Accelerated Roadway Construction

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Accelerated Roadway Construction

- I-15 Corridor Reconstruction – Salt Lake City, Utah
  $1.4 Billion – 1,500 days (16 miles)

- I-25 T-REX – Denver, Colorado
  $1.3 Billion – 1,980 days (17 miles)

- SH130 5/6 Toll Road – Central Texas
  $0.95 Billion – 1,825 days (42 miles)

- DFW Connector – Dallas/Fort Worth, Texas
  $0.92 Billion – 1,700 days (14.4 miles)

- SH99/Grand Parkway F & G – Houston, Texas
  $1.05 Billion – 925 days (38.5 miles)
Accelerated Roadway Construction

- **I-15 Corridor Reconstruction**
  - $900,000 / day
  - 94 days / mile

- **I-25 T-REX** (includes 19 miles of new light rail corridor)
  - $650,000 / day
  - 116 days / mile

- **SH130 5/6 Toll Road**
  - $520,000 / day
  - 43 days / mile

- **DFW Connector**
  - $540,000 / day
  - 118 days / mile

- **SH99/Grand Parkway F & G**
  - $1,140,000 / day
  - 24 days / mile
Accelerated Roadway Construction

- I-15 Corridor Reconstruction
- I-25 T-REX (includes 19 miles of new light rail corridor)
- SH130 5/6 Toll Road
- DFW Connector
- SH99/Grand Parkway F & G
I-15 Corridor Reconstruction

- Brownfield (urban) project
- Bridge Structures – 142 ea
- Major Interchanges – 3 ea
- Roadway – 16 miles complete reconstruction
- Design Hours – 1 million
- Construction Man Hours – 12 million
I-25 T-REX

- Brownfield (urban) project
- Bridge Structures – 75 ea
- Major Interchanges – 2 ea
- Roadway – 17 miles expansion
- Light Rail Transportation Corridor – 19 miles
- Completed 22 months ahead of contract date
SH99/Grand Parkway F & G

- Greenfield/Brownfield (mixed rural & urban) project
- Bridge Structures – 116 ea
- Major Interchanges – 3 ea
- Roadway – 38.5 miles new construction
- Tolling and ITS – new
Project Scope

- Right of Way Acquisition
- Utility Agreements & Relocations
- Environmental Permit Modifications
- Design & Engineering
- Quality Control & Quality Assurance
- Public Information
- Construction
Why Push Schedule This Fast???
I-15 Corridor Reconstruction

World Events

SALT LAKE 2002™
I-25 T-REX

Over-Capacity / Outdated Infrastructure
SH99/Grand Parkway F & G

Commitments to Extreme Economic Development
Key Elements to Accelerated Roadway Construction

- Selection of Contracting Model
- Strength of Design-Build Team
- Commitment of Owner & DB Contractor to Success
- Co-Location
- Design Innovation
- Construction Means and Methods
- Use of Technology
- Labor & Materials Market
"We were able to get it (T-REX) done a lot faster because we finished a lot of the construction before the design was completely done."

Richard Clarke, T-REX project director
Project Delivery Method (Contracting Model)

Project Goals

The I-15 project goals were defined within the imperatives of time, quality and cost.

- **Time**: Time became the dominant goal (driver) for the project. There were two primary time elements. First, research conducted by UDOT in 1995 by a large public relations firm revealed an overwhelming dissatisfaction from the public on the length of time it was taking to complete major capital highway projects for construction or repair. The public was willing to endure a greater level of inconvenience (impact) for a shorter period of time rather than less (but constant) inconvenience for a longer period of time. This response struck directly at traditional highway contracting: the sequential design-bid-build approach, numbers of smaller segments with multiple designers and contractors, and complete control of the schedule by the owner. For the I-15 project, the traditional approach was estimated to take from 8 to 10 years. Second, Salt Lake City was awarded the 2002 Winter Olympic Games which would take place in February 2002. The decision to complete the I-15 project before the Olympics both drove the decision to use design/build as the best (and maybe only) way to complete the project on time and placed a fixed time constraint on the project of international significance.

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**Lessons Learned**: The up-front efforts (coupled with shared risk by UDOT) have been critical in allowing the design/builders to focus on immediate design and construction, and removed uncertainties and contingencies from the proposal pricing. Agreements, permits and working relationships were all in place. It has been said that ROW, utilities and railroads can complicate, frustrate and delay a project more and faster than any other issues. Significant up-front effort and approaches were undertaken to prevent these problems on the I-15 project.
Design – Build Team

JV Partners

- Design
- Quality
- Utilities
- Subcontractors
- Environmental
- ROW
Owner / DB Contractor Commitment to Success

- Partnership
- Team Approach
- Co-Location
- Decision Making Process
- Willingness to “Think Out of the Box”
- Issue Resolution
- Risk Mitigation

“Project managers credit co-location, over-the-shoulder design reviews and partnering as key factors in the project’s success.” – I-15 Corridor Reconstruction Managing Partner (Kiewit)
Co-Location

Owner
- Program Management
- Design Review
- Contract Admin
- ROW/Utility Team
- Construction Oversight

DB Contractor
- Project Management
- Designers
- Contract Admin
- ROW/Utility Team
- Construction Team
Design Innovation
Design Innovation
Design Innovation

So you want to design a highway out of Styrofoam?
Technology
Equipment Technology
Software Technology

SAP Business One

PRIMAVERA P6

XACTRAC
GPS ENABLED TRACKING SYSTEMS

HARD DOLLAR
DATA DELIVERY
Means & Methods

- Aggressive Phasing
- Resource Maximization
  - 2 shifts/day – 7 days/week
    - Equipment and material delivery advantages
    - Major labor scheduling challenges
- Choice of forms tools and supplies
- Sequencing of work activities
Labor & Material Market

**Labor Market**
- Wage & Benefit competition
- Nation-Wide Recruiting
- In-House Training

**Material Market**
- **Sole Source**
  - Known Vendors
  - Known Capabilities
- **Multi-Source**
  - Risk Mitigation
  - More Options
  - Recovery if one fails
- **Self Produce**
  - Control of Schedule
  - Control of Cost
  - Control of Changes
Houston’s construction market: short on labor, high on costs

Oct 8, 2014, 12.09pm CDT

Jenny Agee Aldridge
Reporter-
Houston Business Journal
Email | Twitter

Industry experts say two of the biggest challenges facing Houston’s construction industry are the rising cost of building materials and a strained labor market, where builders are reporting that their competitors are poaching workers from their job sites.

And the challenges are likely to continue.

Houston, a bright spot in U.S. economy, frets about labor shortage

BY TERRY WADE
HOUSTON, June 23

Mon Jun 23, 2014 2:47pm EDT

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(Reuters) - Bustling Houston, one of the bright spots in the U.S. economy, is growing so fast that business leaders fear running out of skilled labor as billions are spent building new energy infrastructure on the Gulf Coast.

Cement and Concrete Prices in the South Take Off

GUEST CONTRIBUTOR - October 2, 2014 2:26 PM
Categories: Commodities, Guest Post | Tags: IHS

Spend Matters welcomes this guest post from Charlie McCarren, an economist at IHS.

Escalation rates for cement and ready-mix concrete nationally have been modest, but regionally, price increases within the Gulf Coast have risen much quicker. According to the Bureau of Labor Statistics, ready-mix concrete prices in the South, region dominated by Gulf Coast states, are rising at almost one-and-a-half times the national rate. In July, ready-mix concrete was up 5.6% year-over-year (y/y) in the
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“HAHAA!! YOU’LL NEVER GET TO WORK ON TIME”