

Appendix B

Marina Facility Condition Surveys



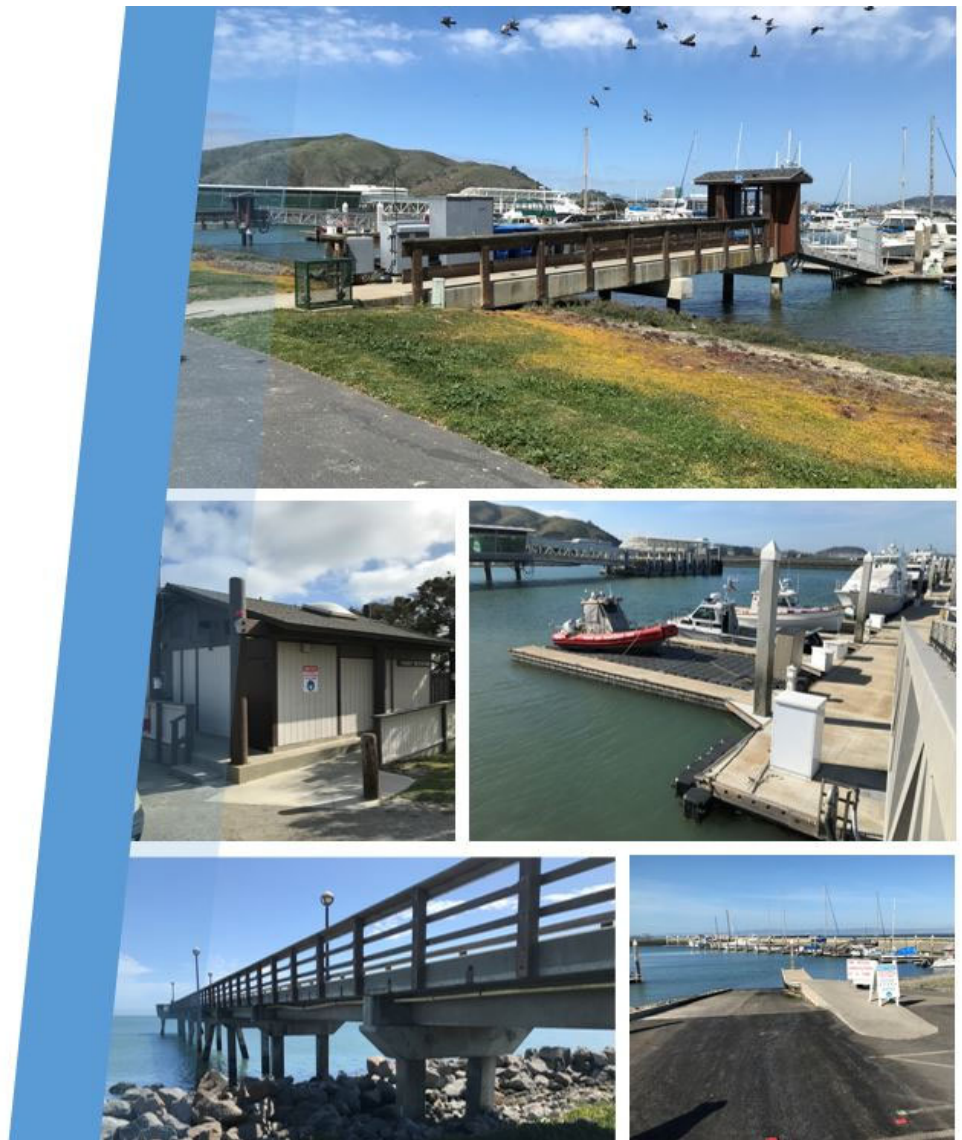
Oyster Point Marina

Updated Marina Facility Condition Survey Report

Prepared for:
San Mateo County
Harbor District



May 2021





EXECUTIVE SUMMARY

The goal of this report is to update the prior 2014 *Oyster Point Marina & Park Facility Condition Survey* and document the present day condition of the facilities within the District's jurisdiction to provide a basis for future master planning efforts. The estimated remaining useful life (RUL), and anticipated costs of repair and/or replacement of key elements of the facility are also considered in this report. This condition survey report is formatted to be as consistent as practicable with past reports for continuity, while still utilizing current accepted industry standards for the inspection of marine facilities. Additionally, the 2016 *Marina Market Evaluation and Updated Conditions Assessment for the Oyster Point Marina* (performed by Anchor QEA), and the 2017 *Oyster Point Fuel Dock Condition Assessment and Recommended Repairs and Replacement* memorandum (also performed by Anchor QEA) will be considered for consistency in our updated condition survey report.

Many changes have occurred at the Oyster Point site since the previous condition surveys, mainly due to the ongoing Kilroy Oyster Point Redevelopment Project consisting of new office buildings, a parking structure, site utilities, and the realignment of Marina Boulevard adjacent to the west basin docks. During construction, the west basin parking lot and Restrooms 4 and 5 have been demolished and a temporary parking lot and restrooms were set up at the time of our survey. The fuel dock dispensers and associated landside underground storage tanks and piping were removed in 2019 due to their degraded condition and safety/environmental concerns. Additionally, many of the major maintenance issues outlined in both prior 2014 and 2016 condition reports have been addressed by the District and staff to extend the life of the facility buildings and docks.

The marina docks are a key component of this condition survey, and include:

- West Basin – Public Docks 1 thru 6: Docks observed to be in “serious” to “poor” condition indicating a need of replacement within 10 years; upgraded electrical system, large percentage of slip fingers out of cross slope tolerance for walking surfaces
- West Basin – Reserved Dock 7: Observed to be in “critical” condition and in need of removal or replacement with an anticipated remaining useful life of 0 to 2 years
- Guest Dock – Dock 8: fairly new concrete dock in “good” condition with an anticipated remaining useful life of at least 30 years before needing replacement; concrete gangway platform and landside utility connections may need to be raised with parking lot
- East Basin – Dock 11: Fairly new concrete dock in “good” condition with an anticipated remaining useful life of at least 30 years before needing replacement; concrete gangway platform in need of replacement (and raising with Bay Trail)
- East Basin - Docks 12 thru 14: Docks observed to be in “serious” to “critical” condition indicating a need of replacement within 5 years; Fairly new concrete wave attenuators at ends, large percentage of slip fingers out of cross slope tolerance for walking surfaces; Platforms in need of replacement (and raising with Bay Trail)



The harbor perimeter protection is essential to the safe function of the harbor, and key components include:

- Shoreline Rock Slope Protection – Observed to be in “satisfactory” condition and should last indefinitely with normal maintenance; may need to be redressed in 20 to 30 years
- Seawall – Vertical concrete sheets appear to be in “fair” condition with an anticipated remaining useful life of 10 to 20 years; reinforced concrete cap in “poor” condition need of localized repairs in several locations in the next 5 to 10 years

Buildings within the harbor include:

- Harbor Office Building – ADA access added and interior recently remodeled, well maintained and in “satisfactory” condition with a remaining useful life of 20 to 30 years; recommend replacement of roof in 5 to 10 years
- Maintenance Building – New paint and exterior doors, well maintained and noted to be in overall “satisfactory” condition with a remaining useful life of 20 to 30 years; recommend repairs and repainting of exterior and remodeling of the interior in 5 to 10 years
- Restroom 1 – Appears to be in “satisfactory” condition, with an anticipated remaining useful life 20 to 30 years before needing major renovations
- Restroom 2 – Appears to be in “satisfactory” condition, with an anticipated remaining useful life 20 to 30 years before needing major renovations
- Restroom 3 – Appears to be in “satisfactory” condition, with an anticipated remaining useful life 20 to 30 years before needing major renovations

Site Work

- Roadways – Remaining useful life varies from 5 to 20 years depending on location
- Parking Lots – Remaining useful life varies from 2 to 20 years depending on location; lower boater and harbormaster parking lots recommend raise with facility improvements
- Sidewalks and Bay Trail – Overall “fair” condition, need to be resurfaced in the next 10 to 20 years, but recommend raising grade with other facility improvements such as dock replacement
- Landside Utilities – Varies from “poor” to “fair” condition; replace and raise with site
- Landscaping – sparse and in “poor” condition; replacement priority may be dependent on location and public visibility, recommend replace some areas with drought-tolerant plants

Boat Launch Ramp - Surface and boarding float docks were observed to be in “good” condition with an anticipated remaining useful life of 30 years or more, and the asphalt pavement from the top of ramp to the boat trailer parking lot is considered to be in “poor” condition with an anticipated remaining useful life of 5 to 10 years before needing resurfacing.

Public Fishing Pier - Recently constructed and is considered to be in “good” condition, with the anticipated remaining useful life of 30 years or more with regular maintenance.



Table ES 1 Oyster Point Marina – Summary of Facility Condition

Marina Facility Element	Estimated Remaining Useful Life in Years	Estimated Probable Cost of Repairs	Estimated Asset Replacement Value
West Docks 1-6	2-10	\$20,790,000	\$20,790,000
West Dock 7	0-2	\$2,800,000	\$2,800,000
Guest Dock 8	30+	Platform \$50,000	\$1,500,000
East Dock 11	30+ / 5-10 Platform	Platform \$150,000	\$10,360,000
East Docks 12-14	0-5	\$7,140,000	\$7,140,000
Shoreline RSP	20-30	-	\$500,000
Seawall	10-20 / 5-10 Cap	Cap \$600,000	\$9,000,000
Harbormaster's Office Building	20-30 / 5-10 Roof	\$10,000	\$500,000
Maintenance Bldg	20-30 / 5-10	\$25,000	\$550,000
Restroom 1	20-30	--	\$300,000
Restroom 2	20-30	--	\$350,000
Restroom 3	20-30	--	\$350,000
Roadways	Varies 5-20	\$760,000	\$500,000
Parking Lots	Varies 2-20	\$860,000	\$1,000,000
Sidewalk / Bay Trail	10-20	\$400,000	\$300,000
Landside Utilities	Varies 5-20	\$2,500,000	\$3,000,000
Landscaping	5-10	\$50,000	\$100,000
Boat Launch Ramp	30+	Repairs in Road and Parking Lot	\$750,000
Windsurfing Launch	10-20	--	\$50,000
Public Fishing Pier	30+	--	\$2,000,000
Overall Totals	-	\$36,135,000	\$61,840,000



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1. INTRODUCTION

1.1 Scope of Report

The scope of this report is to update the prior 2014 *Oyster Point Marina & Park Facility Condition Survey* (performed by Moffatt & Nichol), and document the present day condition of the facilities within the San Mateo County Harbor District's (SMCHD) jurisdiction to provide a basis for future master planning efforts. The 2016 *Marina Market Evaluation and Updated Conditions Assessment for the Oyster Point Marina* (performed by Anchor QEA) will also be considered for consistency in our updated condition survey report. A site visit of the facilities at Oyster Point Marina was conducted by GHD on April 7, 2021 with the assistance of harbor staff.

1.2 Description of Facilities

The facilities within Oyster Point Marina maintained by the District include approximately 468 boat slips serving recreational boaters, a guest dock, boat launch ramp, a windsurf launch area, boater and public restrooms, the harbormaster and maintenance buildings, parking lots, landscape areas and portions of the San Francisco Bay Trail. The extent of this inspection includes the harbor district facilities within the breakwater and portions of the highlighted areas of the peninsula shown below in Figure 1.



Figure 1 - Oyster Point Marina (aerial: Google Earth Pro image Sept 2020)



The Oyster Point Marina facilities within District jurisdiction are listed in Table 1 along with their estimated asset replacement value. The Oyster Point Marina facilities operated and maintained by the District per the 2018 amended Joint Powers Agreement (JPA) with the City of South San Francisco include:

- Floating Docks including:
 - o West Basin Marina (Public Docks 1 thru 6)
 - o West Basin Marina (Reserved Dock 7)
 - o Guest Dock (Dock 8)
 - o East Basin Marina (Public Dock 11)
 - o East Basin Marina (Public Docks 12 thru 14)
- Shoreline Rock Slope Protection
- Breakwater
- Buildings including:
 - o Harbormaster's Office Building
 - o Maintenance Building
 - o Restroom 1
 - o Restroom 2
 - o Restroom 3
- Various Site Work
 - o Roadways
 - o Parking Lots
 - o Sidewalks and Promenade
 - o Landside Utilities
 - o Landscaping
- Boat Launch Ramp
- Windsurfing Launch Area
- Public Fishing Pier



Table 1 Oyster Point Marina – Summary of Facility Assets

Marina Facility Element	Year Installed (Modified)	Estimated Remaining Useful Life in Years	Estimated Asset Replacement Value	Overall Condition Rating
West Docks 1-6	1988	2-10	\$20,790,000	30
West Dock 7	1983	0-2	\$2,800,000	0
Guest Dock 8	2013	30+	\$1,500,000	100
East Dock 11	2013	30+ / 5-10 Platform *	\$10,360,000	90
East Docks 12-14	1983 (2013)	0-5	\$7,140,000	10
Shoreline RSP	Varies	20-30	\$500,000	80
Seawall	1980 (2008)	10-20 / 5-10 Cap *	\$9,000,000	55
Harbormaster's Office Building	1988	20-30 / 5-10	\$500,000	50
Maintenance Bldg	1984	20-30 / 5-10	\$550,000	80
Restroom 1	1988	20-30	\$300,000	80
Restroom 2	1988	20-30	\$350,000	80
Restroom 3	1988	20-30	\$350,000	80
Roadways	Varies	Varies 5-20	\$500,000	60
Parking Lots	Varies	2-5 Lower Lots / 10-20	\$1,000,000	35
Sidewalks and Bay Trail	Varies	10-20	\$300,000	60
Landside Utilities	Varies	Varies 5-20	\$3,000,000	50
Landscaping	Varies	5-10	\$100,000	40
Boat Launch Ramp	2009	30+ *	\$750,000	90 *
Windsurfing Launch	1998	10-20	\$50,000	60
Public Fishing Pier	2006	30+	\$2,000,000	90
Overall Asset Replacement Totals		--	\$61,840,000	--

* Element has an exception to overall condition rating that needs attention (as described in later sections of this report)



1.3 Methodology

The facility condition survey was based upon observations and input received from SCMHD onsite personnel during GHD’s site visit on April 7, 2021 by Robert Sherwood, P.E, and the concrete sheet pile breakwater was observed by the harbor patrol boat with staff. The conditions were rated using a system similar to that used on the previous condition assessment report (San Mateo County Harbor District, Oyster Point Marina & Park Facility Condition Survey, December 2014 by Moffatt & Nichol) to facilitate comparison of the changes over time. Once the condition was rated, the priority and cost and any needed repair or replacement was estimated and compared to previous in present day U.S. dollars. The methods for the parameters of condition rating, priority, cost and type of repair or replacement are described as follows.

“**Condition Rating**” is a numeric score from 0 through 100 given for each component that allows ranking comparison of facilities. The number is based upon visual observations of the facilities qualitative condition as described in the condition rating tables. The remaining useful life (RUL) is the amount of time the component is expected to remain serviceable without further maintenance, in its present condition. The range is generally five to ten year intervals, such as “5 to 10” or “10 to 20.” The measure of remaining useful life is to be distinguished from the original “useful life”, or “service life” that is commonly used in the valuation of an asset.

The overall rating of an entire system, such as a group of docks (e.g. Docks 1 thru 6) is comprised of the average of the individual ratings given to each item within the system (e.g. each dock finger and main walkway), compiled within a spreadsheet from the onsite ratings.

