



2019 PNWS-AWWA Conference
Engineering Track
Friday, May 3rd, 2019
Oak Room --- 8:30 to 9:00 am

Is Alternative Project Delivery Appropriate for My Project?

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Topics

- Introduction to Project Delivery Models
- Traditional
 1. Design-Bid-Build (DBB)
- Alternatives:
 2. Construction Manager/General Contractor (CM/GC)
 3. Progressive-Design-Build (PDB)
 4. Lump-Sum/Design-Build (LS/DB)
- Choosing Your Alternative Delivery Model
 - Selection Criteria
 - Selection Process

Traditional Delivery

1. Design-Bid-Build (DBB)

Design-Bid-Build (D-B-B) Structure

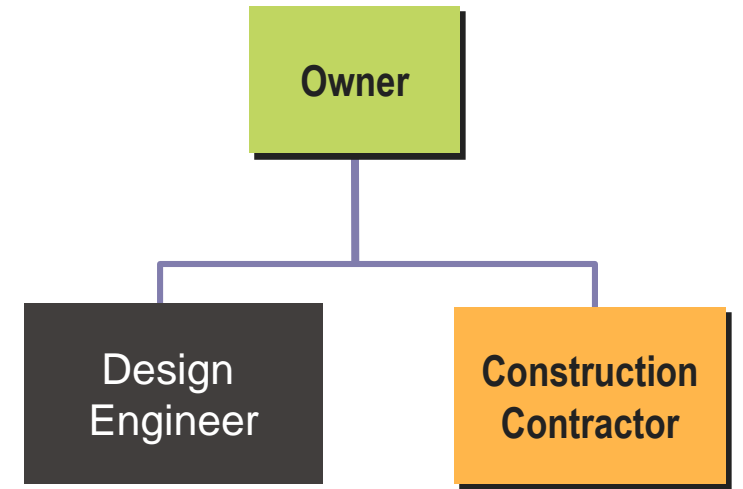
Overview: Traditional Engineer of Record Professional Services Contract selected based on qualifications; Contractor is selected as the lowest, responsible and responsive bidder and enters a Construction Contract with General Conditions.

Contract Structure: Separate design contract and construction contract

Bid Document Requirements: Contractor must build the project as specified in the design documents. Owner has option of pre-qualifying or providing minimum qualifications for bidders to be considered responsible and responsive.

Selection Basis: Low bid

Owner Involvement During Design: High level of involvement



(Two contracts)

D-B-B Benefits

- Most **understood**
 - ✓ Owner “comfort zone”
 - ✓ Default method for government procurement for past century +
 - ✓ Default legal pathway
 - ✓ Insurance and bonding well defined
 - ✓ Established procurement processes; no need for special permissions to use it.
 - ✓ Least subjective selection process for Contractor
- Owner **controls** the design typically through design evolution of 30-, 60-, 90- and 100% design submittal stage gates with cost and schedule estimates provided by Engineer.
- Familiar competitive bidding process.
- Well suited to uncomplicated projects with straightforward objectives and adequate timelines.



D-B-B Limitations

- Inherent **adversarial** interests between Owner, Engineer, and Contractor
 - ✓ Can lead to change orders (Initial low price may not be the final price)
 - ✓ Can lead to disputes
 - ✓ Can affect schedule and quality
 - ✓ No contractual relationship between parties; design is managed by Owner independent of construction
- **No input** from contractor during design
 - ✓ Constructability considerations can impact cost and schedule
 - ✓ Lower potential for innovation
 - ✓ Owner warrants design to contractor (**performance risk**)
 - ✓ ... therefore potential for “design conservatism”
- Contractor selection focused on low price (not qualifications) once pre-qualification requirements are met
- Not many options for “early-out” packages unless Owner wants to procure.



