

Integrated Project Delivery Under State of Washington and Colorado CM/GC Type Contracts

Greg Schroeder¹

Abstract

Question: Why are some states' CM/GC contracts more effective in successfully delivering complex construction projects to their owners on time and on budget?

Purpose: The purpose of this paper is to discuss contract terms that can assist in the successful delivery of a complex construction project via an Integrated Project Delivery (IPD) approach.

Research Method: Direct observation of two complex construction projects constructed in Washington State and Colorado under CM/GC type contracts, one of which utilizes effective IPD concepts.

Findings: This paper identifies the contract terms that may lead to more successful outcomes for both contractors and construction owners on complex projects.

Limitations: While over 30 states have implemented some type of CM/GC contract, this paper looks at only two states, Washington State and Colorado. They are worth studying because of the polar opposite approaches they take towards contracting and the often contrasting results.

Implications: The escalation of construction costs during the procurement of the project can be controlled by appropriate contracting methods under IPD.

Value for practitioners: Assist owners and contractors in understanding the implications of Integrated Project Delivery in CM/GC type contracts.

Keywords: CM/GC, GC/CM, Integrated Project Delivery (IPD), Qualifications Based Selection (QBS), Design Development (DD), Construction Documents (CD).

Paper type: Forum Essay

Introduction

Real VALUE is not the LOW bid on a HIGH cost design - It is the low TRUE cost on the RIGHT Design - Eric Ahlstrom, Lean Construction Institute

¹ Certified Construction Manager - Jacobs Project Management Co. - Land Development and Utility Infrastructure Contract USAG Humphreys Unit 15228 Box# 683 APO, AP 96271 Korea
greg.schroeder@jacobs.com.



Consider two projects - one in Washington State, the other in Colorado. Each is a complex, monumental structure with the construction documents issued in phased packages. The projects offer potential insights that an owner might appreciate in considering the risks and opportunities of various schemes of a Construction Manager/General Contractor (CM/GC) type contracts and Integrated Project Delivery (IPD). A CM/GC contract with IPD principals can “establish a partnership among the owner, designer, and contractor during design development that can carry through to the construction process²”.

The two projects had significantly different cost outcomes. The Colorado project (Research Complex II, University of Colorado, 506,000 sq. ft., \$201 m) had significantly fewer changes and claims than the Washington State project (William H. Gates School of Law, University of Washington 196,000 sq. ft., \$80 m). This was primarily due to several variations in the CM/GC contract language for each state.

State of Washington

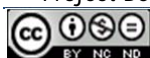
Washington State GC/CM Contract Language - Project A

It is anticipated that the “Maximum Allowable Construction Costs” (MACC) negotiations will occur when the scope of the project is adequately defined and the Contract Documents are at least ninety percent (90%) complete as mutually determined by the GC/CM and the Owner, but no later than the completion of the Contract Documents. At the time a MACC is successfully negotiated, the parties will sign the GC/CM Contract. If the parties cannot agree on a MACC as described in Section 5.4, the negotiations will be terminated and the (owner) reserves the right to begin negotiations with the next highest scoring firm”.

The Washington State contract, which requires establishing the GMP at 90% complete documents, had the effect of delaying the start of construction due to unresolved MACC negotiations, established a one-sided coerced relationship when the owner threatened replacement, hindered the pursuit of value engineering opportunities since the design was mostly complete, and failed to encourage contractor participation since the GC/CM was not truly at-risk while the GMP was unexecuted.

This might better be referred to as CM at little-risk. The owner can expect a large cost increase at the issuance of the construction documents and a contentious negotiation. The contract terms negated the true value of the GC/CM approach that they wished to implement and often created a “spin cycle” of pricing disputes and replaced contractors. The phasing at Project A was enabled by allowing the GC/CM to carry allowances for future bid packages. This increased the risk for owner since they could not finalize the true cost for the MACC until all the design packages were finalized and bid.

² [www.coloradodot.info/business/designsupport/innovative-contracting-and-design-build/icac/Alternative Project Delivery Methods \(Definitions\)](http://www.coloradodot.info/business/designsupport/innovative-contracting-and-design-build/icac/AlternativeProject%20Delivery%20Methods%20(Definitions))



State of Colorado

Colorado CM/GC Contract Language - Project B

"WHEREAS, the Construction Manager shall establish a Guaranteed Maximum Price (GMP) (including Construction Manager's fee) that is within the Fixed Limit of Construction Cost as established by the Principal Representative at the completion of the Design Development Phase; if the parties fail to mutually agree to that number as set forth above, the parties expressly agree that default termination of the Construction Manager shall not be a remedy (no termination)³".