Table 2 - Condition Rating Table from prior M&N Condition Survey

Condition	Description	Remaining Useful Life	Condition Rating
NEW (N)	Like-new condition	More than 15 years	100
GOOD (G)	Generally new condition	10 – 15 years	80
FAIR (F)	Serviceable condition, lightly worn due to normal wear	5 – 10 years	60
WORN (W)	Exhibits cracking, corrosion, or other indicators of deterioration. Still serviceable but requires maintenance to extend the useful life.	Less than 5 years	40
REPLACE (R)	Worn to the point of needing immediate replacement or major repair.	Should replace in 1-2 years	20



ASCE Manuals and Reports on Engineering Practice No. 130 (MOP 130); Waterfront Facilities Inspection and Assessment, is the industry standard reference for inspecting and assessing waterfront facilities, including marinas within small craft harbors. Within ASCE MOP 130 is Table 2.14 (shown below in Figure 2) which provides an overview of the various condition assessment ratings commonly used within the engineering community.

Table 2-14. Condition Assessment Ratings

Rating	Description
6 Good	No visible damage or only minor damage noted. Structural elements may show very minor deterioration, but no overstressing observed. No repairs are required.
5 Satisfactory	Limited minor to moderate defects or deterioration observed but no overstressing observed. No repairs are required.
4 Fair	All primary structural elements are sound but minor to moderate defects or deterioration observed. Localized areas of moderate to advanced deterioration may be present but do not significantly reduce the load-bearing capacity of the structure. Repairs are recommended, but the priority of the recommended repairs is low.
3 Poor	Advanced deterioration or overstressing observed on widespread portions of the structure but does not significantly reduce the load-bearing capacity of the structure. Repairs may need to be carried out with moderate urgency.
2 Serious	Advanced deterioration, overstressing, or breakage may have significantly affected the load-bearing capacity of primary structural components. Local failures are possible, and loading restrictions may be necessary. Repairs may need to be carried out on a high-priority basis with urgency.
1 Critical	Very advanced deterioration, overstressing, or breakage has resulted in localized failure(s) of primary structural components. More widespread failures are possible or likely to occur, and load restrictions should be implemented as necessary. Repairs may need to be carried out on a very high-priority basis with strong urgency.

Figure 2 - ASCE Manual of Practice 130 (Condition Assessment Ratings)

To be more in line with industry standards, a hybrid updated condition ratings table utilizing the previous condition rating table from the prior 2014 M&N condition survey and the accepted ASCE industry condition assessment rating table will be used for this report, and is presented in Table 3.



Table 3 - Updated Condition Ratings (Based on Current Industry Standards)

Condition	Description	Remaining Useful Life	Condition Rating	Repair Priority
GOOD	Like-new condition, shows very minor deterioration, no overstressing observed.	More than 30 years	100	-
SATISFACTORY	Servicable condition, lightly worn due to normal wear, no repairs are required.	20 – 30 years	80	-
FAIR	Localized moderate defects or deterioration; structure serviceable and lightly worn due to normal wear. Repairs are recommended but the priority of the repairs is low.	10 – 20 years	60	Low (Level 4)
POOR	Widespread advanced deterioration or overstressing observed; structure is serviceable with minor loss of structural capacity. Repairs are recommended with moderate priority/urgency.	5 - 10 years	40	Moderate (Level 3)
SERIOUS	Advanced deterioration or overstressing observed; significant loss of capacity with local failures possible. Repairs are recommended with high priority/urgency.	2 - 5 years	20	High (Level 2)
CRITICAL	Very advanced deterioration or overstressing with localized failures observed; significant loss of capacity with load restrictions and repairs recommended with very high priority/urgency.	Should replace in less than 2 years	0	Very High (Level 1)



“**Priority**” is the level of importance or urgency that the component should be repaired or replaced. The numeric assignment is based upon safety and the function of the component as follows:

1. System or element is in failure, or is expected to fail in the next year. Safety: Such failure will pose significant risk of injury. Function: will adversely affect ability to operate (e.g. separation of a dock would block access to the remaining dock even if not a safety risk).
2. System or element is currently functional, but has a probability of failing before the next scheduled inspection or 5 years. Safety: such failure poses little risk to safety. Function: may result in a temporary and minor loss of facility operations.
- 3 & 4. System or element is expected to remain functional until the next scheduled inspection or at least 5 years. If failure does occur, it poses no safety risk and will not likely result in the significant loss of facility operation.

“**Cost**” is the cost for repair or replacement is based upon the following

- Means Building Construction Cost Data and Heavy Construction Cost Data
- Cost data from construction of similar projects
- Input from SCMHD and Engineering judgment
- Prior 2014 M&N Condition Survey

“**Type**” of repair or replacement project is broken out into budgetary categories as follows:

(C) Capital - One time repair or replacement typically costing over \$10,000 to correct.

(M) Recurring Maintenance - Repair/maintenance actions that occur with a frequency of less than 10 years with a cost of less than \$10,000 per action

(SM) Scheduled Maintenance - Repair/maintenance actions that typically occur annually or more frequently with a cost of less than \$5,000 per year.

(I) Improvement - a repair or replacement that provides greater functionality than the existing system.

1.4 Asset Life Cycle

When an element of a facility is first placed in service (new) it is assigned a nominal “useful life”, or “service life”, a duration of time during which function of an element can be expected with normal maintenance. The duration is based upon our experience with these types of facilities, for example, a typical concrete dock may have a useful life of 40 to 50 years, whereas a typical dock built of timber may have a useful life of 30 to 40 years. The remaining useful life (RUL) is often the difference between the years an asset has been in service and the original useful life. The remaining useful life can also be considered from present day going forward, and can be used as a guideline in planning of maintenance and replacement costs; as the RUL approaches zero, increased maintenance to extend the life past the anticipated remaining useful life, or replacement, should be expected and planned for.



2. CONDITION ASSESSMENT

2.1 West Basin - Public Docks 1 thru 6

Based on our observations, it appears that the overall condition of West Basin Docks 1 thru 6 installed in 1988, ranges from “poor” to “serious” condition, mainly due to the age of the docks, and are recommended for replacement within 10 years. The wooden docks have been well maintained since the 2014 and 2016 surveys, allowing the docks to be functional to the full extent of their 30 to 40 year service life. During our survey, it appeared that the District has addressed the majority of prior repair recommendations such as replacement of worn guide pile rollers, floatation with exposed foam, distressed wood stringers and steel fasteners, deck screws, loose and corroded cleats, dock boxes, rub rails and other dock appurtenances.

The docks were found to be fairly stable, however, the majority of dock fingers in the 25-foot to 30-foot range on Docks 1 thru 4 were observed to be uplifting at the finger ends. This condition was also noted in the City’s 2016 condition survey, and remedies seen at other marinas include reducing the depth or spacing of the floats, or adding weight atop the floats near the end of the fingers. Also, a high percentage of the dock fingers, estimated at around 20% to 30% of fingers, are tilting or twisting beyond acceptable limits for a marina walking surface.

The existing square concrete guide piles holding the docks in position were observed to be in generally “good” condition, consistent with the 2014 and 2016 condition assessments. The piles appear to have had internal jetting tubes to accommodate ease of driving, and the tops of the piles were grouted after installation. Removal and reuse of the piles is likely not feasible due to this and revisions to building code loading criteria may call for larger and deeper piles. The guide pile brackets were generally observed to be in “fair” condition with brackets and rollers well-maintained and replaced as needed to keep the dock sliding efficiently on the piles.

The dock electrical system was also upgraded by the District in 2017 and is considered to be in “good” condition, and should outlast the remaining useful life of the docks. The fire protection system, and other safety components on the docks are also well maintained and appear to be in “satisfactory” condition.

The three West Basin gangway platforms for Docks 1 thru 6 are wooden structures supported by metal brackets on reinforced concrete piling, and considered to be in “fair” condition, with an anticipated remaining useful life of 10 to 20 years before needing replacement. The walking surface elevations of the existing gangway platforms are relatively low compared to the new walking surface of the Bay Trail currently being constructed as part of the adjacent Kilroy Oyster Point Redevelopment Project. The existing 40-foot aluminum gangways, utility hangers, and transition plates also appeared to be in “fair” condition, but do not meet current railing clear spacing requirements per code or current ADA standards for accessing a marina.



2.2 West Basin - Reserved Dock 7

The condition of Dock 7 has been documented in the 2017 *Oyster Point Fuel Dock Condition Assessment and Recommended Repairs and Replacement* memorandum for the City of South San Francisco, which called for replacement of the dock (including fuel dock, gangways and approach structures, and landside components of fuel system). The 2017 condition memo prepared for the City also recommended that the vessel pump out system be transferred over to the newer concrete guest dock. For the purposes of this report, Dock 7 is considered to be in “critical” condition and is recommended to be removed and/or replaced within 2 years. Removal of Dock 7 and associated guide piles prior to reconstruction of Docks 1 thru 6 (or Docks 12-14) may provide additional water area for staging a derrick barge during construction of new docks.

2.3 Guest Dock - Dock 8

The relatively new Guest Dock (Dock 8) constructed of reinforced concrete encased styrofoam, was installed in 2013 and was observed to be in “good” condition, with an estimated remaining useful life of more than 30 years. The guest dock piles, 80-foot ADA and code compliant gangway, utilities, safety equipment and landside structures and appurtenances were still in like-new condition with minimal signs of wear. The guest dock was observed to float evenly on the water at low tide and did not appear to be grounding out on the harbor bottom.

2.4 East Basin – Public Dock 11

Similarly, Dock 11 in the East Basin is also relatively new being installed in 2013, at the same time as the guest dock, and was also constructed of reinforced concrete encased styrofoam. The dock was observed to be in “good” condition, with an estimated remaining useful life of more than 30 years. The guest dock piles, on-dock utilities, and safety equipment were still in like new condition with minimal signs of wear. The dock was observed to be at near full occupancy with well-maintained high end vessels occupying the dock.

On the landside, the reinforced concrete gangway support platform serving Dock 11 is considered to be in “poor” condition due to the cracking and spalling observed in the concrete beams (or bents) atop the piling. Replacement of the platforms or repair of the concrete bents should be a priority within the next 10 years. The walking surface elevations of the existing gangway platforms are relatively low compared to the new walking surface of the Bay Trail currently being constructed as part of the adjacent Kilroy Oyster Point Redevelopment Project.



2.5 East Basin – Public Docks 12 thru 14

It appears that Docks 12 thru 14, installed around 1983, have been well maintained by the District since the 2014 and 2016 surveys, allowing the docks to be functional to the full extent of their 30 to 40 year service life. The majority of prior condition survey repair recommendations have been addressed such as replacement of worn guide pile rollers, floatation with exposed foam, loose and corroded cleats, dock boxes, rub rails and other dock appurtenances. The glue-laminated wood beam type of dock system used for Docks 12 thru 14 is susceptible to twisting of the dock fingers over time, with approximately half of the fingers observed to be tilting or twisting beyond acceptable limits for a marina walking surface. Based on our observations, it appears that the overall condition of East Basin Docks 12 thru 14 range from “serious” to “critical” condition, mainly due to the condition and age of the docks, and are recommended for replacement within 5 years.

The existing square concrete guide piles holding the docks in position were observed to be in generally “good” condition, consistent with the 2014 and 2016 condition assessments. The concrete floating docks serving as wave attenuators were installed at the ends of the wooden docks in 2013, and were observed to be in “good” condition, with an estimated remaining useful life of more than 30 years.

The three gangway platforms for Docks 12 thru 14 in the East Basin are concrete structures supported on reinforced concrete piling, and considered to be in “poor” condition due to the localized cracking and spalling observed in the concrete beams atop the piling. Replacement of the platforms or repair of the concrete bents and deck structure should be a priority within the next 10 years. The walking surface elevations of the existing gangway platforms are relatively low compared to the new walking surface of the San Francisco Bay Trail currently being constructed as part of the adjacent Kilroy Oyster Point Redevelopment Project. The existing 40-foot aluminum gangways, utility hangars, and transition plates also appeared to be in “fair” condition, but do not meet current railing clear spacing requirements per code or current ADA standards for accessing a marina.

2.6 Shoreline Rock Slope Protection

The shoreline rock slope protection (RSP) separating the San Francisco Bay Trail and lower parking lot areas from the harbor are unique in that the rock slopes are relatively flat as compared to other harbors, with rip rap stone above and bay mud habitat approximately below Mean Low Water. The existing rock slopes appear to consist of well graded “Facing” class rip rap per Caltrans guidelines, with a median weight of 75 pounds and rock diameter of 12 inches. The rock slopes were observed to be in “satisfactory” condition due to the gentle slope and placement of rock, with a remaining useful life of 20 to 30 years before needing redressing with new rock.



2.7 Seawall

The vertical concrete sheet pile seawall with concrete cap protecting Oyster Point Marina was installed in the early 1980s and modified in 2008 to accommodate the new South San Francisco Ferry Terminal operations. The total length of seawall is just over 3,000 feet long, and the precast concrete sheet piles appear to be in “fair” condition with an anticipated remaining useful life of 10 to 20 years with proper maintenance. The cast-in-place reinforced concrete cap is exhibiting concrete spalling and cracking in sections, and varies from “fair” to “poor” condition, with sections of the seawall cap in need of localized repairs in the next 5 to 10 years.

2.8 Harbormaster’s Office Building

The 1,220 square foot, one-story Harbormaster’s Office Building was constructed around 1988, and is a conventional timber structure with a wood shake roof. The foundation consists of a pile supported reinforced concrete slab, and the finishes consist of exterior wood siding with large windows, and interior tile, carpet and gypsum board. The building is fairly well maintained, with the interior and exterior of the building clean and well kept, with several improvements made to address the recommendations of the 2014 condition survey. There was no noticeable dry rot or damage on the wood surfaces, and no chipping of paint or excessive wear of finishes.

Overall, the Harbormaster’s Office Building appears to be in “fair” condition, and should have a remaining useful life of 10 to 20 years with continued proper maintenance before needing replacement or major renovations. However, the wood shake roof is considered to be in “poor” condition upon inspection due to the appearance, age and type of roof, and will likely need replacing in 5 to 10 years. Additionally, of concern is the building’s 12-inch thick concrete slab foundation which is completely elevated above existing grade as a result of settlement of the surrounding soil and washout due to tidal action during high tide events. The foundation is elevated approximately 2 feet above grade on the north side and 6 inches to a foot on the south face, and no significant cracks or displacements were observed through the tile or carpeted floor (although the 2014 condition survey noted signs of wall cracking and tile damage due to settlement). The original design of the building foundation may allow for the floor to function as-is indefinitely, although it appears the foundation was originally cast on grade with a gravel subbase. A wooden lattice skirt has been placed around the perimeter of the building to prevent animals from living under the building, and the originally buried subsurface utilities are exposed and unbraced, and reportedly being slowly dragged down from the underside of the building requiring occasional repairs.

During king tide events, the access road to the Harbormaster’s Building has been completely underwater at times, with the surrounding at grade utilities and access ramp to the building partially submerged as well. The access ramp to the building has a rise of just over 2 inches per foot which is too steep to meet ADA ramp slope requirements. If the building is to remain, the access ramp to the building is recommended to be reconstructed to meet ADA requirements.



2.9 Maintenance Building

The approximately 2,300 square foot, one-story prefabricated metal Maintenance Building was constructed around 1988, and has a small interior 2nd floor open attic space (mezzanine) at the west end of the building that also serves as a storage and workout area. The floor is a reinforced concrete slab on grade, the exterior walls are a combination of reinforced concrete masonry walls and steel framing covered with corrugated steel cladding, and the roof is corrugated steel. The yard area around the building was well maintained and organized, with an oil recycling station, porta-potty dump station, boat washdown area, and other covered storage are adjacent to the building.