Alternative Project Delivery

2. Construction Manager / General Contractor (CM/GC or GC/CM or CMAR)
3. Progressive-Design-Build (PDB)
4. Lump-Sum / Design-Build (LS/DB)
5. Design-Build-Operate (DBO)

State of Oregon Legal Framework

- ORS 279 (Oregon)
 - ✓ Allows alternatives to “low-bid” requirement
 - ✓ Typically requires public hearing / approval of findings by Review Board
 - ✓ Typically requires justification as to why it is in the best interest of the public (finding of fact)
- A “finding of fact” must demonstrate that the alternative:
 - ✓ ... is unlikely to encourage favoritism or substantially diminish competition
 - ✓ ... is reasonably expected to result in:
 - ... substantial cost savings; and
 - ... substantial benefits to the contracting agency

State of Washington Legal Framework

- RCW 39.10
 - ✓ Allows alternatives to “low-bid” requirement
 - ✓ Design-Build, and General Contractor/Construction Manager (GCCM)
 - ✓ Typically requires approval by Project Review Committee (PRC)
 - (Statewide appointment that serves in advisory to public agencies)
 - ✓ To approve a proposed project for alternative delivery, the PRC shall determine that:
 - Will provide a substantial fiscal benefit
 - The public body has the necessary experience and qualifications to carry out the alternative contracting procedure
 - Public comments must be considered.

State of Idaho Legal Framework

- Mostly limited to Department of Transportation.
- 40-904 Design Build
- 40-905 CMGC
 - ✓ No more than 20% of the DOT's annual highway construction budget shall be used for design-build and CM/GC contracts combined.
 - ✓ No less than 30% of any CM/GC contract awarded shall be self-performed by the CM/GC firm awarded such contract.
 - ✓ A professional engineer licensed in the state of Idaho shall have responsible charge of preparing the request for proposals (RFP).

CM/GC Structure

Overview: Owner & Engineer of Record develop a scope and budget with a CM/GC through a collaborative design process,

Contract Structure: Separate design contract & CM/GC contract

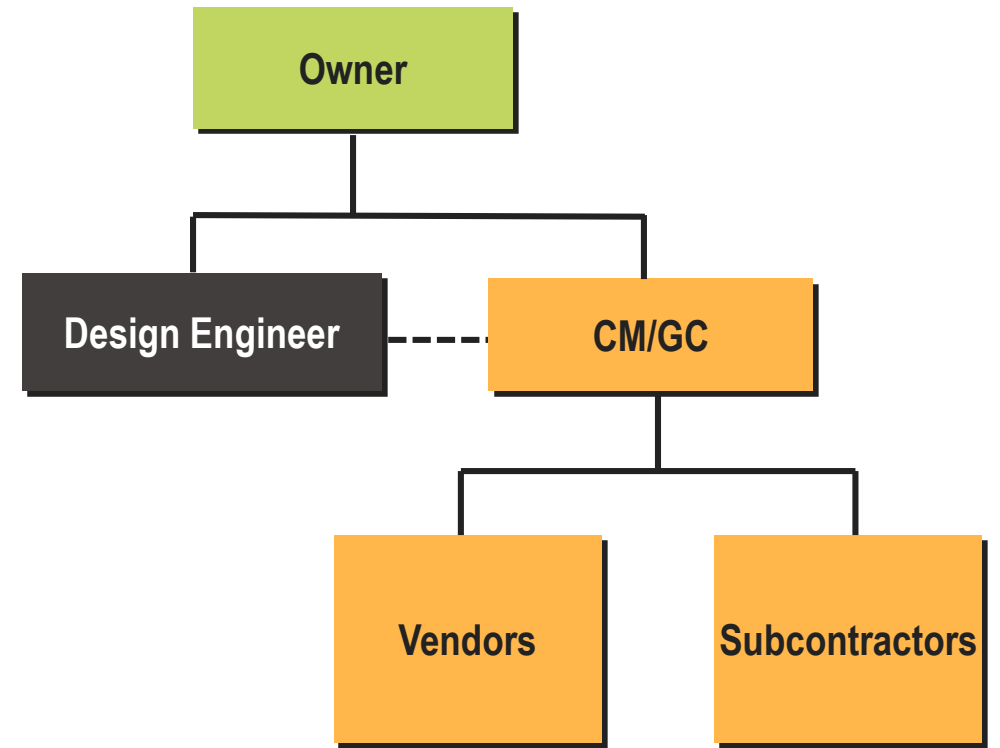
- CM/GC agrees to Guaranteed Maximum Price (GMP) or Maximum Approve Contract Cost (MACC) prior to construction (at-risk)
- Work is competitively bid to subcontractors/vendors or self-performed

