CHANGING PROJECT DELIVERY SYSTEMS

by

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Traditional Method (Design_then_Build)

- Also known as Design_Bid_Build or hard money or Competitive bid contract.
- Has three sequential phases
  Design - Bid - Construction

Architect-Engineer hired

Design Phase → Bid/Award → Construction Phase

Single Construction Contract

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Traditional Organization of Construction

A/E design consultant
Build the project on paper

A/E general supervision

Contractor

Construction

Planning, engineering, and management

Owner user

Use of facility

Project completion and acceptance

Bid acceptance and notice to proceed

Call for bids

Single bid package

Contract construction

Contract

Contract documents

Industry participation bidding

Feasibility

Engineering and design

Contract design and supervision

In-house and consulting services

Feasibility and design bidding documents
Planning, engineering, and management

In-house and consulting services

Specialist and consultants

Project approval and selection of A/E

Call for bids

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Traditional Organization

Owner

A/E

General Contractor

Sub Contractor
Sub Contractor
Sub Contractor
Sub Contractor
Sub Contractor
Estimating Needs for Design-Bid-Build

- Complete set of drawings
- Specification
- Other contract documents
  - General conditions
  - Special conditions
  - Addenda
- Others (soil report)
Hierarchy of Contract Document

- Addenda
- Special Conditions
- General Conditions
- Specification
- Drawing
Single Source Delivery

1. Design Build

2. Space Engineer/Procure/Construct (EPC)
   - EPC model#1 (Pure CM, Construction Management)
   - EPC model#2 (General Contractor acting as construction manager)
   - EPC model#3 (A/E acting as CM)
   - EPC model #4 (CM acting as Contractor)

3. Others
Fast Track or Phased Construction Method

- **Design Phase**
  - Concepts
  - Working Drawing

- **Construction Phase**
  - CM and A/E
  - or
  - DB hired

  Variable separate construction contracts
Level of Influence

Influence vs. Project Cost over Time

Ability to Influence vs. Project Cost over Time

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1. Design Build

- Single firm responsible for both design and construction.
Form of Design Build Organization

- Owner
  - Design-Builder (Architect/Engineer)
  - Contractor

- Owner
  - Design-Builder (Contractor)
  - Architect/Engineer

- Owner
  - Design-Builder (Joint Venture)

- Owner
  - Design-Builder (DB Firm)

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Advantages of Design & Build for Owners

- Owner only has to communicate with one entity for the entire project
- Total project duration can be reduced because phased construction is easier to implement. (Fast tracking)
- Integration of construction planning and design phases
- Claims reduction (reduction of adversary relationships)
- Innovation in design and construction can be encouraged
- Risk assigned to party best able to manage that risk
- Reduce change orders
Disadvantages of DB for Owners

- Fewer checks and balances, owner must rely on integrity of the design-build firm
- Reduced owner involvement in the design process may result in less than expected results
- All your eggs in one basket
Advantages to a design-build organization

- Improved constructibility through design/construction integration
- A specialized organization can be developed that has a specific expertise which will be attractive to specific market areas
- Reduction of negligence claims between the Architect/Engineer and the construction contractor since they are under one umbrella firm
- Ability to react rapidly to change in scope
Disadvantages for the design-build firm

- Acceptance of additional project risk
- Possible premature release of bid packages (when using fast track) which can lead to increased errors in the plans and extras
- Scope of work changes can be difficult to identify under DB/ fast track construction
- Heavy overhead due to large multi-disciplined staff requirements
2. Engineer/Procure/Construct (EPC)

EPC Model #1

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By soliciting more bids and by passing the savings directly to the owner, the owner saves $15,000 compared to the best general contractor price. This example illustrates four bid packages. Typical commercial building projects may have thirty or more bid packages.
2. Engineer/Procure/Construct (EPC) (cont.)

General Contractor acting as CM

Owner

Engineer/Procure Construct

Specialty Contractors and Vendor

Specialty Contractors and Vendor

Specialty Contractors and Vendor

Specialty Contractors and Vendor

EPC Model #2

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Other Models of Single Source Delivery Systems

- A/E acting as CM

EPC Model #3
Other Models of Single Source Delivery Systems (cont.)

👍 CM acting as Contractor

Owner

A/E

Prime Contractors

EPC Model #4

CM

Contractor

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Others

Owner Builder

Owner

Design Department

Construction Department

Contractors

Optional Own Force Work

Prime Contractors

Subs

CM Owner

A/E

Owner C.M.
Estimating Needs for Single Source Delivery

- Conceptual Design
- Assemblies cost data
- Update your estimate as the design develops
- Value engineering studies
Design-Build Issues

1. Prequalification

   The reduction of the number of possible bidders to a small group of serious, qualified bidders improves the effectiveness of the selection process.
Design-Build Issues (cont.)

2. Proposal Evaluation
   - Cost only
   - Cost and time
   - Multiparameter (quality, safety…etc.)
Innovative Contracting Methods

- **Multiparameter Bidding (A+B+C)**

  Multiparameter bidding is a bidding system within the competitive bidding concept where a successful bidder is selected based on the combined cost, time and quality.
Example of Multi-parameter Bidding

<table>
<thead>
<tr>
<th>Contractor</th>
<th>&quot;A&quot;</th>
<th>Bid Time (Days)</th>
<th>&quot;B&quot; Facility User Cost @ $ 4000 per Contract Day</th>
<th>&quot;A+B&quot; Cumulative Bid Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
</tr>
<tr>
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<td>170</td>
<td>$680,000</td>
<td>$3,942,724</td>
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<td>$560,000</td>
<td>$3,611,868</td>
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<tr>
<td>3</td>
<td>$3,231,006</td>
<td>95</td>
<td>$380,000</td>
<td>$3,611,006</td>
</tr>
</tbody>
</table>

Lowest Cumulative Bid Cost
3. Legal

a. Insurance and Bonding
   - The contractor should have the proper insurance to cover design deficiencies or cover construction errors.

b. Conflict of Interest
   - Design-build eliminates the checks and balances of the traditional methods.
Construction Warranties (DBW)

A warranty is a guarantee of the integrity of a project and of the maker responsibility for the replacement or repair of deficiencies for a period longer than the traditional 1-year warranty.

- It is different than project maintenance warranties that provide routine maintenance