Design/Build: A Designers Perspective

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Definition of Design/Build

“Design/Build is a project delivery system used in the construction industry. It is a method to deliver a project in which the design and construction services are contracted by a single entity known as the design–builder or design–build contractor.” - DBIA
Overview of Design/Build
Status of Devore Interchange D/B
Status of SR-91 CIP
Understanding and Approach to Design/Build
Open Discussion
## Design/Build vs. Design/Bid/Build

<table>
<thead>
<tr>
<th>Metric</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Cost</td>
<td>6.1% lower</td>
</tr>
<tr>
<td>Construction Speed</td>
<td>12% faster</td>
</tr>
<tr>
<td>Delivery Speed</td>
<td>33.5% faster</td>
</tr>
<tr>
<td>Cost Impacts</td>
<td>5.2% less</td>
</tr>
<tr>
<td>Schedule Delay</td>
<td>11.4% less</td>
</tr>
</tbody>
</table>
Procurement

- **Assessment of the Project prior to Decision**
  - Owner Education
  - Risks and Opportunities
  - Two-phase Selection Process

- **Procurement Plan that Enhances the Benefits of D/B**
  - Qualifications based
  - Performance Based Requirements

- **Competitive D/B Procurement Process**
  - Technical and Price Proposals
Contracting

- **Collaborative Effort**
  - Identify Risks
  - Fair Process for CCO’s

- **Standards of Care for Design**
  - Owner’s Role

- **Contractor’s Agreements with Team**
  - Teaming Agreements
  - Communication Protocol
Execution

- Design/Build Process
- Infrastructure to Support Integrated Project Delivery
- Communication and Issue Resolution
- Focus on Design Management Process
SR 22 – Orange/Garden Grove, CA
Devore Interchange Design/Build
Best Value Selection

- Price
- Qualifications
- Life-Cycle Costs
- Schedule
- Design Alternatives

- Management Approach
- Quality
- Maintenance of Traffic
- Safety
- Public Communication

RFP specified relative weight of criteria
Preferred Alternative

Alternative 3A maintains most of the existing interchange structures and provides route continuity for southbound drivers. This alternative also features a truck bypass lane in both directions. This alternative rebuilds the Devore Road Bridge in approximately the same location, along with the northbound Devore Road off-ramp. The southbound Devore Road ramps are relocated approximately 1,500 feet further south along I-215 than the present location. Alternative 3A provides significant cost savings compared to Alternatives 2 and 3.
Project Overview

Project Limits:
- 2 miles north of the split
- 2.3 miles south on I-15
- 1 mile south on I-215

Provide route continuity for southbound I-15
Provide truck bypass lanes
Utilizes existing alignments to save cost
Design Concept
Main Features

- **Southbound I-15**
  - Braided connector to 215 south
  - Add 2 GPs + 2 Aux to existing 3 lanes
  - Truck Bypass

- **Northbound I-15**
  - I-215 Truck Bypass

- **I-215**
  - Southbound Devore Road ramps relocated ¼ mile south
Bridges

- Preferred alternative avoids reconstruction of most existing bridges

- Number of bridges: 15
  - 5 New
  - 10 Widenings
  - Most CIP/PS Concrete Box

- 2 additional bridges related to debris basins
SR-91 Corridor Improvement Project

- $700M Design/Build Project
- Design Express lane extension
- Additional GP lanes and Aux Lanes
- Major TMP effort
Moving Fast Forward

- Awarded design-build contract to Atkinson/Walsh Joint Venture: May 2013
- Completed project funding, bond sale: July 2013
- Held groundbreaking: Dec. 2013
- Projected date for lanes to open: 2017
New Lanes and Tolling
Express Lanes

- Extend proven OC 91 Express Lanes
- RCTC to own/operate in Riv Co
- Replace carpool lanes; carpoolers with 3+ and transponder ride free 94% of time
- Revenue reinvested in 91 corridor
- Without toll revenue, full widening would not be possible, project would be delayed for many years
Property Acquisition

249 Parcels:

- 130 commercial, industrial
- 86 residential
- 16 vacant
- 5 BNSF Railway
- 5 Flood Control District
# Selection of Design-Builder