Design Coordination: Design customization to a single contractor's techniques, processes, and methods

Bid Document Requirements: Scope, schedule, contractual terms

Selection Basis: Qualifications with some price components

Owner Involvement During Design: Design phase is a collaborative process between Owner, Engineer and Contractor which includes pricing and value engineering.



CMGC Contract – two agreements

- Preconstruction Phase – professional services contract for labor (schedule / estimating / constructability)
- Construction Phase – Construction agreement for labor, materials and management
- Off ramp to D-B-B if unable to reach agreement on GMP / MACC

CM/GC Attributes -- (Compared to D-B-B)



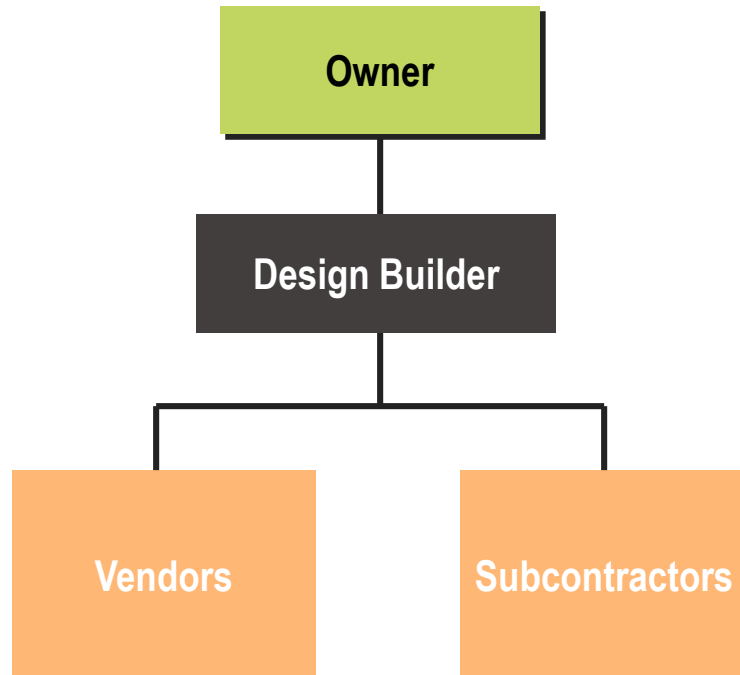
Pros

- Enhanced Engineer and Contractor **collaboration**
- **Owner controls** design input
 - ✓ Maintains trusted-advisor design engineer **relationship**
- Potential for **cost certainty**
 - ✓ (Owner is financing a contractor to engage early in design and work constructability, efficiency, schedule and pricing)
- Pricing & cost model are developed along with design = No surprises
- Helps resolve challenging constructability issues early in the process
- Well suited for maintenance of plant operations or rebuilds
- **Two contracts**
 - Familiar format for Owner; however parties could still have different agendas

Cons

- Owner gets to select designer and GC/CM personnel
- Owner warrants design to CM/GC (**performance risk**)
- Increased Owner **time commitment** during design – manage two relationships
- Potential that parties can't agree to a mutually acceptable GMP
- Design fees might need to increase to account for option-engineering and increase in collaboration with additional parties.

