



**INFORMATION PAPER TO THE  
JOINT BUSINESS ADMINISTRATION AND  
STRATEGIC DEVELOPMENT COMMITTEES**

**CONSTRUCTION MANAGER AT RISK (CMR)  
CONSTRUCTION ACQUISITION METHOD  
AT RONALD REAGAN WASHINGTON NATIONAL AIRPORT**

**MARCH 2015**



# PURPOSE

To provide information on the Construction Manager at Risk (CMR) construction model under consideration for implementing major elements of the Reagan National Airport Capital Construction Program.



## BACKGROUND

- Jan. 1, 2015 New Use and Lease agreement
  - Authorizes 10-year \$1B Capital Construction Plan (CCP) for DCA
  - Authorizes 3-year \$126M CCP for IAD
- Sept. 2014 Board approved DCA CCP A/E solicitation
- Nov. 2014 Board approved award of Planning contract
- Feb. 2015 National Environmental Policy Act process and review initiated
- April 2015 A/E award to be submitted for Board approval



# Construction Methods

There are three basic models for the procurement of construction services.

- Design-Build (DB)
- Design-Bid-Build (DBB)
- Construction Manager at Risk (CMR)



## Design-Build (DB)

- Utilizes the contractor to manage the detailed design and construction based on a schematic design provided by the owner.
- The contractor retains responsibility for the completion and quality of the design.
- Limited use by the Airports Authority.



## Design-Bid-Build (DBB)

- Architect/Engineering (AE) firm is separately contracted to prepare final and detailed design.
- Upon completion of the design, construction firms are solicited and an award is made to the lowest responsible and conforming contractor.
- Overall project schedule is determined by the sequential activities of design, bid process and finally construction.
- This is the typical construction procurement for the Airports Authority.

# Construction Manager at Risk (CMR)

- Emerging best practice for complex projects
- Allows mobilization of construction team efficiently and ordering of long lead materials at opportune market timing to obtain more favorable pricing.
- Fees are generally less than traditional GC bids
- After securing key bids from subcontractors and detailed design, the CMR provides a guaranteed maximum price for completion of the project.
- Upon agreement regarding the guaranteed maximum price, the CMR assumes the role of a General Contractor as if the project had been design-bid-build. This includes minimum and maximum self work requirements.



## **CMR Advantages for DCA Terminal Improvements**

- CMR is advantageous for complex projects where schedule must be minimized and complex project phasing and system interface issues are anticipated.
  - DCA Terminal improvements will occur throughout the existing B/C terminal and all deliveries and work must be carefully planned, coordinated and communicated
  - CMR is desirable in order to
    - balance use of landside roadways for construction traffic; stage on a limited site;
    - carefully demolish large structures; remediate site while preparing for orderly erection of new structures.

