channel acting on the moored vessels in the end slips has overstressed the end floats and caused breakage of the deteriorated structural members in these float connections. This is considered an area of critical condition and immediate repair or removal of the end floats and/or restrictions on use of these slips should be implemented as soon as practicable. Except for these end floats, the rest of these concrete floats in this area are considered to be in serious condition. When these floats are eventually replaced, the fairway distance between J and K Floats as well as between Q and R Floats should be increased to meet current standards (Drawing G2).

Figure 2.29: Tee floats, located along the harbor channel, are broken and severely listing.

Steel piles are used to secure the floats, and in this area of System 1 the original galvanized coating on many of the piles has been consumed and there is evidence of corrosion (Figure 2.31). A project is underway to install anodes on the piles in this area.

Figure 2.30: A metal plate has been installed to a broken Tee Float. Note the bullrail has come apart at the splice.

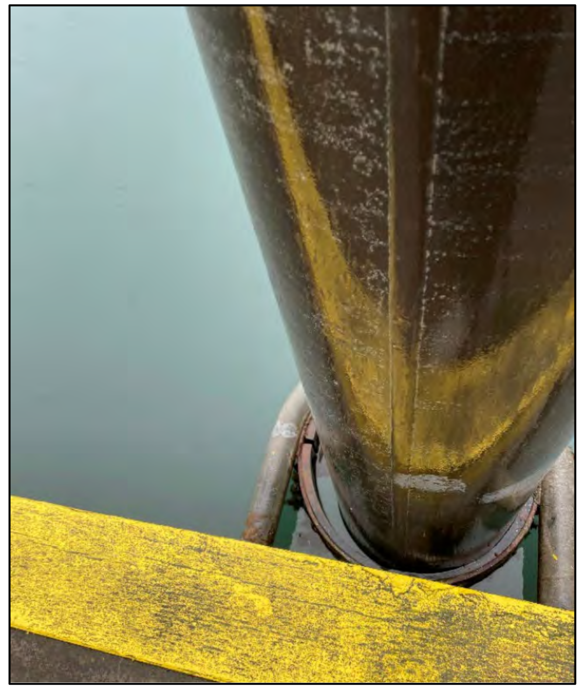


Figure 2.31: Typical steel pile and exterior pile hoop. Note galvanized pile coating is consumed

Water service to the 1986 concrete floats in System 1 appears to be distributed by a combination of piping and hoses. There have been many modifications and the exact piping and source to these floats was not clear from topside visual observation. No fixed water piping was visible on the gangway ramp; although there are hose bibs near the top of the trestle at Ramp 4. It is assumed that there is piping along the headwalk float, to the point of the shutoff valves which were observed at the intersection with the main floats. Hoses are attached to the sides of the floats, which may provide service to hose bibs that are located periodically along the main floats. Alternatively, the hose bibs may no longer be connected and hoses go direct to slips as shown in Figure 2.33.

