Structure Type: SUBSTRUCTURE
Facility Name: Pier 23 Substructure
Asset Number: 1230-SUB
Asset Activity: SUBSTRUCTURE 2 YR INSPECTION
Inspection Number: 1230-SUB-1-2016
Inspection Start Date: 2016/08/19 14:56:35
Inspection End Date: 2016/08/19 14:56:28
Purpose Of Inspection: Periodic Inspection
Address:
Year Built: Approx. 1900

Rating Criteria:
Green - Unrestricted use. May require some minor repair, or minimal barricading.
Yellow With Green Hatching - Restricted use. May require further review, may require load limits, limiting access and barricading until repairs completed.
Red - Unsafe notice. Shall be barricaded to prevent public access and use.

Overall Rating: Green

Immediate Actions: No
Required Repairs: No
Load Limits: No
Barricades: No

Condition Assessment Summary

<table>
<thead>
<tr>
<th>Condition</th>
<th>Yes</th>
<th>No</th>
<th>More Review Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Severe Seawall Failure</td>
<td></td>
<td>X</td>
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<td>2) Many Missing Piles</td>
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<td>3) Many significant damaged pile</td>
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<td>4) Significant beam deterioration</td>
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<td>5) Significant slab deterioration</td>
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<td>X</td>
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<tr>
<td>6) Other Hazard present</td>
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<td>X</td>
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Comments:

Sequence - 1
Description - Inspector Comment
Comment - Port of San Francisco engineer inspected Pier 23 substructure 8/19/2016. The inspection was made via boat at low tide and there was no below water inspection. Pier 23 is a concrete finger pier constructed in 1930. Piles are driven wood piles surrounded by precast grouted concrete jackets from bottom of deck to below the mudline elevation (30 ft to 54 ft long). A concrete extension with driven precast concrete piles was added along the north apron in 1970. There are no wood aprons at Pier 23. There is a shed structure along the entire length of the pier. Overall substructure rating is Green - Unrestricted Use.

1930 concrete pile jackets typically have minor to no damage. Some section loss due to erosion near the water
line was observed. Based on this observation, approximately 10% of pile jackets require repair to be in state of good repair.

1970 concrete piles have no damage.

Concrete deck has minor to no damage. Protective waterproofing paper is intact.

Perimeter concrete beam along east and south faces of pier has major to severe damage. Spalled concrete has exposed corroding rebar. Assume combination of corrosion and mechanical damage from past ship berthing. No immediate repairs required, beam does not support gravity loads other than self-weight. Based on this observation, approximately 5% of deck requires repair to be in state of good repair.

Diagonal brace piles have severe damage in many cases, including complete loss of concrete. Not gravity load bearing members, previously for ship berthing loads.

Attachments:
Appendix A - Facility Data
Appendix B - Photographs and Structural Rating Map
Appendix A - Facility Data

Substructure/Foundation Data:

Substructure FIN: 1230SUB
Piling Type:
Substructure Deck Type:
Apron Type:

Detailed Substructure Description (If available): Concrete slab on concrete beams supported by concrete piles; Concrete seawall.
Appendix B - Photographs and Structural Rating Map

Photo 1. End elevation
Photo 2. Pier 23.5 partial elevation. This diagonal extension was constructed in 1970 along with the entire Pier 23 north apron extension, but is now designated Pier 23.5.
Photo 3. Pier 23.5 substructure in foreground, Pier 23 substructure in background
Photo 4. Typical section loss of concrete pile jacket in tidal zone
Appendix B - Photographs and Structural Rating Map

Photo 5. Pile jacket to deck connection at main substructure
Appendix B - Photographs and Structural Rating Map

Photo 6. Deck under main pier
Appendix B - Photographs and Structural Rating Map

Photo 7. North apron elevation
Appendix B - Photographs and Structural Rating Map

Photo 8. North apron elevation
Appendix B - Photographs and Structural Rating Map

Photo 9. Detail of "Pabcotite" waterproofing paper applied to deck
Photo 10. View along north apron. 1970 addition at left, original pier construction at right.
Photo 11. South apron, deteriorated timber fendering
Appendix B - Photographs and Structural Rating Map

Photo 12. View along south apron
Appendix B - Photographs and Structural Rating Map

Photo 13. Deteriorated concrete diagonal brace piles, non-load bearing, no longer in service
Photo 14. Deteriorated concrete diagonal brace piles, non-load bearing, no longer in service
Appendix B - Photographs and Structural Rating Map

Photo 15. Deteriorated concrete fendering members, non-load bearing, no longer in service
Photo 16. South apron elevation
Appendix B - Photographs and Structural Rating Map

Photo 17. Deck edge beam at end of pier
Appendix B - Photographs and Structural Rating Map

Photo 18. Spalled concrete at underside of edge beam, exposed rebar corroded
Photo 19. Spalled concrete at underside of edge beam, exposed rebar corroded
Appendix B - Photographs and Structural Rating Map

Photo 20. Pier 23 photo map
Photo 21. Substructure rating map updated for Pier 23 only