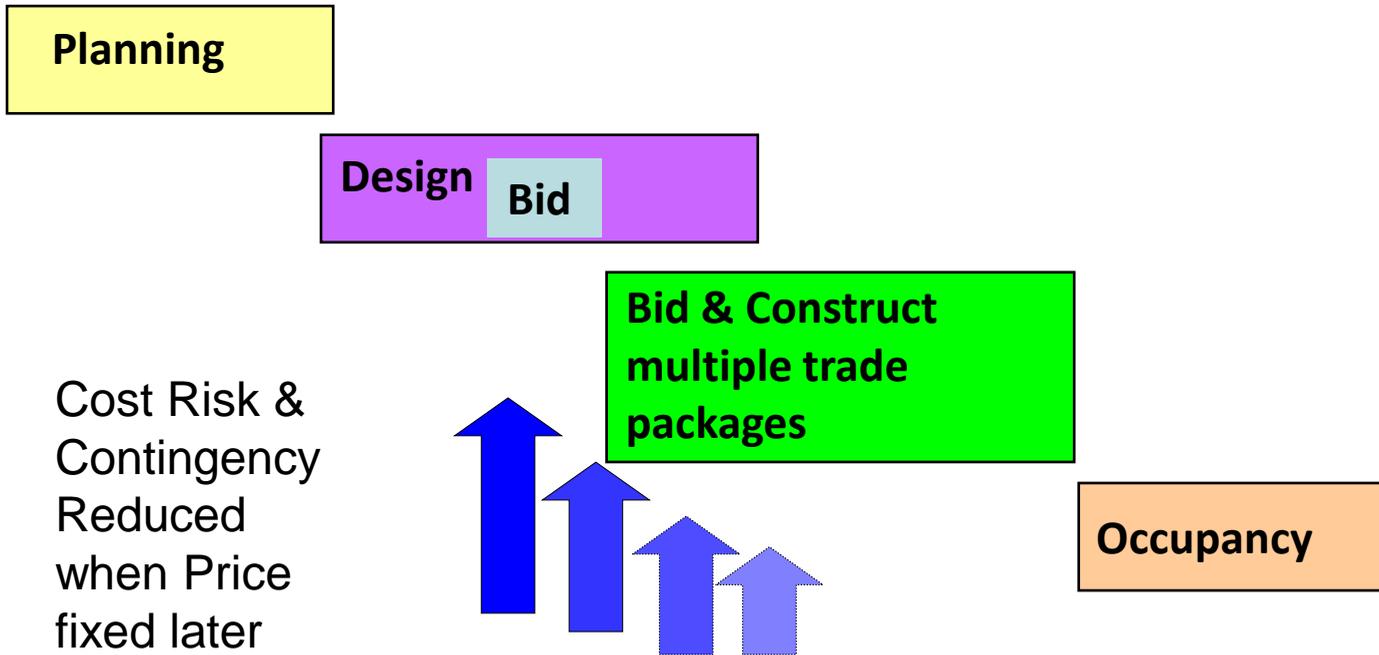


# Schedule Reduction and Cost Risk Strategy

**Design-Bid-Build**



**Construction Manager  
at Risk**





## Airports Authority Policies

- The CMR strategy is permitted by the Airports Authority's Contracting Manual.
- A CMR procurement will incorporate existing Airports Authority construction contract requirements, including, fair and open competition with sub-contractors and DBE goals as we have with other federally eligible contracts.
- Allowed as acceptable delivery mechanism for Airport Improvement Program; however should this option be preferred, the process, requirements and controls must be approved in advance with the federal agency.



Ronald Reagan Washington National Airport



Dulles Corridor Metrorail Project



Dulles Toll Road



Washington Dulles International Airport



METROPOLITAN WASHINGTON  
AIRPORTS AUTHORITY

# **INFORMATION PAPER FOR THE JOINT BUSINESS ADMINISTRATION AND STRATEGIC DEVELOPMENT COMMITTEES**

## **CONSTRUCTION MANAGER AT RISK (CMR) CONSTRUCTION ACQUISITION METHOD AT RONALD REAGAN WASHINGTON NATIONAL AIRPORT**

**MARCH 2015**

### **PURPOSE**

To provide information to the Business Administration and Strategic Development Committees on Construction Manager at Risk (CMR) construction acquisition method under consideration for some elements of the Reagan National Airport Capital Construction Program.

### **BACKGROUND**

There are three basic models for the procurement of construction services: Design Build (DB), Design-Bid-Build (DBB) and Construction Manager at Risk (CMR).

DB methodology for construction utilizes the contractor to manage the design and construction of a project based on a schematic design provided by the owner. The contractor retains responsibility for the completion and quality of the design. DB contracting has been utilized by the Airports Authority on limited aviation projects and the Dulles Corridor Metrorail Project. The Airports Authority's standard procurement strategy for construction is DBB whereby an Architect/Engineering (A/E) firm is separately contracted to create a final design. Upon completion of the design, construction firms are solicited and an award is made to the lowest responsible and conforming contractor. The overall project schedule is determined by the sequential activities of design, construction contractor procurement and construction.

