

**STAFF SUMMARY**



**TO:** Board of Directors  
**FROM:** Frederick A. Laskey, Executive Director  
**DATE:** March 13, 2024  
**SUBJECT:** Metropolitan Water Tunnel Program  
Contract Structure for Final Design Engineering Services, Contract 7556

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**COMMITTEE:** Water Policy and Oversight

           INFORMATION

  X   VOTE



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**RECOMMENDATION:**

To approve staff's recommended contract structure for Engineering Services During Construction under Contract 7556, Final Design Engineering Services for the Metropolitan Water Tunnel Program (Tunnel Program) where the cost for Engineering Services During Construction during tunnel construction, if approved by the Board of Directors, will be authorized and added by amendment(s) to the Final Design Engineering Services Contract 7556, as further detailed in this staff summary.

**DISCUSSION:**

The Tunnel Program is on schedule to achieve a significant milestone with the completion of preliminary design and environmental reviews in early 2024. Passing this milestone will shift the focus of work to final designs with additional emphasis on completing land acquisition, expanding outreach efforts, achieving stakeholder agreements, and preparing for tunnel construction. Based on the proposed FY25 Capital Improvement Plan (CIP), it is projected that, in the coming years, over \$270 million in professional services contracts will be awarded to support the Tunnel Program. These include Final Design Engineering Services (FDES), Construction Management (CM), and a possible second extension to the Program Support Services (PSS) contract.

Ongoing and completed professional services contracts for the Tunnel Program include the following:

- Program Support Services – The Board authorized the Executive Director to exercise the contract's first optional 24-month renewal during the December 13, 2023 meeting. This contract provides assistance with program-wide activities, such as risk management, quality management, design and construction package planning, independent technical reviews, construction practices review and implementation, independent cost estimates, critical path scheduling, and budget tracking. This contract was for an initial award of \$10,247,877 with an increase of \$7,000,000 to \$17,247,877 and 24-month contract extension approved by the Board of Directors at the December 2023 meeting.

- Preliminary Design Engineering Services – This contract’s scope of services consisted of initial geotechnical investigations, preparation of Environmental Impact Reports, and preparation of a Preliminary Design Report, drawings, schedule and cost estimate. This contract was for \$15,692,527 and ended in January 2024.
- Geotechnical Support Services – This contract focuses on the collection of geotechnical/geological data to support final design, bidding and construction of the Program. This contract is for \$12,789,889 and will end in January 2026.

Additional professional services contracts may be required over the course of the Tunnel Program to support legal matters, land acquisition, insurance, labor agreements, and community technical assistance.

The FDES procurement is ongoing with an anticipated recommendation for award at the September 2024 Board meeting. The procurement of Construction Management contract(s) is anticipated to begin in 2025.

### **Final Design Engineering Services**

One FDES contract is planned. A single FDES contract provides a number of advantages over multiple contracts and is consistent with the approach used for the MetroWest Water Supply Tunnel. One FDES engineer provides efficiency in executing the designs, consistency between construction packages, a simplified development of common specifications and standards, a consistent application of risk management, and flexibility in construction procurement if needed. It also requires less MWRA staff to support and manage. The FDES engineer will be precluded from any other future role on the Tunnel Program.

It is expected that the FDES contract will extend from fall 2024 (assuming award in September 2024) through the duration of the tunnel construction projects (currently anticipated before 2040). Two tunnel construction contracts are planned, as well as two or three smaller construction contracts that will be procured and completed prior to the start of tunnel construction. These smaller construction contracts will remove early enabling construction works from the critical path of the tunnel construction contracts.

The proposed FY25 CIP includes \$77.8 million for FDE. This figure does not include ESDC (discussed below). The FDES firm will require a multi-discipline design team with expertise in pressurized water tunnel design and construction, rock engineering, geotechnical engineering, water systems and hydraulics, mechanical systems design, site-civil works, permitting, risk management, construction, cost estimating and scheduling. The team must be efficiently managed so that time critical design submittals are aligned with the targeted Tunnel Program construction schedule. This team will also support the Authority in outreach, land acquisitions, and memoranda of understanding. The FDES engineer will serve as the Engineer of Record for all designs for the Tunnel Program.