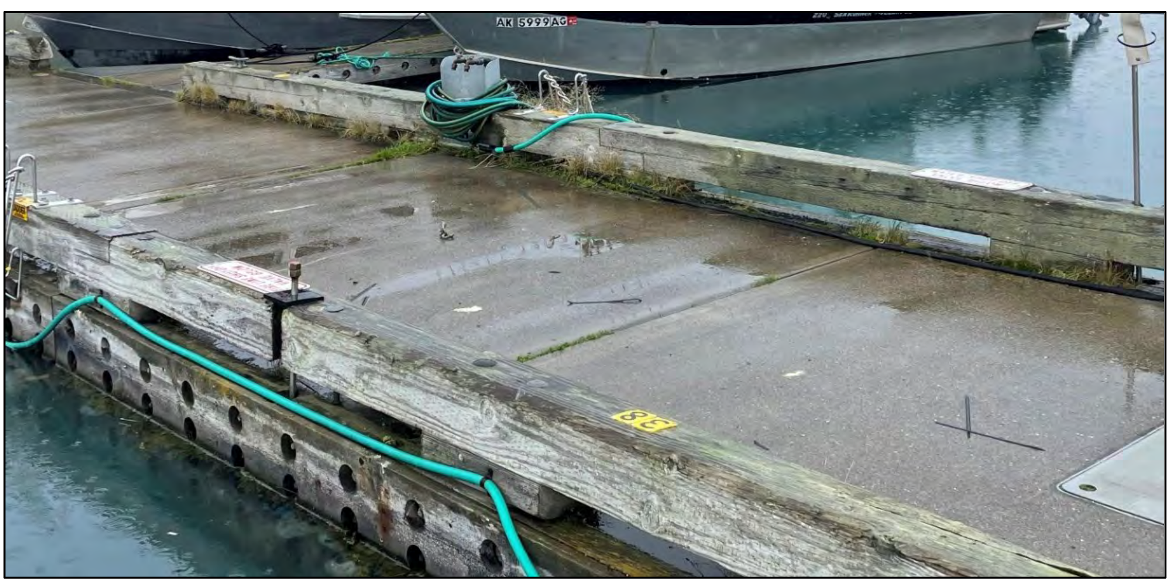


Figure 2.32: Water service on main float. Note T-handle used to operate the water valve, which is located underneath the float. Garden hoses run from under the float and are attached to the side of the float in places.

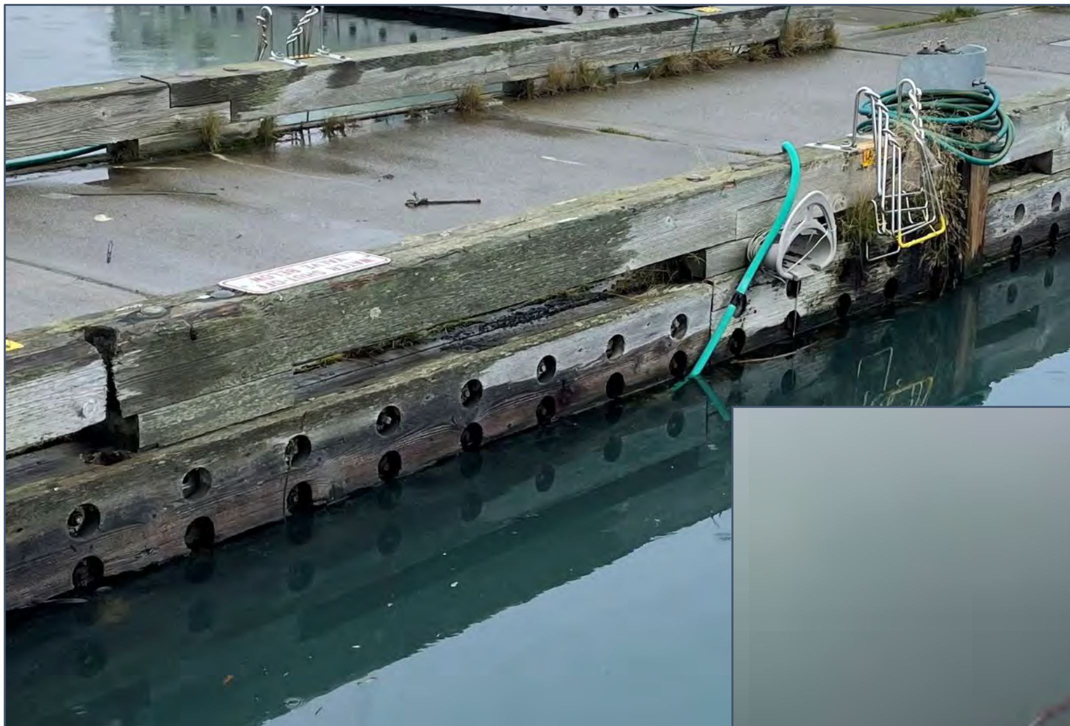


Figure 2.33: Water distribution, with location of valve at the far left (photo above) and hose coming up from under the float. Photo to right shows a hose from under the float to a 3-way connection, with one end going under the float and the other to a nearby slip, with a sprayer attachment.