Design-Build Structure



Two Models:

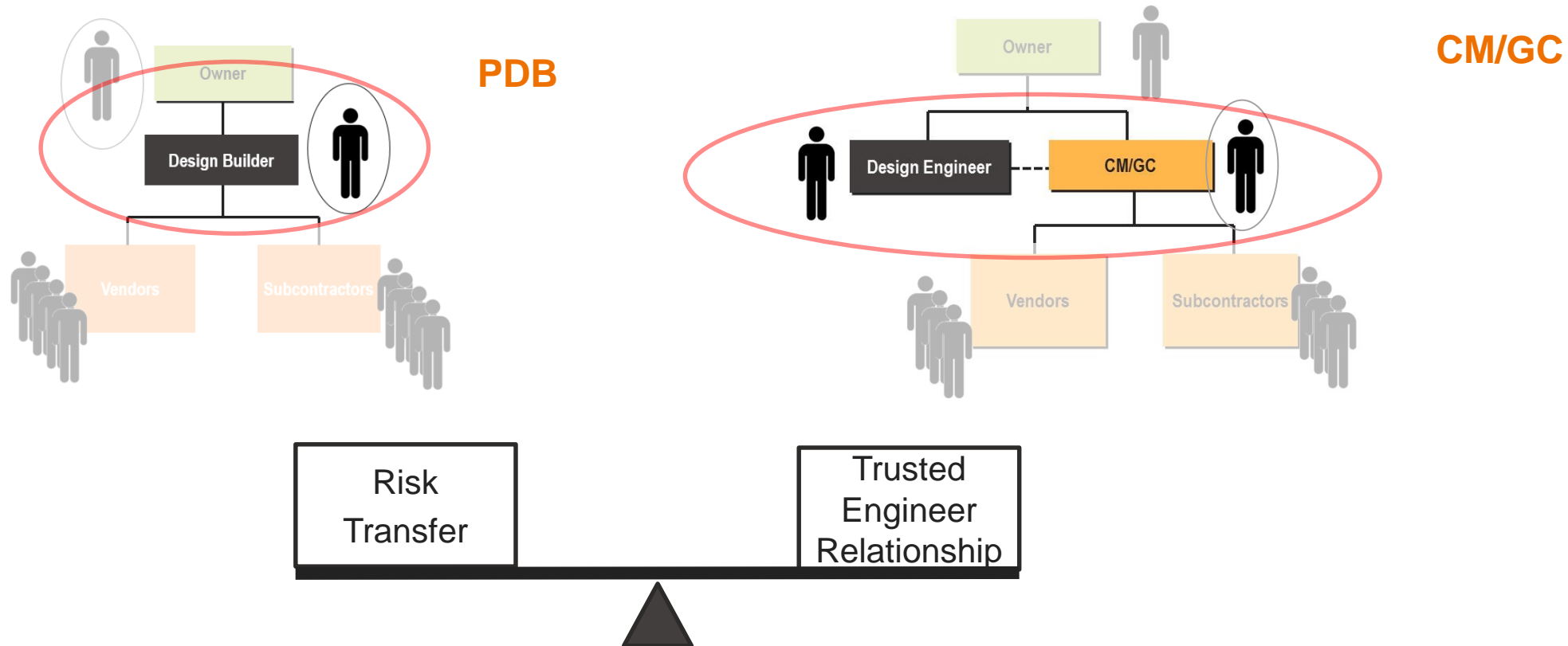
3. Progressive Design-Build (PDB)

4. Lump-Sum / Design-Build (LS/DB)

Progressive Design-Build... What is the "Progressive"?

Design is *progressed* in a collaborative manner with Owner input into project scope, project quality, cost and schedule.

