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DATE February 28, 2025

PAGE 1/12

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PROJECT NO A203047

## City of Berkeley East Timber Docks at South Sailing Basin Inspection Report

Dear Mr. Lancelot,

At the request of the City of Berkeley (City), Jim Kearney and Jessica Rivas from COWI North America (COWI) conducted an inspection of the City of Berkeley East Timber Dock at the South Sailing Basin on February 26, 2025. Our ratings that follow are in accordance with the American Society of Civil Engineers Waterfront Facilities Inspection and Assessment Manual, 2015. (ASCE, 2015).



*Photo 1: Ramp to Dock Approach*

We found damage requiring repair at all four timber piles and all of the diagonal bracing at both pile bents of the timber Dock Approach. There was also damage logged at both pile caps, but it is of a moderate rating and can be repaired in place.

As we relayed at the site, we found that damage to the piles at the pier approach is "Severe" leaving several with very little vertical load carrying capacity. Refer to Figure 2-2

from ASCE 2015 in the Attachments for structural element rating criteria. The orientation of the piles in 2-pile bents also results in zero redundancy should any fail. In the event of any pile failure there is no other load path to support the structure or people above. This leaves the structure with an overall Condition Rating of at least "Serious" and possibly "Critical." See the overall condition ratings criteria in Table 2-14 from ASCE 2015 the Attachments.

We recommend that the pier be closed to the public until such time that repairs can be completed.

Selected photographs of the damage noted during our inspection are provided below.

## 1. Findings

### 1.1. Timber Piles



*Photo 2: View of Outboard (Southern) Row of Timber Piles and Bracing at Dock Approach Looking North*



*Photo 3: Close-up of South-East Timber Pile at Dock Approach*



*Photo 4: North-East Pile at Dock Approach*



*Photo 5: Close-Up of Damage at North-East Pile at Rip Rap*



*Photo 6: North-West Pile at Dock Approach*



*Photo 7: Close-Up of Damage of Rip Rap at North-West Pile at Dock Approach*

All 4 timber creosote piles contain damage and will require replacement or the installation of grout-filled fiberglass sleeves. Grout filled sleeves will not require the use of piledriving equipment. We recommend the sleeves extend 2 feet below the mudline to preclude future damage from marine borers.

Although the percent of void in the piles is very high in some locations, it may be possible to install the sleeves without having to completely remove any sections of piles and replace with new timber and a jack to re-level the structure.

Options for both approaches will be provided. Contractors' method to affect the repairs to the piles could dictate which approach they feel is safest and most economical.

## 1.2. Bracing



*Photo 8: Damaged Bracing at South Bent at Dock Approach*

Three of four braces at the dock approach are damaged and one is completely missing. We recommend replacement of all four diagonal timber braces once the sleeves are installed.

### 1.3.Caps



*Photo 9: North Cap West End*



*Photo 10: South Cap West End*

All four ends of the pile caps have vertical splits that appear to run to the drift pins connecting the caps to the piles. These cracks do not extend for the full length of the caps, and do not reduce the vertical load-carrying capacity of the members. However, they do expose the interior, untreated portions of the members to the elements. We recommend installing horizontal bolts at each end, on each side of the drift pins, to pull the timber closed.

### 1.4.Framing



*Photo 11: Deck Framing*

The stringers, blocking and decking were all in sound condition without any defects noted higher than a moderate rating.

We did not note any defects at the abutment.

## 2. Path Forward

It may be possible to perform some temporary repairs so that the approach to the third dock can remain open to the public. Unfortunately, since the damage at each of the piles is concentrated at the bottom of the piles, and in some cases extends quite a distance up the piles, we cannot install temporary repairs above MHW so "in-water" work will be required even for a temporary fix. Additionally, since the damage is at the bottom of the piles, "bridges" over the damaged areas would not be possible without removing the rip rap and mud at the pile bases that would be required for the permanent repairs.

One option that might be considered is the placement of temporary shoring under the pile caps. A fairly sound (temporary) bearing area for vertical loads could be constructed at the northern pile bent on top of the rip rap by manipulating the existing rocks and placing sandbags and a bearing plate constructed of plywood. Two temporary columns could then be sized and placed beneath the caps and secured top and bottom. It gets more complicated at the southern pile bent. There isn't a sound bearing surface beneath the southern pile cap, rather, only soft bay mud. We could design a "spreader" footing or footings to support temporary columns beneath the southern cap, but if one of the southern piles failed, the transfer of load would likely cause a vertical deflection of the new columns and footing but would hopefully preclude a catastrophic collapse of the deck.

Again, these temporary repairs would likely require a complete permitting review process with all of the relevant agencies. We will be discussing with the project permitting consultant the possibility of obtaining emergency permits for either the temporary or permanent repair solutions.

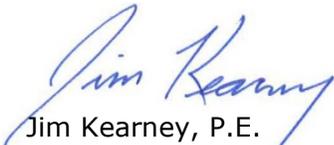
Access to the site is very difficult but not impossible, from the eater given the shallow depth of the mudline. The contractor's choice of means and methods will of course be varied depending on their available equipment and can affect their proposed costs.

