

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

**COMMISSION AGENDA**

**Item No.** 6d

**ACTION ITEM**

**Date of Meeting** August 7, 2012

**DATE:** July 27, 2012

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

**FROM:** Scott Pattison, Seaport Asset Manager  
Anne Porter, Capital Project Manager

**SUBJECT:** Terminal 18 Pilot Pile Cap Repair and Maintenance Project  
(PID #104559)

**Amount of This Request:** \$500,000

**Source of Funds:** General Fund

**Est. State and Local Taxes:** \$15,000

**Est. Construction Jobs Generated:** 8

**Total Project Cost:** \$1,500,000

**ACTION REQUESTED:**

Request Commission authorization for additional funding to complete construction of the Terminal 18 (T-18) Pilot Pile Cap Repair and Maintenance Project at an additional cost of \$500,000 for a total project cost of \$1,500,000.

**SYNOPSIS:**

Construction of the T-18 Pilot Project began this March. The original scope was to repair up to four pile caps. At this time, staff is able to complete repairs to the first two pile caps within the original budget, and staff believes it still makes sense to repair all four pile caps. This request is to fund the Pilot Project to enable the third and fourth pile caps to be repaired also.

The Pilot Project is helping the Port learn a great deal about the extent of deterioration and methods to more efficiently undertake future repairs. Factors resulting in the need for additional funds and time to repair all four pile caps under the Pilot Project include the following:

1. Concrete demolition – The time required for demolition has been greater than anticipated. However, demolition experience with the first two pile caps makes it possible to more accurately determine the amount of concrete necessary for removal and the most cost-effective means of removing it. This will ensure that future projects remove only the concrete that needs to be replaced, using methods that are cost-effective.

## **COMMISSION AGENDA**

Tay Yoshitani, Chief Executive Officer

July 27, 2012

Page 2 of 6

2. Sandblasting to clean the rust off the steel reinforcing bars – After removing the degraded concrete, exposed reinforcing steel must be cleaned of rust and primed before enclosing it in new grout. The Pilot Project has helped staff learn which types of sand blasting equipment and materials work best, and where. It has also helped determine which types of equipment and blasting sand are not effective. This experience will be applied to future pile cap repairs.
3. Splicing in of new reinforcing bar - Engineering has redesigned the method of splicing in order to speed up the process by working closely with PCS crews during the Pilot Project. Understanding the most effective ways to splice rebar will yield efficiencies when major repairs are undertaken.
4. Grout placement –Delivering grout to replace removed concrete requires matching grout pumping equipment with grout mix. The Pilot is looking for alternatives to simplify the injection of grout while ensuring the grout used will meet the Port's design standards for strength and durability.

Based on experience with the first two pile caps, it is estimated that \$500,000 additional funds will be needed to complete the work.

At present, the crews could stop work after completing repairs to two of the four pile caps, and make use of the knowledge gained so far. However, there are compelling benefits to completing repair of all four pile caps under the Pilot. Completing the Pilot Project would allow the Port to document production rates that might be expected after initial mobilization and set up take place and identify ways to reduce construction cost and risk by limiting the demolition to where the distress is occurring. The information gained by repairing all four pile caps will help predicting timing and future costs with greater accuracy. Preliminary estimates for the larger pile cap repair program at T-18 currently ranges from \$15,000,000 to \$20,000,000.

The Commission was previously briefed on the Pilot Project on May 10, 2011. The Commission approved increasing the funding for the project to \$300,000 for design, permitting and preparation of construction documents on May 24, 2011. The Commission approved an additional \$700,000 of construction funds on December 6, 2011, increasing the total project funding to \$1,000,000. The first half of construction is substantially complete and staff is now prepared to move into the second half of the construction phase of work, subject to approval of this request for authorization. This additional funding for the Pilot Project was not anticipated in the 2012 Operating Expense Budget and will result in a negative variance in 2012.