The Maintenance Building was found to structurally be in “satisfactory” condition, and should have a remaining useful life of 20 to 30 years before needing any significant structural repairs, with proper painting and maintenance. Aesthetically, the building is in “fair” to “poor” condition, with the exterior of the building recommended to be repainted in the next 5 to 10 years, and all of the interior metal beams, columns, and connections recommended to be repainted in the next 10 to 20 years to prevent corrosion. Both the northeast and northwest corners of the building are dented, although the dents are superficial and do not affect the structural beams supporting the building. The roll up and exterior doors were noted to have some minor corrosion, and the interior spaces are worn and recommended to be renovated in the next 5 to 10 years. The electrical system of the building is well maintained, with minor defects including an exterior plug noted to not be a GFCI receptacle, and an exterior light on the northwest corner of the building observed to be missing with the junction box taped over.

The 2014 condition survey noted that the building “has shifted significantly and should be considered for total replacement”, and “the frame around the exterior door on the south side of the building is crooked because of the shifting of the building”. From our observations, we did not see any notable cracking of the masonry wall which would be anticipated with any significant settlement of the building. Additionally, the prior survey mentioned that “the mezzanine’s load on the wall girt may have bowed out the wall at the northwest corner of the building”. From our observations, the wall girt was not affected by overstressing in our opinion, and we only found minor damage to the cladding on the corners of the building which is recommended to be fixed when the building is repainted.

2.10 Restroom 1

The approximately 560 square foot, one-story public Restroom #1 is located on the east side of the facility adjacent to the public fishing pier, and contains men’s and women’s restrooms. The prefabricated metal restroom building is supported by a raised reinforced concrete mat slab on grade, and is constructed with steel framed exterior and interior walls, exterior wood sheathing, metal interior wall panels, wood columns and beams, and an asphalt shingle gable roof. A wet utility gallery separates the men’s and women’s sides of the restroom and contains the building



mechanical piping, cleanouts, wet well and electrical panels. There is adequate ADA access and the restroom from the parking lot and adjacent San Francisco Bay Trail. The restroom is well maintained and was recently painted and the roof and interior appear to have been recently replaced. There is some minor corrosion on the doors, but the restroom overall appears to be in “satisfactory” condition, with an anticipated remaining useful life of 20 to 30 years with continued maintenance before needing major renovations again.

2.11 Restroom 2

The approximately 560 square foot, one-story boater Restroom #2 is located along the Bay Trail between Docks 12 and 13, and contains men’s and women’s restrooms, and a laundry room. The prefabricated metal restroom building is supported by a raised reinforced concrete mat slab on grade, and is constructed with steel framed exterior and interior walls, exterior wood sheathing, metal interior wall panels, wood columns and beams, and an asphalt shingle gable roof. A wet utility gallery separates the men’s and women’s sides of the restroom and contains the building mechanical piping, cleanouts, wet well and electrical panels. There is adequate ADA access to the restrooms from the parking lot and adjacent Bay Trail. The restroom is well maintained and was recently painted and the roof and interior appear to have been recently replaced. There is some flaking of paint inside the wet utility gallery, but the restroom overall appears to be in “satisfactory” condition, with an anticipated remaining useful life of 20 to 30 years with continued maintenance before needing major renovations again.

2.12 Restroom 3

The approximately 440 square foot, one-story boater Restroom #3 is located along the Bay Trail, between the South San Francisco Ferry Terminal and Dock 11, and contains men’s and women’s restrooms, and two shower rooms. The prefabricated metal restroom building is at grade on a reinforced concrete mat slab, and is constructed with steel framed exterior and interior walls, exterior wood sheathing, metal interior wall panels, wood columns and beams, and an asphalt shingle gable roof. A wet utility gallery separates the men’s and women’s sides of the restroom and contains the building mechanical piping, cleanouts, wet well and electrical panels. There is adequate ADA access to the restrooms and showers from the parking lot and adjacent Bay Trail. The restroom is well maintained and was recently painted and the roof and interior appear to have been recently replaced. The restroom overall appears to be in “satisfactory” condition, with an anticipated remaining useful life of 20 to 30 years with continued maintenance before needing major renovations again.

Photos of the facility buildings and restrooms can be found in Appendix A of this report.



2.13 Roadways

The west half of the Oyster Point peninsula is undergoing significant changes on the landside with the construction of the Kilroy Oyster Point Redevelopment Project. The west half of Marina Boulevard, the entrance road to the harbor facilities which runs from Oyster Point Boulevard, has recently been realigned. The unaffected portion of Marina Boulevard on the east half of the peninsula runs roughly from the halfway point of the peninsula in line with the spit, to just south of the yacht and maintenance buildings, and along the south side of the upper parking lot to the launch ramp at the northeast corner of the peninsula (see Figure 1 highlighted area).

The asphalt roadway surface of Marina Boulevard leading from the Boat Launch Ramp to the boat trailer parking area is degraded and was observed to be in “poor” condition due to saltwater runoff from trailered boats with an anticipated remaining useful life of 5 to 10 years before needing resurfacing. The remainder of the Marina Boulevard asphalt roadway surface appears to be in “fair” condition, and is anticipated to have a remaining useful life of 10 to 20 years before needing significant resurfacing.

2.14 Upper and Lower Parking Lots

The upper parking lot was last resurfaced in 2011, and consists of roughly 70,000 square feet of asphalt pavement and is used mainly for boat launch ramp trailer parking. Similar to Marina Boulevard, the east end of the lot adjacent to the ramp that sees a lot of boat trailer traffic and roughly 20,000 square feet was observed to be in “poor” condition due to saltwater runoff from trailered boats with an anticipated remaining useful life of 5 to 10 years before needing resurfacing or replacement with a more saltwater resistant surface. Roughly 50,000 square feet of the remaining asphalt parking lot appears to be in “fair” condition, and is anticipated to have a remaining useful life of 10 to 20 years before needing significant resurfacing.

The west half of the lower parking lot is adjacent to the South San Francisco Ferry Terminal and mainly serves commuters. The Ferry Terminal lot consists of roughly 35,000 square feet of asphalt pavement and was installed in 2012, and was found to be in “fair” condition with an anticipated remaining useful life of 10 to 20 years before needing to be resurfaced.

The eastern portion of the lower parking lot is mainly used by boat slip renters and is adjacent to Docks 11, 12 and 13. The boater lot has roughly 50,000 square feet of area and mostly consists of degraded asphalt pavement and gravel. The boater parking lot was observed to be in “critical” condition, and is recommended to be reconstructed in the next 2 years.

The harbormaster parking lot and entrance road on the spit consists of roughly 10,000 square feet of asphalt pavement, and was found to be in “serious” condition with an anticipated remaining useful life of 2 to 5 years before needing to be resurfaced.



Worth noting, the boater lower parking lot and harbormaster's office parking lot and access road have recently been inundated with up to a few inches of saltwater during king tide events and raising of the parking lots and access road at least two feet is recommended to avoid future flooding due to higher tide levels.

2.15 Sidewalks and Bay Trail

The existing sidewalks from the parking lots to the waterfront and Oyster Point Marina portion of the San Francisco Bay Trail promenade were observed to be in "fair" condition, with an anticipated remaining useful life of 10 to 20 years before needing resurfacing. Worth noting, the existing Bay Trail walking surface elevations are relatively low compared to the new sections of the Bay Trail currently being constructed as part of the adjacent Kilroy Oyster Point Redevelopment Project. The District's portion of the Bay Trail has recently been inundated with up to a few inches of saltwater during king tide events and raising the trail at least two feet is recommended to avoid future flooding, as well as match the elevations of planned future gangway platforms serving any newly replaced docks.

2.16 Landside Utilities

Consistent with the 2014 condition survey, no mapping or observations were made of the existing underground utilities, which are recommended to be raised above groundwater (and the capped landfill) with any new site redevelopment or raising of the parking lots and Bay Trail.

The existing 190 square foot, one-story Sewer Vacuum and Ejection Building (or sewer lift station) is located landward of the spit in the middle of the peninsula and was constructed around 1983. The building is maintained and operated by the District per the latest JPA with the City. The roof is fairly new and the building structure, vacuum pumps and mechanical appurtenances were noted to be in "fair" condition with an anticipated remaining useful life of 10 to 20 years before needing replacement or a major overhaul. Worth noting, staff was working on maintaining the vacuum building during our site visit, and mentioned that the upkeep of the pumps and equipment is a constant effort.

The main switchgear from Edison to the marina buildings and docks, installed as part of the original marina construction, is located next to the vacuum building. Worth noting, the vacuum building and adjacent switchgear cabinets are considerably lower than the surrounding improvements being made as part of the Kilroy Oyster Point Redevelopment Project, and are recommended to be lifted to new grade elevation if possible with any new infrastructure improvements on District controlled areas of the facility. The electrical switchgear cabinets were observed to be in "poor" condition, with an anticipated remaining useful life of 5 to 10 years before needing replacement since the steel cabinets are showing signs of corrosion and the surrounding concrete pad is lacking the proper clearances around the cabinet doors.



2.17 Landscaping

The existing site landscaping is fairly sparse throughout the facility and consists mostly of hearty grasses, small trees and shrubs, and some iceplant. From looking at past Google Earth aerial images, the grass areas often go brown in the summer and fall seasons, likely due to mandated water conservation efforts. The landscaping is currently considered to be in “poor” condition, but the priority of making improvements to the existing landscape areas may be dependent on how the site is ultimately redeveloped, and where in the facility the green space is relative to pedestrian high-traffic areas such as the Bay Trail and scenic overlooks. The use of drought-tolerant plants in certain landscape areas may be a good option for the facility, as further discussed in the recommendations section of this report.

2.18 Boat Launch Ramp

The existing public Boat Launch Ramp was constructed in 2009 and has two boat launching lanes supported by a single boarding float dock down the middle of the ramp. The existing launch ramp surface and boarding float docks were observed to be in “good” condition with an anticipated remaining useful life of 30 years or more provided regular dredging occurs to maintain the integrity of the boarding float docks and keep them from landing on the harbor bottom. The asphalt pavement at the top of ramp, also known as the ramp apron, and the asphalt roadway from the ramp apron to the boat trailer parking lot are both showing signs of deterioration due to saltwater runoff from trailered boats as they are being hauled out and are considered to be in “poor” condition as mentioned in the previous sections.

2.19 Windsurfing Launch

The Windsurfing Launch Ramp was constructed in 1998 and lies in the southeast corner of the peninsula adjacent to the Bay Trail. The ramp can also be used for other small hand-launched craft such as kayaks, and was observed to be in “fair” condition with some settlement of the rock slope surrounding the ramp, with an anticipated remaining useful life of 10 to 20 years before needing any significant repairs.

2.20 Public Fishing Pier

The public fishing pier at the east end of the peninsula was constructed in 2006 with the assistance of a California Department of Fish & Game grant. The pier decking was constructed of a reinforced concrete slab on precast concrete double T-beams. The beams are supported by reinforced concrete pile and bents, and some of the reinforcing steel can be seen exposed on the edges of the beams as a result of insufficient concrete cover during casting of the beams. The pier is still relatively new and is considered to be in “good” condition, with the anticipated remaining useful life of the pier structure and reinforced concrete piles to be 30 years or more with regular maintenance.



3. RECOMMENDATIONS

3.1 Facility Recommendations

The overall facility is well maintained and functional, especially given the age of the majority of docks and the inundation of the lower areas of Oyster Point Marina with saltwater during extreme high tide events. The existing buildings are somewhat dated, the landscaping is fairly sparse, and the connectivity and accessibility along the waterfront to and from the adjacent parking areas can be improved upon. Recent landside site improvements such as the new public fishing pier and public boat launch ramp provide greater access to the boating and fishing public, and access around the facility may be greatly enhanced by incorporating the following:

- Raise and reconstruct the San Francisco Bay Trail
- Raise and reconstruct the boater Lower Parking Lot
- Raise and reconstruct the harbormaster's access road and parking lot
- Install more 80-foot gangways for ADA access to all of the marina docks

Details and prioritization of anticipated upcoming repairs and improvements to existing harbor structures and other key elements are described in the following section.

3.2 Priority of Repairs / Replacement

Priority of repairs and/or replacement of key elements of the harbor facilities are outlined in Table 4. The priority of repairs is somewhat related to the remaining useful life (RUL) of the element, but priority is also affected by life safety concerns and how essential the element is to the operation of the harbor facilities.

High Priority

Removal or replacement of Dock 7 is considered to be a very high priority (Level 1) in our opinion due to the advanced degraded condition of the docks and gangway access platforms. Removal of Dock 7 and associated guide piles prior to reconstruction of other marina docks may reduce the risk of boater injury and provide the flexibility of additional water area for staging a derrick barge during construction of new docks.

Replacement of East Basin Docks 12 thru 14 are considered to be a high priority (Level 1 to 2) in our opinion due to the degraded condition and advanced age of the docks, with roughly half of the slip fingers twisting out of walking surface tolerances, and the low elevation and structural deterioration of the reinforced concrete gangway platforms.

Replacement of West Basin Docks 1 thru 6 are considered to be a high priority (Level 2) in our opinion after replacement of the East Basin docks due to the age and degraded condition of the docks, with roughly a quarter of the slip fingers twisting out of walking surface tolerances, and the majority of dock fingers in the 25-foot to 30-foot range on Docks 1 thru 4 observed to be uplifting at the finger ends



Initiation of the dock replacement process, including the fuel dock if reintroduced in the harbor, is considered a high priority (Level 2), and for project timing purposes we recommend that relevant construction drawings and permits should be started in the next couple of years subsequent to public input through the master planning and related processes. The new dock construction will likely need to incorporate minimum 80-foot long ADA gangways at each existing marina access point, and the gangway platforms and adjacent Bay Trail will likely need to be raised.

Raising the elevation of the San Francisco Bay Trail along the perimeter of the facility can be considered a fairly high to moderate priority (Level 2-3) due to the related need to raise the gangway platforms during replacement of the East Basin Docks 12 thru 14 and reconstruction of the Dock 11 gangway platform.

Raising the boater lower parking lot and harbormaster's office parking lot and access road are considered to be a high priority (Level 2) in our opinion. These areas are significantly degraded and have recently been inundated with up to a few inches of saltwater during king tide events, and raising of the parking lots and access road at least a couple of feet is recommended to avoid future flooding.

Moderate Priority

With the raising of the harbormaster access road and parking lot, raising of the guest dock gangway platform and utility connections is considered to be a moderate (Level 3) priority. Additionally, replacing and raising the landside utilities to the docks and buildings is related to the raising of the lower parking lots and Bay Trail and is also considered to be a moderate (Level 3) priority. Replacing and raising the Dock 11 gangway platform is also related to the raising of the lower parking lots and Bay Trail and considered a moderate (Level 3) priority.

Repair of the existing seawall cap (and the tops of some of the concrete sheets) is considered to be a moderate (Level 3) priority, since delaying repairs to the cap in our opinion may leave the seawall sheet piles susceptible to displacement of piles if damaged due to large vessel wakes or wind driven waves from major storm events. The prevention of future cracking and spalling may be significantly reduced with the adding of sacrificial anodes within the repairs, pending further analysis.

The launch ramp boat trailer parking lot at the far east end of the site, and the asphalt roadway from the top of ramp to the parking lot are degraded and considered to be a moderate priority (Level 3) condition in need of resurfacing. Use of an alternative saltwater resistant pavement surface is recommended by using either a concrete pavement or a modified asphalt pavement (e.g. using a denser pavement with higher asphalt content, thicker wearing surface course, enhancing binder with additives, etc.). Proper drainage along the roadway and boat trailer parking areas should also be considered, including the use of ribbon gutters to direct runoff more efficiently. A higher traffic index value may also need to be considered in the design of any new pavement in these areas.

