

# Memorandum

**TO:** HONORABLE MAYOR  
AND CITY COUNCIL

**FROM:** Kerrie Romanow  
Barry Ng

**SUBJECT:** SEE BELOW

**DATE:** April 28, 2015

Approved

*D. D. SyL*

Date

*5/5/15*

## INFORMATION

**SUBJECT: DECISION TO USE THE DESIGN-BUILD DELIVERY METHOD FOR THE HEADWORKS PROJECT AT THE SAN JOSE-SANTA CLARA REGIONAL WASTEWATER FACILITY**

The purpose of this memorandum is to inform City Council of the decision by the Director of Environmental Services and the Interim Director of Public Works to use the progressive design-build method to deliver the Headworks Project and provide a summary of the reasoning behind such decision.

## BACKGROUND

The San José-Santa Clara Regional Wastewater Facility<sup>1</sup> (RWF) serves a number of jurisdictions. Due to the regional nature of the RWF, projects are subject to State law (as opposed to the City's Charter and Municipal Code). Prior to January 1, 2015, the RWF could only utilize the design-build project delivery method for projects valued over \$2,500,000 after obtaining approval from the Governor's Office of Planning and Research; however, on January 1, 2015, Senate Bill 785 (Wolk) took effect and allowed the use of design-build by special districts, local and state agencies for projects valued over \$1,000,000 as long as their respective governing bodies approved. Subsequently, on March 24, 2015, City Council adopted a resolution approving the use of low bid design-build and progressive design-build as possible delivery methods for projects in the RWF's Capital Improvement Program (CIP) and delegated authority to the Directors of Environmental Services and Public Works to determine the appropriate delivery method for each project. As stated in the memorandum which recommended the delegation of authority, staff is considering the use of the low bid design-build and progressive design-build delivery methods in addition to the traditional design-bid-build for various projects.

<sup>1</sup> The legal, official name of the facility remains San José/Santa Clara Water Pollution Control Plant, but beginning in early 2013, the facility was approved to use a new common name, the San José-Santa Clara Regional Wastewater Facility.

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### Project Description

Headworks facilities at wastewater treatment plants are of high importance as they direct influent sewage flow, provide sewage screening and grit removal, and protect downstream treatment facilities from large solids. The RWF has two functioning headworks facilities, Headworks 1 and Headworks 2. Based on recent condition assessments and feasibility reports, staff has determined that various improvements and a new headworks are needed as Headworks 1 is reaching the end of its useful life and Headworks 2 has experienced operational and reliability issues. Staff has also identified critical improvements that must be implemented in the short-term. The goals of the Headworks Project are to improve the reliability of Headworks 2 and make the necessary improvements to Headworks 1 to enable it to remain in service long enough to design and construct a replacement for Headworks 1.

Improvements to Headworks 1 primarily include structural repairs and rerouting flows from Headworks 1 to Headworks 2 for the eventual decommissioning of Headworks 1. Improvements to Headworks 2 include reliability and operational modifications. The new headworks facility will include a pump station, screens, grit removal, piping and other appurtenances to replace Headworks 1 as the long-term duty headworks. Attachment A shows the location of the existing headworks facilities and anticipated location of the new headworks facility.

Due to a number of large underground pipelines and other utilities, construction of the Headworks Project is anticipated to be complex. The complexity will be compounded by the difficulty in taking the existing headworks facilities and pipelines off line during certain times of the year and the need to coordinate with multiple other construction projects scheduled for the RWF.

### Project Delivery Methods

Design-bid-build is the conventional project delivery method the RWF has used for many years. It is based upon a sequential process of engineering a detailed design, advertising of the design for bidding by contractors, and awarding a construction contract to the lowest responsive bidder.