Sounds a lot like CM/GC... But there is only one contract:



P-D-B Structure

Overview: Owner and P-D-B develop the design and project budget through collaborative process

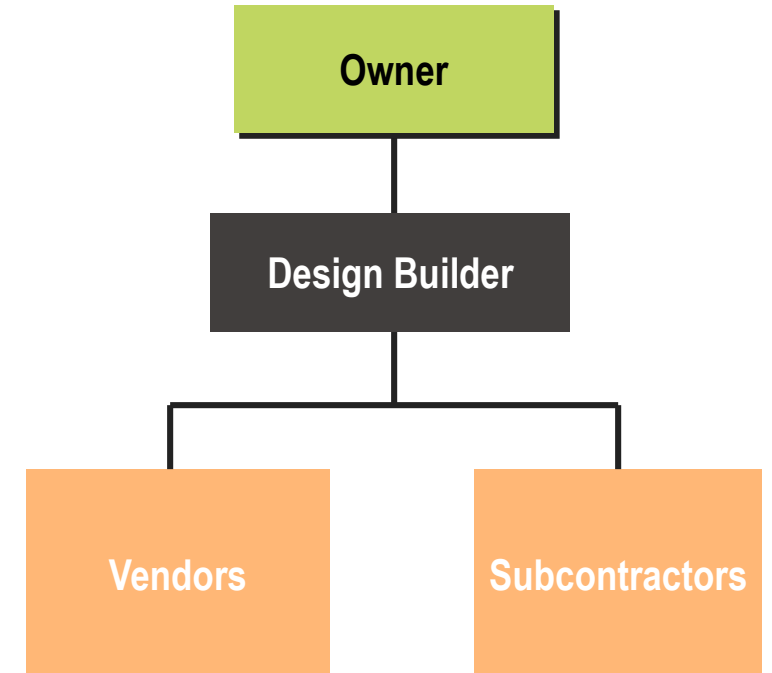
Contract Structure: Single design & construction contract

- P-D-B agrees to GMP prior to construction (at-risk)
 - Work can be competitively bid to subcontractors/vendors or self-performed

Bid Document Requirements: Scope, schedule, contractual terms

Selection Basis: Qualifications with some price components

Owner Involvement During Design: Design phase is a collaborative process between Owner, Engineer and Contractor which includes pricing, sequencing and scheduling and value engineering



P-D-B Attributes

Pros

- Qualification and cost-based selection
- Single point of accountability for design and construction
 - ✓ Improved owner risk posture
 - ✓ Performance guarantees
 - ✓ Potential to reduce change orders, and disputes
- Inherent engineer and contractor **collaboration**
- Retain **owner control** and design input
- Potential for cost **containment** (and contingency reduction)

Cons

- Traditional owner-design engineer **relationship** diminished
- Requires **rapid and earlier decision-making** by Owner regarding project scope and quality, cost and schedule.
- Significant owner time **commitment**
- Owner can't independently select engineer and contractor

Some Owner's consider adding an Owner's Agent to the team to perform independent oversight, management, parallel cost estimating, construction management and/or other critical tasks that would be performed by the engineer, if they were under contract to Owner. Usually a factor of project complexity and Owner resources.

Lump-Sum/Design-Build Structure

Overview: Design/Builder responsible for delivering the project subject to the specifications defined by the DB contract

- Selection process requires specialized attention to procurement documents since it includes pricing.
- The process requires development of performance criteria and unique contracts and general conditions.

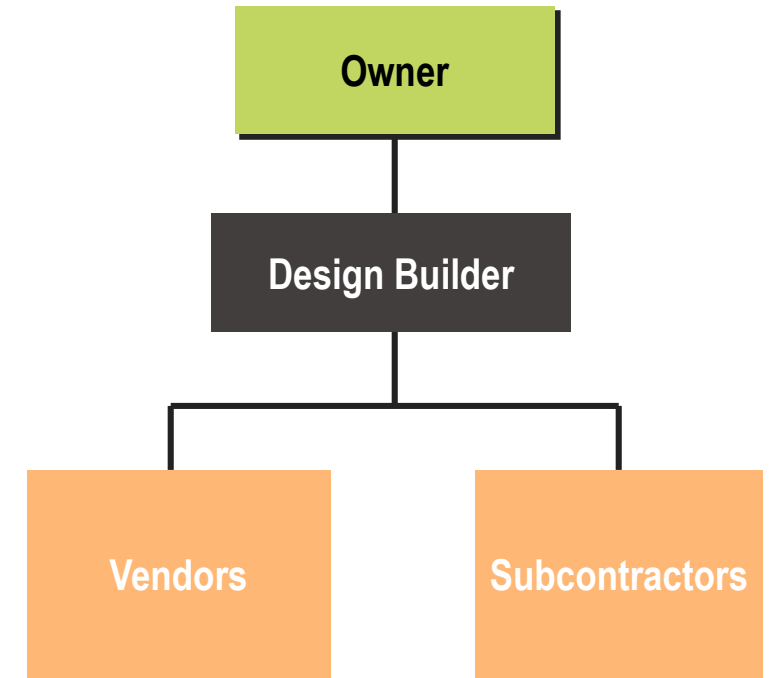
Contract Structure: Single design & construction contract

