CALTRANS PROCEDURES FOR CONSTRUCTION MANAGER/GENERAL CONTRACTOR (CMGC) PILOT PROGRAM PROJECTS

1. Introduction

Construction Manager/General Contractor (CMGC) is a project delivery method that allows the California Department of Transportation (Caltrans) to select a contractor early in the project development process to act in an advisory role. The CMGC Contractor provides constructability reviews, value engineering suggestions, construction estimates, and other construction-related recommendations. When design is completed to about 90 to 95 percent design, the CMGC Contractor will provide a price to construct the project. If the price is acceptable, the CMGC Contractor will become the general contractor and will construct the project.

These procedures are a compilation of efforts and lessons learned from CMGC projects delivered by Caltrans and other state Departments of Transportation (DOTs). CMGC is an evolving contracting process. These procedures will be reviewed annually and updated periodically to address additional lessons learned, evolving approaches, and updates to federal and state laws, regulations, and policies. The Caltrans CMGC Program under the Division of Design is responsible for maintaining these procedures with collaboration with the FHWA California Division.

2. Background

The federal surface transportation act "Moving Ahead for Progress in the 21st Century" (MAP-21) was signed into law July 6, 2012. MAP-21 authorized the use of the CMGC contracting method for delivering Federal-aid projects. Section 1303 of MAP-21 required the FHWA to promulgate regulations as are necessary to implement the statutory provisions. FHWA issued a Final Rule for CMGC that became effective on January 3, 2017. The provisions of the Final Rule have been incorporated into these procedures, for use on federally-funded projects.

In 2012, the California Legislature passed and the Governor signed Assembly Bill 2498 authorizing Caltrans to use the CMGC delivery method. The 2012 law authorized Caltrans to use CMGC on up to six projects as a pilot program. Subsequent legislation has provided authority for additional projects.

These procedures have been approved by the California Division of FHWA for use by Caltrans on Federal-aid projects as required by the Code of Federal Regulations (CFRs). Other agencies may adopt Caltrans CMGC procedures or may follow their own CMGC procedures as long as they are approved by Caltrans and FHWA.

3. Project Selection

The availability of alternative contracting methods, such as design-build and CMGC, has made it important to evaluate projects early in their development to determine the most beneficial method of delivery. Caltrans uses a variety of methods to help assess the most appropriate delivery method for projects that are being considered for alternative delivery. Caltrans uses its project delivery selection tool developed in 2008, the Project Delivery Selection Matrix (PDSM) developed by the Colorado DOT and the University of Colorado and past experience to help assess the most appropriate delivery method. Design-bid-build, design-build and CMGC delivery methods are considered in the assessment.

Potential projects are identified and nominated by the districts. The nominations are assessed by the Office of Innovative Design and Delivery. After the assessment is completed and an appropriate project delivery method is identified, the project is presented to the Caltrans Alternative Contracting Steering Committee. The Steering Committee is made up of Caltrans headquarters management and FHWA. The Steering Committee approves the use of CMGC.

The optimal CMGC project has one or more of the following attributes: a high level of technical complexity, the need for a high level of risk management, complex phasing, the need for overall schedule acceleration, the need for Caltrans to retain control over some or all of the design and construction, phased funding, a new non-standard type of design, and/or budget constraints requiring construction cost certainty.

4. Procuring the CMGC Contractor

The CMGC Contractor should be procured early in the design process. This typically occurs around the time final design begins but in some instances it may be beneficial to do so prior to completing the NEPA approval process. The goal in selecting the right timing is to maximize the value of the contractor's participation in the preconstruction phase by allowing them to provide input (e.g., risk, costs, schedule, and innovative construction methods) into important design decisions that shape the project and direct design development.

The project team should consult with the CMGC Program to determine the optimal time to procure the CMGC Contractor. See Section 6, Pre-NEPA Approval Activities and Requirements, if the procurement is anticipated prior to the completion of the NEPA approval process.

Procurement of a CMGC contract can be based on qualifications or on a best value based selection process. A qualifications based selection is based simply on the qualifications of the proposer as described in the proposer's Statement of Qualifications (SOQ). A best value selection is based on both qualifications of the proposer as well as pricing information such as preconstruction services cost or the proposed markups on construction costs. Both processes use a one-step solicitation process utilizing a Request for Qualifications (RFQ). The RFQ provides the following:

- the scope of services being requested,
- the evaluation factors and subfactors including their relative importance in evaluating SOQs,
- the pass/fail factors,
- what is required to be submitted in the SOQ,
- required referenced contract provisions,
- the evaluation rating guidelines,
- the method of payment for preconstruction services,
- whether interviews will be conducted before establishing the final rank,
- protest process, and
- sample contract form(s) or references the contract forms.

Upon issuance of a RFQ, the entire procurement process is managed by the CMGC Program (Office of Innovative Design and Delivery) in the Division of Design. All communication between Caltrans

and the prospective proposers, such as responses to questions, will be through the designated contact identified in the RFQ. All responses to questions and any addenda required will be posted to Cal e-Procure by the designated contact once approved.