Under the progressive design-build project delivery method, the design-build entity is selected through a (primarily) qualifications-based process. Once selected, the design-build entity will enter into contract with the City for preliminary services to advance the project design from a conceptual level while simultaneously providing construction cost estimates in an open-book format until the detail design is completed and a Guaranteed Maximum Price (GMP) is agreed upon. It is possible that early equipment procurement can begin before final design details have been developed, but in general, construction of the project does not start until the contract with the design-build entity has been amended to include the GMP.

## ANALYSIS

To determine which delivery method was most appropriate, the Headworks Project team consisting of RWF operations and maintenance (O&M) and CIP staff (including Program consultants and City engineers) evaluated seven factors before recommending a delivery method

to CIP leadership. These seven factors form part of a methodology developed by the CIP to determine the preferred delivery method for any given project and are listed below:

1. Project Size;
2. Environmental Review & Permitting;
3. Complexity;
4. Performance Risk;
5. Design Control;
6. Optimizing Quality, Scope and Cost; and
7. Schedule.

Staff's decision to use the progressive design-build delivery method for the Headworks Project is based on an analysis of these seven factors. A discussion of the pertinent information for each factor is included below, with construction complexity and performance risk as the main drivers for the decision. In the process, low bid design-build was eliminated from further consideration because the dynamic between the environmental permitting process, procurement process and the delivery method would likely result in significant schedule delays (approximately six months to one year). As previously stated, an element of this project is to perform some critical improvements to the existing headworks facility; however, due to the urgent nature of the work and the relatively small size (estimated to cost under \$1,000,000), these critical improvements are recommended to be delivered using the traditional design-bid-build method. The following analysis is focused on comparing design-bid-build with progressive design-build for delivering the other necessary improvements and replacement headworks facility.

1. Project Size

The Headworks Project is estimated to cost a total of approximately \$121 million which exceeds the State's \$1,000,000 minimum project size requirement for design-build. Due to the large size of the project, any delivery method is likely to attract a number of capable teams and no inherent advantage was found in a particular delivery method, based on the size of the project alone.

2. Environmental Review & Permitting

The Headworks Project will need to go through the California Environmental Quality Act review and approval process. Furthermore, biological permits may need to be obtained before the start of construction of the Headworks Project. There was no inherent advantage identified between the design-bid-build and the progressive design-build method as both methods can adequately incorporate environmental review and permitting in the schedule.

3. Complexity

The technologies under consideration for the Headworks Project are industry standard and not inherently complex; however, because of the large number of underground utilities as well as the importance of coordinating with various other RWF projects under construction, the Headworks Project becomes relatively complex. Also, the site has been modified numerous times over the past 50 years and it is expected that unforeseen and/or undocumented utilities will be encountered in the congested location. These utilities include piping, electrical and communications conduit and subsurface structures. There may also be a

number of operational shutdowns and bypasses during construction. Lastly, there may be times of the year (particularly wet weather periods) when Headworks 1 and 2 or specific pipelines cannot be taken out of service. It is during these periods when a well-coordinated team can keep the project moving while putting appropriate backup measures in place to handle peak flows and storm events.

Two key advantages of progressive design-build are having a single point of responsibility for both design and construction, and the increased potential for innovative solutions to complex issues. Additionally, an integrated progressive design-build team can make use of the designer's and contractor's skills during the project's design phase to better coordinate construction sequencing, and find solutions to difficult construction scenarios and shutdowns. For these reasons, progressive design-build was thought to be the more advantageous delivery method when considering the Headworks Project's complexity.

4. Performance Risk

Headworks are typically one of the most equipment intensive process areas in a wastewater treatment facility. While the equipment is generally proven and well understood, a key risk is the technical challenge to integrate and tie new equipment into the existing RWF treatment process. This project's hydraulic design presents another risk for the City. The headworks facilities will receive flows from the collection system, mostly composed of gravity flow pipes, and will convey them through numerous hydraulically complex junction structures, pipelines and channels. Failure to provide a proper hydraulic design could limit the capacity and performance of the entire RWF and leave the City at risk of operational failure.