### **PROJECT JUSTIFICATION:**

The Pilot Project is designed to repair and maintain up to four existing cast-in-place pile cap beams at Terminal 18 as a means of providing practical guidance to:

1. Understand the extent and rate of deterioration of pile caps within our pier structures;
2. Analyze site conditions and more precisely determine when future repairs are required;
3. Prepare specific design documents and detailed project specifications on future scopes of work;

## **COMMISSION AGENDA**

Tay Yoshitani, Chief Executive Officer

July 27, 2012

Page 3 of 6

4. Identify means to reduce risk to the Port associated with overly conservative or overly aggressive bids on similar future Major Works contracts;
5. Identify means to reduce cost associated with similar and expanded future pile cap repair and maintenance actions; and
6. Identify means to perform maintenance and repair actions while minimizing disruption of cargo operations at marine terminals, avoiding negative impacts on Port tenants and preserving revenues to the Port.

As a function of this project, these pile caps will be repaired to extend their service lives and preserve existing revenues.

### **PROJECT STATEMENT AND OBJECTIVES:**

#### ***Project Statement:***

Conduct a pilot pile cap repair and maintenance project at Terminal 18 for less than \$1,500,000 by the end of 2012.

#### ***Project Objectives:***

Objectives under the construction phase of the Pilot Project include the following:

- Identify effective means for construction access
- Accurately estimate material and labor costs under alternative repair methodologies
- Refine repair procedures to be more time and cost-efficient
- Document repair production rates for various types of repair solutions
- Reduce disruption to marine terminal cargo operations
- Reduce the cost, time and disruption associated with pile cap repairs anticipated at T-18 and other terminals in the future
- Determine elements to incorporate into any similar Major Works contracts to increase quality and decrease cost and impact
- Repair up to four (4) pile caps at T-18 as part of the Pilot Project

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

#### ***Scope of Work:***

- The project was designed in-house and utilized Port Construction Services to demolish and replace the underside of up to four pile caps at T-18.
- The Pilot Project's sample is representative of conditions identified on other pile caps, and selected alternative repair techniques will be performed to gain field experience with each, which will be useful when preparing to undertake future larger scopes of work to repair and maintain pile caps at T-18 and at other, similar marine cargo pier structures.

## **COMMISSION AGENDA**

Tay Yoshitani, Chief Executive Officer

July 27, 2012

Page 4 of 6

### ***Schedule:***

The construction schedule originally anticipated site mobilization in January 2012 and completion of repairs and demobilization by June 2012. However, due to other projects in the area and tenant operations, a 2-month delay occurred, and work started in March. The table below reflects key milestones to date and targeted through the Pilot Project's close-out.

	<b>Start</b>	<b>Finish</b>
Pre-Design	January 2011	May 2011 <b>(Completed)</b>
Design	June 2011	August 2011 <b>(Completed)</b>
Permits	August 2011	October 2011 <b>(Completed)</b>
Construction	<del>January</del> March 2012	<del>May</del> November 2012 <b>(In Progress)</b>
Project Construction Report	<del>January</del> October 2012	<del>June</del> November 2012
Project Close-Out	November 2012	December 2012

## **FINANCIAL IMPLICATIONS:**

### **Budget/Authorization Summary**

Original Budget	\$0
Previous Authorizations	\$1,000,000
Current request for authorization	\$ 500,000
Total Authorizations, including this request	\$1,500,000
Remaining budget to be authorized	\$ 0
Total Estimated Project Cost	\$1,500,000

### **Project Cost Breakdown**

<b><i>Project Cost Breakdown:</i></b>	<b>This Request</b>	<b>Total Project</b>
Construction	\$281,000	\$1,052,000
Construction Management	\$ 1,000	\$ 45,000
Design	\$ 13,000	\$ 119,000
Project Management	\$ 36,000	\$ 90,000
Permitting	\$ 14,000	\$ 30,000
State & Local Taxes (estimated)	\$ 6,000	\$ 15,000
10% Construction Contingency	\$149,000	\$ 149,000
Total	\$500,000	\$1,500,000

### **Source of Funds**

This project was included in the 2012 Operating Budget in the amount of \$700,000, based on the project cost estimate and the project completion schedule available at the time the budget was developed. Due to the increase in total project costs of \$500,000 and timing differences of

## **COMMISSION AGENDA**

Tay Yoshitani, Chief Executive Officer

July 27, 2012

Page 5 of 6

\$210,000 on the schedule of project work completed in 2011 and 2012, an unfavorable operating expense variance of \$710,000 is anticipated in 2012. The Seaport Division expects to have offsets to this unfavorable variance through increased revenue or through operating expense reductions in the current year.