We think a rough order of magnitude cost for permanent repairs would be in the neighborhood of \$200,000 including mobilization (the cost of which is highly dependent on the choice of equipment and approach) sleeves, new bracing, and miscellaneous bolting repairs.

Please email Jessica Rivas at [jrvs@cowi.com](mailto:jrvs@cowi.com), or me at [jwk@cowi.com](mailto:jwk@cowi.com), or you can call Jessica at (510)267-7143, or me at (510) 267-7170 to discuss any questions you may have.

Regards,

COWI NORTH AMERICA, INC.



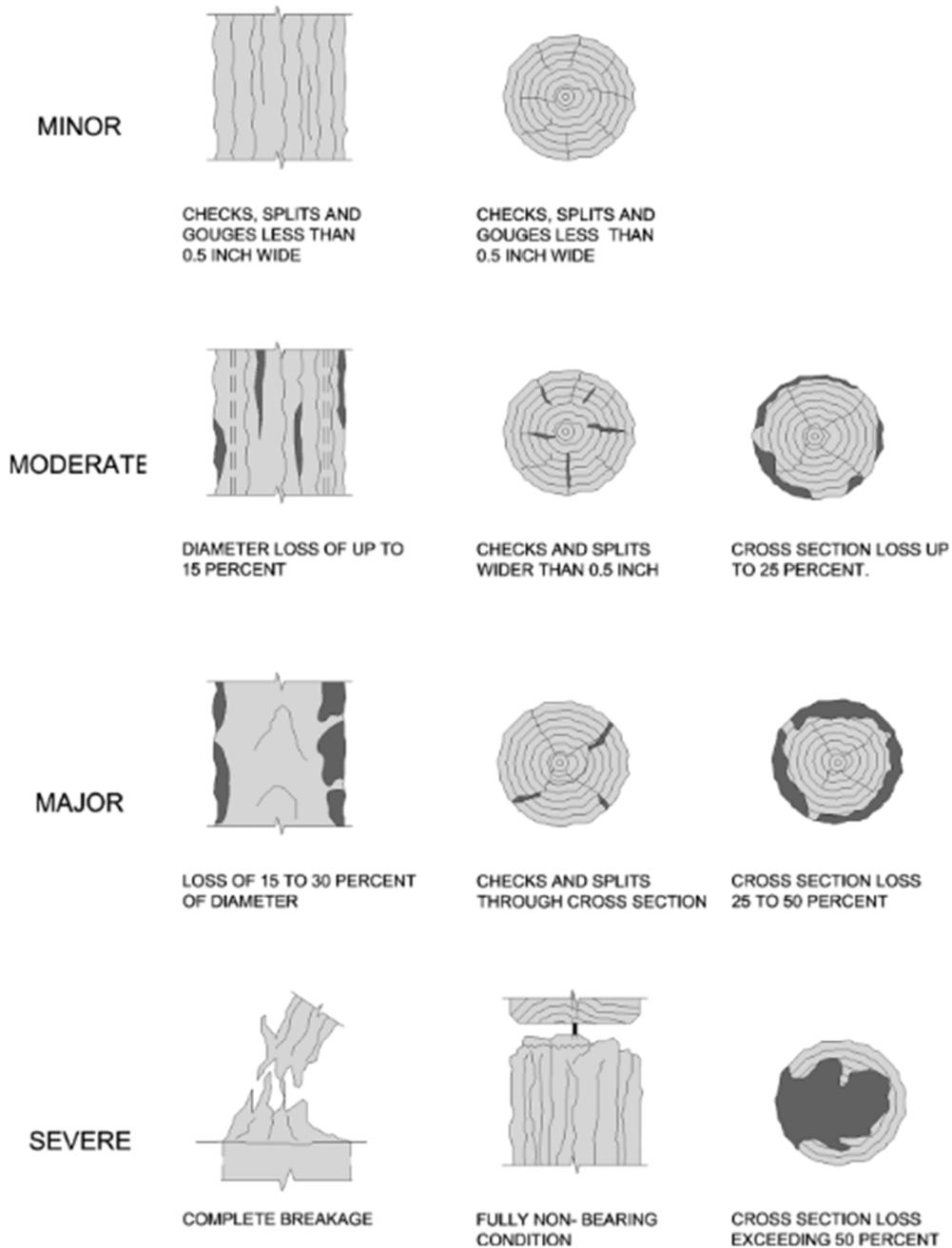
Jim Kearney, P.E.  
CA Civil Engineer No. C052439

Attachments: Excerpts from ASCE 2015

## Attachments

### Selected Tables from the

American Society of Civil Engineers Waterfront Facilities Inspection and Assessment Manual, 2015. (ASCE, 2015)



*Fig. 2-2. Condition ratings for timber elements  
Source: Courtesy of CH2M HILL, Inc. and Ben C. Gerwick, Inc., reproduced with permission.*

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.