Port of Seattle

COMMISSION
AGENDA MEMORANDUM **Item No.** 8j

ACTION ITEM **Date of Meeting** November 14, 2023

DATE: November 3, 2023

TO: Stephen P. Metruck, Executive Director

FROM: Keri Stephens, Director AV Facilities & Capital Programs
Eileen Francisco, Director Aviation Project Management

SUBJECT: **Flow Meter Replacement CMP Design and Construction**

Amount of this request:	$ 4,165,000
Total estimated project cost:	$4,235,000

ACTION REQUESTED

Request Commission authorization for the Executive Director to (1) prepare design and construction bid documents for Flow Meter Replacement in the Central Mechanical Plant (CMP), (2) advertise, bid, and execute a major works construction contract, execute related project change orders, amendments, work authorizations, purchases, contracts, and take other actions necessary to support and deliver the Flow Meter Replacement project within the approved budget, (3) use Port of Seattle crews and small works contracts to support the design and construction activities. The amount of this request is $4,165,000 for an estimated total project cost not to exceed $4,235,000.

EXECUTIVE SUMMARY

This is a renewal and replacement project that will be replacing flow meters and some isolation valves in the CMP which are at their end of life. The flow meters are critical to the operation of the entire cooling system. It provides cooling to the terminal building and concourses, as well as all other critical mechanical, electrical and data communication rooms. Additionally, select isolation valves were identified as needing replacement in conjunction with the flow meters because they are not properly sealing and stopping the water flow as intended. New isolation valves on the condenser supply and return side of equipment will ensure adequate equipment isolation during project construction, regular maintenance, and emergency operations.

JUSTIFICATION

The cooling system consists of chillers, heat exchangers, water loops, and cooling towers. The flow meters are essential for the efficient operation of these systems. In 2019, four flow meters in two of the cooling towers failed and had to be replaced by a separate project. This project will be replacing the remaining cooling systems' flow meters to mitigate unplanned outages and loss

off cooling capacity. Four isolation valves were identified as needing replacement because they can no longer maintain a complete seal after approximately 20 years of use. These are large valves that are upstream of the flow meters and replacing the isolation valves at the same time provides efficiency by consolidating shutdowns during one capital project.

This project was one that was deferred during the COVID-19 workplace disruption. The project scope was confirmed and the addition of the four isolation valves was re-estimated with current market trends which resulted in an increase project cost.

Diversity in Contracting

The design services will be completed using an existing IDIQ contract that was established in 2022 which has a 16% WMBE commitment. The project staff, in coordination with the Diversity in Contracting Department, will evaluate the WMBE goals for the construction services during the design phase.

DETAILS

The work detailed in this memo is to remove and replace a total of thirty-one flow meters and four isolation valves throughout the CMP and cooling towers.

Scope of Work

The Flow Meter Replacement in the CMP project will consist of:

(1) Remove and replace six flow meters at the cooling towers. There are two flow meters at Towers 3, 4, and 5.
(2) Remove and replace sixteen flow meters at the chillers. One chilled water meter and one condenser water flow meter on each of the eight chillers.
(3) Remove and replace six flow meters at the heat exchangers. One chilled water meter and one condenser water flow meter on each of the three heat exchangers.
(4) Remove and replace three flow meters on the main secondary water loops. All three meters are chilled water flow meters.
(5) Remove and replace four isolation valves on two chillers. Two valves on chiller #3 and chiller #4.
(6) Integrate new flow meters and isolation valves with the Siemens Direct Digital Control (DDC) system.
(7) Connect the thirty-one flow meters to the flow rate remote displays (MagFlow).
(8) If necessary, provide piping support as required to meet current building codes.

Schedule

Activity

Advertisement	2025 Quarter 1
Construction Start	2025 Quarter 3
In-use date	2026 Quarter 3

Cost Breakdown	This Request	Total Project
Design	$1,559,000	$1,609,000
Construction	$2,626,000	$2,626,000
Total	$4,185,000	$4,235,000

ALTERNATIVES AND IMPLICATIONS CONSIDERED

Alternative 1 – Defer project to a later date or cancel project.