SOQs will be submitted to Caltrans by a specified date and time. They are received in the district in which the project is located, kept in a secure location and then transferred to the CMGC Program after the deadline for receipt. The CMGC Program oversees the opening and completes the initial review of the SOQs for completeness. The pass/fail evaluations factors are also verified by the CMGC Program.

The SOQs are then distributed to the evaluation team members to be evaluated. The evaluation team consists of project members and/or subject matter experts appointed by the District Director who perform independent evaluations of the SOQs against the evaluation factors. The evaluation team is divided into two committees a Qualifications Review Committee and a Project Scoring Committee. The Qualifications Review Committee develops a consensus report on the strengths and weaknesses of each proposer against the evaluation factors. The Project Scoring Committee assigns consensus qualitative ratings to each of the evaluation factors for each proposer. FHWA staff may participate on the evaluation team as a non-voting member.

During the evaluations, communications may be used through the designated contact to the proposers to clarify minor ambiguities, errors, omissions, or other information which would not necessitate a change of the SOQ.

Once all evaluations are complete, the qualitative ratings are converted to points and a score is assigned to each proposer. If the selection process includes interviews, a short-list is established based on the SOQ scores and only those proposers on the short-list are invited to interview. All evaluations are performed in accordance with the RFQ and the evaluation procedures approved by the CMGC Program. A Preconstruction Services Contract will be awarded to the highest ranked proposer.

Allowable methods of payment for preconstruction services are lump sum, cost plus fixed fee, cost per unit of work, or specific rates of compensation. Method of payment for construction services will be defined in the construction contract.

5. Preconstruction Services

After award of the Preconstruction Services Contract, the CMGC Contractor becomes a member of the project development team and can perform a variety of preconstruction services at the direction of Caltrans. In addition, Caltrans will procure an Independent Cost Estimator (ICE) to provide independent cost estimates and to advise Caltrans on cost related issues. The ICE will be a consultant not affiliated with the CMGC Contractor. The ICE consultant will be procured using Caltrans normal A&E procurement process.

The following is a brief overview of the typical activities involved in the CMGC preconstruction phase and included in the preconstruction services contract.

CALTRANS PROCEDURES FOR CONSTRUCTION MANAGER/GENERAL CONTRACTOR (CMGC) PILOT PROGRAM PROJECTS

A. Project Kickoff Meeting and Partnering Workshop

The CMGC Preconstruction Phase usually begins with a Project Kickoff Meeting and Partnering Workshop. These can be conducted separately or they may be combined into a multiday workshop. The Partnering Workshop is often facilitated by a third party experienced in Partnering, with the goal to develop trust, respect, and cooperation among all key players. The Project Kickoff Meeting is used to review the teams roles and responsibilities , preliminary schedule, scope of work and project goals.

B. Prepare Risk Management Plan/Risk Register

Following, or in conjunction with, the Project Kickoff Meeting, the project team meets, typically for a half-day or full-day workshop, to develop a risk register for the project as part of the Risk Management Plan. The Risk Register is a tool used to identify, assess, mitigate, and monitor project risks. The Risk Register includes a matrix that identifies each risk; its risk level, cost impact, schedule impact, and responsible party; approaches to minimize risk and results of the risk mitigation. The Risk Register is continually reviewed and updated by the project team throughout the preconstruction phase to assist with key decisions on design development, risk, and project costs.

C. Prepare Cost Model

The CMGC Contractor prepares a project cost model with input from the project team. The cost model is an open and transparent document that defines the CMGC Contractors pricing assumptions for use by the ICE and the Caltrans estimator who develops the Engineers Estimate (EE). The cost model defines the CMGC Contractors costs related to labor, materials, equipment, subcontractor and supplier quotes, means and methods, production rates, risk, direct costs, mobilization, overhead and profit. Beginning with typically a half-day workshop, the cost model is continually reviewed and discussed by the project team and updated by the CMGC Contractor prior to submitting their Opinion of Probable Construction Cost (OPCC) at each pricing milestone and prior to submitting their Price Proposal. This assists all estimating parties in developing their estimates and ensuring item costs can be reviewed and compared among the estimates. Although the CMGC Contractor is responsible for developing the cost model, the intent is to have the ICE and EE concur with the CMGC Contractors cost model.

D. Design Development

Caltrans develops 30% design plans, collaborating with the CMGC Contractor on key design decisions. During the 30% design development stage, the CMGC Contractor provides both formal and informal input on constructability, construction phasing and potential early work packages, innovative design alternatives, and potential schedule and cost savings opportunities. Once the 30% design is complete, Caltrans submits 30% plans and specifications to the CMGC Contractor and ICE for review.

E. Design Review Workshop

A Design Review Workshop is held after the 30% design is issued. This workshop is typically a half-day to a full-day in duration and includes the CMGC Contractor, ICE, and Caltrans staff. The

purposes of the workshop are to (1) ensure a constructible and cost-effective design that is consistent with the design intent; (2) ensure that the design complies with standards; (3) endeavor to confirm that all work has been included and described in sufficient detail for that stage of design to ensure complete pricing of work; (4) allow all parties to provide feedback on the constructability of the plans; (5) discuss assumptions on means and methods, and construction staging or sequencing of work that affects cost; (6) reconcile quantity differences between the estimators; and (7) identify any errors, omissions, ambiguities, or other items that need to be corrected.