Note that the garden hoses are not NSF-approved materials and so would not satisfy the requirements of a public water system for potable water use. It is unlikely, given all the various hose connections, that sufficient backflow prevention is provided. Signs should be posted to clarify the water is non-potable. When new floats are installed, the new water system should be constructed of materials suitable for drinking water and include proper backflow prevention, as regulated/permitted by Alaska Department of Environmental Conservation (ADEC).

No power service is available at K through Q Floats.

The fire suppression systems include fire extinguishers placed on the floats as well as a dry standpipe fire suppression system. Similar to the other floats in System 1, the fire suppression system at the 1986 concrete floats appears to be inadequate because the above-water piping is HDPE which is not a fire-resistant material. As noted previously, this piping should be replaced with metal and/or a fire rated covering to meet modern NFPA standards.

Table 2.2 provide a summary of the condition ratings assigned to the various floating docks and other elements within System 1.

Table 2.2 System 1 Condition Summary

ITEM	RATING		DESCRIPTION
Floating Docks, 1986 Concrete (K, L, M, N, P, Q, & connecting A)	1.5	Serious-Critical	Lack of freeboard/reserve flotation, concrete and timber deterioration (serious). Broken structural elements at end floats (critical).
Floating Docks, 1992 Concrete (B, C, D, & connecting A)	2	Serious	Lack of freeboard/reserve flotation, deterioration of timber and steel elements. Possible failures, twist in some headwalk/main float modules.
Floating Docks, 2002 Timber (E, F, G, H)	5	Satisfactory	Minor to moderate timber deterioration, damage.
Floating Docks, 2015 Timber (J, R, S, & A from E to K)	6	Good	Only minor damage noted in timber: checks, splits, and fungal growth.
Piling (steel)	5	Satisfactory	Reduced galvanizing & active corrosion on some piles, but new anodes have/are being installed.
Trestles (R1, R2)	2	Serious	Deterioration of timer piles and cross bracing, missing members, corroded hardware.
Trestles (R3)	5	Satisfactory	Steel pile/caps, minor deterioration of timber.
Trestles (R4)	4	Fair	Shore end moderate deterioration of timber and poor connection to piles
Gangways (R1, R2, R4)	5	Satisfactory	Some corrosion/track wear evident
Gangways (R3)	6	Good	
Water System (2002 & 2015 Floats)	5	Satisfactory	
Water System (1986 & 1992 floats)	3	Poor	Non-NSF materials (garden hose) distribution piping. Inadequate backflow prevention.
Fire Suppression System	3	Poor	Dry standpipe system (where present) does not meet NFPA due to plastic materials.

2.2 System 2

The Ramp 5 approach trestle and gangway have evidence of wear, typical of their age. Steel piles have evidence of corrosion in the tidal zone. Trestle timber treatment is reduced, some minor cracking in pile caps, and decking has evidence of wear. The gangway ramp, at 70-ft long does not meet ADA-guidelines; however, as long as there are sufficient ADA slips (5 total) in the 20-24-ft length available in the harbor (i.e., System 1), this is not required; although it is recommended to replace the ramp with an 80-ft minimum length ADA ramp when the trestle and/or floating docks are replaced. The gangway ramp bottom slide guides have evidence of wear and these as well as the steel floor grating have evidence of corrosion (Figure 2.34). However, there is no visible major damage or defects that immediately affect the capacity of these structures; other than the float on which the gangway ramp lands has low freeboard, as is noted by the timber walers in/near the water especially at the shoreward end (Figure 2.35).

Figure 2.34: Ramp 5 aluminum gangway w steel floor grating.


Figure 2.35: Ramp 5 trestle and gangway. Note landing on concrete float with reduced freeboard.

The concrete floating dock modules appear to be in serious condition. The floats throughout System 2 have reduced freeboard (Figure 2.36) due to a lack of flotation and/or saturated foam as a result of the concrete encasement having spalled or cracked. The City has added flotation tubs underneath to supplement the lack of flotation in the most severe locations. The structural through rods which connect the exterior walers have evidence of corrosion throughout the system and several are missing—as no rod/nut was visible on the sides of the floats (Figure 2.37). Many rubboards are cracked and many bullrails, used for securing mooring lines, are cracked or deteriorated due to fungal growth (Figure 2.38), resulting in loss of structural capacity in some locations.


