

PORT OF SEATTLE
MEMORANDUM

COMMISSION AGENDA
ACTION ITEM

Item No.	<u>6d</u>
Date of Meeting	<u>October 8, 2013</u>

DATE: September 26, 2013
TO: Tay Yoshitani, Chief Executive Officer
FROM: Robert A. Hoyman, Marine Maintenance Project Manager
Paul Meyer, Manager of Environmental Programs
SUBJECT: Terminal 91 Lighting Upgrade
CIP C800160 Seaport Green Port Initiative, Project #104765

Amount of This Request:	\$945,000	Source of Funds:	General Fund
Est. Total Project Cost:	\$1,035,000		
Est. State and Local Taxes:	\$75,000		

ACTION REQUESTED

Request Commission authorization for the Chief Executive Officer to complete the design, purchase materials and proceed with construction by Port Crews of the T-91 Lighting Upgrades project, for a total cost of \$1,035,000. This request seeks a single Commission authorization to combine design, materials purchase, and construction.

SYNOPSIS

The purpose of this project is to reduce energy usage while providing improved lighting at facilities and parking for Piers 90 and 91 at Terminal 91. Existing exterior lighting for Piers 90, 91 and Cruise Parking is inefficient and has surpassed its useful life span. Lighting requirements for work areas have changed over the years, requiring improved lighting for activities in marine loading and unloading areas. The Port currently provides area lighting to its tenants and customers without the ability to vary light levels based on lighting needs. Conversion of inefficient High Pressure Sodium fixtures to more efficient Light Emitting Diode (LED) fixtures and installing lighting controls will reduce electrical energy usage by more than 75%, reduce GHG emissions, reduce light spillage and glare to surrounding neighborhood and provide a safe, well lit working environment. Seattle City Light will pay an estimated \$200,000 toward the cost of this project as incentives to implement energy efficient modifications.

Installation of lighting fixtures is anticipated to begin in January 2014 and be completed in April 2014. Commissioning will take place immediately following installation and is expected to be complete in May 2014. The schedule is dependent on material lead times, weather, crew availability and terminal operations schedules. Combination of authorization for design,

COMMISSION AGENDA

Tay Yoshitani, Chief Executive Officer

September 26, 2013

Page 2 of 7

materials purchase, and construction is requested because the design and construction portions are small in comparison to the materials purchase.

BACKGROUND

Pier and parking lighting for both Pier 90 and Pier 91 is provided by high mast lighting atop 65-foot poles. The high mast poles and fixtures were originally installed in the 1970s and most have only received minor upgrades and improvements. The existing lighting consists primarily of 381 1000W High Pressure Sodium (HPS) lighting arranged in four, six and eight fixture arrays. Existing lamps requires re-lamping at 3-7 year intervals for all 381 of the existing area lighting fixtures. Many of the existing fixtures are old and in poor condition due to the corrosive environment. Port maintenance estimated \$185,000 of needed maintenance to sustain operation of the existing area lighting in 2014. Ongoing maintenance for the next five years is expected to cost an additional \$145,000 and will cost over \$260,000 for years 6-10.

Existing exterior lighting for Piers 90, 91 and Cruise Parking consumes approximately 950,000 kWh of energy per year, costing the Port in 2013 about \$57,000 in electricity fees. Replacement of existing fixtures with high efficiency LED lighting coupled with operational changes to lighting patterns will reduce energy consumption by up to 76% based on calculations using Seattle City Light Energy Conservation tools. This maximum reduction translates into an electricity cost reduction of approximately \$42,000 per year. Over the ten-year lifespan of the LED fixtures, inflation-adjusted electricity costs total approximately \$237,300 compared to the inflation adjusted electricity cost of over \$806,500 without modernizing current lighting systems. Electrical costs alone will be reduced nearly \$569,206 over the ten-year lifespan of the fixtures. Reducing electrical consumption also has a net effect of reducing 3,759 tons of greenhouse gas emissions (GHGs) over the ten-year lifespan due to reduced electrical generation needs.

Terminal 91 Lighting Upgrade -Expected energy savings and GHG emission reduction						
	2014 no upgrade	2014 LED + controls	2014 savings	10 yr total no change	10 yr total with energy efficiency	Total Savings
kw/hrs	950,000	228,465	721,535	9,500,000	3,234,650	6,265,350
Electricity costs*	\$ 57,095	\$ 14,769	\$ 42,326	\$ 806,532	\$ 237,327	\$ 569,206
GHG emissions (tons)	570	137	433	5,700	1,941	3,759

*Electricity costs inflation adjusted as per City Light Guidance

LED lighting has many advantages over High Pressure Sodium lighting. LED lighting delivers white light, which is a full-spectrum light (see examples in Attachment-C) and can be directed to areas where the light is needed. Unlike HPS lighting, which is a yellow light, LED lighting enables users to differentiate colors that are not clearly identifiable under HPS lighting. Safety features such as pavement markings, cautionary signage, and other features become more legible under LED lighting. LED lighting can be dimmed, turned off and instantly turned back on to respond to needs. HPS requires up to 30 minutes to come back on; for this reason, once existing fixtures have been turned on, they tend to be left on all night. HPS typically has a life span of

COMMISSION AGENDA

Tay Yoshitani, Chief Executive Officer

September 26, 2013

Page 3 of 7

15,000-25,000 hours depending on lamp and ballast quality. Current LED lighting is rated at 50,000-60,000 hours (11-13 years).