- Design/Builder works under lump sum contract and manages all subcontractors/vendors

Bid Document Requirements: Design and performance requirements

Selection Basis: Best value: lump sum price, scope and qualifications

Owner Involvement During Design: Limited



Lump-Sum / Design-Build Attributes

Pros

- Contractor qualifications considered in selection
- Single point of **accountability** for design and construction
 - Enhanced owner risk posture
 - Performance guarantees
 - Potential to reduce change orders
 - Inherent engineer and contractor **collaboration** (innovation potential too)
- Early **cost** information
- Potential for cost share between DB and Owner (pain/gain)

Cons

- Costly and lengthy **procurement** period
 - Procurement documents have to ensure quality while allowing innovation
 - DB bid includes contingency for risk that is inherent to pricing unfinished design
- Limited **owner control** and design input
- Traditional owner design engineer **relationship** diminished
- A proposal stipend helps to attract interest and quality proposals

DBO Structure

Overview: Design/Build/Operator responsible for all phases of the project, subject to the performance requirements. Costs & regulatory compliance guaranteed with annual operating cost adjustments. Owner retains ownership, permits, and rate setting.

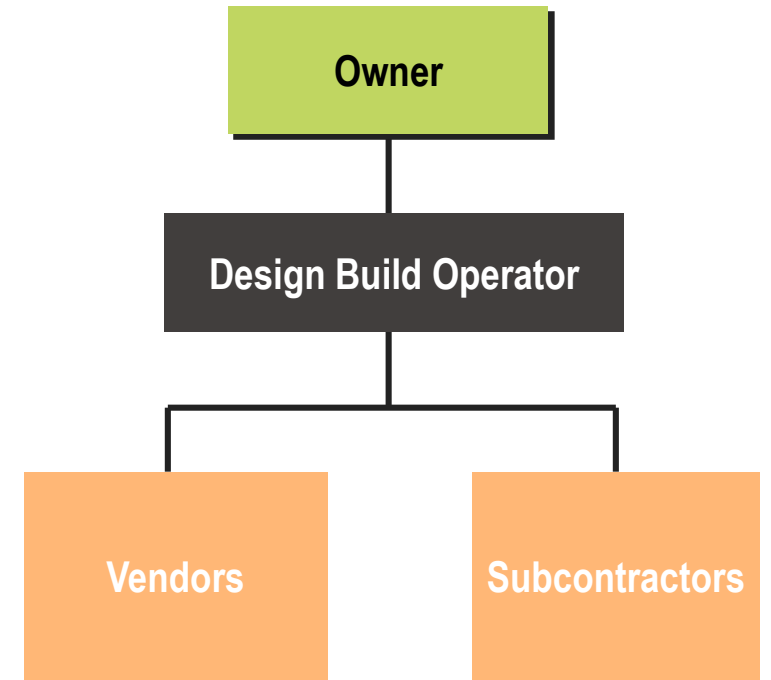
Contract Structure: Owner contracts with a single firm for design, construction and operations

- Design/Builder works under lump sum contract and manages all subcontractors/vendors
- Operator provides long-term operations under a pre-determined pricing agreement

Solicitation Requirements: Focused largely on facility performance requirements, often times includes life cycle cost comparisons

