

**PORT OF SEATTLE**  
**MEMORANDUM**

**COMMISSION AGENDA**

**Item No.** 6f  
**Date of Meeting** March 23, 2010

**DATE:** February 26, 2010

**TO:** Tay Yoshitani, Chief Executive Officer

**FROM:** Darlene Robertson, Director, Harbor Services, Real Estate Division  
Harold Brende, Project Manager, Capital Development Division

**SUBJECT:** Fishermen's Terminal, Northwest Dock East Fender Pile Replacement Project. CIP# C800386

**Amount of This Request: \$550,000**

**Source of Funds: Tax Levy**

**Approving This Amount Possibly Commits \$4,000,000 This Year or in Future Years**

**ACTION REQUESTED:**

Request Port Commission authorization for the Chief Executive Officer to proceed with engineering analyses and design, preparation of construction documents (plans and specifications), permit acquisition, project management, and execution of service directives under existing Indefinite Delivery Indefinite Quantity contracts for the replacement of the fender piles and fendering system on the east section of the Northwest Dock at Fishermen's Terminal in the amount of \$550,000. The preliminary estimated cost of this project, prior to design work and completion of the engineer's estimate, is \$4,793,000.

**SYNOPSIS:**

The existing fender system along the east section of Northwest Dock at Fishermen's Terminal was constructed in 1987 and is now beyond its structural useful life. The proposed project involves replacing the existing timber fender piles with steel piles, along with the associated above-water components. Northwest dock itself is in good structural condition with a projected remaining useful life of 50 years. The new fender system would also have a useful life of 50 years. This project is needed to enable continued berthing of large commercial fishing vessels at Fishermen's terminal.

## **COMMISSION AGENDA**

Tay Yoshitani, Chief Executive Officer

February 26, 2010

Page 2 of 8

### **BACKGROUND:**

The Northwest Dock was constructed in 1987 and the fender system along the east portion of the dock is at the end of its useful life. The dock itself is in good structural condition. In 2007 Harbor Consulting Engineers performed a condition survey of the docks at Fishermen's Terminal. It was determined that the majority of the fender system timber piles along the east portion of the Northwest Dock (from Finger Dock No. 2 eastward; see attached site figure) have structurally deteriorated due to wood decay and being subsequently crushed by large vessel impacts. Consequently, the consultant's report recommended replacement of the fender piles within one to two years. This deterioration has caused a substantial risk that the fender system could fail in the near term to an extent that limits large commercial fishing vessel berthing operations in this area and may result in loss of revenue from these vessels.

Along with the piles, the fendering system needs to be replaced. The fendering system is part of the mooring system and protects the dock from the larger commercial fishing vessels that are typically berthed along this portion of the dock. The project involves replacement of 149 existing timber fender piles and associated fender system components along approximately 1370 linear feet of dock.

The \$550,000 authorization requested herein is for design, preparation of construction documents, permit acquisition, and project management. Once the design and associated construction cost estimate have been completed, we will return to the Commission tentatively in June of this year. This initial scope of work will be funded from the \$4,000,000 currently budgeted in the 2010 Plan of Finance under CIP C800386.

The proposed project design will use steel piles and will result in an expected 50-year useful life of the fender system, which will be consistent with the expected 50-year remaining useful life of the dock structure itself. The preliminary estimated total project budget range is \$3,900,000 to \$4,800,000. We will also evaluate the feasibility of a modification to the proposed steel pile design that involves retaining some of the existing timber fender system components to reduce project costs.

A fender system involving timber piles was also evaluated during preliminary project work. However, a timber pile system is less desirable than a steel pile system for several important reasons and is, therefore, not proposed. Timber piles have a useful life of only 15 years and thus would need to be replaced several times over the projected remaining 50-year life of the dock. In the future, regulatory agencies may not allow treated timber piles to be installed due to potential environmental concerns. Steel fender piles are currently predominantly installed at the Port's seaport facilities and are structurally superior to timber piles for docks where large vessels are berthed, as is the case for the Northwest Dock project area.

## **COMMISSION AGENDA**

Tay Yoshitani, Chief Executive Officer

February 26, 2010

Page 3 of 8

A subsequent Commission Request will be submitted this summer for the remaining project budget needed for construction, construction management, and pre-purchase of steel piles, as well as the authorization to advertise for bid. The project will be implemented under a standard design-bid-build process. Project design, construction management, and project management will be performed by Port staff. Except, possible underwater surveys would be performed by a consultant under an existing Indefinite Delivery Indefinite Quantity contract.

