Structuring the Procurement Phase of a Progressive Design Build Project to Meet a Rapidly Approaching Permit Deadline

A Case Study with Great Lakes Water Authority

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Project Background

- Detroit’s WRRF is the largest single site wastewater treatment plant in North America
- Meets 35% of Michigan population’s treatment needs including Detroit and 76 surrounding communities
- Serves a combined sewer system
  - Wet weather capacity of 1,700 MGD and secondary treatment capacity of 930 MGD
  - When secondary treatment is exceeded, primary effluent is sent to Detroit River Outfall (DRO) or Rouge River Outfall (RRO)
- Only the DRO has disinfection and RRO needs disinfection to meet NPDES permit
**RRO Disinfection Project**

- Modifications needed at the WRRF in order to achieve disinfection under all flow conditions
- Successful completion of this project would discharge 1,700 MGD of treated effluent while meeting effluent limits for bacteria and total residual chlorine
- Three previous related projects were not finished due to funding or construction issues
- 3 year design and construction timeframe to meet NPDES permit substantial completion deadline
## NPDES Implementation Timeline

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Deadline</th>
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<tbody>
<tr>
<td>Submit complete plans and specifications for first segment</td>
<td>November 01, 2016</td>
</tr>
<tr>
<td>Commencement of Construction</td>
<td>April 01, 2017</td>
</tr>
<tr>
<td>Substantial Completion</td>
<td>April 01, 2019</td>
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## RRO Disinfection Project Permit Timeline
| 1 | MDEQ Performance Requirements Must be Completely Met  
Excess wet-weather flow from the RRO is treated to primary treatment standards but not disinfected. NPDES requires that **100%** of wastewater treated at the WRRF is disinfected. |
| 2 | Strict Delivery Timeline Requirements  
GLWA must deliver a basis of design report by **June 1, 2016**, commence project construction by **April 1, 2017**, and reach substantial completion by **April 1, 2019**. |
| 3 | Critical Need to Optimize Technical Approach  
Although a viable concept existed, GLWA remains interested in the **exploration of other technical solutions** (including a substitute for chlorine gas). |
| 4 | Project Needs to be Structured to Attract Bidder Interest  
GLWA to conduct a **single, streamlined procurement process** that attracts **sufficient market interest** and allows for innovation, technical competition, and opportunities for fair pricing through the use of “off-ramps.” |

**RRO Disinfection Project - Challenges**
The project challenges led GLWA to take the following actions:

✓ Attain a team of financial and technical advisors to assist in the project procurement

✓ Select a design-build approach to meet compressed delivery timeframe

✓ Evaluate design-build methods to elect the best fit for this project

✓ Choose a qualitative Design Build team selection process to solicit innovative time and cost-saving solutions
Overall Procurement Approach

1. Advisory Team Support
2. Qualifications-based Selection (Request for Statement of Qualifications)
3. One-Step Request for Qualifications, Interviews & Negotiation
4. Role-based Team and Project Experience
5. Encourage Creative, High-Quality Technical Solutions
6. Thoughtful Evaluation of Project Delivery Method
Advisory Team Roles

- Assist with selection of Alternative Delivery approach
- Communication with Procurement and Board for process buy-in
- Contribute to development of the Request for Statement of Qualifications (RFSoQ) including minimum qualification requirements
- Set up online Data Room in support of RFSoQ process
- Participate in technical review of qualifications and design approach
- Input for interview evaluation criteria and list of standard questions
- Support during negotiation process
Alternative Delivery

Advantages

• Schedule efficiencies
• Less risk for Owner
  (Avoid dilution of responsibility)
• Fewer claims
• ‘Best Value’ based selection
• Guaranteed Maximum Price Collaborative Design
  (with Constructor’s input)
Alternative Delivery Method Evaluation

Key Criteria

1. Ability to Achieve Accelerated Timeline
2. Technical Innovation/Flexibility
3. Market Participation

PASSES ALL KEY CRITERIA

Shortest Turnaround Time  Maximum Bidder Competition  Reduced Risk  Qualifications Based Selection
### Alternative Delivery Method Evaluation

**Design-Bid-Build**

- **Project Plan**: Completed 6-8 Months
- **Select Designer**: Basis of Design 8-9 Months
- **Working Drawings**: RFP Period 6-8 Months
- **Construction**: 8-9 Months

**Traditional Design-Build**

- **Project Plan**: Completed 2-3 Months
- **Select Design / Builder**: Basis of Design 8-9 Months
- **Working Drawings / DB Packages**: RFP Period 6-8 Months
- **Construction**: 6-8 Months

**Progressive Design-Build**

- **Project Plan**: Completed 2-3 Months
- **Select Design / Builder**: Basis of Design 8-9 Months
- **Agree on GMP or “Off ramp”**: Working Drawings / DB Packages 6-8 Months
- **Construction**: 6-8 Months