Issuing a GMP at the design development stage assures the contractors' full attention and involvement in the pricing and development of the construction documents. Once the GMP is finalized the bid packages can be issued sequentially by phase to support the early start of construction, with minimal risk to the owner since the GMP is already established.

The differences in contract language are most apparent in the ease of collaboration, reduction in changes and claims, improved schedule performance, and the lack of disputes with the State of Colorado. By going to contract at the end of Design Development the owner gets a true GMP with the requirement that the CM/GC will maintain the budget by shaping and influencing the final construction documents and the owner avoids the expense of modifying construction documents due to late value engineering suggestions. The costs issues are worked out in the Design Development process. This is true target value pricing and the basis for an IPD type approach to contracting.

IPD - Goals

Under the Colorado CM/GC contract the Integrated Project Delivery (IPD) aspect might appear as IPD light, without a monetary form of contractual risk sharing. In this instance the shared risk is the development and maintenance of the business relationship with the client. A failure to successfully deliver the any project can have severe implications for the architect, contractor, or owner's representative looking for repeat work. The structure of the Colorado CM/GC contract, with no bonus or savings split, makes the team effort a straightforward proposition.

The joint goals that have worked for IPD under the Colorado CM/GM type contract include:

1. Forming an integrated project team from the start.
2. Establishing and working to a target value project cost.
3. Leveraging conceptual estimating skills.
4. Optimizing the design using BIM and subcontractor input.

³ Construction Manager/General Contractor Agreement CMGC (STATE FORM SC-6.4)

5. Creating an innovative learning environment.
6. Delivering excellence.

Under the Colorado statute the CM/GC is tightly integrated with the project team at the start; both the architect and CM/GC are contractually obligated to work together for the benefit of the project. Establishing the GMP at the end of Design Development assures that the contractor works “effectively” with the owner, architect, users, and primary subcontractors (mechanical, electrical, and curtain wall are typical) to define scope, control cost, and manage risk.

Due the late GMP requirement (90% CD) under the Washington GC/CM contract the delivery is more of a standard Design Bid Build (DBB) procurement with a limited preconstruction effort and all the typical ramifications. This is shown in Figure 1 where the late GMP negotiations tend to both extend and complicate the final procurement process.

The CM/GC Colorado GMP is a variation of a standard GMP contract with some important differences.

Contracting Issues - CM/GC Colorado

1. The GMP price includes no conditions, qualifications, or exceptions. The contract stipulates that “If, in developing a Guaranteed Maximum Price, the Construction Manager believes any documentation or information, consistent with the Design Development level of documentation, is not sufficiently complete to clearly define the anticipated work, the Construction Manager shall be responsible for making all necessary inquiries and requests to establish the same”. In other words the contractor needs to work with the architect to modify the Design Development documents to conform to the target GMP budget. This eliminates the “qualifications and exclusion” conflicts and provides an opportunity for the team to work together for the benefit of the project. The CM/GC is actually at risk to participate in the design process and many complex issues are worked out in the DD phase prior to the issuance of construction documents and the start of construction. If the owner and architect wish to maintain specific plan, specification, or program requirements the contractor needs to price the work per the documents and allow the costs to become part of the GMP negotiations.
2. The contract provides for a 2.5% bidding contingency. The end balance of the bidding contingency is returned to the owner after buyout. The contractor can hold “bid reserves” in the bid packages and return those contingencies once the bid packages are executed. The bidding contingency helps mitigate the CM/GCs risk of going to GMP at the Design Development phase.