Figure 2.36: System 2 Headwalk float has reduced freeboard and appears to be listing to one side, as noted by partially submerged rubboards.

Figure 2.37: Through rods corroded or missing.

Figure 2.38: Deteriorated bullrails

Years of maintenance is evident: patches over already patched concrete (Figure 2.39) decking over deteriorated concrete stall floats (Figure 2.41), replacing sections of timber bullrails and rubboards, and adding safety equipment including fire extinguishers and ladders is evident and have allowed continued use of these floats.

Figure 2.39: Deteriorated/patched concrete on main floats.

Figure 2.40: Patched concrete and deteriorated waler and rubboards on stall floats.

Piles in this area are steel and have consumed galvanizing and corrosion evident; however, these piles are included in an anode installation project currently underway.

The water distribution system at System 2 appears to have been added and modified over the years. It is fed from System 1 (S Float) via an underwater flex hose. Hose bib stanchions are located periodically on the floats (Figure 2.42). Users run t hoses across the floats to the nearest hose bib. A reduced pressure backflow prevention assembly was not evident/observed for this system. The hose bibs are equipped with vacuum breakers; however, these are not reliable or normally accepted as the only backflow prevention device in a public water system. In addition, some hoses had splitters to individual slips, and these did not have vacuum breakers.

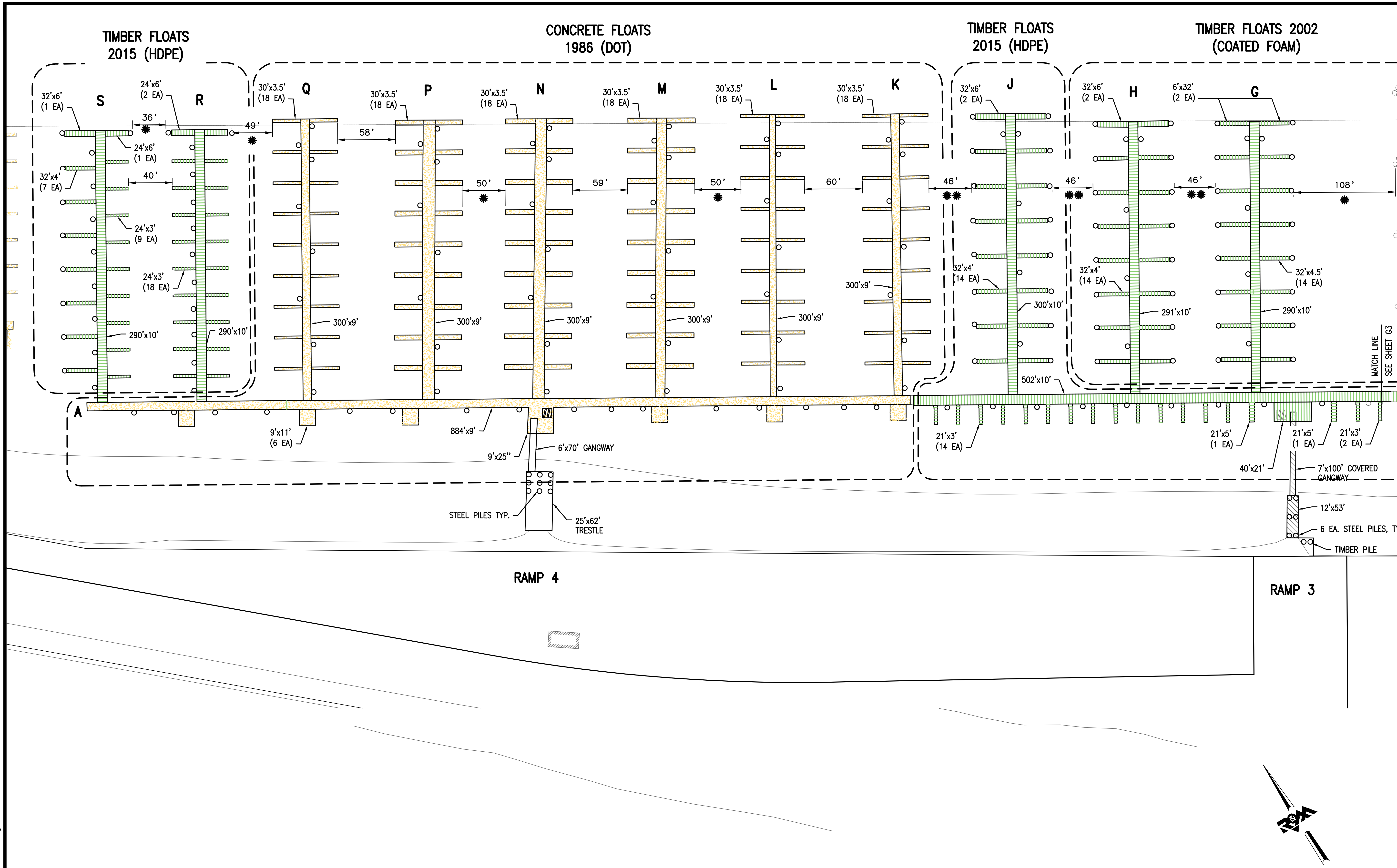
Figure 2.41: concrete stall float with decking attached over the top.