Selection Basis: Best value: price, scope, and qualifications

Owner Involvement During Design: Limited



DBO Attributes

Pros

- Contractor qualifications balanced with costs
- Single point of **accountability** for design, construction and operations
 - (same as LS/DB)
 - Inherent lifecycle focus; lower lifecycle risks for Owner
- Inherent engineer, contractor and operator **collaboration** (increases in innovation)
- Early **cost** information
 - Guaranteed operation costs (including variable costs)

Cons

- Limited **Owner control** and design input
- Traditional owner design engineer **relationship** diminished
- May over-pay for risk transfer
- Technology may be less desirable for Owner
- Limited pool of qualified / interested firms
- A proposal stipend will likely be needed to attract interest and quality proposals

Where Owner Spends Effort

DBB

RFP development

Proposal evaluations

Design decisions and milestones

Solicitation and Bidding

Contract administration

Construction Administration

CMGC

RFP development x 2

Proposal evaluations

Risk analysis

Innovation analysis

Design decisions

Cost comparisons and GMP

Contract administration

Progressive Design-Build

RFQ/RFP development

Proposal evaluations

Risk analysis

Innovation analysis

Design decisions

Cost comparisons and GMP

Contract administration

LS Design-Build

Define goals and performance criteria

RFQ/RFP development

Proposal evaluations

Risk analysis

Innovation analysis

Design decisions

Cost comparisons and GMP

Contract administration

So what is the right answer for my project?

PLAN FOR SUCCESS

- 1) Define the project, its goals, budget & schedule requirements, and degree of complexity
- 2) Define the project risks (technical, commercial, political, operational, quality) and mitigation strategies (avoid, own, reduce, control or transfer)
- 3) Determine success criteria and performance requirements, what does success look like.
- 4) Determine how much involvement and/or control of design process is desired, what is your staff availability, qualifications to manage a large capital project, technical depth regarding technology applications unique to your project, political climate, does your procurement department and legal department support deviation from standard protocols



So what is the right answer for my project?

EVALUATE YOUR OPTIONS

- 1) Assemble into a matrix and rank the importance of criteria to each other as well as the importance of the individual criteria and completed a weighted average analysis as a starting point
- 2) Very difficult to quantify or forecast cost savings and schedule compression when it is considered on a “cradle to grave” basis as similar projects are usually not available for comparative analysis
- 3) Look for opportunities where innovation in construction sequencing or techniques, technology application, or specialized qualifications are desired or may result in accrued benefits – these may be likely candidates for alternative delivery
- 4) Discuss with peers who have completed alternative delivery projects and industry professionals from the project management, design, construction and legal/insurance trades.



So what is the right answer for my project?

EDUCATE, COMMIT AND SUPPORT

- 1) Educate your stakeholders (management, engineering, ops/maintenance staff, ratepayers, legal, procurement, the public, delivery teams, vendors and suppliers, and yourself)
- 2) Commit the resources needed (both human, capital and time)
- 3) Support the process, the teams and anticipate the outcomes
- 4) Communications is critical



PARKING LOT

Quick Reference Matrix

Project Attribute	DBB	CM/GC	PDB	LS/DB	DBO
Procurement Selection	Low bidder	Qualifications and some cost components	Qualifications and some cost components	Best value; price, proposal, and qualifications	Best value; price, proposal, and qualifications
Contracts	Design + Construction	Design + Preconstruction/Construction	Design build	Design build	Design build (+ operate)
Contractor involvement during design	None	Yes + significant owner involvement	Yes + significant owner involvement	Yes, + limited owner involvement	Yes, + very limited owner involvement
Design Risk	Owner	Owner	Design builder	Design builder	Design builder
Project Price	Lump Sum	GMP	GMP	Lump Sum	Lump Sum
Schedule	Sequential, but known process	Potential for efficiencies	Potential for efficiencies	Potential for efficiencies	Potential for efficiencies

