



AGENDA MEMORANDUM

Item No.

4d

ACTION ITEM

Date of Meeting

May 9, 2017

DATE: May 1, 2017

TO: Dave Soike, Interim Chief Executive Officer

FROM: Bob Maruska, Assistant Director Engineering, Design Services
Tina Soike, Director of Engineering Services

SUBJECT: Development of Building Information Modeling (BIM) Process and Standards

ACTION REQUESTED

Request Commission authorization for the Chief Executive Officer to execute a consultant service agreement for an amount not to exceed \$400,000 to provide Building Information Modeling (BIM) process and standards development.

EXECUTIVE SUMMARY

Building Information Modeling is a tool that can be used in the planning, design, construction, operations and maintenance of a facility. BIM can aid in the visualization of vertical construction and supports collaboration during the design and construction process. Basic modeling data can be enriched with additional information appropriate for asset management including total cost of ownership. This study will provide the framework to determine specific Port needs that can be cost effectively addressed through the use of BIM and to define the processes and standards that are needed to implement use of this tool. This authorization request is to select and retain an experienced consultant to work with the Port in development of modeling processes and appropriate standards.

Recently, several requests have been made to Engineering for Building Information Modeling standards. Two projects for the Aviation Division, the International Arrivals Facility and NorthSTAR along with one Maritime Division project, Bell Street Cruise Terminal Improvements, are currently using various forms of BIM for design and construction of Port facilities. The trend to move beyond 2D design into 3D modeling on complex vertical construction projects is continuing in the building design and construction environment. Designers and contractors are using various modeling tools to better visualize projects, sequence construction and resolve potential conflicts before constructing the various disciplines of a facility (mechanical, electrical, HVAC, communication etc.).

The industry as a whole is simultaneously developing processes and standards for use of BIM data. There are currently over 20 different individual standards and several national guidelines

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developed for the use of BIM. Many owners are now faced with deciding the best approach for use of BIM during design and construction, as well as possible opportunities for long term asset management, operations and maintenance. Based on internal discussion and those with industry representatives, the Port should establish guidelines and standards to be used when this technology is applied to design and construction of our facilities.

Due to the emergent nature of this technology and application to asset management of Port facilities, we do not currently have resources with the breadth of experience in applying BIM to large complex facilities.

JUSTIFICATION

Advancements in the design and construction of facilities continue to apply technology as a means to optimize the delivery process. Through the use of increasingly sophisticated tools, such as BIM, substantial facility data can be developed that has potential application beyond design and construction extending into the operation, maintenance, and long term asset management of a facility. This agreement will include review of current industry practices and assess opportunities for application of project data for maintenance and asset management activities, evaluate the cost/benefit to the Port and develop a recommended methodology for moving forward. The following are some key points considered:

- Technology advancements will continue to influence design, construction, operation and maintenance, and asset management of facilities.
- Collaboration between owners, designers and contractors can benefit from implementation of integrated 3D modeling tools.
- Design and construction efficiencies can be realized by using appropriate modeling tools.
- Development of Port BIM processes and procedures are a long term investment that will yield dividends for future capital project development.
- Not all port projects are candidates for BIM, applying the One Port philosophy for development of processes and standards will guide the use of this tool across all divisions to optimize cost vs benefit.
- Implementation of BIM technology is still in the emergent phase, especially for operations, maintenance and asset management applications; public owners need to establish processes and standards appropriate for use at their facilities and to assess long term financial and staff commitments needed to support those efforts.

The decisions and requirements developed through this process will establish the future use of BIM, for Port facilities.

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Scope of Work

The contract will be procured according to Port policies and procedures in accordance with the General Delegation of Authority and procurement policy CPO-1. The Port will advertise and issue a solicitation that will include a goal for small business participation. The contract will be structured with a specific not-to-exceed amount and identify tasks and services required. Service directives may be used to authorize specific tasks and services within the total maximum contract value.

The scope of work is anticipated to consist of five (5) work elements as listed below:

- (1) Develop Port BIM Needs Assessment
- (2) Define Options for One Port use of BIM
- (3) Develop Internal BIM Processes and Procedures
- (4) Develop BIM Standards and Library
- (5) Develop Port Guidelines and Standards Documentation

Schedule

The overall duration of this service agreement is two years. A preliminary schedule has been developed to complete the work within approximately 18 months beginning mid-2017 with completion by the end of 2018. Due to the emergent nature of implementation of BIM beyond the design and construction phases of projects into a long term asset management tool by public owners, the overall schedule will be adjusted in conjunction with the final scope of services.

ALTERNATIVES AND IMPLICATIONS CONSIDERED

Alternative 1 – Do not hire consultant to develop BIM processes and standards

Cost Implications: Save \$400,000 in Engineering Operating expense.

Pros:

- (1) Port saves operating costs for consultant services.
- (2) Port saves staff costs needed to support consultant scope of services.

Cons:

- (1) Port forgoes opportunity for long term benefits related to operations, maintenance and asset management.
- (2) Port continues to use 2D (AutoCAD) drawings and spreadsheets for transfer of asset data as only source for record documents.
- (3) Each project that uses BIM as part of the design and construction process will be to a different standard and BIM data will not be compatible between projects.

This is not the recommended alternative.

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Alternative 2 – Hire Consultant to work with the Port to develop BIM process and standards

Cost Implications: Engineering Operating expense of \$400,000 for consultant services in addition to staff resources required to support the consultant.

Pros:

- (1) Port will have a clear set of guidelines for when and how to implement BIM.
- (2) BIM requirements will be consistently applied to projects.
- (3) Validation, review and ownership of BIM data will be standardized across the Port.
- (4) BIM data can be used across multiple projects or facilities.
- (5) Potential efficiencies for maintenance and asset management.
- (6) Port will have standards and procedures in place to keep pace with current industry practices.

Cons:

- (1) Port spends up front operating expense for undefined future benefit.
- (2) Port staff resources are being stretched with current capital project work, adding another task may reduce resource availability to complete assigned work.
- (1) More process and standards for project implementation.

This is the recommended alternative.

FINANCIAL IMPLICATIONS

Funding for this consultant service agreement will be through approved Engineering operating expense. All Port staff support costs required to complete the scope of services will also be funded through approved operating expense budgets.

Annual Budget Status and Source of Funds

Half of the cost (\$200,000) of this agreement is included as a one-time expense in the approved 2017 Engineering Operating Budget and the remainder will be requested in the 2018 budget.

ATTACHMENTS TO THIS REQUEST

None

PREVIOUS COMMISSION ACTIONS OR BRIEFINGS

None