Figure 2.42: water hose bib and hose stand.

System 2 fire suppression system is in poor condition, primarily due to not meeting modern standards. The fire suppression system includes periodic extinguishers and other equipment (in a shed) on the float system and a hydrant in the uplands. However modern standards such as National Fire Protection Association (NFPA) 303 "*Fire Protection for Marinas and Boatyards*" include a piped dry standpipe system that would allow an upland charging station and risers for Fire Department access on the float system. Table 2.3 provides a summary of the condition ratings assigned to System 2.

Table 2.3 System 2 Condition Summary

ITEM	RATING		DESCRIPTION
Floating Docks (1986)	2	Serious	Low freeboard, lack of reserve flotation. Deteriorated/missing thru-rods and bullrails.
Piling (steel)	5	Satisfactory	Reduced galvanizing observed in tidal zone. Anode installation project underway.
Trestle	5	Satisfactory	Cracks in timber pile caps, minor deterioration/wear in other timber members.
Gangway (R5)	4	Fair	Evidence of corrosion and wear of bottom guide, does not meet ADA.
Water System	3	Poor	Many modifications, non-NSF hoses, likely inadequate backflow prevention.
Fire Suppression System	3	Poor	Does not meet NFPA, lacks dry standpipe fire suppression system.



1 **SYSTEM 1A SITE PLAN**
Scale: NTS

NOTES:

✱✱ DENOTES FAIRWAY WIDTH IS LESS THAN THE MINIMUM REQUIRED PER STANDARD (1.5 X LONGEST SLIP LENGTH).

✱ DENOTES FAIRWAY WIDTH IS LESS THAN IDEAL PER STANDARD (1.75 X LONGEST SLIP LENGTH).

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City of Homer
Homer Small Boat Harbor
Float Condition Assessment

No.	Description	Date

Drawn By: RG/CH
Checked By: XX
Date: OCTOBER 27, 2022
Phase:
Project No: 3002.01
SHEET TITLE: SYSTEM 1A SITE PLAN
SHEET NO: 2 OF 6
G2