The project also plans to install modern lighting controls to manage lighting from a central location. Modern controls provide accurate energy use monitoring and can provide reliable reports to determine lighting energy usage. When the piers and other operating areas or portions of the piers are unoccupied, the lights will automatically dim to a security level. In unoccupied mode, the lights will also respond to occasional occupants (a person leaving a vessel for example) by sensing movement and elevating light levels for safety. Also, in an emergency situation, the Port can respond by instantly lighting the entire property or specific portions.

Engineering design for the project is minimal. Berger ABAM / Wood Harbinger (Electrical Engineering) is working through the Port's Infrastructure IDIQ Contract to perform preliminary design, provide lighting fixture and control specifications, and estimate costs for the project. The consultant will provide product specifications and wiring diagrams. Material costs make up the predominant cost of the project and will be competitively bid. Installation will be performed by Port Crews to allow continuity of Terminal operations. Wood Harbinger will provide bid documents and support through installation. They will oversee commissioning with the Controls Contractor, Port Electricians, and a Seattle City Light Energy Conservation Official.

PROJECT JUSTIFICATION AND DETAILS

The Terminal 91 Lighting Upgrade project will reduce electricity usage by approximately \$42,000 per year, reduce maintenance costs, reduce GHG emissions by over 400 tons per year, allow accurate monitoring of energy use, provide improved lighting illumination levels and quality of light in the loading/unloading areas of Piers 90 and 91 and the cruise parking area.

Project Objectives

- **Improve lighting performance:** Improve lighting illumination levels to provide a safer, more effective workplace for pier activities and visitors to the Port. Improve security through enhanced visibility on the piers.
- **Energy Efficiency:** Reduce terminal outdoor lighting electrical energy usage by 76%.
- **Carbon Reduction:** Avoid greenhouse gas emissions from deferred energy generation
- **Controllability:** Lighting controls will enable the Port to deliver light as is needed and accurately monitor and measure energy used.
- **Reduce light and glare:** Fixtures will be shielded to conserve night sky darkness and reduce light and glare spillage to neighborhoods.
- **Reduce Maintenance Costs:** Fixture maintenance and replacement at Piers 90, 91 and the cruise parking will be reduced from approximately \$592,000 to \$110,000 for LED lighting over the next ten years.
- **Economic Responsibility:** Total cost of ownership of lighting systems replaced meets a financial objective of simple payback in approximately eight years. Seattle City Light Energy Conservation Resources will provide rebates to the Port for a portion of the cost associated with this project. Seattle City Light will pay an estimated \$200,000 toward the cost of this project as incentives to implement energy efficient modifications.

COMMISSION AGENDA

Tay Yoshitani, Chief Executive Officer

September 26, 2013

Page 4 of 7

Inclusion of controls with “Revenue Grade Energy Metering” will enable the Port to accurately calculate the cost for lighting use.

- Compliance: Installed lighting will comply with federal OSHA, Washington State Labor and Industry standards, Coast Guard and other applicable regulations and standards. LED lighting will enhance the capability of existing security cameras through delivery of full spectrum light evenly distributed throughout.
- Sustainability: Modern LED fixtures are expected to have a life span of 10-13 years versus 3-5 year replacement for existing lamps. Controls will enable the Port to limit lighting to the hours and levels required by the users resulting in extended fixture life. Replacement lights will be rated for marine environment and include bird deterrents to avoid buildup of corrosive materials.

Scope of Work

- Provide a unified design for lighting throughout the entire pier and cruise parking areas compatible with existing wharf lighting systems.
- Application and contract approval for energy conservation incentives through Seattle City Light.
- Advertise and purchase LED fixtures and controls.
- Advertise and purchase wireless lighting controls. A single vendor will provide fixtures and controls guaranteeing compatibility.
- Removal and proper disposal of existing HPS, MH and Sodium fixtures by Port crews.
- Install 319 LED fixtures in place of 381 existing HPS fixtures.
- Install wireless controls.
- Commissioning: Using the Port’s IDIQ contract, the fixtures and controls will be commissioned. This will include programming for the controls and verifying performance of the LED light fixtures.
- Contract verification and rebate approval by Seattle City Light; issuance of rebate to the Port.