Replacement of the Harbormaster Building roof is considered to be a moderate (Level 3) priority. Additionally, repairs and repainting of exterior and remodeling of the interior of the



Maintenance Building is also considered to be a moderate (Level 3) priority to be addressed in the next 5 to 10 years.

Low Priority

Even though rated to be in “poor” to “serious” condition, the site landscaping is mainly for aesthetic value and is considered a low priority (Level 4) improvement suggested for the site. The timing of these improvements is likely best addressed with any other redevelopment projects, or other harbor beautification projects in the future. Other harbors in California, such as Dana Point Harbor, have successfully incorporated the use of drought tolerant plants such as succulents to add appeal to the harbor for the visiting public.

Other future improvements to the harbor facilities beyond those observed for the existing structures will likely be addressed in the master planning efforts and are outside the scope of this report.

Table 4 gives a list of the recommended Oyster Point Marina repairs and improvements, estimated remaining useful life, probable costs, priority and type of repairs and improvements.



Table 4 Oyster Point Marina – Priority of Repairs / Improvements

Marina Facility Element Repairs / Improvements	Estimated Remaining Useful Life in Years	Estimated Probable Cost of Repairs / Improvements	Priority and Type of Repairs / Improvements
Replace West Basin Docks 1 thru 6	2-10	\$20,790,000	Level 2 – Type C
Replace West Basin Dock 7	0-2	\$2,800,000	Level 1 – Type C
Reconstruct Guest Dock 8 Platform	With HM Parking Lot and Road Raising	\$50,000	Level 3 – Type I
Replace Dock 11 Platform / Utilities	5-10	\$150,000	Level 3 – Type C
Replace East Basin Docks 12 thru 14	0-5	\$7,140,000	Levels 1-2 – Type C
Repair Seawall Cap	5-10	\$600,000	Level 3 – Type C
Replace Roof of Harbormaster Bldg	5-10	\$10,000	Level 3 – Type C
Maintenance Bldg Repairs and Repaint	5-10	\$25,000	Level 3 – Type C
Resurface Roadways	5-20	\$200,000	Levels 3-4 – Type C
Reconstruct & Raise Harbormaster Road	2-5	\$560,000	Level 2 – Types C & I
Reconstruct & Raise Lower Parking Lots	2-5	\$860,000	Level 2 & 4– Types C & I
Reconstruct & Raise SF Bay Trail	10-20	\$400,000	Level 2-3 – Types C & I
Replace and Raise Landside Utilities	5-20	\$2,500,000	Levels 3-4 – Types C & I
Landscaping and Irrigation Installation	5-10	\$50,000	Level 4 – Type C
Overall Repair and Replacement Totals	--	\$36,135,000	--

Type (C) Capital - One time repair or replacement typically costing over \$10,000 to correct.

Type (I) Improvement - a repair or replacement that provides greater functionality than the existing system.



4. ESTIMATED COSTS OF REPAIRS / REPLACEMENT

For purposes of this report, estimated probable costs of repair and replacement are in present value US dollars. Non-residential construction cost escalation from 2014 to 2020 has been approximately 4% to 5% per year according the Engineering News Record, and 2021 is seeing a significant spike in material costs affecting total construction costs. The anticipated current bare construction costs (without engineering or permits) of replacement for the existing buildings, restrooms, parking lots and roadways, and other various items are based on both RS Means construction costs, the Harbor District’s 5-year CIP spreadsheet, recent project experience, and previous 2014 condition survey, all factoring in escalation to 2021 costs.

Marina Docks

The total number of slips for the marina has varied over the years with various improvements, as well as between previous condition and market study reports. According to the 2016 Marina Market Evaluation and Updated Conditions Assessment for the Oyster Point Marina (performed by Anchor QEA), there are 428 boat slips not counting Dock 7 (with an estimated 40 boat slips). Adding Dock 7 to the overall count gives total 468 boat slips broken out as follows in Table 5.

Table 5 Oyster Point Marina – Existing Dock Slips

Dock #	Estimated Number of Slips	Slip Sizes	Condition (RUL)	Estimated Asset Replacement Value
Dock 1	32	20’ - 25’ w/ Sideties	“serious” to “poor” (2-10 years)	\$1.92M - \$2.56M
Dock 2	52	24’ – 30’ w/ Endtie	“serious” to “poor” (2-10 years)	\$3.12M - \$4.16M
Dock 3	55	24’ – 30’ w/ Endtie	“serious” to “poor” (2-10 years)	\$3.30M - \$4.40M
Dock 4	57	24’ – 30’ w/ Endtie	“serious” to “poor” (2-10 years)	\$3.42M - \$4.56M
Dock 5	51	24’ – 30’ w/ Endtie	“serious” to “poor” (2-10 years)	\$3.06M - \$4.08M
Dock 6	50	30’ – 45’ w/ Endtie	“serious” to “poor” (2-10 years)	\$3.0M - \$4.0M
Dock 7	40	30’–40’ w/ Pumpout and Fuel Dock	“critical” (0-2 years)	\$2.4M - \$3.2M
Dock 11	29	40’-65’ w/ Sideties	“good” (30+ years)	\$1.74M - \$2.32M
Dock 12	44	35’ – 65’	“serious” to “critical” (0-5 years)	\$2.64M - \$3.52M
Dock 13	37	40’ – 75’	“serious” to “critical” (0-5 years)	\$2.22M - \$2.96M
Dock 14	21	30’ - 60’	“serious” to “critical” (0-5 years)	\$1.26M - \$1.68M



Replacement costs per slip of a modern heavy-duty concrete dock marina ranges from \$60k to \$80k per slip, including guide piles, utilities, platforms and gangways, and other miscellaneous dock items. The anticipated overall cost of replacing the West Basin Marina (Docks 1 thru 7) with a similar number of docks is anticipated to be roughly between \$20.2M and \$27.0M. The anticipated overall cost of replacing the degraded portions of the East Basin Marina (Docks 12 thru 14) with a similar number of docks is anticipated to be between \$6.12M and \$8.16M.

Replacement of the gangway platform and landside utilities for Dock 11 is anticipated to be roughly \$150,000, including four new support piles, a reinforced concrete deck, and upgraded mechanical and electrical systems to the existing dock.

Guest Dock

Replacing the just over 1,500 square foot concrete guest dock along the spit is estimated to be approximately \$250 per square foot, including piles, utilities, access platform and gangways, for a bare construction cost of \$375,000. This replacement cost can include moving the vessel sewer pumpout from Dock 7 to the guest dock if landside sewer improvements are made.

Rock Slope Protection

The anticipated cost of reconstructing the approximately 80,000 square feet of rock slope protection, approximately 18 inches deep and assuming roughly 3,000 cubic yards of rock will be utilized in the section at \$100 per cubic yard for facing class stone installed on gentle slope, gives a ROM bare construction cost of approximately \$500,000 (which is similar to the 2014 condition survey report cost with escalation).

Seawall

The existing concrete sheet pile seawall is just over 3,000 feet long, and assumed to extend approximately 20 to 30 feet above mudline and 70 to 80 feet below mudline (with an assumed 100 vertical square feet per foot of seawall). The anticipated replacement cost of sheet piling is \$25 per vertical square foot (VSF) installed, with cap at \$500 per linear foot installed, gives a ROM bare construction cost of approximately \$9.0M (which is roughly double the anticipated 2014 cost with escalation). Anticipated repair costs include repairing or replacing roughly 20% of the existing cap (or 600 feet) at the \$500 per linear foot cost, or \$300,000, and doubled to \$600,000 with derrick barge mobilization and water quality measures for duration of the repairs.

Harbormaster's Office Building

Replacement of the 1,220 square foot Harbormaster's Building in kind is anticipated to be about \$400 per square foot in the San Francisco Bay area including pile foundation, utilities, and observation tower, for a price of \$500,000 (a high per square foot cost but still less than the amount from the 2014 report).



Recommended repairs in the next 5 to 10 years to the Harbormaster's Building include replacement of the wood shake roof, with an anticipated cost of roughly \$8 per square foot for a municipal project which should be around \$10,000. Filling in of the void underneath the building foundation is likely impractical due to the continual sinking of the surrounding soil.

If the adjacent harbormaster parking lot and access road are to be raised in elevation close to the Harbormaster's Office Building entrance finish surface elevation the near future, there may be no need for an ADA ramp to the building. Raising of the harbormaster parking lot and access road may effectively be achieved by installing a short sheet pile with cap around the perimeter with ground improvements under the new surface per geotechnical recommendations. The top of sheet pile cap should be no more than 30 inches above the surrounding gentle slope into the bay to avoid having to install a railing. The cap should also have enough height above new parking lot pavement to act as a curb to prevent cars from driving onto the slope. Anticipated costs of these harbormaster roadway and parking lot improvements are discussed further in the subsequent Roadways and Parking Lot sections.

Maintenance Building

Replacement of the existing prefabricated metal 2,300 square foot Maintenance Building in kind was researched to be around \$50 to \$100 per square foot, but is anticipated to be much higher at about \$550,000 based on escalation of the 2014 condition survey report cost. This higher replacement cost takes into account the build out of the interior of the building, as well as reconstruction of the exterior masonry block wall.

Recommended repairs in the next 5 to 10 years to the Maintenance Building include repair and repainting of the two building exterior corners, roll up and access doors. The interior of the building is also recommended to be renovated with a rough anticipated repair cost of \$25,000.

Restrooms

Building and restroom replacement costs from the 2014 condition survey report have been escalated to present value costs and verified against similar recent projects estimates. For example, the bare installed cost for a typical replacement modular masonry wall restroom was quoted in 2017 for a launch ramp project in the San Francisco Bay area was around \$200,000 bare construction cost with existing utilities intact. In today dollars the same building rough order of magnitude cost should be around \$300,000 with escalation.

The existing restrooms are well maintained, and no repairs are anticipated at this time since the restrooms appear to have been recently painted and the roof and interior appear to have been recently replaced. The restroom mechanical and electrical systems were also observed to be well maintained.



Roadways

The asphalt roadways within District control include the unimproved east half of Marina Boulevard and other miscellaneous access roads on site, and add up to just over 60,000 square feet of road surface. Total replacement of the roadways is anticipated to be approximately \$8 per square foot, or a rough bare construction cost of \$500,000.

Resurfacing of all the roadways in the next 5 to 20 years is anticipated to be around \$3 per square foot, equivalent to a bare construction cost of roughly \$200,000.

Raising roughly 10,000 square feet of the harbormaster building access roadway on the spit a couple of feet to be near the same elevation as the Harbormaster's Building entrance with overexcavation would likely require approximately 1,000 cubic yards of gravel fill at \$60 per cubic yard installed and compacted, or \$60,000 bare construction cost for fill. The length of sheet pile wall on the east and west side of the raised spit roadway is anticipated to be approximately 500 feet, with a depth of 10 feet to 12 feet similar to a residential scale bulkhead. The anticipated cost of short sheet pile with cap is \$500,000, assuming around \$1,000 per linear foot using land based equipment, such as an excavator with pile driving attachment.

Parking Lots

The combined asphalt and gravel parking lot areas add up to roughly 165,000 square feet. Replacement of the existing parking lots in kind with new pavement is anticipated to cost around \$6 per square foot, which gives a full replacement value of roughly \$1.0M for all parking areas.

Anticipated parking lot repairs range from resurfacing the top layers of asphalt in certain areas (anticipated to be \$3 per square foot) to full replacement of the asphalt and adding a couple of feet of subbase in low lying areas as described below. Recommended repairs include resurfacing include roughly 20,000 square feet of the east end of the upper parking lot in 5 to 10 years, for an estimated \$60,000 bare construction cost in present day dollars.

Raising the 50,000 square feet of lower parking lot adjacent to Docks 11 thru 13 a couple of feet would likely require roughly 5,000 cubic yards of compacted fill, borrowed from another location on site such as Parcel 6 for the future hotel. The anticipated bare construction cost for removing and placing borrow with 1,000 foot of hauling and compaction is around \$20 per cubic yard, or \$100,000 for subbase, and \$300,000 for lower parking lot pavement replacement. Adding in demolition, drainage, landscaping, and other miscellaneous items, full replacement and raising of the lower boater parking lot adjacent to Docks 11 thru 13, for roughly 100 cars is anticipated to be around \$500,000.

Raising of the roughly 5,000 square feet of the harbormaster building parking lot a couple of feet to be near the same elevation as the Harbormaster's Building entrance with overexcavation would likely require approximately 500 cubic yards of gravel fill at \$60 per cubic yard installed



and compacted, or \$30,000 bare construction cost for fill. The length of sheet pile wall on the east and west side of the raised parking lot is anticipated to be approximately 250 feet, with a depth of 10 feet to 12 feet similar to a residential scale bulkhead. The anticipated cost of short sheet pile with cap is \$250,000, assuming around \$1,000 per linear foot using land based equipment, such as an excavator with pile driving attachment. Adding in demolition, drainage, landscaping, and other miscellaneous items, full replacement and raising of the harbormaster parking lot for roughly 10 cars is anticipated to be around \$300,000.

Sidewalks and Bay Trail

The existing sidewalks and Bay Trail add up to roughly 50,000 square feet of walking surface, and if replaced in kind with new asphalt pavement are anticipated to cost around \$6 per square foot, which gives a rough bare construction cost of roughly \$300,000. Raising of the 8' to 15' wide Bay Trail a couple of feet would add roughly \$100,000 to the replacement cost, for a combined anticipated cost of \$400,000 total.

Public Fishing Pier

The anticipated full replacement cost of the Public Fishing Pier was increased dramatically from the prior 2014 condition survey to take into account cost escalations, demolition of the existing pier, utilities, and other miscellaneous items. Assuming \$300k for demolition, roughly 4,500 square feet of pier area at \$300 per square foot of deck, roughly 25 piles are needed at \$10,000 per pile installed, and utilities and miscellaneous items at roughly \$100k, gives a rough order of magnitude (ROM) bare construction cost (without engineering or permits) of approximately \$2.0M for demolishing and replacing the Public Fishing Pier in kind.

ACKNOWLEDGEMENTS

We appreciate the opportunity to assist the District by providing this updated condition survey report. Please feel free to contact us with any questions regarding these findings and recommendations.

Sincerely,
GHD Inc.

A handwritten signature in black ink, appearing to read "R. Sherwood", written in a cursive style.