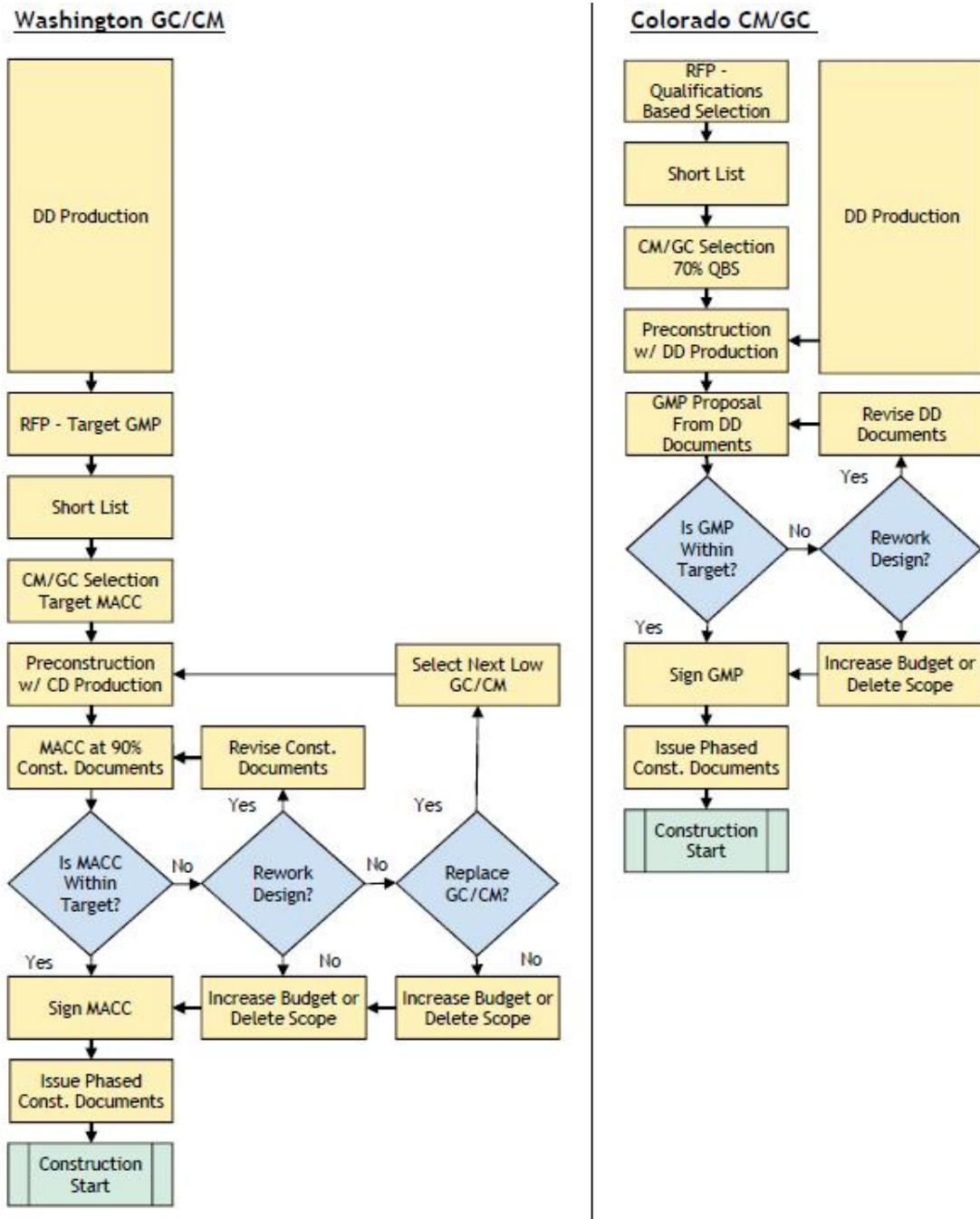


Figure 1: GC/CM Washington vs. CM/GC Colorado Flow Chart Contracting Issues - CM/GC Colorado

3. The contract provides for a 3.5% construction contingency with no savings split. The advantage of having no savings split is that contractors do not calculate savings split revenue into the initial fee calculations. The construction contingency is actually used as intended and is not hoarded to realize a "bid day" fee projection. The CM/GC has the potential to improve their fee by bidding on lump

sum self-perform bid packages such as the concrete package, steel erection, or equipment supply. The self-perform opportunity should be at the owner's discretion as the contractor may lack proven expertise in managing some packages, such as self-performed metal stud framing and drywall.

4. "The Construction Manager acknowledges that time is critical for Project delivery and that portions of the Work could have their design completed as separate Bid Packages and be under construction before other portions of the Work are fully designed." The key is to agree on the total number of bid packages in advance as part of the RFP to assist in evaluating the CM/GC proposals. Contractors may off load management cost by having fewer and larger bid packages. This does not typically work in the best interests of the project due to sub-tier dilution.
5. "In the performance of the Work under this Agreement It is further recognized that this accelerated approach to construction utilizing the services of an Architect/Engineer and Construction Manager/General Contractor is an unique concept and that its utilization requires maximum cooperation between all parties. It is also recognized that the services to be rendered by the Construction Manager and the inter-relationships and coordinative aspects thereof are in the developmental state and not fully defined." The contractor's experience in delivering this type of project is essential to the RFP and oral presentation. How will the contractor deal with this new approach and fill in the blanks?