### **PROJECT DESCRIPTION AND JUSTIFICATION:**

The proposed project involves replacement of the existing timber fender pile system along the section of Northwest Dock east of Finger Dock No. 2 (see attached figure). The fender pile system has structurally deteriorated since it was originally constructed, and the majority of it has exceeded its useful service life. The dock itself is in good structural condition with an estimated remaining useful life of 50 years. It is anticipated there will most likely continue to be an operational need for the Northwest Dock in its current configuration over the next 50 years based on the trend within the commercial fishing fleet of moving to larger vessels, which Northwest Dock accommodates & the economic stability of this segment of the industry. Therefore, the overall project planning horizon is 50 years. Replacing the fender system will significantly extend the useful life of the asset by protecting the dock during vessel berthing operations. The new fender system will ensure that lineal moorage can continue to be provided to the North Pacific commercial fishing fleet.

The Northwest Dock, which was constructed in 1987, is currently listed within the Port's financial system as a single asset including all of its components (i.e. structural, surface deck, fender system, lighting, and utilities). Although the fender pile system along the main dock section consists entirely of timber piles originally installed at the same time, it has experienced a different rate of deterioration between its west and east sections. As a result, as documented in a 2007 pile survey performed by Harbor Consulting Engineers, approximately 70% of the 149 fender piles located along the main dock east of Finger Dock No. 2 were determined to be in need of replacement as opposed to approximately 5% of the 303 piles located west of and along Finger Dock No. 2. Additionally, the other fender system components (such as the timber chocks) along the east dock section have experienced a proportionately greater amount of damage than those along the west dock section. The lower service life of the fender pile system on the east section compared to the west section is attributable to berthing of large commercial fishing vessels with high impact loads, higher rate of vessel traffic, and more loading and unloading operations.

The proposed project is one element of overall asset management and renewal and replacement of critical infrastructure at the Terminal with the objective of providing effective operational facilities to tenants with low life-cycle costs to the Port. Future renewal and replacement work which is part of the asset management plan for the Terminal includes the South Wall Replacement Phase 4 project in 2010 (to date 3 phases

## **COMMISSION AGENDA**

Tay Yoshitani, Chief Executive Officer

February 26, 2010

Page 4 of 8

have been completed), the C-15 Building HVAC upgrade project in 2011, and the planned complete replacement of the fender system on the west section of the Northwest Dock with steel piling in approximately 10 to 15 years per Harbor Consulting Engineers' 2007 pile condition survey.

### **PROJECT SCOPE OF WORK AND SCHEDULE:**

- Overall project scope includes the replacement of approximately 1370 linear feet of old creosote and deteriorated fender pile system along the east section of the Northwest Dock with a new fender system using steel piles.
- Scope of work under this authorization to include engineering analyses and design, preparation of construction plans and specifications document, preparation of construction cost estimate, preparation and submission of applicable permit applications, and project management.

### **Tentative Project Schedule:**

Commission Construction Funding	June, 2010
100% Design Complete	July, 2010
Permits Obtained	August, 2010
Major Works Construction Bid Advertisement	August, 2010
In-Water Construction Begins	October, 2010
Construction Complete	May, 2011

### **STRATEGIC OBJECTIVES:**

This project supports the Port's strategies to "Ensure Airport and Seaport Vitality" and "Exhibit Environmental Stewardship through our Actions" by:

- Investing in, and renewal of, Port assets;
- Maintaining the long-term revenue generating capability of the Northwest Dock;
- Providing protection to the dock during fishing vessel berthing operations and significantly extending the useful life of the asset;
- Improving water quality by removing creosote treated timber piles from the marine environment.

### **Meet Environmental Obligations**

In addition to removing predominantly creosote treated timber piles from the marine environment, the project will:

- Acquire all necessary and required permits from appropriate agencies prior to start of construction; and
- Comply with all conditions stipulated by permit authorizations.

## **COMMISSION AGENDA**

Tay Yoshitani, Chief Executive Officer

February 26, 2010

Page 5 of 8

### **Develop and Maintain Community Support**

This project will develop and maintain community support by showing the Port's commitment to long-term asset renewal and replacement of the infrastructure at Fishermen's Terminal, and its continued support for the commercial fishing industry and its positive economic impacts to the region.

