DESIGN-BUILD;

Is Reality Meeting Expectations

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DESIGN - BUILD DELIVERY

- Single Firm or Entity
- Single Point of Responsibility
- Integrates Design-Procure-Construct
- Architect or Engineer of Record & Constructor of Record
- Warrants Design & Construction Quality and Performance
Design/Build Method
Project Structure

Owner

D/B Entity

Multiple Construction And Equipment Packages
Design / Build Continuum

- Design - Build to performance specs
  Design @ 10%-20%

- Design - Build to Design Criteria
  Design @ 20%-30%

- Design - Build to Prelim. Design
  Design @ 30%-40%

- Design - Build to Design Draw - Build
  Design @ 40%-50%

- Design Draw - Build

- Evaluated Bid - Qualifications Based Selection

- Typically Low Bid
50% of all new (non-residential) construction by year 2010??
EXPECTED BENEFITS

- Shorter Project Duration
- Less Owner Risk
- Less Change Orders
- Less Surprises
- Lower Owner Costs
- Lower Project Costs
- Comparable Quality
- Better Constructability
- More Flexibility for Owner Changes
- Better Warranty Service
Shorter Project Duration

- Studies indicate; 10 - 30 % Savings
- Fed DOD; 18 % Savings
- 25 % if Successful Partnering
  - Mutually Address Interfaces
  - Mutually Overcome Obstacles
  - Mutually Support Objectives
Less Risk For Owner

- Single Responsibility
- Early Discussion of Risk Management
- Less conflicts; more “Team Ball”
- Reduced Disputes & Claims
Less Change Orders

- Design-Builder covers design errors & omissions
- Design-Builder warrants both Design & Construction
- Better Control of “Scope Creep” and “Scope Leap”
Less Surprises

- Early Focus on Mutual Understanding of Project Requirements
- Cost & Schedule are Fixed Earlier in Project Duration
- Schedule Urgency Promotes Proactive Approach
Lower Owner Costs

- Less Owner Contracts Administration
- Less Coordinating Parties
- Less Owner Interfaces
- Shorter Project Duration
- More Efficient Owner Involvement
Lower Project Costs

- Studies indicated 6 -13 %
- Sources of savings
  - Shorter project duration
  - designing to build
  - design supports construction
  - innovation
  - more efficiencies
Comparable Quality

“IT IS IMPOSSIBLE TO HAVE TOTAL QUALITY MANAGEMENT WITHOUT BEING ABLE TO CONTROL BOTH DESIGN AND CONSTRUCTION”

William Hayden, Quality Management Expert and “Deming Disciple”
Improved Constructability

- **Builder has Early Involvement**
- **Project Designed to be Built**
- **Early Selection of Means & Methods**
- **Early “Buy-in” by all Parties**
Flexibility in Owner Changes

- DB Team can better evaluate both Technical Impact & Constructability
- Includes Cost & Schedule Impact
- More Easily Integrated into Project
- Easier Communication & Mutual Understanding
Better Warranty Service

- Less Warranty problems due to single source responsibility, and scope usually extends through performance
- No debate about whether it’s a designer or constructor problem
- Qualifications based and Best Value selection process is motivator to maintain client service
Construction Industry Institute (CII) Study

- 351 Projects
- Various types / Industry sectors
- Compared performance between DBB, CM@R, & DB
- Performance evaluated - Cost, Schedule, Quality areas
Construction Industry Institute (CII) Study

- **Design-Build Performance compared to Design/Bid /Build**
  - Unit Cost - 6% less
  - Construction Time - 12% faster
  - Project Time (design & const)- 33% faster

- **Quality on a 10 point scale -**
  - Start-up; Call Backs; O&M; Exterior & Structure; Interior; Environmental; Equipment
  - DB outperformed D/B/B in every category
Expected Constraints & Threats

- Legislative, Licensing & Permitting Restrictions
- Organizational & Political Resistance
- Pre-qualification of D/ B Firms
- Owner Ability in Determining Requirements
- Perceived Conflict of Interest
- Limited Standards Usage
- Limited Owner Experience & Expertise
- Lack of Experienced D/ B Firms
- Industry Obstructions
Legislative, Licensing & Permitting Restrictions

- **State & Local Legislation**
  - 30+ states have capability
  - Charter cities have flexibility

- **Engineer and Architect Licensing**
  - modifications in progress while maintaining professional purpose

- **Permitting Agencies mission and practices**
Organizational & Political Resistance

- Organizations Resistant to Change
- Industry Players Resistant to Change
- Political Entities Resistant to Change
- Conflict with Organizational focus
- Trying to Do “New Things” the “Old Way” will not produce Best Results
Inability to Pre-qualify Firms