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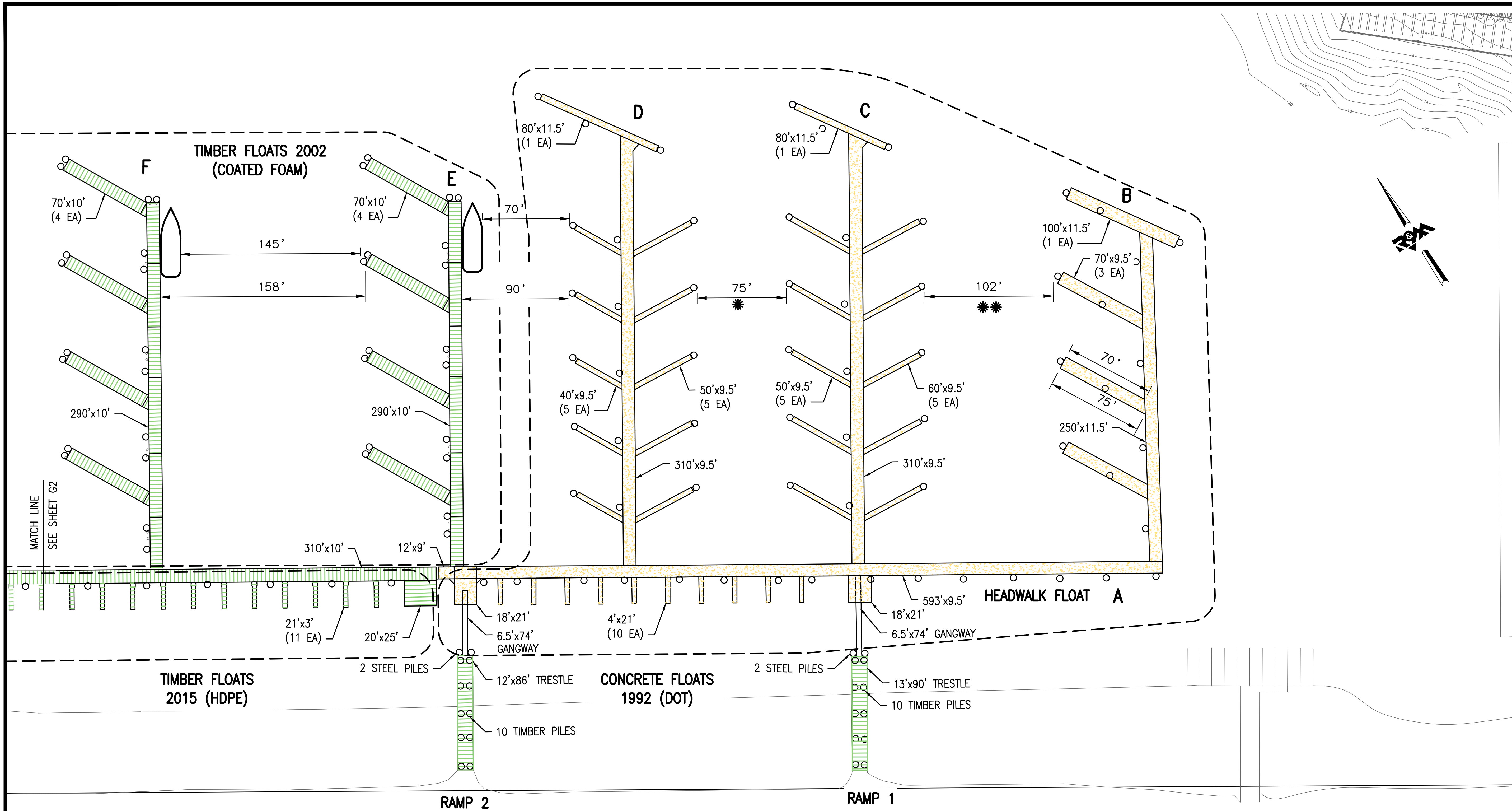
Plotted 11/4/2022 2:32 PM by Russell Gingras



1 SYSTEM 1B SITE PLAN

Scale: NTS

NOTES:

✱✱ DENOTES FAIRWAY WIDTH IS LESS THAN THE MINIMUM REQUIRED PER STANDARD (1.5 X LONGEST SLIP LENGTH).

✱ DENOTES FAIRWAY WIDTH IS LESS THAN IDEAL PER STANDARD (1.75 X LONGEST SLIP LENGTH).

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City of Homer

Homer Small Boat Harbor
Float Condition Assessment

No.	Description	Date

Drawn By: RG/CH | Checked By: XX

Date: OCTOBER 27, 2022

Phase:

Project No: 3002.01

SHEET TITLE: SYSTEM 1 B SITE PLAN

SHEET NO: 3 OF 6

G3