Schedule

Commission Authorization	October 8, 2013
Final design	October 25, 2013
Advertise for Materials Purchase	November 2013
Purchase of Materials	December 2013
Begin installation	January 2014
Complete Installation	April 2014
Controls Commissioning	May 2014
Measurement and Verification	May 2014

COMMISSION AGENDA

Tay Yoshitani, Chief Executive Officer

September 26, 2013

Page 5 of 7

FINANCIAL IMPLICATIONS

<i>Budget/Authorization Summary</i>	Capital	Expense	Total Project
Previous Authorizations	\$0	\$90,000	\$90,000
Current request for authorization	\$945,000	\$0	\$945,000
Total Authorizations, including this request	\$1,035,000	\$0	\$1,035,000
Remaining budget to be authorized	\$0	\$0	\$0
Seattle City Light Energy Incentive	(\$200,000)		(\$200,000)
Total Estimated Project Cost	\$745,000	\$90,000	\$835,000

<i>Project Cost Breakdown</i>	This Request	Total Project
Materials	\$700,000	\$700,000
Construction (Port Crew Installation)	\$75,000	\$75,000
Construction Management	\$10,000	\$10,000
Design	\$45,000	\$45,000
Project Management	\$45,000	\$45,000
ICT Support	\$5,000	\$5,000
CPO Costs	\$10,000	\$10,000
Permitting	\$15,000	\$15,000
State & Local Taxes (estimated)	\$75,000	\$75,000
Contingency	\$55,000	\$55,000
Total	\$1,035,000	\$1,035,000
Seattle Light Energy Rebate	(\$200,000)	(\$200,000)

Budget Status and Source of Funds

Initial project design, preliminary energy audit, acquisition planning and project initiation and management was funded from Seaport expense funds for \$90,000 to determine feasibility of project before requesting Commission action. This project was included in the 2013 Plan of Finance as a Green Initiative Project under CIP C800160 for \$835,000. While the gross project cost is \$1,035,000, the Port is expected to receive \$200,000 from Seattle City Light's energy incentive fund as a rebate, which brings the net cost to the Port to \$835,000. The project will be funded by the general fund.

Financial Analysis and Summary

CIP Category	C800160
Project Type	Infrastructure Renewal/Replacement
Risk adjusted discount rate	7.0%
Key risk factors	Project Costs exceed estimates. Seattle City Light rebate is not received or is less than expected.
Project cost for analysis	\$835,000 (\$1,035,000 less \$200,000 rebate)
Business Unit (BU)	Cruise and Maritime Operations

COMMISSION AGENDA

Tay Yoshitani, Chief Executive Officer

September 26, 2013

Page 6 of 7

Effect on business performance	Lower annual electricity expense of \$48,400. Lower annual maintenance expense of \$20,000. Lower 2014 maintenance expense of \$235,600 due to savings from necessary lighting repairs and additions to meet code requirements. Increase in annual depreciation of \$83,500 based on a 10 year asset life.		
IRR/NPV	NPV (in \$'s)	IRR	Payback (in years)
	\$15,216	7.4%	8

STRATEGIES AND OBJECTIVES

This project aligns with the Port's commitment to be the nation's leading green and energy-efficient port. Upon completion, The Terminal 91 Lighting Upgrade project will reduce electricity usage by 721,435 kw/hrs per year translating to an operation cost savings of approximately \$42,000 per year, reduce maintenance costs, reduce GHG emissions by over 400 tons per year, allow accurate monitoring of energy use, provide improved lighting illumination levels and quality of light in the loading/unloading areas of Piers 90 and 91 and the cruise parking area.

TRIPLE BOTTOM LINE

Economic Development

This project provides necessary infrastructure upgrades that will improve customer safety and security, reduce operating costs and control future maintenance costs.

Environmental Responsibility

Replacement of existing fixtures will reduce port-controlled greenhouse gas emissions and reduce light and glare from Terminal 91 yard lighting.

Community Benefits

Neighbors of the Terminal 91 vicinity will be shielded from light and glare and appreciate the active controls, which will automatically reduce lighting levels when work is not being performed or the property is not occupied.

ALTERNATIVES AND IMPLICATIONS CONSIDERED

Alternative 1) – Do not upgrade Terminal 91 lighting. Maintenance costs will continue to increase due to an aging system, and energy use costs will continue to rise due to utility rate increases. Alternative 1 is not recommended.

COMMISSION AGENDA

Tay Yoshitani, Chief Executive Officer

September 26, 2013

Page 7 of 7

Alternative 2) – Authorize \$945,000 for a total project budget of \$1,035,000 to upgrade to lighting at Terminal 91. The lighting upgrade will potentially reduce energy used for lighting the terminal by up to 76% while improving the quality of light and reducing light pollution. Maintenance costs as well as energy costs will be reduced. **This is the recommended alternative.**

ATTACHMENTS TO THIS REQUEST

- Terminal 91 Site
- Attachment B – Project Cost Off-set
- Attachment C - Comparisons of HPS and LED lighting

PREVIOUS COMMISSION ACTIONS OR BRIEFINGS

None.