Robert Sherwood, PE
Waterfront / Civil Engineer
CA Lic: C 64351

Attachments:

Attachment A – Site Photos



REFERENCES

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- Prefabricated Steel Building: <https://steelbuildingszone.com/cost-for-5000-sq-ft-steel-warehouse/>



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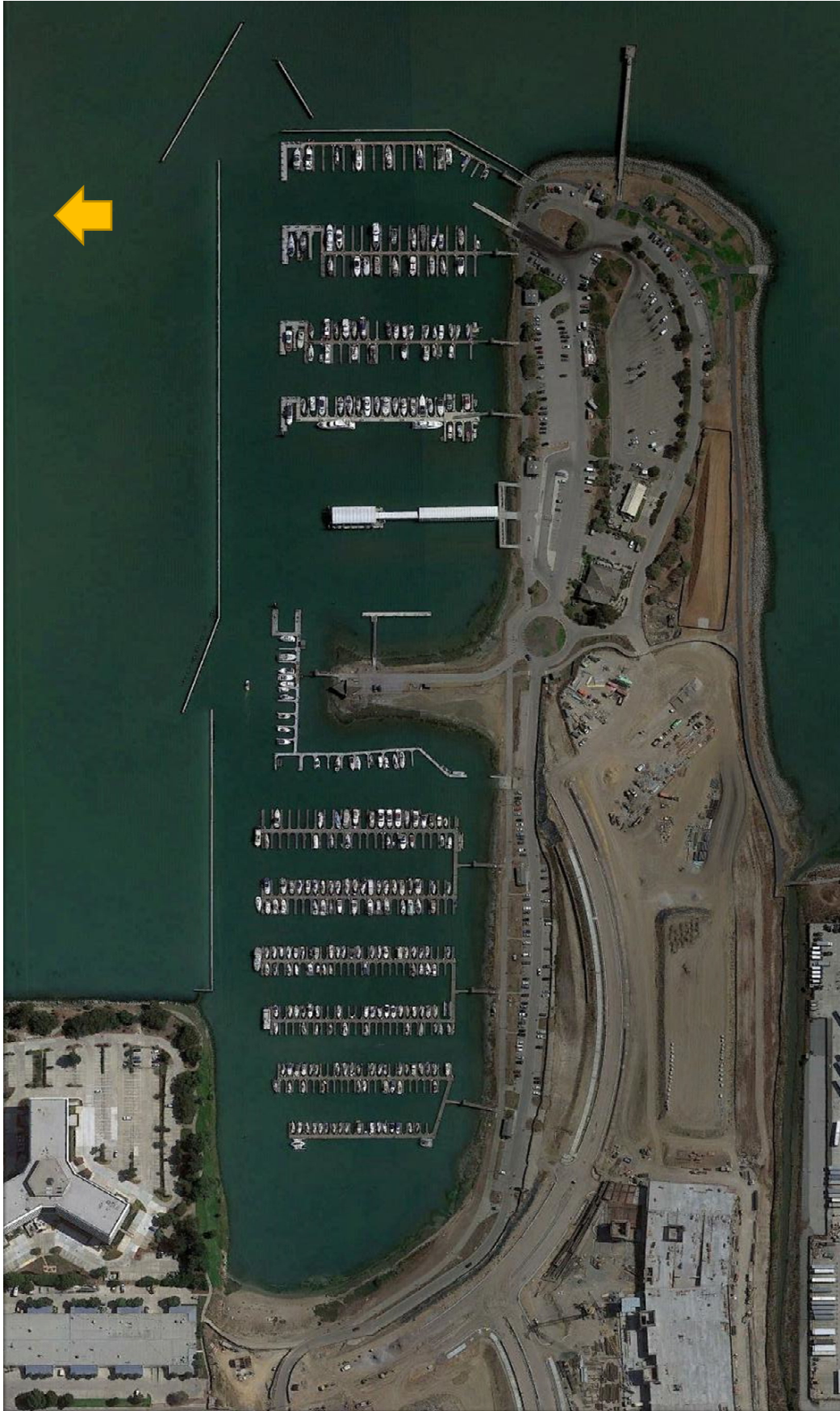
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Appendix A

Site Photos



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3 – View of West Basin Docks 1 and 2 Gangway Platform



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81 – View of Fishing Pier abutment



Pillar Point Harbor

Updated Marina Facility Condition Survey Report

Prepared for:
San Mateo County
Harbor District



May 2021





EXECUTIVE SUMMARY

The goal of this report is to update the prior 2014 Pillar Point Harbor Marina Facility Condition Survey and document the present day condition of the Pillar Point Harbor facilities within the District's jurisdiction to provide a basis for future master planning efforts. The estimated remaining useful life (RUL), and anticipated costs of repair and/or replacement of key marina elements of the facility are also considered in this report. This condition survey report is formatted to be as consistent as practicable with past reports for continuity, while still utilizing current accepted industry standards for the inspection of marine facilities.

Johnson Pier is the backbone and centerpiece of the harbor, and key components include the:

- Support Piles and Pile Bents – The majority of piles and pile bents are in “good” condition; some of the reinforced concrete beams (or bents) supporting portions of the deck at the end of the pier were noted to be in “poor” condition and in need of repair in the next 5 to 10 years due to corrosion, and one pile under Fish Buyer Building noted to also be in “poor” condition and in need of repair in the next 5 to 10 years
- Decking and Bullrail – Well maintained and in “good” condition
- Railing – Relatively new plastic lumber and well maintained in “good” condition
- Pier Utilities – Recently renovated under pier and well maintained in “good” condition

The harbor perimeter protection is essential to the safe function of the harbor, and key components include:

- Rock Slope Protection – Observed to be in “critical” condition with failed sections needing immediate replacement; high priority but fair amount of buffer at top of slope for now
- Sheet Pile Wall – Vertical concrete sheets appear to be in “satisfactory” condition with an anticipated remaining useful life of 20 to 30 years; reinforced concrete cap in “poor” condition need of localized repairs in several locations in the next 5 to 10 years

The Marina Docks are at end of their 30 to 40 year useful life and components include:

- Docks A thru C (majority recreational boat owners) – Wooden docks with conditions range from “serious” to “poor” indicating a need of replacement within 10 years
- Docks D and E (majority commercial fishing boats) – Wooden docks with conditions range from “serious” to “poor” indicating a need of replacement within 10 years
- Docks F thru H (mix of recreational and commercial vessels) – Wooden docks with conditions range from “serious” to “poor” indicating a need of replacement within 10 years
- Guest Dock (along Johnson Pier between Docks “D” and “E”) – Concrete dock in “fair” condition indicating a need of replacement in 10 to 20 years
- Fuel Dock – Dock was observed to be worn with uneven freeboard possibly due to loss of foam floatation in the open top tubs from chemical attack, and considered to be in “serious” condition indicating a need of replacement of the fuel dock in 2 to 5 years. Replacement is recommended for only the floating fuel dock and various mechanical and dock fueling appurtenances, and assumes the landside underground storage tanks and



under pier fuel lines to the dock, gangway, guide piles and fuel dispensers do not need replacement.

Buildings within the harbor include:

- Harbor Office Building – ADA access added and interior recently remodeled, well maintained and in “satisfactory” condition with a remaining useful life of 20 to 30 years
- Maintenance Building – New paint and exterior doors, well maintained and noted to be in overall “satisfactory” condition with a remaining useful life of 20 to 30 years
- Tenant Row Building – In overall “fair” condition structurally with a remaining useful life of 10 to 20 years before needing major renovations; interior upgrades tenant responsibility
- West Restroom at Docks A thru C – Overall “fair” condition, with an anticipated remaining useful life 10 to 20 years; existing ramps to showers need to be ADA compliant
- Central Restroom at Base of Pier – Appears to be in “fair” condition, with an anticipated remaining useful life 10 to 20 years before needing major renovations
- East Restroom at Boat Ramp – Appears to be in “poor” condition, with an anticipated remaining useful life 5 to 10 years before needing major renovations or replacement
- Fish Buyer Building – Appears to be in overall “fair” condition structurally with 10 to 20 years before needing major renovations; interior upgrades tenant responsibility
- Ice House Building – Appears to be in overall “satisfactory” condition structurally with a remaining useful life of 20 to 30 years before needing major renovations

Site Work

- Roadways – Remaining useful life varies from 2 to 20 years depending on location
- Parking Lots – Remaining useful life varies from 2 to 20 years depending on location
- Sidewalks and Promenade – Conditions range from “serious” to “poor” depending on location, with remaining useful life of 2 to 10 years before needing replacement. At the landside base of the pier, the 3-step stairs from the promenade to the pier walking surface appear to be worn and in “poor” condition, need to be replaced in the next 5 to 10 years.
- Landside Utilities – Varies from “fair” to “satisfactory” condition for existing uses
- Landscaping – Landscaping is sparse and overgrown, with condition varying from “poor” to “serious” condition; priority may be dependent on location and public visibility

Boat Launch Ramp - Surface and boarding float docks were observed to be in “fair” condition with an anticipated remaining useful life 10 to 20 years, and the concrete pavement at the top of ramp is considered to be in “poor” condition with an anticipated remaining useful life of 5 to 10 years before needing replacement. The asphalt concrete roadway from the launch ramp to the boat trailer parking area is more heavily degraded and considered to be in “serious” condition with an anticipated remaining useful life of 2 to 5 years before needing replacement.

Public Fishing Pier - Recently completely renovated and is considered to be in “good” condition, with the anticipated remaining useful life of 20 to 30 years with regular maintenance.



Table ES 1 Pillar Point Harbor – Summary of Facility Condition

Marina Facility Element	Estimated Remaining Useful Life in Years	Estimated Probable Cost of Repair / Replacement	Estimated Asset Replacement Value
Johnson Pier	30-40 *	Repair Bents / Pile \$1,000,000	\$16,000,000
Shoreline RSP	0-2	\$750,000	\$750,000
Bulkhead Wall	20-30 / 5-10	Cap Only \$250,000	\$1,500,000
Docks A thru C	2-10	\$10,360,000	\$10,360,000
Docks D thru E	2-10	\$4,830,000	\$4,830,000
Docks F thru H	2-10	\$12,110,000	\$12,110,000
Guest Dock	10-20	\$100,000	\$100,000
Fuel Dock	2-5	\$500,000	\$500,000
Harbor Office Bldg	20-30	--	\$1,000,000
Maintenance Bldg	20-30	--	\$250,000
Tenant Row Building	10-20	TBD	\$3,330,000
West Restroom	10-20	ADA \$50,000	\$250,000
Central Restroom	10-20	ADA \$50,000	\$250,000
East Restroom	5-10	\$200,000	\$200,000
Fish Buyer Building	10-20	\$100,000	\$825,000
Ice House Building	20-30	--	\$300,000
Roadways and Parking Lots	Varies 2-20	\$350,000	\$3,500,000
Sidewalks and Promenade	Varies 2-10	\$250,000	\$150,000
Landside Utilities	10-20	\$150,000	\$1,000,000
Landscaping	2-10	\$50,000	\$50,000
Boat Launch Ramp	10-20 *	\$250,000	\$6,500,000
Fishing Pier	20-30	--	\$425,000
Overall Totals	-	\$31,350,000	\$64,180,000

* Element has an exception to overall condition rating that needs attention (as described in later sections of this report)



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1. INTRODUCTION

1.1 Scope of Report

The scope of this report is to update the prior 2014 Pillar Point Harbor Marina Facility Condition Survey and document the present day condition of the Pillar Point Harbor facilities within the San Mateo County Harbor District's (SMCHD) jurisdiction to provide a basis for the future overall master planning efforts. A site visit was conducted by GHD from April 5-6, 2021 with the assistance of harbor staff.

1.2 Description of Facilities

Pillar Point Harbor serves a large commercial fishing fleet, recreational boating, kayaking and standup paddling needs, and other public waterfront experiences at the various restaurants, shops, piers, trails and promenade. The extent of this inspection includes the harbor district facilities within the inner breakwater, as well as the boat launch ramp just east of the inner breakwater as shown below in Figure 1.



Figure 1 - Pillar Point Harbor Map (source: SMCHD website)



The Pillar Point Harbor facilities include most amenities typically found in a well-functioning small-craft harbor including perimeter protection for the basin, docks for recreational and commercial vessels, a pier and promenade with gangways to access the docks, a fuel dock, a boat launch ramp, utilities and support buildings, parking lots and other various amenities as listed in Table 1 along with their estimated asset value. Within the inner breakwater the Pillar Point Harbor facilities specifically include:

- Johnson Pier
- Rock Slope Protection
- Bulkhead Wall
- Floating Docks including:
 - o Marina Docks / Guest Dock
 - o Fuel Dock
- Buildings including:
 - o Harbor Office Building
 - o Maintenance Building
 - o Tenant Row Building
 - o West Restroom at Docks A thru C
 - o Central Restroom at Base of Pier
 - o East Restroom at Boat Ramp
 - o Fish Buyer Building on End of Pier
 - o Ice House Building on Pier
- Various Site Work
 - o Roadways
 - o Parking Lots
 - o Sidewalks and Promenade
 - o Landside Utilities
 - o Landscaping
- Boat Launch Ramp (adjacent to and east of inner breakwater)
- Public Fishing Pier



Table 1 Pillar Point Harbor – Summary of Facility Assets

Marina Facility Element	Year Installed (Reconstructed)	Estimated Remaining Useful Life in Years	Estimated Asset Replacement Value	Overall Condition Rating
Johnson Pier	1961	30-40	\$16,000,000	90 *
Shoreline RSP	1982	0-2	\$750,000	0
Bulkhead Wall	1961	20-30 / 5-10	\$1,500,000	70
Docks A thru C	1985	2-10	\$10,360,000	30
Docks D thru E	1987	2-10	\$4,830,000	30
Docks F thru H	1987	2-10	\$12,110,000	30
Guest Dock	199x	10-20	\$100,000	60
Fuel Dock	1985	2-5	\$500,000	30
Harbor Office Bldg	1961	20-30	\$1,000,000	80
Maintenance Bldg	1979	20-30	\$250,000	80
Tenant Row Building	1961	10-20	\$3,330,000	60
West Restroom	1982	10-20	\$250,000	60
Central Restroom	1982	10-20	\$250,000	60
East Restroom	1992	5-10	\$200,000	40
Fish Buyer Building	1961	10-20	\$825,000	60
Ice House Building	1985	20-30	\$300,000	80
Roadways	1961	Varies 2-20	\$1,000,000	40
Parking Lots	1961 - 1982	Varies 2-20	\$2,500,000	40
Sidewalks and Promenade	1961 - 2017	2-10	\$150,000	40
Landside Utilities	1961	10-20	\$1,000,000	70
Landscaping	--	2-10	\$50,000	30
Boat Launch Ramp	1992	10-20	\$6,500,000	50 *
Fishing Pier	1989 (2019)	20-30	\$425,000	100
Overall Asset Replacement Totals		--	\$64,180,000	--

* Element has an exception to overall condition rating that needs attention (as described in later sections of this report)



1.3 Methodology

The facility condition survey was based upon observations and input received from SCMHD onsite personnel during site visit on April 5 - 6, 2021 by Robert Sherwood, P.E, with GHD. The underside of the pier, concrete sheet pile bulkhead, and fuel dock at Pillar Point Harbor were observed by boat. The conditions were rated using a system similar to that used on the previous condition assessment report (San Mateo County Harbor District, Pillar Point Harbor Marina Facility Condition Survey, December 2014 by Moffatt & Nichol) to facilitate comparison of the changes over time. Once the condition was rated, the priority and cost and any needed repair or replacement was estimated and compared to previous in present day U.S. dollars. The methods for the parameters of condition rating, priority, cost and type of repair or replacement are described as follows.

“**Condition Rating**” is a numeric score from 0 through 100 given for each component that allows ranking comparison of facilities. The number is based upon visual observations of the facilities qualitative condition as described in the condition rating tables. The remaining useful life (RUL) is the amount of time the component is expected to remain serviceable without further maintenance, in its present condition. The range is generally five to ten year intervals, such as “5 to 10” or “10 to 20.” The measure of remaining useful life is to be distinguished from the original “useful life”, or “service life” that is commonly used in the valuation of an asset.

The overall rating of an entire system, such as a group of docks (e.g. Docks A thru C) is comprised of the average of the individual ratings given to each item within the system (e.g. each dock finger and main walkway), compiled within a spreadsheet from the onsite ratings.