Cost Implications: Approximately $50,000 would need to be expensed for notebook development.

Pros:

(1) No further capital investment at this time.

Cons:

(1) Flow meter failure could occur at any time resulting in a large expense cost for replacement and result in lengthy down time with incremental loss of cooling capacity.
(2) Potential for increased costs of materials and labor if deferred to a later date.

This is not the recommended alternative.

Alternative 2 – Remove and replace the flow meters and all thirty-four isolation valves in the CMP and cooling towers.

Cost Implications: Capital project investment of an estimated $5.2M for planning, design, and construction.

Pros:

(1) Mitigate potential for failures that negatively affect the operation of the cooling systems.
(2) Improved efficiency over existing systems.
(3) Increase reliability and decrease maintenance costs.
(4) Future routine maintenance is made easier and smaller segments of the system can be shutdown with more reliable isolation valves.
(5) Reduces potential for change orders due to faulty isolation valves.

Cons:

(1) Increases project schedule.
(2) Increases capital investment.

(3) Increases the number of shutdowns and disruptions to the cooling systems.

This is not the recommended alternative.

Alternative 3 – Remove and replace the flow meters and four isolation valves in the Central Mechanical Plant as scoped.

Cost Implications: Capital project investment of an estimated $4.2M for planning, design, and construction.

Pros:

(1) Mitigate potential for failures that negatively affect the operation of the cooling systems.
(2) Improved efficiency over existing systems.
(3) Increase reliability and decrease maintenance costs.

Cons:

(1) Large capital project investment.
(2) Increases potential for change orders due to faulty isolation valves.

This is the recommended alternative.

FINANCIAL IMPLICATIONS

Cost Estimate/Authorization Summary

COST ESTIMATE	Capital	Expense	Total
Original estimate	$2,954,000	$0	$2,954,000
Budget Increase	$1,281,000	$0	$1,281,000
Revised estimate	$4,235,000	$0	$4,235,000
AUTHORIZATION			
Previous authorizations	$70,000	$0	$70,000
Current request for authorization	$4,165,000	$0	$4,165,000
Total authorizations, including this request	$4,235,000	$0	$4,235,000
Remaining amount to be authorized	$0	$0	$0

Annual Budget Status and Source of Funds

The Flow Meter Replacement CMP (CIP #C801182) was included in the 2023-2027 capital budget and plan of finance with a budget of $2,954,000. The capital increase of $1,281,000 was transferred from the Aeronautical Allowance[1] CIP C800753 resulting in no net change to the

[1] The Aeronautical Allowance is included in the Capital Improvement Plan to ensure funding capacity for unspecified projects, cost increases for existing projects, new initiatives, and unforeseen needs. This ensures funding capacity for unanticipated spending within the dollar amount of the Allowance CIP.

Airport capital budget. The funding sources will be the Airport Development Fund and revenue bonds.

Financial Analysis and Summary

Project cost for analysis	$4,235,000
Business Unit (BU)	Terminal Building
Effect on business performance (NOI after depreciation)	NOI after depreciation will increase due to inclusion of capital (and operating) costs in airline rate base
IRR/NPV (if relevant)	N/A
CPE Impact	$0.01 in 2027

Future Revenues and Expenses (Total cost of ownership)

This project will likely have no impact on Aviation Maintenance operating & maintenance (O&M) costs. This is a renewal and replacement project that replaces flow meters and some isolation valves in the CMP which are at their end of life. Replacement will require a similar level of maintenance. Therefore, there will not be a material impact on Aviation O&M costs.

ATTACHMENTS TO THIS REQUEST

(1) Presentation

PREVIOUS COMMISSION ACTIONS OR BRIEFINGS

None.