**Timeline**

- **2015**: 1 2 3 4 5 6 7 8 9 10 11 12
- **2016**: 1 2 3 4 5 6 7 8 9 10 11 12
- **2017**: 1 2 3 4 5 6 7 8 9 10 11 12
- **2018**: 1 2 3 4 5 6 7 8 9 10 11 12
- **2019**: 1 2 3 4 5 6 7 8 9 10 11 12

**Dates**

- **June 1, 2016**: Submission of Design
- **November 1, 2016**: Completed Plan
- **April 1, 2017**: Construction Start
- **April 1, 2018**: Progress Report
- **April 1, 2019**: Project Completion
Advantages

- Qualifications contribute to selection
- Single Point of Responsibility
- Accelerated schedule
- Project can be implemented in phases or task orders
- Owner has specific preferences and desires high degree of involvement
- Promotes innovation during design with input from contractor and owner
- Cost analysis of options available as project progresses
Progressive Design-Build

Disadvantages

• Perceived lack of competitive selection by governing bodies
• Off-ramp decision after GMP may impact project schedule
• Owner access to engineer may be through contractor
• Significant Owner effort and oversight needed for buy-out and GMP negotiation

An Owner's Representative or Engineer can assist in overcoming these disadvantages by overseeing the work completed by the Design-Builder and providing a third-party opinion of the GMP
Progressive Design-Build Process Map

1. Select Design-Builder
2. Design to 30%
3. Design to 60%
4. Design to 90%
5. Design to 100%
6. Value Engineering
7. Constructability Review
8. Cost Estimates
9. Off-ramp and take bids
10. MDEQ Permitting
11. Accept Project
12. Phased Construction by Design-Builder

Key:
- GLWA
- Design-Builder (DB)
- Owner and DB
<table>
<thead>
<tr>
<th>RFSoQ Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Information</td>
<td>Legal notices, definitions, and contents of RFSoQ</td>
</tr>
<tr>
<td>Scope of Services</td>
<td>High level overview of requirements</td>
</tr>
<tr>
<td>Progressive Design Build Services</td>
<td>Outline of Phase 1 and 2 services and roles of design-builder and GLWA</td>
</tr>
<tr>
<td>Procurement Considerations</td>
<td>Structure and process of selection, pre-submittal meeting, data access, and procurement deadlines</td>
</tr>
<tr>
<td>Submission Requirements</td>
<td>Design builder profiles, project team, minimum experience, project and technical approach</td>
</tr>
<tr>
<td>Evaluation/Selection Criteria</td>
<td>Details of criteria and evaluation process for selection</td>
</tr>
<tr>
<td>Attachments</td>
<td>Scope of services, general terms and services, project technical requirements, compliance forms, insurance / bond requirements, contract form for Phases I &amp; II, required performance criteria*</td>
</tr>
</tbody>
</table>
Minimum Qualifications

Established minimum qualification threshold for eligibility:

- Legal Eligibility
- Performance Bond
- Licensing and registration
- Adequate financial capacity / no material adverse condition
- Ability to perform work

<table>
<thead>
<tr>
<th>Category</th>
<th>Requirement</th>
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<tbody>
<tr>
<td>Design Experience</td>
<td>Within past 10 years, Designer must have successfully completed design of 3 projects at municipal WWTP of at least 50 MGD in USA</td>
</tr>
<tr>
<td>Construction Experience</td>
<td>Within past 10 years, Builder must have successfully completed construction of 3 projects of similar size and complexity.</td>
</tr>
<tr>
<td>Design-Build Experience</td>
<td>Within the past 10 years, Design-Builder must have successfully completed 3 projects for municipal WWTP of at least 50 MGD in USA</td>
</tr>
<tr>
<td>Safety Record</td>
<td>Builder must evidence an acceptable experience modification rate (EMR) for the current and past two years.</td>
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Evaluation & Selection

• Qualifications Based Selection (QBS)
• 6 team submissions received for project
• Only submissions meeting minimum qualification requirements eligible for evaluation
• Weighted comparative evaluation criteria
• Highest ranking respondents shortlisted and invited for interviews – 3 of 6 teams
• Highest score between SoQs and interviews invited for negotiation of RRO Disinfection PDB
Design & Construction Oversight

Owner's Engineer Services contract initiated in August 2016 to assist GLWA in delivery of PDB contract
Current Project Status

• Basis of Design/Detailed Engineering Report submitted to MDEQ on June 1, 2016

• 60% Design documents and Part 41 permit application submitted to MDEQ on November 1, 2016

• Submitted Final GMP Design Documents to GLWA

• Submitted GMP to GLWA on January 20, 2017 and negotiated successfully

• Begun construction by April 1, 2017

• Current RRO disinfection project has an estimated total cost of $44.5 M
Current Design and Function

Schematic by CDM

- PE Conduits
- East CCC
- West CCC
- JC-1
- DRO
- RRO
- Hypo Facility
- Sampling Facility
- SBS Diffuser
- Hypo Diffuser
- Cl₂ Diffuser
- Flow Meter
- East CCC
- West CCC
Dry Weather Flow Pathways
Dry Weather Flow Pathways

- Mostly SE
- PE Conduits
- JC-1
- West CCC
- RRO
- East CCC
- DRO
- Both PE and SE
Procurement Process Results

A design-build team was on board within 6 months of the Request for Qualifications Posting to meet first permit deadline.