Risk Issues - CM/GC Colorado

1. The contractor needs to be brought on at no later than the 30% Design Development phase. Any later than this negates the value of the process. The intent is to price the design opportunities and use the budget to steer the project, not just price what the architect delivers.
2. "If the Construction Manager, in good faith, furnishes the Principal Representative with a Guaranteed Maximum Price proposal which meets the criteria of paragraphs 9.3.1, 9.3.2, and 9.3.3 and the parties fail to mutually agree to that number as set forth above, the parties expressly agree that default termination of the Construction Manager shall not be a remedy therefore under this Agreement, and, the Principal Representative shall be entitled to proceed with the Project and Work as set forth elsewhere in this Agreement."
3. Regarding Risk Issue Item 2 - See Risk Issue item 1.
4. GC/CM requires increased involvement by the owner's staff. The owner or owner's representative will be much busier during Design Development than is typical. The management team will need to monitor and support the architect and contractor relationship, actively manage the value engineering process, and deal with the early start the construction and inspection work. This is where "front loading" the construction process often produces the greatest benefit to the project.
5. If the architect's construction document work flow is not properly managed the construction work can easily overrun the design effort. This will create enormous complications.



RFP - CM/GC Colorado

1. "Minimum Requirements: Notice is hereby given to all interested parties that all teams will be required to meet all minimum qualifications to be considered for this project. To be considered as qualified, interested teams shall have, as a minimum:
 - Provided Construction Management/General Contracting services within the last five (5) years for at least two (2) projects each in excess of \$ xx (hard costs), utilizing the expertise present in their Colorado Office; and
 - Demonstrated specific Construction Management/General Contracting experience in projects of similar scope and complexity"

The RFP requirement for previous experience on CM/GC programs rapidly winnows the field of unqualified contractors. They will not make the short list due to a lack of demonstrable preconstruction or CM/GC management skills.

The failure of a CM/GC to successfully deliver a project has the serious implications to the business relationship with the state. The State of Colorado CM/GC statute includes university, justice and corrections, department of transportation, and other state entities which share the CM/GC approach on a growing number of projects.

2. The RFP weighs general conditions and fee at 30% and experience at 70%. This allows qualified general contractors to submit reasonable fee and staffing proposals without being undermined by more aggressive and less qualified contractors. The experience factors include:
 - Qualifications of the Firm
 - Qualifications of the Management Team Members
 - Project Management Approach
 - Prior Project Experience / Success
 - Miscellaneous Considerations
 - Craft Labor Capabilities
 - Apprenticeship Training Program
 - Other

Design Contract for the CM/GC Colorado

Per the coordinated Colorado AE Agreement "The Architect/Engineer's services shall be provided in conjunction with the services of the Construction Manager/General Contractor, hereinafter referred to as Construction Manager or CM". This establishes the "single participating entity" required by law.

The contract requirements include:

- Design packages to be reviewed by the CM/GC
- Design milestones to facilitate bid package delivery
- Requirements to incorporate and respond to CM/GC review comments
- Budget review points
- Requirement to notify the CM/GC of significant design changes
- Value engineering with the CM/GC
- Material availability and selection decisions



In August of 2005 the construction market was under severe inflationary pressure which caused the proposed GMP to exceed the owner's budget. In order to maintain the project budget the University shelled the vivarium space and gave up their entire contingency budget.

In exchange the CM/GC agreed to fund all of the non-program related changes out of their bidding and construction contingency. The changes were processed as normal change proposal requests; the significant difference being that the CM/GC drew down their contingency each month rather than requesting an increase to the contract amount.

The CM/GC funded all of the routine construction changes between their 2.5% buy out contingency and 3.5% construction contingency, made their projected fee, and completed the vivarium ahead of the project schedule once funding became available one year into the project.

