Construction Management at Risk and Progressive Design–Build

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Project Delivery Methods

- Design–Bid–Build (DBB)
- Indefinite Delivery/Indefinite Quantity (ID/IQ)
- Construction Management at Risk (CMAR) (Construction Manager/General Contractor (CM/GC))
- Design–Build (DB)
  - Traditional (Bridging) Design–Build
  - Progressive Design–Build
- Public Private Partnerships (P3)
Project Delivery Methods

Design–Bid–Build

Owner

- Designer-of-Record
  - Design Subs
  - Trade Subs

- Constructor/GC
  - Trade Subs

CMAR / CM/GC

Owner

- Designer-of-Record
  - Design Subs

- CM/GC
  - Trade Subs

Design–Build

Traditional & Progressive

Owner

- Design-Builder
  - Designer-of-Record
  - Trade Subs

- Design Subs
Project Delivery Process

Design-Bid-Build

CMAR / CM/GC

Traditional Design-Build
Reasons to Utilize Alternative Delivery Methods

- Shorten Project Delivery
- Maximize Dollars/Better Cost Certainty
- Provides Opportunities for Innovation
- Better Risk Allocation
- Informed Owner Decision Making
- Early Contractor Involvement
- Highly Qualified Teams
- Group Cohesion and Team Integration
Why Owners May Decide Against Using Design-Build

• Owner’s desire to be involved throughout design process
  • Direct contractual relationship with designer
  • Interest in making all design decisions
• Owner’s ability to quickly respond to design submittals
• Owner’s need to have design fully completed before construction
• Cost and time of a competitive, price-based, procurement
• Owner’s inherent ability to trust the contractor
CMAR Definition

Construction Management at Risk (CMAR)

- A project delivery method where the owner utilizes a two-phase construction contract with a General Contractor:
  - **Phase 1** – Provide Preconstruction Services, which may include, but are not limited to, constructability analysis, value analysis, scheduling, site assessments, and cost estimating.
  - **Phase 2** – Construct the project based on final design plans (or design packages) at an agreed GMP.
Began developing CMAR process in 2013

Three projects have been selected for delivery using CMAR

- MD 24 – Slope Stabilization – Construction Complete
- MD 97 – Brookeville Bypass – Preconstruction Phase – Construction planned to begin in Fall 2016
- I–95 – Greenbelt Metro Access – Preconstruction Phase – Construction planned to begin in Spring 2017
Procurement of CMAR Projects at MSHA

- One Step Process
- Technical Ratings – Adjectival
- Method of Selection – Best Value
  - Technical Proposal – Qualifications/Past Performance & Project Approach
  - Price Proposal – Preconstruction Fee/Other Elements
- Technical Proposal is significantly more important than Price
CMAR Preconstruction Phase

- CMAR Design Team
  - Owner
  - Engineer
  - Contractor
  - Independent Cost Estimator (ICE)
  - Other Stakeholders

- Cost Validation
  - Owner
  - Contractor
  - ICE

MD 24 CMAR Project
CMAR Cost Validation

- Cost Model Elements
  - Profit & Overhead
  - Equipment Types & Rates
  - Labor
  - Materials
  - Subcontractor Items of Work
  - Risk Agreement & Assignment
  - Schedule
  - Agreement on which “bucket” costs go to

- Opinion of Probable Construction Costs
  - Submitted at Milestones (30/65/90%)
  - Independent Quantity Takeoffs/Pricing
  - Blind Estimate Comparison
  - Discuss items out of tolerance
  - Reconcile differences in assumptions
CMAR Award/Construction

- Design is Complete
  - Contract Documents collaboratively developed
  - Typical Standards/Specifications
  - Minimum 50% Self-Performance
  - DBE Requirements

- Guaranteed Maximum Price (GMP) Submission
  - Contractor & ICE Independently Price
  - Price Reconciliation Meetings as needed
  - Up to 3 GMP Submissions
    - Accept GMP and award construction
    - Terminate contract and bid as DBB (“Off Ramp”)

- Project Construction
  - Typical SHA–Contractor Roles
  - Payment of GMP through approved Work Breakdown Structure

MD 24 CMAR Project
Project Delivery Process

Design–Bid–Build

CMAR / CM/GC

Traditional Design–Build

Progressive Design–Build
Progressive Design-Build Definition

Progressive Design-Build (PDB)