In addition, the permit process requires notification of neighboring communities, agencies of interest and appropriate environmental groups. Comment from these groups is expected and welcome.

### **BUSINESS PLAN OBJECTIVES:**

The NW Dock is a critical piece of infrastructure at Fishermen's Terminal. Replacement of the dock protective system as described will allow continued long-term operation of the dock at a level of service that meets the needs of large commercial fishing vessels. The proposed work is part of the overall asset management and renewal and replacement program at Fishermen's Terminal, as well as our strategy of continuing to provide moorage to the North Pacific Fishing Fleet that contributes to the economic vitality of the region.

### **FINANCIAL ANALYSIS:**

#### **Budget/Authorization Summary**

Previous Authorizations ( <i>prior RE Managing Director authorization</i> )	\$30,000
Current request for authorization	\$550,000
Total Authorizations, including this request	\$580,000
Remaining budget to be authorized ( <i>to be determined during design &amp; permitting</i> )	TBD

#### **Project Cost Breakdown**

Approximate cost breakdown:

Design Services	\$343,000
Permit Acquisition	\$35,000
Project Management and Other Soft Costs	\$172,000
Total	\$550,000

#### **Source of Funds**

This project is included in the 2010 Plan of Finance as a committed project under CIP # C800386 FT NW Dock East Fender System Replacement in the amount of \$4,000,000. Since this is a Real Estate Division project, the source of funds will be the tax levy.

## COMMISSION AGENDA

Tay Yoshitani, Chief Executive Officer

February 26, 2010

Page 6 of 8

### Financial Analysis Summary

<b>CIP Category</b>	Renewal / Enhancement																								
<b>Project Type</b>	Renewal and Replacement of Existing Infrastructure																								
<b>Risk adjusted discount rate</b>	7.5%																								
<b>Key risk factors</b>	<ul style="list-style-type: none"> <li>• Key risk factors include unforeseen construction costs, unforeseen other project soft costs, and project delays that preclude meeting the targeted allowed in-water construction “fish window” from October 1, 2010 through April 15, 2011.</li> <li>• The preliminary financial analysis includes an estimate of revenue from vessels that currently use the project section of the Northwest Dock. Related operating expenses have also been estimated based on current operating performance. Financial performance could be lower if usage demand or rates are lower or costs are higher than anticipated in the analysis. Financial performance will also be lower if the dock is used for less than the 50 years assumed in the analysis.</li> </ul>																								
<b>Project cost for analysis</b>	\$4,793,000 (preliminary estimate based on high end of cost range)																								
<b>Business Unit (BU)</b>	Harbor Services																								
<b>Effect on business performance</b>	<p>This is a renewal and replacement project and, accordingly, preserves Net Operating Income, (NOI) rather than creating new NOI. The estimated Net Operating Income (NOI) and NOI after Depreciation for Years 1 through 5 is shown below.</p> <table border="1"> <thead> <tr> <th><b>NOI (in \$000's)</b></th> <th><b>2011</b></th> <th><b>2012</b></th> <th><b>2013</b></th> <th><b>2014</b></th> <th><b>2015</b></th> </tr> </thead> <tbody> <tr> <td>NOI</td> <td>\$65</td> <td>\$113</td> <td>\$114</td> <td>\$116</td> <td>\$117</td> </tr> <tr> <td>Depreciation</td> <td>(\$56)</td> <td>(\$96)</td> <td>(\$96)</td> <td>(\$96)</td> <td>(\$96)</td> </tr> <tr> <td>NOI After Depreciation</td> <td>\$10</td> <td>\$17</td> <td>\$19</td> <td>\$20</td> <td>\$21</td> </tr> </tbody> </table>	<b>NOI (in \$000's)</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	NOI	\$65	\$113	\$114	\$116	\$117	Depreciation	(\$56)	(\$96)	(\$96)	(\$96)	(\$96)	NOI After Depreciation	\$10	\$17	\$19	\$20	\$21
<b>NOI (in \$000's)</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>																				
NOI	\$65	\$113	\$114	\$116	\$117																				
Depreciation	(\$56)	(\$96)	(\$96)	(\$96)	(\$96)																				
NOI After Depreciation	\$10	\$17	\$19	\$20	\$21																				
<b>IRR/NPV</b>	<p>Based on preliminary financial analysis using the high range cost estimate for the project:</p> <table border="1"> <thead> <tr> <th><b>NPV</b> (in</th> <th><b>IRR</b></th> <th><b>Payback</b> (in years)</th> </tr> </thead> <tbody> <tr> <td><b>(\$2,959)</b></td> <td><b>1.6%</b></td> <td><b>37</b></td> </tr> </tbody> </table>	<b>NPV</b> (in	<b>IRR</b>	<b>Payback</b> (in years)	<b>(\$2,959)</b>	<b>1.6%</b>	<b>37</b>																		
<b>NPV</b> (in	<b>IRR</b>	<b>Payback</b> (in years)																							
<b>(\$2,959)</b>	<b>1.6%</b>	<b>37</b>																							