ESDC are those services provided by the Engineer of Record during construction that are necessary to maintain the integrity of the design. These services include construction advice, interpretation and clarification through Request for Information responses, review of contractors’ submittals, review of contractors’ value engineering proposals, onsite meetings and observations,

change order and dispute assistance, structural geology mapping for final tunnel lining, development of record drawings, startup assistance, operations and maintenance training, and certification reporting.

While ESDC involves technical reviews and technical inspections by the Engineer of Record to ensure the construction contractor's approach is in conformance with the technical requirements of the design, the CM consultant is responsible for overall administration of the construction contracts. CM services include resident inspection to ensure the work conforms with the contract documents, document control, project controls, change management, and the point of contact between the construction contractors, the Authority and its consultants (including the FDES staff).

ESDC will begin upon the start of the first tunnel construction contract, targeted for 2028, and extend through all tunnel construction contracts. The proposed FY25 CIP includes \$40 million for ESDC with an estimated duration of approximately ten years.

### **Procurement Process**

On November 15, 2023, MWRA commenced a two-step procurement process for FDES. A Request for Qualifications (RFQ) was publicly advertised, and a Request for Proposals (RFP) will be issued to the firms that were shortlisted after the RFQ phase.

On December 15, 2024, four firms submitted statements of qualifications (SOQs) in response to the RFQ. A Selection Committee reviewed the SOQs, and shortlisted the following three firms: Jacobs Associates d/b/a Delve Underground; Mott MacDonald, LLC; and WSP USA, Inc. The RFP will be made available to those firms once the development of the Scope of Services is completed and the final structure of the FDES contract is determined.

### **Recommended Contract Award Structure for ESDC**

Historically, for professional design engineering service contracts the Authority's Request for Qualifications Statements/Proposals contains a detailed scope of services that includes specific tasks to perform during the full design phase including preliminary and final design, the preparation of bid documents and bid-related services through the award of the construction contract, and specific tasks for ESDC. Proposals for these contracts typically include costs for this entire scope of work, including ESDC. Proposed costs for ESDC are based on the specified scope and anticipated level of effort required during construction. This results in a total contract award/amount that includes both full design services and ESDC.

For the Tunnel Program's FDES contract, staff recommend that proposals be received, and the initial contract scope and price include, final design services through the construction contract award and ESDC for the smaller enabling works construction packages. Staff recommend that the detailed ESDC scope of work for the tunnel construction be prepared by staff after completion of the final design for each tunnel construction package and that the cost for those services be negotiated with the FDES firm and, if approved by the Board of Directions, authorized and added by amendment(s) to the FDES contract. Importantly, key financial parameters (i.e., maximum overhead rate and fee) that will be utilized for ESDC will be submitted by proposers and evaluated as part of the initial contract award.

Staff recommend this alternative approach of not receiving detailed cost proposals for specific ESDC tasks for tunnel construction because of the challenges associated with accurately developing a scope and the level of effort required to support future significant and long-term tunnel construction work. Additionally, staff propose to include ESDC for the smaller enabling works as part of the initial FDES contract award as these services are more straight forward, can be scoped and priced at the proposal stage, and will mostly likely be performed during the first five years of the contract (during the design of the tunnel construction package).

It is industry best practice on large tunnel projects to defer negotiations the cost for ESDC services until late in the final design phase when construction scope, phasing, and duration are better defined. Several public agencies, such as the New York City Department of Environmental Protection, Naragansett Bay Commission (Providence, RI), DC Water, ALCOSAN (Pittsburgh, PA), and Metropolitan District Commission (Hartford, CT) negotiate the level of effort for ESDC services after award of the design contract, closer to 90% or 100% design stage.

