Construction Quality Assurance and Quality Control Overview

Transportation, Technology & Infrastructure Committee

December 10, 2018
APPROACH

- State of Texas Requirements
- Industry Best Practices
- Collaboration between Design-Builder and Project Management Team
- Full Team Participation
- Commitment to Excellence
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2. Construction Quality Assurance & Quality Control
3. Upcoming Requests for Council Action
BACKGROUND
SUBSIDENCE REQUIREMENTS *

*As mandated by Harris-Galveston and Fort Bend Subsidence Districts, both of which were created by the Texas legislature for regulating groundwater withdrawals.
CONSTRUCTION

*New facilities shown are renderings of the completed project*
### Preliminary Services
- **Basis of Design**
  - Component 1
  - Design/Preconstruction

### Final Design & Construction Services
- **GMP Proposal/60% design**
- **100% design**
- **Phase 1 (80 mgd) milestone**
  - 8/31/22 (current estimate)
- **Phase 2 (240 mgd) milestone**
  - 6/30/24 (current estimate)

### Timelines
- **Contract Award & Notice-to-Proceed** (December 2015)
- **Amendments 1-6** (Jun '16 – Nov '18)
- **Guaranteed Maximum Price Approval** (early 2019)
- **Amendment 7 (current RCA)**
- **Final Acceptance** (Dec 2024)
WHAT IS QUALITY ASSURANCE AND QUALITY CONTROL?

**Quality Assurance (QA)**

- Process Oriented
- Proactive – Prevent Defects
- Establish Processes, Create Checklists, Require Documentation
  
  *For Example – Set Speed Limits*

**Quality Control (QC)**

- Product Oriented
- Reactive – Identify Defects
- Observe, Test, Complete Checklists, Document
  
  *For Example - Enforce Speed Limits*
COMPLIANCE WITH STATE OF TEXAS REQUIREMENTS

Texas Administrative Code 2269

Services required to be provided independently * of the design-build firm

• Inspection services
• Construction materials engineering and testing
• Verification testing services

* Project Advisor/Technical Consultant (Carollo Engineers, Inc.) is contracted with the City to provide the services mentioned above.
SHARED APPROACH TO QUALITY

- **Project Advisor/Technical Consultant Team**
- **INSPECTION TEAM**
- **GENERAL CONDITIONS LEVEL**
- **SUBCONTRACTOR LEVEL**
- **FIELD LEVEL**

**PROJECT TEAM MANAGEMENT**
- Independent inspection, materials & verification testing

**Houston Waterworks Quality Assurance Team**
- Separate team providing quality assurance as part of Houston Waterworks Team

**Houston Waterworks Construction Team**
- Houston Waterworks Team personnel overseeing quality, schedule, safety and budget

- **Project Advisor/Technical Consultant Team**
  - Houston Waterworks Team personnel overseeing quality, schedule, safety and budget

- **INSPECTION TEAM**
  - Separate team providing quality assurance as part of Houston Waterworks Team

- **GENERAL CONDITIONS LEVEL**
  - Houston Waterworks Team personnel overseeing quality, schedule, safety and budget

- **SUBCONTRACTOR LEVEL**
  - Quality control provided by managers & superintendents

- **FIELD LEVEL**
  - Crews build the facilities with a focus on quality
ROLES ARE CLEARLY DEFINED

Houston Public Works

Design/Builder (Houston Waterworks Team)
- Design and Construct
- Certify components conform to the Contract Standards
- Supervise, direct, and inspect the Work
- Provide full-time construction management and construction inspectors
- Guarantee performance at the completion of construction, which require that they manage all aspects of the design, construction, and start-up

Project Advisor/Technical Consultant (Carollo Engineers)
Independent services in compliance with state law:
- Inspection services
- Construction materials engineering and testing
- Verification testing services

LEGEND
- Working Relationship
- Contractual Relationship
UPCOMING REQUESTS FOR COUNCIL ACTION
### UPCOMING REQUESTS FOR COUNCIL ACTION

<table>
<thead>
<tr>
<th>Approval Action</th>
<th>Date</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Amendment #7 – Early Work Package 6</td>
<td>December 2018</td>
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<td>Guaranteed Maximum Price Amendment</td>
<td>Early 2019</td>
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<tr>
<td>Project Advisor/Technical Consultant Amendment</td>
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QUESTIONS?

greaterhoustonwater.com