- A project delivery method where the owner utilizes a two-phase Design-Build contract with a Design-Build (Contract-Engineer Team):
  - **Phase 1** – Provide Design and Preconstruction Services to develop design packages to level necessary to establish a Guaranteed Maximum Price (GMP).
  - **Phase 2** – Construct the project based on design packages at an agreed GMP.
Progressive Design–Build

- **Overall objectives**
  - Introduce design–builder to project early in design process
  - Work in collaboration with owner to advance design
  - Overall project price negotiated after design is developed

- **Single or two phase procurement process**
  - Pure qualifications–based
  - Best value procurement with minimal price–based factors
Overall project price not meaningfully considered during procurement
- Open book estimating
- GMP/lump sum developed post-award
  - Can establish this at 100% of design completion
  - Normally see price commitment at 50–70% of design completion

Should be no Spearin liability, as there is no design “handoff”
Reasons Owners Choose Progressive over Traditional Design–Build

- Ability to introduce design–builder to the project as early as possible
  - Design–builder becomes a strategic partner in planning and project definition
  - Avoids Spearin liability
  - Facilitates having design–builder involved in permit and other development activity
- It may substantially reduce cost and time for procurement
Reasons Owners Choose Progressive over Traditional Design–Build (cont’d)

- Owner interest in being involved in design and procurement
  - Development of design solutions in conjunction with design–builder
  - Direct discussions with design–builder on O&M/life cycle costing
  - Procurement of subcontractors and suppliers

- Owner access to real–time information
  - Enhanced cost and schedule information during design development
  - Facilitates designing to budget
  - Open book pricing allows transparency into design–builder’s costs

- Process fosters collaborative relationships
Reasons Owners Choose Traditional over Progressive Design–Build

- **Statutory restrictions**
  - Mandates that overall price be provided at time of contract
  - Constraints on hiring and integrating subcontractors

- **Owner interest in:**
  - Obtaining a competitive fixed price for entire project during procurement
  - Developing detailed technical requirements prior to starting procurement
  - Seeking different technical solutions through a competitive procurement process

- **Owner concerns about exercising the contractual “off-ramp”**
Choosing Between CMAR and Progressive Design–Build

- Benefits of CMAR
  - Ability of Owner to have a direct contract with a designer who is independent of contractor
  - Easier ability to exercise “off-ramp”

- Benefits of progressive DB
  - Owner does not have to procure/manage designer
  - May be slight schedule benefit
  - Ability to obtain performance guarantee and other benefits of design–build
    - Elimination of Spearin liability
    - Enhanced relationship between contractor and designer
IS 270 Progressive Design–Build Contract
I–270 Corridor Facts

- Average daily traffic approaching 240 K in many segments
- One of the most congested corridors in MD and the Washington, DC region with strong directional peaks
- Strong economic development and housing activity projected along the corridor
- Over-saturated conditions, extended peak periods greatly impacts reliability
Project Vision

- No identified solutions or constraints on proposed solutions to any concept
- Engage expertise of design and construction industries to provide innovative solutions to address goal of moving the most traffic the fastest
- Relevant expertise elsewhere in the world
- Fixed Value Contract
- Best Value Selection
Environmental evaluation cannot begin until after selection nor can schedule be developed until scope of improvements is known

Unpredictable timeframe to begin and end construction

Adequate data collection needed for price proposal preparation will be costly and time consuming. Lack of data leads to increased risk and reduced cost efficiency for improvements

Time consuming process to define various project requirements

Right-of-Way impacts (if any) would be unknown at time of procurement potentially leading to extended construction completion
Advantages of Progressive Design–Build

Better Management of Risks than Traditional Design–Build

- Environmental Analysis (Noise, Air, Historical, etc.)
- Permitting
- Geotechnical and Utility Risks
- Right-of-Way
- Construction Schedule
- Risk Assignment/Risk Sharing Pool
Procurement of Pilot PDB Contract

- Two Step Process
  - RFQ
  - RFP
- Proposed Technical Concepts (PTCs) during RFP Phase
- Technical Ratings – Adjectival
- Method of Selection – Best Value
  - Technical Proposal – Design-Builder’s solutions to address Contract Goals
  - Price Proposal – Fixed Value
- Technical Proposal is significantly more important than Price
Use similar approach to address other major congested corridors in Maryland
Evaluate for consideration on other projects (DBB, DB, CM/GC)
Ultimately, an additional “Tool” in the “Tool Box” for project delivery
QUESTIONS?

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