## **Conclusion**

For FDES , staff are recommending that proposals be received (including labor rates, maximum overhead, fee and level of effort) and an initial contract executed for specific design development tasks, including development of the Basis of Design reports, performance of subsurface investigations, and design development of two tunnel construction packages and two or three enabling works construction projects along with risk management, quality management, cost estimating, and construction scheduling. Given the complexity and scope of the Tunnel Program, the performance of these design services will be critical to determine the duration of each tunnel construction package, and the schedule and level of effort required for ESDC. Accordingly, staff recommend that the Authority prepare the detailed scope of ESDC for the tunnel construction work after the preparation of the final design for such work.<sup>1</sup> Staff will thereafter negotiate the cost for ESDC and seek the authorization for such services from the Board of Directors, which if approved will be implemented through a contract amendment(s) of the FDES contract. The FDES contractual maximum overhead rate and fee for ESDC for the tunnel construction packages will apply to this amendment(s).

## **BUDGET/FISCAL IMPACTS:**

The proposed FY25 CIP includes \$77.8 million for Final Design services and \$40 million for ESDC.

## **MBE/WBE PARTICIPATION:**

The minimum MBE and WBE participation requirements for this contract are established at 7.18% and 5.77%, respectively.

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<sup>1</sup> The Authority may seek separate ESDC authorizations as tunnel construction packages are completed by the FDES firm.



*Presentation to*

## **MWRA Board of Directors**

*Metropolitan Water Tunnel Program  
Final Design Engineering Services  
Contract 7556  
Recommended Contract Structure*

March 13, 2024



## Advantages of one FDES contract

- Efficiency in executing the designs
- Consistency between construction packages
- Simplifies development of common specifications and standards
- Consistent application of risk management approach
- Provides for flexibility in construction procurement, if needed
- Requires less MWRA staff to support and manage
- Serves as the Engineer of Record for the Tunnel Program
- Will be precluded from any other future role on the Tunnel Program



## Procurement Process

- Two Phases:
  - Request for Qualification Statements (RFQ)
  - Request for Proposals (RFP)
- RFQ advertised in November 2023
- Statements of Qualifications received in December 2024
- RFP will be issued soon
- Anticipated award in September 2024



## Design Phase Services

- Basis of Design reports
- Final phase of subsurface investigations
- Design of two tunnel construction packages
- Risk management and quality management
- Cost estimating and construction scheduling
- Design and ESDC for two or three early enabling works construction packages





## Tunnel Construction Phase / ESDC

- Request for Information responses
- Review of contractors' submittals
- Review of contractor's value engineering proposals
- Onsite meetings and observations
- Change order and dispute assistance
- Structural geology mapping for final tunnel lining
- Development of record drawings
- Startup assistance
- Operations and maintenance training
- Certification reporting



## ESDC Services

- Not the same as Construction Management or Resident Engineer/Resident Inspection
- Provided by the Engineer of Record during construction
- Necessary to maintain the integrity of the design
- Difficult/impossible to accurately scope and price ESDC services before the design is near complete for large complex projects
- Industry practices on large tunnel projects
  - Defer negotiations for ESDC until late in the final design



# Recommended Contract Structure

- Proposals will include:
  - Labor rates, maximum overhead, percentage fee and level of effort for Final Design Phase services
  - Maximum overhead rate and percentage fee to be used for tunnel construction ESDC
- Evaluation of the proposals is based on multiple criteria which includes cost
- Contract will be awarded for the full duration of the contract including completion of tunnel construction
- Near end of tunnel design phase, tunnel construction ESDC scope of work will be determined by the Authority and negotiate level of effort and labor rates with Consultant
- Amend the FDE contract to include tunnel construction ESDC, which will required Board approval
  - Proposed FY25 CIP includes \$77.8M for Final Design Engineering and \$40M for ESDC