### SUSTAINABILITY AND LIFE CYCLE COSTS

Replacement of the existing timber fender system with a steel pile system will follow Policy EX-15, Sustainable Asset Management. Factors such as life-cycle costs, structural

## **COMMISSION AGENDA**

Tay Yoshitani, Chief Executive Officer

February 26, 2010

Page 7 of 8

performance, maintenance frequency, constructability, construction impacts on tenants, and environmental objectives, and overall business objectives were considered.

- *What plans have been made to reduce maintenance costs? If not, why?*  
This project replaces the existing fender system that is an essential part of the protective system on the Northwest Dock. The project will reduce maintenance and repair costs by preventing damage from large fishing vessels impacting the dock structure.
- *What is the design life span of this project?*  
Steel piles are commonly designed for a 30-year life span. However, for this project it is proposed to increase the pile wall thickness to provide a 50-year life span against corrosion in order to match the 50-year remaining life left on the main dock structure or on the fender system? . The difference in wall thickness is expected to have only a small impact on the total project budget.
- *What plans have been made to reduce chemical and pollutant source control (low volatile organic compounds) in the construction of this project to improve air quality? If not, why?*  
This project will remove 149 existing predominantly creosote treated timber piles and replace them with steel piles.

## **ALTERNATIVES CONSIDERED AND THEIR IMPLICATIONS**

**Alternative 1** – Do nothing. Doing nothing at this time would mean continuing deterioration of the existing fender system resulting in a level of service not suitable for vessels, and a condition that makes the dock itself more susceptible to damage from docking operations. This alternative is not recommended.

**Alternative 2** – Replace the existing timber pile fender system with a new timber pile fender system. A timber pile fender system would be similar to a steel pile system, but the piles would have only a 15-year useful life compared to a 50-year useful life for steel piles. Therefore, a timber pile system would need to be replaced multiple times during the remaining 50-year life of the dock itself. However, future environmental regulations may not allow treated timber piles and follow-on replacements would need to be with steel piles or another allowed material. Timber piles are more susceptible to damage from large vessels than are steel piles. A new timber pile fender system could be installed as a major public works project, or potentially as a series of annual small works projects over several years where a limited number of piles are replaced each year. The latter implementation method would result in project mobilization and de-mobilization inefficiencies and additional disruption to vessel tenants due to repeated construction periods. This alternative is not recommended.

## **COMMISSION AGENDA**

Tay Yoshitani, Chief Executive Officer

February 26, 2010

Page 8 of 8

**Alternative 3– Replace the existing timber pile fender system with a steel pile fender system. A complete new fender system using steel piles would be installed on the east section of Northwest Dock during 2010-2011 and a new capital asset would be created. A hybrid alternative in which a portion of the existing above-water timber fender system is retained will also be evaluated as part of the initial design process in order to achieve the most cost efficient final improvement. The steel alternative would be a one-time project that results in a fender system with a 50-year useful life that would match the estimated 50-year remaining useful life of the existing dock itself. In addition, this alternative would minimize construction impacts on commercial fishing vessel tenants and would meet environmental objectives by removing the existing predominantly creosote-treated timber piles. This is the recommended alternative.**

### **NEXT STEPS**

Staff will return this summer to request Commission authorization for construction funding to begin the construction work in the fall of 2010, as anticipated to be allowed by the regulatory permit.

### **PREVIOUS COMMISSION ACTIONS OR BRIEFINGS**

There have been no previous Commission actions or briefings on this project.