Table 2 - Condition Rating Table from prior M&N Condition Survey

Condition	Description	Remaining Useful Life	Condition Rating
NEW (N)	Like-new condition	More than 15 years	100
GOOD (G)	Generally new condition	10 – 15 years	80
FAIR (F)	Servicable condition, lightly worn due to normal wear	5 – 10 years	60
WORN (W)	Exhibits cracking, corrosion, or other indicators of deterioration. Still serviceable but requires maintenance to extend the useful life.	Less than 5 years	40
REPLACE (R)	Worn to the point of needing immediate replacement or major repair.	Should replace in 1-2 years	20



ASCE Manuals and Reports on Engineering Practice No. 130 (MOP 130); Waterfront Facilities Inspection and Assessment, is the industry standard reference for inspecting and assessing waterfront facilities, including marinas within small craft harbors. Within ASCE MOP 130 is Table 2.14 (shown below in Figure 2) which provides an overview of the various condition assessment ratings commonly used within the engineering community.

Table 2-14. Condition Assessment Ratings

Rating	Description
6 Good	No visible damage or only minor damage noted. Structural elements may show very minor deterioration, but no overstressing observed. No repairs are required.
5 Satisfactory	Limited minor to moderate defects or deterioration observed but no overstressing observed. No repairs are required.
4 Fair	All primary structural elements are sound but minor to moderate defects or deterioration observed. Localized areas of moderate to advanced deterioration may be present but do not significantly reduce the load-bearing capacity of the structure. Repairs are recommended, but the priority of the recommended repairs is low.
3 Poor	Advanced deterioration or overstressing observed on widespread portions of the structure but does not significantly reduce the load-bearing capacity of the structure. Repairs may need to be carried out with moderate urgency.
2 Serious	Advanced deterioration, overstressing, or breakage may have significantly affected the load-bearing capacity of primary structural components. Local failures are possible, and loading restrictions may be necessary. Repairs may need to be carried out on a high-priority basis with urgency.
1 Critical	Very advanced deterioration, overstressing, or breakage has resulted in localized failure(s) of primary structural components. More widespread failures are possible or likely to occur, and load restrictions should be implemented as necessary. Repairs may need to be carried out on a very high-priority basis with strong urgency.

Figure 2 - ASCE Manual of Practice 130 (Condition Assessment Ratings)

To be more in line with industry standards, a hybrid updated condition ratings table utilizing the previous condition rating table from the prior 2014 M&N condition survey and the accepted ASCE industry condition assessment rating table will be used for this report, and is presented in Table 3.



Table 3 - Updated Condition Ratings (Based on Current Industry Standards)

Condition	Description	Remaining Useful Life	Condition Rating	Repair Priority
GOOD	Like-new condition, shows very minor deterioration, no overstressing observed.	More than 30 years	100	-
SATISFACTORY	Servicable condition, lightly worn due to normal wear, no repairs are required.	20 – 30 years	80	-
FAIR	Localized moderate defects or deterioration; structure serviceable and lightly worn due to normal wear. Repairs are recommended but the priority of the repairs is low.	10 – 20 years	60	Low (Level 4)
POOR	Widespread advanced deterioration or overstressing observed; structure is serviceable with minor loss of structural capacity. Repairs are recommended with moderate priority/urgency.	5 - 10 years	40	Moderate (Level 3)
SERIOUS	Advanced deterioration or overstressing observed; significant loss of capacity with local failures possible. Repairs are recommended with high priority/urgency.	2 - 5 years	20	High (Level 2)
CRITICAL	Very advanced deterioration or overstressing with localized failures observed; significant loss of capacity with load restrictions and repairs recommended with very high priority/urgency.	Should replace in less than 2 years	0	Very High (Level 1)



“**Priority**” is the level of importance or urgency that the component should be repaired or replaced. The numeric assignment is based upon safety and the function of the component as follows:

1. System or element is in failure, or is expected to fail in the next year. Safety: Such failure will pose significant risk of injury. Function: will adversely affect ability to operate (e.g. separation of a dock would block access to the remaining dock even if not a safety risk).
2. System or element is currently functional, but has a probability of failing before the next scheduled inspection or 5 years. Safety: such failure poses little risk to safety. Function: may result in a temporary and minor loss of facility operations.
- 3 & 4. System or element is expected to remain functional until the next scheduled inspection or at least 5 years. If failure does occur, it poses no safety risk and will not likely result in the significant loss of facility operation.

“**Cost**” is the cost for repair or replacement is based upon the following

- Means Building Construction Cost Data and Heavy Construction Cost Data
- Cost data from construction of similar projects
- Input from SCMHD and Engineering judgment
- Prior 2014 M&N Condition Survey

“**Type**” of repair or replacement project is broken out into budgetary categories as follows:

(C) Capital - One time repair or replacement typically costing over \$10,000 to correct.

(M) Recurring Maintenance - Repair/maintenance actions that occur with a frequency of less than 10 years with a cost of less than \$10,000 per action

(SM) Scheduled Maintenance - Repair/maintenance actions that typically occur annually or more frequently with a cost of less than \$5,000 per year.

(I) Improvement - a repair or replacement that provides greater functionality than the existing system.

1.4 Asset Life Cycle

When an element of a facility is first placed in service (new) it is assigned a nominal “useful life”, or “service life”, a duration of time during which function of an element can be expected with normal maintenance. The duration is based upon our experience with these types of facilities, for example, a typical concrete dock may have a useful life of 40 to 50 years, whereas a typical dock built of timber may have a useful life of 30 to 40 years. The remaining useful life (RUL) is often the difference between the years an asset has been in service and the original useful life. The remaining useful life can also be considered from present day going forward, and can be used as a guideline in planning of maintenance and replacement costs; as the RUL approaches zero, increased maintenance to extend the life past the anticipated remaining useful life, or replacement, should be expected and planned for.



2. CONDITION ASSESSMENT

2.1 Johnson Pier

Johnson Pier was built in 1961 and is the backbone and centerpiece of the harbor, and has been well maintained and structurally and mechanically is considered to be in overall “good” condition. In 2013, a comprehensive repair and improvement project was undertaken that focused on various aspects of the pier including deck and bullrail repairs, utility improvements, and upgrades to the perimeter railing and area lighting. With continued maintenance, the remaining useful life for the majority of the structure is anticipated to be 30 to 40 years, while several of the reinforced concrete beams (or bents) supporting portions of the deck at the end of the pier were noted to be in “poor” condition and in need of repair in the next 5 to 10 years due to corrosion. One reinforced concrete support pile near the end of the pier has also been identified to be in “poor” condition and in need of repair (jacketing) in the next 5 to 10 years.

The above deck areas of the pier were found to generally be well maintained. The reinforced concrete deck and bullrail along the main section of pier appeared to be in “good” condition, with previous patching and repairs noted to be sound. The structural, UV resistant plastic lumber railing along the main section of pier also appeared to be structurally sound, well-maintained and in “good” condition. At the end of the pier what appears to be a rubberized asphalt coating has been applied to the deck for durability and traction during fish off-loading operations. The coating appears to be holding up well under the conditions with occasional patching being required to maintain the non-skid finish. The bullrail and cleats appear to be in “good” condition at the end of the pier as well.

The majority of the below deck areas of the pier visually inspected were found to be in “good” condition with the reinforced concrete pilings, support beams (bents), and deck panels not showing signs of significant cracking, spalling or overstressing. However, at the end of the pier in the vicinity of the Fish Buyer Building, under the stacking/storing of fish gondolas (boxes) and the off-loading of fish there appears to be several reinforced concrete deck support beams showing signs of corrosion spalling and in need of repair.

The majority of utilities running underneath the pier, including piping, valves, conduit, couplings, junction boxes and support brackets, appeared to be in “good” condition. Photos of the above and below deck portions of the pier can be found in Appendix A of this report.



2.2 Shoreline Rock Slope Protection

The rock slope protection separating the promenade and parking lot areas from the harbor have failed and are in “critical” condition and in need of immediate repair, with a remaining useful life (RUL) of 0 to 2 years. Sloughing of the slope underneath the rock has created areas where the underlying filter fabric has been ripped and displaced, and bare earth is exposed to the elements allowing the slope to deteriorate and loose soil material to enter the harbor.

The roughly 600 feet of sidewalk and dirt promenade located between the western portion of the inner breakwater and the centrally located sheet pile wall is set back from the top of slope enough to not make the loss of slope protection a significant hazard to public safety. From the east side of the sheet pile wall to the kayak and standup paddleboard area, the parking lot and dirt promenade are much closer to the top of slope, and the failed rock slope protection poses a slightly higher level of risk to existing infrastructure and public safety. Most notably, a roughly 3’ wide by 5’ tall by 4’ deep section of concrete cast against the end of the sheet pile appears to have significant undermining and may be at risk of falling or rotating out of position during a significant storm or earthquake event.

2.3 Bulkhead Wall

The vertical sheet pile bulkhead wall (or seawall) with concrete cap and structural plastic railing, is within the inner breakwater and between the main parking lot area and the boat docks. The wall is approximately 514 feet long, and supports a 20 foot wide promenade, the public fish offloading dock and crane, and the access road and utilities at the base of Johnson Pier. The precast concrete sheet piles appear to be in “satisfactory” condition with an anticipated remaining useful life of 20-30 years with proper maintenance. The favorable condition of the sheet piling is likely due to proper installation, use of high-strength marine concrete with corrosion inhibitors, and sufficient concrete cover over the concrete reinforcing. The cast-in-place reinforced concrete cap is in “poor” condition and in need of localized repairs in the next 5 to 10 years. The cap is exhibiting concrete spalling and cracking in sections of the waterside face of the cap, possibly due to chloride intrusion over time into the concrete producing corrosion of the reinforcing steel that may not have had sufficient cover during the construction of the cap.

The structural, UV resistant plastic lumber railing secured to the concrete cap appears to be structurally sound, well-maintained and in “good” condition. The public dock serving the public hoist was observed to be in “poor” condition and in need of replacement in 5 to 10 years. Photos of the seawall and cap can be found in Appendix A of this report.



2.4 Floating Docks

Based on our observations, it appears that the overall condition of the wooden floating docks, originally constructed in 1985, range from “poor” to “serious” condition, mainly due to the age of the docks, and are in need of replacement within 10 years. The floating concrete guest dock along the pier and between “D” and “E” Docks was observed to be in “fair” condition and in need of replacement in 10 to 20 years. The docks have been very well maintained, and replacement of worn guide pile rollers, distressed wood stringers and steel fasteners, loose and corroded cleats, and key elements of the dock electrical and fire systems has been key to allowing the docks to be functional to the full extent of their 30 to 40 year service life. However, the docks are at the end of their useful life with a high percentage of the fingers tilting beyond acceptable limits for a marina.

The guide piles holding the docks in position have been observed to be in generally “good” condition, consistent with the 2014 condition assessment. The electrical system, fire protection system, and other safety components on the docks are also well maintained and in “satisfactory” condition, and should outlast the remaining useful life of the docks. Photos of the docks can be found in Appendix A of this report.

2.5 Fuel Dock

The fuel system appears to be functional with an emergency pump shutoff switch readily accessible on the dock. The floating fuel dock was observed to be in “serious” condition, with an anticipated remaining useful life of 2 to 5 years before needing to be replaced, since many cleats are damaged or missing, the deck is in worn condition, and the dock is tilting possibly due to loss of foam in the open top floatation tubs. Fuel and other chemicals in contact with floatation can dissolve foam over time. The California Department of Boating and Waterways guidelines warn against exposed floatation foam around fuel docks as far back as 1984.

Per the 1984 California Department of Boating marina design guidelines:

“All floatation material used in and adjacent to the fuel float shall be highly resistant to hydrocarbons. The use of unprotected polystyrene for fuel float construction is specifically prohibited.”

There are three double-walled underground storage tanks (USTs) in parking lot installed in 1988 per USEPA website (UST ID# CA10064224). The three USTs include one 12,000 gallon tank for unleaded fuel, and two 12,000 gallon tanks for diesel fuel. USTs are required to have monthly and annual inspections per 40 CFR Part 280, and these inspections should already have been performed by others. The rigid piping under the pier from the USTs to the fuel dock was replaced in 2013 and appears to be in good condition. The flexible fuel lines from the pier to the fuel dock appear to have been recently replaced, and the fuel dock dispenser pumps currently operate at maximum flow rate of approximately 16 gallons per minute, which is considered a standard dispensing rate. Comparatively, a high speed dispenser delivers fuel at a



rate of 35 to 100 gallons per minute. According to the operator, high speed fuel is not needed and they consider the current setup a “safe rate”.

Some of the electrical wiring and conduit in the vicinity of the fuel dock has been broken or dislodged in areas and is in need of immediate repair. Pertinent code requirements related to the inspection and maintenance of marine fueling facilities are referenced in NFPA 30A follows:

Chapter 11 Marine Fueling

11.1 Scope

11.1.3 For the purpose of this chapter, the word pier shall also mean dock, floating dock, and wharf.

...

11.3 Piping Systems

11.3.2 Piping systems shall be supported and protected against physical damage and stresses arising from impact, settlement, vibration, expansion, contraction, and tidal action.

11.3.3 Means shall be provided to ensure flexibility of the piping system in the event of motion of the pier. Flexible piping shall be of a type designed to withstand the forces and pressures exerted on the piping.

11.3.4 Where dispensing is from a floating structure or pier, approved oil-resistant flexible hose shall be permitted to be used between shore piping and the piping on a floating structure or pier and between separate sections of the floating structure to accommodate changes in water level or shoreline, provided that the hose is either resistant to or shielded from damage by fire.

11.3.5 A valve to shut off the liquid supply from shore shall be provided in each pipeline at or near the approach to the pier and at the shore end of each marine pipeline adjacent to the point where each flexible hose is attached.

...

11.5 Sources of Ignition

11.5.3 Clearly identified emergency electrical disconnects that are readily accessible in case of fire or physical damage at any dispensing unit shall be provided on each marine wharf. The disconnects shall be interlocked to shut off power to all pump motors from any individual location and shall be manually reset only from a master switch. Each such disconnect shall be identified by an approved sign stating EMERGENCY PUMP SHUTOFF in 50 mm (2 in.) red capital letters.

11.6 Bonding and Grounding

11.6.1 Pipelines on piers shall be bonded and grounded. Bonding and grounding connections on all pipelines shall be located on the pier side of hose riser insulating flanges, if used, and shall be accessible for inspection.

11.7 Fire Control

11.7.3 Materials shall not be placed on a pier in such a manner that they obstruct access to fire-fighting equipment or important piping system control valves. Where the pier is accessible to vehicular traffic, an unobstructed roadway to the shore end of the wharf shall be maintained for access by fire-fighting apparatus.



2.6 Harbor Office Building

The one-story Harbor Office Building was constructed around 1961, and has approximately 2,300 square feet of floor space with a 200 square foot second story observation tower. The roofing is asphalt shingle over the sloped portions of the wood framed mansard roof and built-up roofing on the flat portions. The observation tower has wood framed walls and the first floor walls are a mix of masonry and conventional wood framing. The foundation consists of a raised reinforced concrete slab on grade. The finishes consist of exterior wood siding and interior gypsum board.

The building is well maintained, with the interior of the building recently remodeled and ADA access improvements made as recommended in the 2014 condition survey. Additionally, the exterior of the building was recently painted, a new roof and gutters were installed, and an emergency backup generator was installed. With recent improvements, the Harbor Office Building was noted to be in “satisfactory” condition with an anticipated remaining useful life of 20 to 30 years before needing major renovations again, provided the building continues to be well maintained.