Given these complexities, constructing the project using the progressive design-build delivery method provides a significant advantage over traditional design-bid-build because the contract will require that the design-build entity be generally responsible for meeting the performance specifications for the project, as established by the City. When the designer and contractor are procured separately, as with design-bid-build, there may be conflicting opinions regarding whose responsibility it is to resolve a project performance issue. This transfer of responsibility shifts much of the performance risk to the single design-build entity and is an important component of the progressive design-build process. Because the design-build entity will take on much of the performance risk from the City, progressive design-build was the preferred delivery method. Essentially, the performance of the constructed project is guaranteed by the design-build entity under contract with the City.

5. Design Control

Staff prefers to have input throughout the design on equipment, layout and construction sequencing because of the potential major impacts to RWF operations. Both progressive design-build and design-bid-build offer a high level of design control. Therefore, neither delivery method provides a significant advantage.

6. Optimizing Quality, Scope and Cost

Given the importance of the headworks facilities in the treatment process, the type and quality of the equipment installed is extremely important to the successful operations of the

RWF. Both progressive design-build and design-bid-build can provide a high level of involvement from City staff when specifying the equipment requirements for the contractor procurement documents. However, the progressive design-build method can be more advantageous in procuring preferred equipment since contractors selected in the design-bid-build often base their bid on cheaper or lower quality equipment to win the construction contract. During the design-build process, the equipment is proposed, jointly approved by the design-build entity and the City, priced under the GMP, and then installed.

Construction contracts for design-bid-build are cost competitive and generally based upon lowest bid costs; however, construction cost savings may be equally, if not more, attainable in progressive design-build as a result of the increased collaboration and creativity between the City, designer and contractor. Claims, disputes and change orders in complex projects also tend to be less prevalent in progressive design-build since the scope of a project is negotiated as part of the development of the GMP. Progressive design-build was considered to be the more advantageous delivery method for optimizing quality, scope and cost.

7. Schedule

The project's schedule will be important since many of the elements in the Headworks Project are meant to keep Headworks 1 functional until a new headworks is commissioned. The progressive design-build project delivery method offers a schedule advantage because the contractor can begin some construction activities such as clearing/grubbing, demolition, grading, trenching and long lead-time equipment purchases prior to completion of the detailed design. Potential schedule delays can be identified and resolved as part of the development of the GMP. However, due to the expected duration to procure a design-build entity, some of the typical schedule advantages associated with progressive design-build were negated for the Headworks Project. Therefore, the schedule factor did not favor any particular delivery method.

Conclusion

Of the seven factors evaluated, three indicated that progressive design-build would be the most advantageous delivery method while the other four factors indicated no significant advantage between the two delivery methods. Based on staff's evaluation, the progressive design-build method to deliver the Headworks Project is expected to reduce the City's risk, lower the volume and cost of change orders, decrease construction delays, increase the likelihood of having the preferred equipment installed, result in more efficient solutions to complex construction sequencing issues and provide a superior end product. Therefore, staff recommended progressive design-build as the most appropriate delivery method for the Headworks Project.

Staff has completed scoping the Headworks Project and is finalizing a Request for Qualifications to procure the services of a consulting firm to evaluate alternatives, develop a conceptual design, prepare the procurement documents to select a design-build entity, represent the City (as an owner's representative) and provide construction management services. The consulting firm will also be tasked with designing the critical improvements. Staff will return to Council for approval of both the consultant agreement and contract with the design-build entity for the Headworks Project following the respective procurement processes.

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**COORDINATION**

This memo has been coordinated with the Office of the City Attorney

/s/Ashwini Kantak for  
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Director, Environmental Services

/s/  
BARRY NG  
Interim Director of Public Works

For questions please contact Ashwini Kantak, Assistant Director of the Environmental Services Department at (408) 975-2553.

Attachment A: Headworks Project Location within the San José-Santa Clara Regional Wastewater Facility

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