



Design Review Committee Briefing #22

Subject: Progressive Design-Build Delivery Model

Date: April 12, 2019

The Issue

Project Group F, the largest project in the Phase II Upgrades, is proposed to be constructed using a progressive design-build (PDB) delivery method. This delivery approach and the rationale for this decision have been addressed in previous Design Review Committee (DRC) briefings (see DRC Briefings #10, #17, and #18). During the most recent DRC meeting, the DRC requested additional information regarding the PDB delivery model. This DRC briefing is intended to present additional information on the PDB delivery model.

Background and Analysis

PDB delivery is a two-phase, collaborative delivery method where the project's design, cost-estimating, construction schedule and final guaranteed maximum price (GMP) or fixed price are developed in phase one. Phase two encompasses the final design, construction and commissioning of the project. Phase two begins only if the City and the design-builder reach agreement on the schedule and GMP or fixed price.

The PDB model uses a collaborative relationship between the City and the design-builder. The PDB procurement stage uses the familiar two-step request for qualifications (RFQ) and request for proposals (RFP) process to select a design-builder based primarily on qualifications. There is little project price definition and additional pre-construction services. The PDB delivery facilitates greater City input into the design process than other design-build approaches. This model uses concurrent design development and construction cost estimation, with iterative cost estimates prepared that help "design to budget." Once the City and design-builder agree upon a GMP or fixed price the project would advance to construction. If the design-builder and the owner cannot reach agreement on an acceptable GMP or fixed price, the owner can use the completed design as the basis for a hard construction bid procurement (i.e. the traditional design-bid-build [DBB] approach). In this case, an "off-ramp" occurs, and the project becomes more like a contract DBB, which may impact design ownership.

At the conclusion of construction, the design-builder is responsible for demonstrating the facility's performance through an acceptance-testing procedure that is agreed upon with the City and included in the contract. Performance risk is borne by the design-builder until the City accepts the project, which represents the transfer of operation, maintenance, and performance risk to the City.

During DRC meeting #3, the Technical Team surveyed the DRC using an anonymous, interactive polling methodology to force-rank priorities relative to each other and presented survey results at meeting #4. Based on the survey responses, the PDB delivery model aligns with the DRC's priorities for Project Group F. These priorities include interest in cost transparency, City input to design process, transfer of performance risk to the designer, and consideration of life-cycle cost within design and construction decisions.

Potential Consequences

The PDB delivery model has some defining characteristics as compared to other, more traditional delivery models such as DBB and construction manager/general contractor (CM/GC) as well as the fixed-price design-build (FPDB) model. The following sections describe these characteristics in more detail.

City's Role in Project Delivery Process

The PDB model allows for greater owner involvement in project delivery compared to traditional design-build delivery methods. The City would follow an RFQ process to generate a short list of candidate design-build firms. The City next conducts interviews and selects the design-build firm based on qualifications, past performance, and limited pricing information. The design-builder and City would develop the project scope and detailed design together. This allows for continued input from the Nampa WWTP staff throughout the design process, similar to the traditional DBB delivery model. The design-builder also prepares the construction cost estimate progressively and in parallel to the detailed design development. The City would negotiate the price with the design-builder, manage the design-build contact, verify that performance guarantees have been met, and transition operations after the constructed project is accepted.

Risk Transfer

Project design risk is shared by the design-builder and the City because they work together during the design phase, with the City providing input to the design at specific milestones. This collaboration reduces risk of design decisions impacting constructability. Because of the single-point responsibility for the design-builder, design coordination risks are shifted to the design-builder, which distinguished PDB from DBB and CM/GC delivery methods. These risks often result in project changes in the DBB and CM/GC delivery methods because the designer's liability is limited to the "standard of care" and the contractor's liability is restricted to the as-bid construction documents.

The design-builder retains construction schedule risks, assuming the design reviews and other City responsibilities are met. The cost of the constructed project up to the GMP is the responsibility of the City, such as price escalation not explicitly addressed by the contract, owner-requested changes in scope, and changed conditions. Beyond the GMP limit, the design-builder is responsible for budget overages. The design-builder is responsible for project performance/acceptance. The quantity and quality of the facility effluent, which can be specified in the contract standards, is the responsibility of the design-builder to achieve.