- Reduces Best Competitors Interest
- Reduces Benefit / Cost Opportunity
- Increases Competitor’s Risk
- Increases Owner Risk
- Reduces Probability of Selecting Proven Team
Difficulty in Determining Requirements

- Establish Basic Requirements w/o Detail Design
- No Design by RFI & Submittal
- Defining Preferences
- Owner Organizational Coordination; internal and with 3rd parties
Perceived Conflict of Interest

- Traditional Perspective
- Quality Assurance & Quality Control
- Fox in the Hen-house
- Owner’s Representative, if req’d
Industry Standards Usage

- Limited Public Records
- Limited Documentation
- Some Industry Efforts
  - AIA, AGC, EJCDC, FIDIC
  - DBIA
Limited Owner Experience

- Limited History & Familiarity
- Limited Understanding of Process
- Existing Procedures Not Applicable
- Partnering and Risk Sharing
- Difficulty in Experimenting
- Untested Evaluation Methods (Best Value vs Low Price)
Lack of Experienced Design-Build Firms

- New Market
- New Insurance & Bonding Issues
- New Working Partners
- New Risks (e.g., performance)
- New Approach between participants
Industry Obstructions

- Market Changes
- Greater Risk
- Industry Roles & Responsibilities
- New Competition
- Heavier Financial Requirements
Let’s talk about some Completed Projects, and Success Factors
Maxson Wastewater Treatment Plant - City of Memphis - (Public)

Facility

• Add treatment for organic load capacity

Professional Procurement

• D/B with prequal procedure
• Low bid w/ alternatives

Costs/Schedule

• $12 Million w/20 mo. schedule

Special Features

• 20% Savings under Owner budget
• Project Completed 2 mos ahead of schedule to meet treatment requirement
**Bayou Marcus Wastewater Reclamation**
*Escambia County; Pensacola, FL - (Public)*

### Facility
- Replace existing with new 8 mgd plant

### Professional Procurement
- D/B based on prelim. engineering
- Pre-qualified list - low price w/ alt’s

### Costs/Schedule
- $10 Million w/24 mo. schedule

### Special Features
- Delivery restructured project delivery after bids exceeded owner budget
- Owner purchased equipment
- Work completed 2 mos. ahead of schedule
BAYOU MARCUS
Ford Road Water Plant
Indianapolis Water Co.; IN - (Private)

Facility
• New 4 mgd water plant; greenfield site

Professional Procurement
• Design/Build w/max price + shared savings
• Negotiated selection

Costs/Schedule
• Value $4 million w/7 mo. schedule

Special Features
• Project complete; 2 mos. ahead of schedule
• Savings 5% of GMP
Milwaukee Ozone Plants
City of Milwaukee - (Public)

Facility
• Ozonation systems - existing water plants
  – Linnwood - 275 mgd
  – Howard Ave. - 105 mgd

Professional Procurement
• Design / Build w/ Guaranteed Max Price
• Pre-qual. list / evaluated price w/ alternatives

Costs/Schedule
• Value $40 Million w/17 mo. Schedule
• $8 Million in added scope as change order
• Owner pre-qualified ozone equipment
• Bid price 20% less than initial budget
• Project Complete
• $1 Million savings to GMP

Special Features
Intel Pretreatment Project

Phoenix - (Private)

Facility
- Expanding pretreatment (filtration) system

Professional Procurement
- D/B Negotiated contract; reimbursable; open book
- Equipment - Pre-qual. - Low Bid
- Balance of plant - Low bid

Costs/Schedule
- $1 Million Rev.; w/4 mo. Schedule
- Project Complete on schedule

Special Features
- Partnering to develop Hi-tech solution
- Owner procured some equipment (Process)
Menu of Success

- Clearly Defined Project w/ min. external restraints and influences
- Funds available & committed
- Consultant assists Owner to define scope, performance, and preferences
- Pre-qualification process; 3-5 firms
- Designer shares DB Risk - integrated into the DB team (no over the fence)
- DB Contract has fair allocation of Risk
Menu for Success (cont’d)

- Owner promotes innovation and allows flexibility of Design Builder (means and methods)
- Owner proactive w/ permitting agencies; work packages
- Owner proactive in Design Submittals - Workshops
- Each Party actively controls own staff
- Changes are negotiated promptly
Construction Industry Institute (CII) Study

- **Best performing projects**-
  - Owner decision making
  - Good scope definition
  - Excellent team communication
  - Qualified contractors

- **Worst performing projects**-
  - Contractor engaged late in design
  - Limited team experience
  - Onerous contract clauses
  - Poor decision making process
  - No pre-qualification process
CONCLUSION

- Continued Obstacles
- Continued Successes
- Continued “Lessons Learned”
- Improved Understanding
- Yes - Reality is meeting Expectations, but not without hard work and, occasionally, some disappointments along the way