2.7 Maintenance Building

The one-story Maintenance Building was constructed around 1979, and has approximately 1,000 square feet of space, with a small interior 2nd floor storage attic at the west end of the building that also serves as a maintenance staff locker room and workout area. The floor is a reinforced concrete spread footing on grade, the exterior walls are reinforced concrete masonry, and the asphalt shingle roof is supported by plywood over 2x wood rafters. At the northeast side of the building, there is a wood framed storage building of approximately 120 square feet, with an asphalt shingle roof. The yard area around the building was well maintained and organized, with a new awning for the harbor patrol golf carts recently constructed on the south side of the building. Site stormwater runoff within the yard runs to a filtered catch basin.

The exterior of the building was recently painted, and several repairs and improvements had been made to the maintenance building based on the 2014 condition survey recommendations, including repairing the eaves and exterior electrical conduit, adding LED security lighting, and adding a new rollup door and front door. The maintenance building appeared to be well maintained and was noted to be in overall “satisfactory” condition with an anticipated remaining useful life of 20 to 30 years before needing major renovations.

2.8 Tenant Row Building

The mostly one-story Tenant Row Building was constructed around 1961, and houses five businesses ranging from a seafood market on the east end of the building to a two-story surf shop on the west end of the building with a large enclosed sun room. The building construction



is concrete slab on grade with masonry block exterior walls, wood framed interior walls, and a mansard roof (except for the two-story surf shop).

The area in front of the exterior of the building was recently expanded to include a public patio area, and ADA accessibility improvements had been made to access the building based on the 2014 condition survey recommendations. The tenant row building was noted to be in overall “fair” condition structurally with an anticipated remaining useful life of 10 to 20 years before needing major renovations, and interior upgrades are the responsibility of the tenants.

2.9 West Restroom

The 1,200 square foot, one-story West Restroom is located landside of Docks A thru C, and contains men’s and women’s restrooms, showers and laundry service. The restroom building construction is concrete slab on grade with masonry block exterior and interior walls, and a mansard roof. A wet utility gallery separates the men’s and women’s sides of the restroom.

The restroom fixtures, laundry room, roof, soffits and fascia boards, exterior block walls and doors appear to be in “fair” condition, with an anticipated remaining useful life (RUL) of 10 to 20 years before needing major renovations again. Notable from the previous 2014 condition survey report, efflorescence was observed on the masonry block wall and sides of the concrete foundation, and the concrete ramps leading to the showers are still slightly too steep (1-3/8” rise per foot on the women’s side and 1-1/4” rise per foot on the men’s side) to meet ADA requirements. Also, the interior ceiling sheathing has fallen down in the women’s room and is in need of repair.

2.10 Central Restroom

The 900 square foot, one-story Central Restroom is located adjacent to the Harbor Office Building and the base of Johnson Pier, and contains men’s and women’s restrooms, and two separate showers. The restroom building construction is concrete slab on grade with masonry block exterior and interior walls, and a mansard roof. A wet utility gallery separates the men’s and women’s sides of the restroom.

The restroom fixtures, laundry room, roof, soffits and fascia boards, exterior block walls and doors appear to be in “fair” condition, with an anticipated remaining useful life of 10 to 20 years before needing major renovations again. Notable from the previous 2014 condition survey report, the concrete ramp on the south side of the restroom is still slightly too steep to meet ADA requirements, and both of the showers do not have an access ramp. Also, the concrete stairs on the west side of the restroom are exhibiting horizontal cracks and appears to be starting to spall due to corrosion of the reinforcing steel.

Photos of the buildings and restrooms can be found in Appendix A of this report.



2.11 East Restroom

The 350 square foot, one-story East Restroom was constructed in 1992, and is located adjacent to the Boat Launch Ramp, and is open to the public and contains both men's and women's restrooms. The restroom building is entirely of wood construction, with an asphalt shingle gable roof and wood sheathing for siding. A wet utility gallery separates the men's and women's sides of the restroom.

The exterior doors and finish of the restroom building is worn and appears to be in "poor" condition, with an anticipated remaining useful life of 5 to 10 years before needing major renovations or replacement. Notable from the previous 2014 condition survey report, the men's room privacy screen on the west side of the restroom has been replaced, and now the women's privacy screen on the east side of the restroom is likely in need of replacement. Also, perimeter LED security lighting and conduit has been added to restroom attached to the roof fascia board.

2.12 Fish Buyer Building

The two-story Fish Buyer Building at the end of Johnson Pier was constructed around 1961, and has approximately 2,200 square feet of floor space on the bottom floor and 1,600 square feet of space on the upper floor. The roof and second floor are plywood over wood framing and the walls are wood studs placed on a four foot high reinforced concrete stem walls. The exterior walls are sheathed with plywood and there are interior walls between the three tenant spaces and large roll up doors at the front and back of each space.

Consistent with the previous condition survey, the exterior of the building is worn with the surfaces worn due to being exposed to the elements at the end of the pier, with the concrete walls and several exterior man-doors still showing signs of moderate to severe corrosion. The overall structure appears to be in "fair" condition, and is anticipated to be in need of renovation, replacement or significant repairs in 10 to 20 years. Photos of the buildings and restrooms can be found in Appendix A of this report.

2.13 Ice House Building

The Ice House is a two-story building with a 600 square foot upper floor which houses the ice generating equipment and the lower floor stores the ice. The roof consists of builtup roofing over plywood supported by 2x roof rafters slightly sloped to the west side of the building. The walls are conventionally frame stud walls with plywood sheathing with aluminum siding over rigid foam board insulation. The building is built over a concrete pile supported reinforced concrete deck adjacent to the southeast side of Johnson Pier. Adjacent to the ice building is a 130 square foot modular building which serves as the ice plant and fueling office. Overall, this building appears to be in "satisfactory" condition structurally with an anticipated remaining useful life of 20 to 30 years before needing renovation, replacement or significant repairs.



Worth noting, there were a couple of wood piles underneath the Ice House that appear to be disconnected from the underside of the building support deck, but they appear to be redundant and abandoned quite a while ago and are not a concern structurally.

2.14 Roadways

Pillar Point Harbor Boulevard runs from Capistrano Road at the entrance to the harbor facilities to the Boat Launch Ramp. As noted in the Boat Launch Ramp section, the asphalt concrete roadway from the launch ramp to the boat trailer parking area is more heavily degraded and considered to be in “serious” condition with an anticipated remaining useful life of 2 to 5 years before needing resurfacing. The remainder of Pillar Point Harbor Boulevard asphalt roadway surface appears to be in “fair” condition, and is anticipated to have a remaining useful life of 10 to 20 years before needing significant resurfacing. The Johnson Pier roadway from Pillar Point Harbor Boulevard appears to be in “poor” condition given the higher frequency of vehicles and traffic loading from commercial vehicles, and is anticipated to have a remaining useful life of 5 to 10 years before needing significant resurfacing.

2.15 Parking Lots

The launch ramp boat trailer parking lot at the far east end of the site is heavily degraded and considered to be in “serious” condition with an anticipated remaining useful life of 2 to 5 years before needing resurfacing. The adjacent Parking Lot C for recreational vehicle, day use, and trailer parking in the lots on the north side of Pillar Point Harbor Boulevard were observed to be in “poor” condition, with an anticipated remaining useful life of 5 to 10 years before needing to be resurfaced. Public Parking Lot B, just north of the Tenant Row Building, and the permit parking lot east of Johnson Pier Road were also observed to be in “poor” condition. Parking Lot A to the west of Johnson Pier Road serves both the public and slip renters, and was found to be in “fair” condition with an anticipated remaining useful life of 10 to 20 years before needing to be resurfaced.

2.16 Sidewalks and Promenade

The existing sidewalks and promenade range from “serious” to “poor” condition depending on location, with an anticipated remaining useful life of 2 to 10 years before needing replacement. Adjacent to the Harbor Office Building and restroom at the base of the pier, the existing promenade is approximately 20 feet wide. The existing promenade concrete walking surface appears to be subject to differential ground settlement and/or undermining of the substrate and has been patched and planed down in several locations. Properly sized drainage inlets and grates should be incorporated into any new promenade construction, with ribbon gutters directing flow away from expansion joints where runoff water can infiltrate through the pavement.



The pathways from the promenade to the adjacent parking lots and going west to Docks A thru C, and east to the kayak and SUP rental and launch area are dirt paths along the top of rock slope. There are existing 6- to 8-foot wide sidewalks along the perimeter of the parking lots that get people to these locations, but appear to be less traveled than the dirt paths along the top of slope. At the landside base of the pier, the 3-step stairs from the promenade to the pier walking surface appear to be worn and in “poor” condition, and in need of replacement in the next 5 to 10 years. The handrail for these two separate stairs do not have proper returns per code, but may have been given a variance due to their location adjacent to the pier and guardrail.

The scenic Half Moon Bay Coastside Trail section of the California Coastal Trail runs approximately 8 miles from the Half Moon Bay Ritz Carlton north to Pillar Point Harbor. The northern section of the trail ends near the Boat Launch Ramp, and trailgoers were observed to either travel along Pillar Point Harbor Boulevard on bicycles, or walk along the 12-foot wide asphalt sidewalk on the harbor side of the boulevard. The asphalt sidewalk trail extension is in “satisfactory” condition, with an anticipated remaining useful life of 10 to 20 years. The sidewalk transitions into a dirt path about 500 feet east of the road to Johnson Pier, and further extending the asphalt sidewalk trail to the intersection of Pillar Point Harbor Boulevard may help direct pedestrians to the commercial core of the harbor.

2.17 Landside Utilities

The existing sewer lift stations were likely installed in the early 1960s, and according to District staff, are maintained at least four times a year by an outside company. The lift station in the main parking lot appeared to be in good working order and properly secured. The lift station next to the East Restroom by the boat launch ramp also appeared to be in good working order, but the steel lid at grade appeared to be worn and not lockable (and in need of replacement). The sewer lift stations were noted to be in “fair” condition with an anticipated remaining useful life of 10 to 20 years before needing replacement or a major overhaul.

San Mateo County Fire Department, Coastside Fire Station 41 is within a mile of Pillar Point Harbor, and the fire department and district personnel regularly check the flow rate and condition of the hydrants, sprinklers and extinguishers on Harbor District property. From our visual inspection, the fire protection system appears to be functional throughout the site, including the pier and docks, and fire lanes are properly marked. There is an immediate need for the fire department connections (FDCs) and post indicator valves (PIVs) to be properly labeled on the landside and pier.

The electrical service distribution panel from the Edison pad-mounted transformer was observed to be in “satisfactory” condition, with the steel cabinets showing nominal signs of corrosion and the aging panels and breakers being well-maintained and properly labeled for their current use. The majority of electrical panels serving the individual district controlled buildings and pier were



also observed to be in “satisfactory” condition, with panels in tenant controlled buildings being the responsibility of the tenants.

2.18 Landscaping

The existing site landscaping is fairly sparse throughout the facility and generally overgrown in most locations. From looking at Google Earth aerial images, the Parking Lot A islands and landscape areas have had vegetation growing on them for many years. The landscaping is currently considered to be in “poor” to “serious” condition, but the priority of making improvements to the existing landscape areas may be dependent on where in the facility the green space is relative to pedestrian high-traffic areas and scenic overlooks, such as along the public promenade, and relation to the commercial core of the facility. Drought-tolerant plants may be a good option for the various landscape areas, as discussed further in the recommendations section of this report.

2.19 Boat Launch Ramp

The existing public Boat Launch Ramp was constructed in 1992 with California Department of Boating and Waterways grant funds and ramp has six launching lanes and is supported by four boarding float docks. The ramp is critical to the local fishing fleet and can see 200 to 300 boat launches per day during peak fishing seasons according to harbor staff. The bottom of the ramp has since been maintenance dredged in 1998, 2006, 2013, and 2019. The existing launch ramp surface and boarding float docks were observed to be in “fair” condition with an anticipated remaining useful life of 10 to 20 years provided regular dredging occurs to maintain the integrity of the boarding float docks and keep them from landing on the harbor bottom.

The concrete pavement at the top of ramp, also known as the ramp apron, and includes turnaround area for cars towing boat trailers. The apron is showing signs of deterioration due to runoff water from boats as they are being hauled out and is considered to be in “poor” condition with an anticipated remaining useful life of 5 to 10 years before needing replacement. The asphalt concrete roadway from the launch ramp to the boat trailer parking area is more heavily degraded and considered to be in “serious” condition with an anticipated remaining useful life of 2 to 5 years before needing replacement. Additionally, undermining of the east and west boarding float abutments was observed, indicating a need to redress the adjacent rock slopes.

2.20 Public Fishing Pier

The public fishing pier at the west inner breakwater was originally constructed in 1989, and was completely renovated in 2019 with new structural plastic lumber railing, timber decking, water and electrical service, low-level lighting, a fish cleaning station, and improvements to the walkway along the top of breakwater. The pier and access is considered to be in “good” condition, with the anticipated remaining useful life of the improvements and existing reinforced concrete piles to be 20 to 30 years with regular maintenance.



3. RECOMMENDATIONS

3.1 Facility Recommendations

The overall facility is well maintained and functional, especially given Pillar Point Harbor is very much a working harbor, as well as a destination harbor for the visiting public. The existing buildings are somewhat dated, the landscaping is sparse, and the connectivity and accessibility along the waterfront to and from the adjacent parking areas can be improved upon. Recent landside site improvements such as the new outdoor patio seating appear to be well received by the public, and the existing access to and from the commercial core may be greatly enhanced by incorporating the following:

- Extend the 12-foot wide Coastal Trail to retail shops and base of Johnson Pier
- Extend concrete promenade to both public fishing pier and kayak rental
- Add large arrays of bike racks to reinforce harbor as a destination

Details and prioritization of anticipated upcoming repairs and improvements to existing harbor structures and other key elements are described in the following section.

3.2 Priority of Repairs / Replacement

Priority of repairs and/or replacement of key elements of the harbor facilities are outlined in Table 4. The priority of repairs is somewhat related to the remaining useful life (RUL) of the element, but priority is also affected by life safety concerns and how essential the element is to the operation of the harbor facilities.

High Priority

Johnson Pier has been well maintained, and the reinforced concrete beams (bents) supporting the deck in the vicinity of the Fish Buyers Building, as well as a single under pier support pile, appear to be exhibiting corrosion spalling and are in need of high priority repair (Level 2). A more in depth structural investigation of the effects of corrosion and analysis of existing loads on the deck due to storage and transferring of fish gondolas via forklift should be undertaken to verify that the existing support beams meet the needs of fish offloading operations.

The rock slope protection on the shoreline slopes within the inner breakwater has failed and is in need of reconstruction. The underlying soil has been scoured out and the remaining armor stone section is sloughing in a way that suggests using a larger armor stone at a flatter slope may be more appropriate for the conditions, recommended sizes and slope pending further analysis. The reconstruction of the rock slope protection is considered a high priority repair (Level 2), and not a “very high priority” due to the fair amount of dirt pathway width at the top of slope. Construction of a new 12- to 20-foot wide promenade at the top of slope in lieu of the existing dirt paths could occur at the same time for project efficiency. If slope reconstruction is delayed significantly the future available area at top of slope may be diminished due to further erosion. Additionally, the roughly 3’ wide by 5’ tall by 4’ deep section of concrete cast against the end of the sheet pile wall appears to be at risk of falling or rotating out of position during a significant storm or earthquake event and should be addressed soon.



Replacement of all of the floating docks, including the fuel dock, is considered a high priority (Level 2), and for project timing purposes we recommend that relevant construction drawings and permits should be started in the next couple of years subsequent to public input through the master planning and related processes. The new dock construction will likely need to incorporate 80-foot long ADA gangways at each existing marina access point, and the upper gangway landings will likely need to be modified to better accommodate the higher loading and current code structural requirements of the new gangways.