The design-builder is responsible for demonstrating the facility's performance through an acceptance-testing procedure that is agreed upon with the City during the contract negotiation or GMP/fixed price negotiation stages. The contract explicitly states these performance standards required for project acceptance. Performance risk is borne by the design-builder until the City accepts the project, which represents the transfer of operation, maintenance, and performance risk to the City.

The table below shows the risk transfer profile for the PDB delivery model as it relates to the Phase II Upgrades. The risk transfer profile for the DBB delivery approach is also shown for comparison. The risks with differing risk profiles between the delivery models are highlighted for convenience.

Risk	Progressive Design-Build		Design-Bid-Build	
	<i>Design-Builder</i>	<i>Owner</i>	<i>Contractor</i>	<i>Owner</i>
Project Design	Shared	Shared		X
Coordination with Existing Facilities	Shared	Shared	Shared	Shared
Quantity and Quality of Influent		X		X
Quantity and Quality of Effluent	X			X
Project Performance / Acceptance	X		Shared	Shared
Proprietary Processes or Equipment	Shared	Shared	Shared	Shared
Schedule	Shared	Shared	Shared	Shared
Cost of Constructed Project beyond GMP	X			X
Site Conditions		X		X
Construction Warranty	X		X	
Materials Cost Escalation	TBD	TBD		X

¹ Adapted from the Water Design Build Council's Water and Wastewater Design-Build Handbook (Fourth Edition)

Determining Project Price and Project Value

At the point when the City procures a design-builder firm there is little price definition. The selected design-builder prepares a fixed price or GMP for the project. The City can help select key subcontractors and equipment suppliers proposed by the design-builder and used in their cost estimation. The City and design-builder would collaborate to determine the team that will provide the most value.

During the design development, the construction cost is progressively developed by the design-builder often in conjunction with the 30- and 60-percent levels of design detail. The iterative, “design to budget” approach to cost estimates from the design-builder help ensure the project budget is not exceeded. As compared to the often single, value engineering step within a DBB or CM/GC model, this continuous price feedback allows the City to constantly evaluate decisions and adjust as needed to deliver the best overall project value.

After sufficient design definition is achieved, often around the 60- to 90-percent range, a proposed GMP or fixed price is prepared by the design-builder for City approval. There is an “off-ramp” in the event the City and design-builder cannot reach an agreement on the GMP or fixed price. The City could either renegotiate with a different design-build firm or opt to take the partially-completed design and proceed with a DBB procurement.

Performance Guarantees

Compared to traditional DBB and CM/GC delivery, the PDB model shifts performance risk responsibility from the City to the design-builder through performance guarantees. The PDB model involves an “acceptance test” where the design-builder must demonstrate the project meets performance standards established in the contract. The performance standards may be set in the initial contract or can be negotiated as part of the GMP or fixed price negotiations process. Performance standards can include hydraulics, effluent quality, quantity (volume) of treatment, and/or regulatory requirements. The acceptance test is typically performed over a 30-day period to confirm the performance standards can be achieved. The achievement of these standards can be a pass/fail test. If the project doesn't pass, the design builder has the opportunity to make adjustments and re-test. If the performance standards are still not met after multiple acceptance tests, the design-builder is liable for liquidated damages or may have to invest in capital fixes to remedy the issues.

Procurement Considerations

The PDB delivery model is often preferred when an owner prefers greater involvement in the design process while leveraging the schedule, collaboration, and contractual advantages of a design-build method. This model is also valuable when an owner believes that it can lower cost by participating in design decisions and in managing risk progressively through the project definition phase. It is the owner's responsibility to provide clear and consistent direction to the design-builder. The PDB model allows for a straightforward procurement process that can be executed on a shorter timeframe. This delivery method also results in one contractual relationship between the City and the design-builder, which translates to less procurement and management effort by the City.

Recommendation

This briefing is intended to provide additional information to the DRC regarding the selected delivery method for Project Group F. This information will be discussed during DRC Meeting 7 and will be presented to the City Council at an upcoming workshop.