<table>
<thead>
<tr>
<th>Proposer</th>
<th>Price Score (80 pts. max)</th>
<th>Technical Score (20 pts. max)</th>
<th>Total Score (100 pts. max)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atkinson/Walsh, a Joint Venture</td>
<td>75.28</td>
<td>20.00</td>
<td>95.28</td>
</tr>
<tr>
<td>Shimmick/Obayashi/FNF, a Joint Venture</td>
<td>80.00</td>
<td>13.78</td>
<td>93.78</td>
</tr>
<tr>
<td>Flatiron/Skanska/Rados, a Joint Venture</td>
<td>64.24</td>
<td>20.00</td>
<td>84.24</td>
</tr>
<tr>
<td>The Kiewit Team</td>
<td>55.28</td>
<td>15.94</td>
<td>71.22</td>
</tr>
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Innovations: ATCs

ATCs ... shall be limited to those deviations from the ... Contract Documents, or those concepts requiring further environmental evaluation, that result in performance and quality of the end product that is equal to or better than the performance and quality of the end product absent the deviation or concept, as determined by RCTC, in its sole discretion.
ATC Process

- Received prior to Price/Technical Proposal
- Confidential and not shared with other Proposers
- Diversified team reviewed and:
  1. Accepted (with or without conditions)
  2. Rejected
  3. Asked for meetings or clarifications
  4. Determined to be “Not an ATC”
- RCTC owns ATCs and can use them after paying stipend
### ATC’s Implemented

<table>
<thead>
<tr>
<th>Team</th>
<th>ATC #4</th>
<th>ATC #5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atkinson/Walsh (AW) Team</td>
<td>Main St and Viaduct reconfiguration</td>
<td>MOT lane reductions</td>
</tr>
<tr>
<td>Flatiron/Skanska/Rados (FSR) Team</td>
<td>Maple Street Tight Diamond Interchange</td>
<td></td>
</tr>
</tbody>
</table>

- 21 ATCs approved or conditionally approved, 3 implemented
- Implemented FSR Team’s ATC#4 by issuing a deductive Change Order
- Recall that RCTC owns ATCs and can use them after paying stipend
AWJV ATC #4

ATC Connector

RCTC Benefits:
- Over 200,000 square foot reduction in bridge area for initial project
- Reduces long-term maintenance costs
- Fewer impacts to traffic during construction
- Improves driver experience
- No additional right-of-way required
- "Unstacks" the bridges south of SR-91 at Temescal Wash
- Reduces number of ontrigger bents from nine to two
- Allows cast-in-place bridge construction
- Reduces number of intermediate hinges from nine to five

Future Connectors

RCTC Benefits:
- Over 80,000 square foot reduction in bridge area for future project
- Reduces long-term maintenance costs
- Profile passes under existing I-15-W91 GP connector, which lowers these future connectors by 45 ft. versus the baseline concept
- Reduces number of ontrigger bents
- Allows cast-in-place bridge construction
- More cost-effective future project could be built sooner, allowing toll collections to/from north leg of I-15

Design/Build: A Designer’s Perspective
AWJV ATC #4

ATC Connector

RFP Connector
Why Design-Build?

• Will save 3-4 years over design-bid-build method by overlapping design and build phases
• Shorter construction = Fewer impacts, lower cost
• Schedule and complexity ripe for innovations
• “Best Value” design-builder selected
• Price certainty needed for financial market
• Proper risk allocation reduces risk to RCTC
• Co-located project team = close coordination
Risk Allocation

- Agency Reviews
- Utilities
- Railroad Agreements
- Property Acquisition
- Environmental Permits
Challenges Ahead

• Aggressive schedule
• QC/QA vs. IQA
Pre-Bid Design Effort

- Provide Value Engineering to Reduce Costs
- Work closely with Estimating Team through Task Groups
- Brainstorm and advance only ideas agreed upon with estimators
Success Factors

- Establishing ground rules
- Partnering from beginning to completion
- Integrated Project office
- Over-the-shoulder review ahead of time