Cost Qualification Matrix

COSTS	CMGC	DBB	PDB	DB
Owner Administrative Costs	Higher	Lower	Higher	Higher
A/E Design Costs	Higher	Lower	Higher	Lower
Change Order Costs	Lower	Higher	Lower	Lower
RFI Administrative Costs	Lower	Higher	Lower	Lower
Claim / legal costs	Lower	Higher	Lower	Lower
Costs for Missed VE/Constructability input to design	Lower	Higher	Lower	Lower
Extended Schedule Costs	Lower	Higher	Lower	Higher
Life Cycle Costs	Lower	Lower	Higher	Higher

Selection Criteria and Process

Quantitative Process to Select Delivery Option

Criteria	Description	DBB	CMGC	PDB	DB	DBO	Weight
FAMILIARITY							
Project Delivery Method Familiarity	Familiarity of Owner staff, management and citizens with the project delivery method.						
QUALS BASED							
Ability to make a qualification-based selection of the Contractor	Selection criteria can focus on demonstrated success and safety.						
OWNER INPUT							
General project objectives	Promotes Owner's input during design regarding technology and other options.						
Weighing quality vs. cost	Empowers the Owner to participate in detailed decision regarding quality vs. costs.						
O&M staff input during design	Promotes involvement of O&M staff during the design phase in order to build a facility that meets the operators' needs.						
Construction safety program	Empowers Owner to oversee the Contractor's safety program.						
Sequencing	Enables coordination between Contractor and Owner in order to maintain water supply during construction.						
CONTRACTOR INPUT							
Constructability and innovations	Promotes feedback during design regarding project constructability and Value Engineering (VE) concepts.						
Cost estimates and schedule information	Provides the Owner with the most information regarding the implications of design decisions on cost and schedule.						

Quantitative Process to Select Delivery Option (continued)

Criteria	Description	DBB	CMGC	PDB	DB	DBO	Weight
COST							
Cost information	Provides Owner with early cost information.						
Innovation and value engineering	Contractual relationships promote innovation and value engineering to reduce costs and prolong project life.						
Competitive bidding environment	Promotes a competitive bidding environment that minimizes project costs to the Owner.						
Contingency pricing	Minimizes the amount of risk and contingency pricing that vendors put in their price.						
Life Cycle costs	Contract's ability to incentivize lifecycle costs reductions.						
RISK ALLOCATION							
Flexibility in risk allocation	Enables the allocation of risk to the party that is best able to manage the risk (performance design, warranty, permit compliance, unforeseen conditions)..						
SCHEDULE							
Potential scheduling efficiencies	Allows for overlap of project phasing in order to gain schedule efficiencies						
QUALITY	Empowers the City to participate in detailed decision regarding quality vs. costs.						
Vendor/Equipment Preference	Promotes Owner preference/selection of preferred equipment						
Quality Management	Owner provided third party QA/QC						

CMGC Best Practices

- Consider co-location of your project team at appropriate times
- Be clear about your expectations for the GC/CM's use of BIM
- Bring major trade contractors on board early to support the design effort
- Consider competitive GC/CM selection for 1st phase of the work with ability to negotiate future phases later.
- Require separate GC/CM team for self-performed work.
- Carry a reasonable design and construction contingency.
- Establish a prescribed allowance for preconstruction services as part of the bid process.
- Staff the project with people that understand the cultural, legal, and administrative differences between DBB & GC/CM

DB Best Practices

- Set aside traditional processes/relationships
- Shortlist offerors
- Consider the need for an Owner's Design-Build consultant
- Provide criteria in lieu of bridging documents in RFP
- Develop performance-based criteria in lieu of prescriptive specifications
- Limit design direction in RFP
- Provide a stipend (honorarium) for shortlisted teams not selected
- Ask for reasonable submission requirements
- Adequately disclose selection criteria & weighting
- Consider financial requirements of proposals
- Best value vs. low price emphasis on scoring
- Balance responsibility/risk in contract language
- Disclose project budget & schedule
- Conduct a balanced evaluation
- Establish adequacy & certainty of funding
- Create unbiased, knowledgeable selection panels