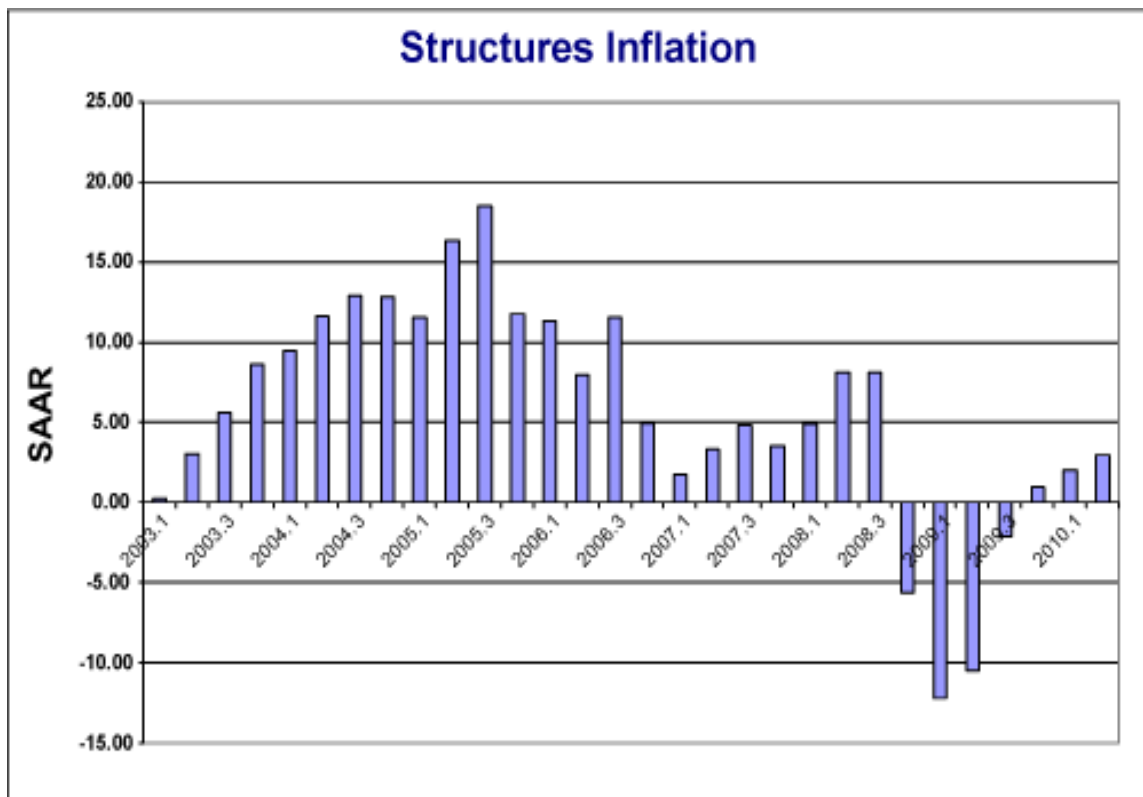


Figure 3: Structures Inflation - Reed Construction Data 2011

Change Analysis

Table 1: Percent Change - Project B

| | Laboratory | BSL 2 Space | User Modifications | Totals |
|--------------------------|----------------|----------------------|--------------------|---------------|
| Direct Cost of Work | \$163,207,547 | \$25,943,396 | \$467,925 | \$189,618,868 |
| 2.5% Buy Out Contingency | \$4,080,189 | \$648,585 | \$11,698 | \$4,740,472 |
| 3.5% Const. Contingency | \$5,712,264 | \$908,019 | \$16,377 | \$6,636,660 |
| | \$173,000,000 | \$27,500,000 | \$496,000 | \$200,996,000 |
| | 468,000 sq ft | 38,000 sq ft | | 506,000 sq ft |
| | \$369.65 sq ft | \$723.68 | | \$397.23 |
| | | Direct Cost of Work | | \$189,618,868 |
| | | Total Contingency 6% | | \$11,377,132 |
| | | Percent Change | | 6% |

Conclusion

The CM/GC project delivery program can increase risk if the owner is unaware of the intricacies and potential pitfalls. On the other hand, it is the system with the largest potential to result in the best possible project delivery in terms of cost, schedule, and overall quality.

If an owner wishes to improve project delivery a new standard of care requires more than a plan flip at each stage of development, a third party review of the MEP systems, and a final coordination back check prior to issuance of construction documents.

The Integrated Project Delivery system requires a committed contractor, architect, and owner's representative working jointly under the correct contractual terms with sophisticated CAD tools. The team needs to establish joint goals for using virtual design and construction (VDC) to enhance productivity, optimize the project schedule, and provide effective collaboration during construction.

You can argue that some projects perform better due to the team and this is exactly the point. The IPD method of contracting provides a means for the team to emerge which creates project success.

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