The launch ramp boat trailer parking lot at the far east end of the site, and the asphalt roadway from the top of ramp to the parking lot are heavily degraded and considered to be a high priority (Level 2) condition in need of resurfacing. Use of an alternative salt water resistant pavement surface is recommended by using either a concrete pavement or a modified asphalt pavement (e.g. using a denser pavement with higher asphalt content, thicker wearing surface course, enhancing binder with additives, etc.). Proper drainage along the roadway and boat trailer parking areas should also be considered, including the use of ribbon gutters to direct runoff more efficiently. A higher traffic index value may also need to be considered in the design of any new pavement in these areas.

Adding proper signage to the existing fire department connections (FDCs) and post indicator valves (PIVs) to be properly labeled on the landside and pier is considered another high priority (Level 2) item that is recommended to be addressed.

Moderate Priority

Repair of the concrete cap atop the existing sheet pile wall is considered a moderate (Level 3) priority repair, and the observed damage is likely due to the use of concrete not optimally suited for the marine environment, and possibly insufficient cover over the reinforcing steel. The prevention of future cracking and spalling may be significantly reduced with the adding of sacrificial anodes within the repairs, pending further analysis.

Replacement of the East Restroom adjacent to the boat launch ramp is considered a desirable moderate priority (Level 3) improvement given the frequency of use and age of the building, continual maintenance, and worn condition of the building. The other restrooms are concrete block construction, which is substantially more durable and suited for exposed locations adjacent to the ocean. Adding more ADA compliant ramps and railing to access the existing Central and West Restrooms as described in this report, is another suggested moderate priority (Level 3) improvement to consider.

Resurfacing of the paved concrete apron at the top of the boat launch ramp, as well as the parking lots on the north side of Pillar Point Harbor Boulevard (Parking Lot C) and the parking lot on the north side of the Tenant Row Building (Parking Lot B), are considered moderate priority (Level 3) improvements recommended to be done in the next 5 to 10 years. The Johnson Pier access roadway is also in this resurfacing priority category due to the frequency of use, and a higher traffic index value may also need to be considered in the design of any new pavement for this roadway. Undermining of the east and west boarding float dock abutments at the top of boat launch ramp is also considered a moderate priority (Level 3) repair, and redressing of the adjacent rock slopes is advised to occur in conjunction with other rock slope reconstruction or during future top of boat ramp apron repairs.



The existing concrete walking surfaces of the existing landside waterfront sidewalks and promenade have been spot repaired and planed down in areas to prevent tripping hazards from developing, and replacement of larger sections of concrete pavement is an anticipated upcoming recommended moderate priority (Level 3) improvement. Properly sized drainage inlets and grates should be incorporated into any new promenade construction, with ribbon gutters directing flow away from expansion joints where runoff water can infiltrate through the pavement. Replacement of the 3-step stairs leading from the promenade to the base of the pier is also considered a moderate priority (Level 3) improvement necessary in the next 5 to 10 years given the condition of the stair railing and concrete.

Low Priority

Even though rated to be in “poor” to “serious” condition, the site landscaping is mainly for aesthetic value and is considered a low priority (Level 4) improvement suggested for the site. The timing of these improvements is likely best addressed with any promenade, commercial core revitalization, or other harbor beautification projects in the future. Other harbors in California, such as Dana Point Harbor, have successfully incorporated the use of drought tolerant plants such as succulents to add appeal to the harbor for the visiting public.

Other suggested low priority repairs or improvements to consider for existing key elements of the harbor, that may not need to be immediately addressed with proper maintenance for a decade or more include:

- Replacing the guest dock along the pier
- Replacing the sewer lift stations and other misc utilities
- Resurfacing Pillar Point Harbor Boulevard
- Renovating portions of the Fish Buyer building
- Renovating portions of the Tenant Row building

Other future improvements to the harbor facilities beyond those observed for the existing structures will likely be addressed in the master planning efforts and are outside the scope of this report.

Table 4 gives a list of the recommended Pillar Point Harbor repairs and improvements, estimated remaining useful life, probable costs, priority and type of repairs and improvements.



Table 4 Pillar Point Harbor – Priority of Repairs / Improvements

Marina Facility Element Repairs / Improvements	Estimated Remaining Useful Life in Years	Estimated Probable Cost of Repairs / Improvements	Priority and Type of Repairs / Improvements
End of Johnson Pier Pile & Bent Retrofit	30-40	\$1,000,000	Level 2 – Type C & I
Replace Shoreline RSP	Failed 0-2	\$750,000	Level 2 – Type C
Bulkhead Wall Repair Concrete Cap	Cap Only 5-10	\$250,000	Level 3 – Type C
Docks A thru C Replacement	2-10	\$10,360,000	Level 2 – Type C
Docks D thru E Replacement	2-10	\$4,830,000	Level 2 – Type C
Docks F thru H Replacement	2-10	\$12,110,000	Level 2 – Type C
Guest Dock Replacement	10-20	\$100,000	Level 4 – Type C
Fuel Dock Replacement	2-5	\$500,000	Level 2 – Type C
Tenant Row Building Improvements	10-20	TBD	Level 4 – Type I
West Restroom ADA Improvements	10-20	\$50,000	Level 3 – Type I
Central Restroom ADA Improvements	10-20	\$50,000	Level 3 – Type I
East Restroom Replacement	5-10	\$200,000	Level 3 – Type C
Fish Buyer Building Improvements	10-20	\$100,000	Level 4 – Type I
Resurface Launch Ramp Parking Lot and Roadway	2-5	\$250,000	Level 2 – Type C
Johnson Pier AC Roadway Resurface	5-10	\$50,000	Level 3 – Type C
Various Upper Parking Lot Resurfacing	5-10	\$300,000	Level 3 – Type C
Various Sidewalk / Promenade Reconstruction	5-10	\$250,000	Level 3 – Type C
Various Landside Utility Upgrades	10-20	\$150,000	Level 4 – Type C
Landscaping and Irrigation Installation	2-10	\$50,000	Level 4 – Type C
Overall Repair and Replacement Totals	--	\$31,350,000	--



4. ESTIMATED COSTS OF REPAIRS / REPLACEMENT

For purposes of this report, estimated probable costs of repair and replacement are in present value US dollars. Non-residential construction cost escalation from 2014 to 2020 has been approximately 4% to 5% per year according to the Engineering News Record, and 2021 is seeing a significant spike in material costs, which subsequently affect total construction costs. The anticipated current bare construction costs (without engineering or permits) of replacement for the existing buildings, restrooms, parking lots and roadways, and other various items are based on both RS Means construction costs, the Harbor District's 5-year CIP spreadsheet, our recent experience with similar projects, and the previous 2014 condition survey, all factoring in escalation to anticipated 2021 costs.

Johnson Pier

The anticipated full replacement cost of Johnson Pier was increased dramatically from the prior 2014 condition survey to take into account cost escalations, demolition of the existing pier, utilities, and other miscellaneous items. Assuming \$2.0M for demolition, roughly 33,000 square feet of pier area at \$300 per square foot of deck, roughly 250 piles are needed at \$10,000 per pile installed, and utilities and miscellaneous items at roughly \$1.5M, gives a rough order of magnitude (ROM) bare construction cost (without engineering or permits) of approximately \$16.0M for demolishing and replacing Johnson Pier in kind.

The bare construction cost to repair the underpier bents and jacket the single support pile is anticipated to be in the range of \$1.0M given the need to mobilize specialty marine equipment and do repairs and upgrades over and in the water.

Rock Slope Protection

The anticipated cost of reconstructing the approximately 800 linear feet of rock slope protection, assuming roughly 3,000 cubic yards of rock will be utilized in the section at \$250 per cubic yard, gives a ROM bare construction cost of approximately \$750,000 (which is similar to the 2014 cost with escalation). The existing concrete sheet pile wall is just over 500 feet long, with an anticipated replacement cost of \$3,000 per linear foot installed with cap, gives a ROM bare construction cost of approximately \$1.5M (which is similar to the 2014 cost with escalation).

Marina Docks

For the marina, Docks A thru C serve the recreational boaters, and consist of approximately 148 boat slips of varying lengths, and the replacement cost per slip of a modern heavy-duty concrete dock marina ranges from \$60k to \$80k per slip, including guide piles, utilities, gangways, and other miscellaneous dock items, indicating a replacement cost of between \$8.9M and \$11.8M for these docks. Docks D and E mainly serve the commercial fishing fleet, and consist of approximately 69 boat slips in the range of 25 to 55 feet, with an anticipated bare construction replacement cost of \$4.2M to \$5.5M. Docks F thru H serve both the recreational boaters and the commercial fishing fleet, and consist of approximately 173 boat slips in the range of 25 to 65 feet, with an anticipated bare construction replacement cost of \$10.4M to \$13.8M. If the existing marina guide piles and pier utility points of connection and on dock electrical transformers can be reused, the replacement cost may be able to be reduced significantly.



Guest Dock

Replacing the just over 1,000 square foot concrete guest dock along the pier between Docks D and E is estimated to be approximately \$100 per square foot, or a bare construction cost of \$100,000. Similarly, the bare construction cost of replacing the approximately 500 square foot dock serving the public hoist is estimated to be around \$50,000.

Fuel Dock

Replacement of the roughly 2,000 square foot fuel dock at Pillar Point Harbor assumes the landside underground storage tanks and under pier fuel lines to the dock, gangway, guide piles and fuel dispensers do not need replacement, and only the floating fuel dock and various mechanical and dock appurtenances would be replaced. Assuming a replacement cost of approximately \$250 per square foot for a heavy-duty deep draft concrete dock, the estimated bare construction cost is around \$500,000.

Buildings and Restrooms

Building and restroom replacement costs from the 2014 condition survey report have been escalated to present value costs and verified against similar recent projects estimates. For example, the bare installed cost for a typical replacement modular masonry wall restroom was quoted for a launch ramp in San Francisco was quoted between \$200,000 to \$300,000 with existing utilities intact, which is consistent with the escalated value from the previous report.

Future structural repairs to the Fish Buyer Building are anticipated to be needed in the next 10 to 20 years, and will likely include reconditioning of the four foot high reinforced concrete stem walls supporting the timber framing. Future improvements to other tenant controlled buildings such as the Tenant Row Building cannot be effectively determined for the purposes of this report since too many variables including future use of retail space due to market demands are out of the scope of this report.

ACKNOWLEDGEMENTS

We appreciate the opportunity to assist the District by providing this updated condition survey report. Please feel free to contact us with any questions regarding these findings and recommendations.

Sincerely,
GHD Inc.

Robert Sherwood, PE
Waterfront / Civil Engineer
CA Lic: C 64351

Attachments:

Appendix A – Site Photos



REFERENCES

- San Mateo County Harbor District, Pillar Point Harbor Marina Facility Condition Survey, Moffatt & Nichol, December 2014.
- San Mateo Harbor District – 5-Year Capital Improvement Plan Spreadsheet (Website: https://smharbor.specialdistrict.org/files/b47dd670c/2017_05_17_CIP_5%20Year%20CIP%20Summary%20Excel%20Spreadsheet.pdf)
- San Mateo Harbor District – Archived Meeting Minutes (Website: https://smharbor.specialdistrict.org/archived-meeting-minutes#body_file-fc897aac-2270-4938-a070-e1412081d6bc)
- Pillar Point Harbor / Oyster Point Marina Electrical Upgrade Project - Advertised August, 2017
(Website: <https://www.smharbor.com/opm-pph-electrical-upgrade>)
- NFPA 30A - Code for Motor Fuel Dispensing Facilities and Repair Garages (2018 Edition)
- 1984 California Department of Boating & Waterways, Layout and Design Guidelines for Small Craft Berthing Facilities
- United States Environmental Protection Agency, Underground Storage Tanks (USTs)
(Website for UST Finder: <https://www.epa.gov/ust/ust-finder>)
- ENR Article, 2020 2Q Cost Report: Construction Starts Drop as Global Pandemic Continues <https://www.enr.com/articles/49652-2q-cost-report-construction-starts-drop-as-global-pandemic-continues>
- RS Means Sitework and Landscaping Costs



about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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Appendix A
Site Photos



1 – Aerial view of harbor (source: Google Earth Pro)



2 – View of east side of Johnson Pier



3 – View of east side of Johnson Pier



4 – View of 3-step stairs at base of pier



5 – View of utilities under base of pier



6 – View of support piles, deck, bents and utilities under pier



7 – View of support beam and utilities under end of pier



8 – View of support beam and utilities under end of pier



9 – View of support beam and utilities under end of pier



10 – View of support pile and bent at end of pier



11 – View of Fish Buyer Building at end of pier



12 – View of high traffic area of pier deck next to Fish Buyer Building



13 – View of high traffic area of pier deck next to Fish Buyer Building



14 – View of Ice House Building and Fuel Dock modular office



15 – View of dock access from pier



16 – View of pier from landside promenade / access road



17 – View of promenade at base of pier



18 – View of promenade in front of Harbor Office Building



19 – View of promenade and east end of sheet pile wall (with exposed concrete block)



20 – View of west end of sheet pile wall and public hoist



21 – View of distressed sheet pile wall concrete cap



22 – View of rock slope and Docks A-C gangway platform



23 – View of failed rock slope protection



24 – View of failed rock slope protection



25 – View of benches, sidewalk and dirt path at top of rock slope



26 – View of West Restroom adjacent to A-C Docks



27 – View of West Restroom concrete ramp to shower room (does not meet ADA slope requirements)



28 – View of Maintenance Building



29 – View of maintenance yard and storage area (with filtered catch basin)



30 – View of Harbor Office Building (recently renovated and ADA improvements added)



31 – View of Harbor Office Building exterior soffit and added security lighting



32 – View of Central Restroom exterior and access



33 – View of Central Restroom interior



34 – View of Tenant Row Building extended patio seating (Google Earth Pro)



35 – View of Tenant Row Building electrical panels and storage area



36 – View of sewer lift station in Parking Lot A



37 – View of water service valves (FDC in foreground needing signage)



38 – View of main harbor distribution panel from Edison transformer



39 – View of public hoist



40 – View of kayak and SUP washdown area



41 – View of kayak and SUP rental and launch area



42 – View of boat launch ramp and boarding docks



43 – View of worn concrete apron turnaround at top of boat launch ramp



44 – View of East Restroom with new men's privacy screen



45 – View of East Restroom and fish cleaning station



46 – View of boat ramp abutment undermining



47 – View of worn and failing pavement from boat ramp to trailer parking area



48 – View of worn and failing pavement to boat trailer parking area



49 – View of worn and failing pavement in boat trailer parking area



50 – View of Dock A-C gangway and main walkway



51 – View of Dock A-C fire protection and safety equipment



52 – View of Dock A-C upgraded electrical transformer



53 – View of typical Dock A finger



54 – View of typical Dock B finger



55 – View of typical Dock C finger



56 – View of access to D Dock from pier



57 – View of harbor patrol berth on D Dock



58 – View of typical Dock D finger



59 – View of electrical transformer on Dock D



60 – View of entrance to Dock E



61 – View of typical Dock E finger



62 – View of Dock E electrical transformer



63 – View of entrance to Dock F



64 – View of typical Dock F finger



65 – View of typical Dock F finger



66 – View of entrance to Dock H



67 – View of Dock H berth



68 – View of Dock H electrical transformer



69 – View of typical Dock H finger



70 – View of Fuel Dock piping from pier to dock



71 – View of Fuel Dock from water



72 – View of Fuel Dock dispenser and emergency shut-off switch



73 – View of electrical to Fuel Dock