<table>
<thead>
<tr>
<th>Date</th>
<th>Procurement Step</th>
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<tbody>
<tr>
<td>8/1/2015</td>
<td>Request for Qualifications Posted</td>
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<tr>
<td>8/14/2015</td>
<td>Pre-Solicitation Meeting and Site Tour</td>
</tr>
<tr>
<td>9/4/2015</td>
<td>Submittal of Qualifications</td>
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<tr>
<td>10/9/2015</td>
<td>Notice of Award</td>
</tr>
<tr>
<td>10/2015 to 1/20/2016</td>
<td>Scoping and Contract Negotiation</td>
</tr>
<tr>
<td>1/27/2016</td>
<td>Contract Approved by Board of Directors</td>
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<tr>
<td>2/19/2016</td>
<td>Start Work Letter Issued</td>
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<tr>
<td>3/2/2016</td>
<td>Project Kickoff Meeting</td>
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<tr>
<td>6/1/2016</td>
<td>Basis of Design Report Deadline</td>
</tr>
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</table>
Lessons Learned

1. Create a dedicated procurement team with sufficient authority and support to adopt and execute an innovative procurement strategy.
2. Establish the right level and type of minimum qualifications.
3. Provide clear selection criteria, a dedicated Request for Qualifications data center, and detailed orientation sessions.
4. Emphasize innovation that will result in time and cost-savings ideas from the design community.
5. Provide more than one month for due diligence and bid presentation to enhance the quality of bids and development of innovative solutions.
6. Use Design-Build Institute of America (DBIA) or Water Design Build Council standard procurement and contract documents and guidelines, attaching them to the Request for Qualifications – incorporate provisions to protect the Owner’s interests.
Lessons Learned
Continued

7. Establish **equitable construction contract terms** and conditions *(including performance guarantee)* before receiving initial proposals

8. Competitively **establish construction pricing criteria** before initial contract award

9. Consider **culture and organizational change** as a critical factor during the process as the organization endures short-term uncertainty over pricing to realize longer-term savings in schedule, and change order costs
Acknowledgements

- Wendy Barrott (GLWA)
- Sanjeev Mungarwadi (formerly GLWA)
- Carter Strickland (formerly HDR)
- Jill Jamieson (JLL)
- Stephen Goldsmith (Baker & McKenzie)
Thanks for Attending!

Questions?
RRO Disinfection Project

Objectives

- **Regulatory Compliance**: Reliably disinfect effluents in full compliance with federal and state regulations
- **Schedule**: Meet NPDES-prescribed schedule
- **Optimized Technical Approach**: Encourage concepts that not only meet current federal and state regulations, but also minimize future regulatory compliance risk
- **Constructability & Integration**: Maximize system integration and minimize operational disruptions during construction
- **Risk**: Optimal risk allocation between GLWA and Design-Builder
- **Cost**: Minimize life-cycle costs
- **Quality & Safety**: Optimize quality and safety levels
RRO Disinfection Project Timeline

June 1, 2016
Submission of Design

November 1, 2016
Completed Plan

April 1, 2017
Construction Start

April 1, 2018
Progress Report

April 1, 2019
Project Completion

2015 | 2016 | 2017 | 2018 | 2019
---|---|---|---|---
1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12

Project Plan
3-4 months

RFQ and Negotiation Period
6-7 Months

Basis of Design
Submit Basis of Design Report
5-6 Months

Working Drawings
11-12 Months

60% Design – Agree on GMP or “off-ramp”

Commence Construction
Construction
Substantial Completion
The Use of Alternative Delivery for Public Sector Projects is Growing Rapidly

GLWA has over 20 years of Design/Build experience
Earlier application of resources with Design Build approach enables Innovation otherwise untapped
A one step procurement process was selected due to time limitations and a qualifications approach to partner with the most qualified team yet manage cost through the alternative delivery process.
Progressive Design-Build: Project Approach

**Plan Project**
Define Performance Criteria

**RFQ**
RFQ Defines qualifications criteria; short-lists qualified firms

**Permits / 60% Design**
Select from Qualified Firms
Selection based on qualifications

**Verify Design**
Agree on GMP
Based on collaborative scope and design; pricing verified by third party

**Verify Performance**
Ongoing

**Contractual Relationship**

**Collaborative Relationship**

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<tr>
<th>Milestones</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
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<tr>
<td>Complete</td>
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<td>Basis of Design</td>
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<td>6 Months</td>
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<td>Commence</td>
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<td>Construction</td>
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<td>11-12 Months</td>
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