Use of the CMR methodology has increased greatly in the past decade due to the Owners' desire to limit contractor fees, improve construction planning, and optimize program schedule. The CMR methodology is essentially a variation of traditional DBB contracting. The Owner procures and holds a services contract with an A/E firm to produce a complete, final design. However, during the design process the Owner solicits and procures a CMR contractor to act in an agency relationship to the Owner providing preconstruction services through a close interaction with the Owner and Designer in the completion of the design. Preconstruction services include but are not limited to: construction estimating; value engineering; constructability reviews; logistics plans; phasing and bid package plans; and schedule development. The CMR is a full and active

member of the project team (Owner, Designer and Contractor). After securing key bids from subcontractors and sufficiently detailed design documents, the CMR is requested to provide a guaranteed maximum price (GMP) for the completion of the project. Upon agreement between the Owner and the CMR regarding the GMP, the CMR takes on the role of a General Contractor. The project schedule using CMR is shortened by the overlapping of the CMR with the designer, resulting in a streamlined, shorter bid process and the ability to start some remediation, construction and procure critical materials such as steel and specialty electrical gear prior to completion of 100 percent design.

It is important to note that the CMR can have multiple variations where price determination can be made. Some involve a GMP or graduated GMP; however, CMR contracts utilizing time and materials, cost plus fixed fee, cost plus percentage fee have been employed. In select situations where schedule is highly valued shared savings may be considered.

The CMR strategy is permitted in the Airports Authority's Contracting Manual.

Any CMR procurement would incorporate existing Airports Authority construction contract requirements, including, fair and open competition with sub-contractors and LDBE goals.

## **DISCUSSION**

The opportunity to compress the overall project schedule and to take delivery of a new facility at an earlier date is a major benefit of the CMR methodology.

CMR contracting is most applicable to large, complex projects where schedule compression is required and complex project phasing and system interface issues are anticipated. While the methodology is applicable to all types of projects, it is more widely accepted in vertical construction or complex mechanical or industrial construction. It is less applicable in civil construction (roads, airfields and site preparation) where differing site conditions are more probable and where unit price contracting is prevalent. The portion of the Reagan National's Capital Construction Plan in the South campus, which is primarily civil work, is an example of a typical DBB program. In the aviation environment, CMR is more applicable to terminal construction and renovation, specialty construction such as fuel facilities and fuel distribution systems, aircraft maintenance hangars, cargo and maintenance facilities, and mechanical systems than in runway or taxiway construction. The method is allowed as an acceptable delivery mechanism for the Airport Improvement Program (AIP) and federally funded projects. If employed on projects where federal funding and reimbursement is anticipated, the process, requirements and controls must be coordinated and approved in advance with the federal agency.

The CMR contractor selection process considers both technical capability and fee. In other words, it is a best value process, which is considered a best practice.

The CMR methodology can also benefit project cost management. The CMR provides contractor construction based estimates and expertise to the design process, and allows mobilization of the construction team and order long-lead materials early in order to obtain more favorable pricing. Specialty items can cost a premium if purchase is accelerated. With time to plan, an open slot in a manufacturing plant can be utilized to obtain more favorable prices. Another example is steel, which can vary widely in price. By locking in a tonnage order, the total price can be reduced. At a point of mutual agreement between the Owner and the Contractor, the Owner requests a firm, GMP for delivery of the project. A GMP is proposed by the CMR and negotiated and accepted by the Owner. It establishes the contracted delivery price for the project and includes: the physical cost of the work, general conditions, construction contingency, allowances and a detailed listing of assumptions and clarifications.

## **CONCLUSION**

CMR is an accepted, viable procurement methodology for construction of large, complex and unique projects where schedule is a primary concern. Successful application of this methodology hinges upon clear definition of responsibilities between the Owner, Designer and CMR Contractor.

Construction of the secure terminal and new north concourse will occur in a limited area and requires close coordination of traffic as well as central management of the construction site. In addition, early work for removal of contamination and foundations should proceed, while design of the concourse is completed. Use of CMR is a methodology that must be evaluated and considered for future Reagan National Capital Construction projects.

Prepared by:

Office of Engineering

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