



# Oyster Point Marina

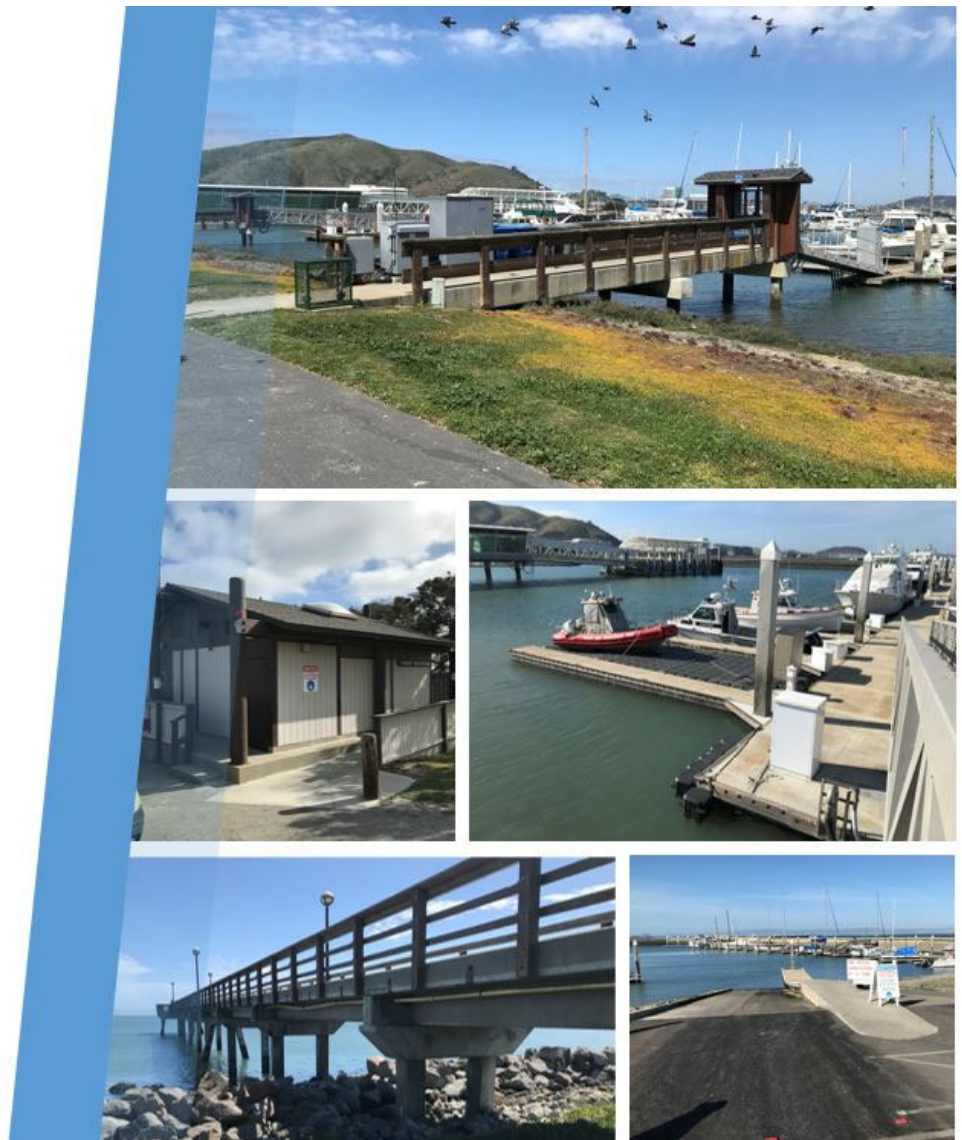
## Updated Marina Facility Condition Survey Report

Prepared for:  
San Mateo County  
Harbor District



May 2021

**DRAFT**





## 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
<b>Overall Totals</b>	-	<b>\$36,135,000</b>	<b>\$61,840,000</b>



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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
<b>Overall Asset Replacement Totals</b>		--	<b>\$61,840,000</b>	--

\* 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. <b>No repairs are required.</b>
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. <b>Repairs are recommended, but the priority of the recommended repairs is low.</b>
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. <b>Repairs may need to be carried out with moderate urgency.</b>
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. <b>Repairs may need to be carried out on a high-priority basis with urgency.</b>
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. <b>Repairs may need to be carried out on a very high-priority basis with strong urgency.</b>

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 oversteering 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 oversteering 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 oversteering 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 oversteering 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 2<sup>nd</sup> 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
<b>Overall Repair and Replacement Totals</b>	--	<b>\$36,135,000</b>	--

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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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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