This project will be funded from the General Fund.

### **Financial Analysis Summary:**

<b>CIP Category</b>	N/A																
<b>Project Type</b>	Repair (expense project)																
<b>Risk adjusted Discount Rate</b>	N/A																
<b>Key Risk Factors</b>	<ul style="list-style-type: none"><li>• Project does not accomplish stated objectives</li><li>• Cost to construct the pilot exceeds the stated budget</li><li>• Project is not completed by stated schedule</li></ul>																
<b>Project Cost for Analysis</b>	\$1,500,000																
<b>Business Unit (BU)</b>	Container Operations																
<b>Effect on Business Performance</b>	<p>The T-18 Pile Cap Pilot Project has been undertaken to provide knowledge and experience in order to develop cost effective approaches for larger scale pile cap repairs at T-18 and other marine terminals.</p> <p>The impact of this pilot project on Net Operating Income Before Depreciation is shown below. Depreciation Expense will not be impacted by this project, as this pilot project is an operating expense.</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>TOTAL</b></th></tr></thead><tbody><tr><td>Incremental Revenue</td><td>-</td><td>-</td><td>-</td></tr><tr><td>Incremental OpExp</td><td>(90)</td><td>(1,410)</td><td>(1,500)</td></tr><tr><td><b>NOI Before Depreciation</b></td><td><b>(\$90)</b></td><td><b>(\$1,410)</b></td><td><b>(\$1,500)</b></td></tr></tbody></table>	<b>NOI (in \$000's)</b>	<b>2011</b>	<b>2012</b>	<b>TOTAL</b>	Incremental Revenue	-	-	-	Incremental OpExp	(90)	(1,410)	(1,500)	<b>NOI Before Depreciation</b>	<b>(\$90)</b>	<b>(\$1,410)</b>	<b>(\$1,500)</b>
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<b>NOI Before Depreciation</b>	<b>(\$90)</b>	<b>(\$1,410)</b>	<b>(\$1,500)</b>														
<b>IRR/NPV</b>	N/A																

### **BUSINESS PLAN OBJECTIVES:**

Proceeding with the second half of the construction phase of the Pilot Project will ensure additional knowledge is gained to benefit future repairs.

### **STRATEGIC OBJECTIVES:**

This project supports Seaport Economic Vitality by analyzing and evaluating the service-life requirements of aging infrastructure assets and implementing repair and maintenance solutions in a cost-effective manner, while minimizing and avoiding potential disruption of tenant cargo operations.

## **COMMISSION AGENDA**

Tay Yoshitani, Chief Executive Officer

July 27, 2012

Page 6 of 6

### **ENVIRONMENTAL SUSTAINABILITY:**

- Project construction includes practices to avoid and minimize potential negative environmental effects. The pilot project also identifies repair and maintenance methods, materials, and practices for effective under-pier work while avoiding release of deleterious materials to the environment and reducing the potential for adverse effects on aquatic area natural resource values.
- Timely repair and maintenance extends the service life of existing infrastructure, as an alternative for avoiding more environmentally disruptive and resource/materials consumptive large scale structure replacement actions.

### **TRIPLE BOTTOM LINE:**

Extending the useful service life of our existing assets defers eventual replacement costs for a longer period of time, supporting the economic vitality of our operations.

### **ALTERNATIVES CONSIDERED AND THEIR IMPLICATIONS:**

Alternative 1: Continue the pilot repair and maintenance project and use the results of design, planning and construction experience to improve efficiency of similar projects in the future, including cost-effectiveness, schedule, and operational impacts on working terminals. **This is the recommended alternative.**

Alternative 2: Cease construction activities and demobilize from site to avoid further expense on the pilot project. This alternative is not recommended due to the loss of opportunity to observe accelerated production rates on second half of construction.

### **OTHER DOCUMENTS ASSOCIATED WITH THIS REQUEST:**

PowerPoint presentation

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

- May 10, 2011, the Commission was briefed on this project.
- May 24, 2011, the Commission authorized increasing the funding for the project to \$300,000 for design, permitting and preparation of construction documents.
- December 6, 2011, the Commission authorized start of construction and increased the funding for the project to \$1,000,000.