F. Innovation Management

The CMGC Contractor develops, proposes, and tracks challenges and quantifies benefits of innovations throughout the preconstruction phase, including proposing criteria to evaluate suggestions and select improvements that will offer the most value in terms of cost, schedule, and quality. The CMGC Contractor prepares, modifies, and maintains an innovation register, which identifies the person and entity that proposed the idea, the value of the idea (in terms of cost, savings, risk reduction/mitigation, and schedule impact), and which ideas were incorporated by the project team into the final design and construction documents. Ideas which were not incorporated and the reasons why should also be documented. The CMGC Contractor submits written documentation of all suggested innovations at each design milestone at a minimum. While Caltrans will entertain Value Engineering Change Proposals during the construction phase, the expectation is that these proposals are developed and incorporated into the project during the design development phase.

G. Risk Workshop

A Risk Workshop is typically a half-day to full-day workshop that occurs in conjunction with, or shortly after, the Design Review Workshop. The Risk Workshop allows the Project Team to update the risk register.

H. Develop and Submit Cost Estimates and Schedule

The CMGC Contractor and ICE each independently prepare a contractor-style, production-based, cost estimate and schedule that is based on the 30% construction plans and specifications (i.e., 30% OPCC Package). The CMGC Contractor's estimate is referred to as an "Opinion of Probable Construction Cost" or OPCC. Caltrans will prepare an independent estimate using its typical historical bid-based estimating process. All three estimates are submitted to the CMGC Program. The CMGC Program then develops a variance report for use by the project team. The variance report shows the CMGC Contractor's OPCC. In addition, the variance report notes whether the CMGC Contractor's OPCC is within 10% or alternately within a fixed dollar figure of the ICE for each Price Proposal item. The CMGC Contractor's schedule is provided to the ICE, and Caltrans for their review and comment. This occurs at, or slightly before, the submission of the CMGC Contractor's OPCC.

I. Price Reconciliation Meeting

Following the submission of the estimates for the 30% price milestone, Caltrans staff, the CMGC Contractor, the ICE, and CMGC Program attend a Price Reconciliation Meeting that typically ranges from one to three days, depending on the size and complexity of the project and the extent

of the price differences. The purpose of the meeting is to review pricing assumptions and attempt to reconcile price differences between the CMGC Contractor's OPCC and the ICE. The meeting gives each party an opportunity to understand each other's perspective about pricing assumptions and risk assignment. This meeting also helps Caltrans develop a greater confidence level regarding the cost of the project and the reasonableness of the CMGC Contractor's OPCC. Caltrans staff participate in these meetings, but does not disclose the Engineer's Estimate.

J. Adjust Cost Model, Schedule, and Pricing

Caltrans and CMGC Contractor agree upon changes to the pricing assumptions. The CMGC Contractor makes adjustments to the cost model and the schedule to reflect these changes and resubmits them to Caltrans. This information is then documented in the project file. Any pricing changes will be carried forth to the next estimating milestone or the Price Proposal. During the reconciliation process, the ICE and/or EE may believe it is necessary to adjust their pricing assumptions and estimate.

K. Subsequent OPCCs

As the design progresses, the previous activities are repeated to coincide with each remaining design milestone (typically occurring at the 60% and 90% designs. Additional OPCCs may be necessary if significant design changes occur or significant pricing variances remain. One of the goals through this iterative process is to reconcile pricing differences throughout the preconstruction phase, thereby helping ensure that the CMGC Contractor's Price Proposal is acceptable to Caltrans.

In addition to the activities described above, the CMGC Contractor may provide other potential preconstruction services to assist Caltrans in developing the project. Table 1 provides a list of these potential preconstruction services. A description of these services can be found in Appendix A. The services requested by Caltrans will vary from project to project.

TABLE 1 – POTENTIAL PRECONSTRUCTION SERVICES

DESIGN RELATED	SCHEDULE RELATED
Validate Department/Consultant design	Validate agency/consultant schedules
Assist/input to Department/Consultant design	Prepare and manage project schedules
Design reviews	Develop sequence of design work
Design charrettes	Construction phasing
Constructability reviews	Schedule risk analysis/control
Operability reviews	**ADMINISTRATION RELATED**
Regulatory reviews	Coordinate with 3rd party stakeholders
Market surveys for design decisions	Attend public meetings
Verify/take-off quantities	Bidability reviews
Assistance shaping scope of work	Subcontractor bid packaging
Feasibility studies	Prequalifying Subcontractors
COST RELATED	Assist in right-of-way acquisition
Validate agency/consultant estimates	Assist in permitting actions
Prepare project estimates	Study labor availability/conditions
Cost engineering reviews	Prepare sustainability certification application
Early award of critical bid packages	Coordinate site visits for subcontractors
Life cycle cost analysis	**PRECONSTRUCTION RELATED FIELD WORK**
Value analysis/engineering	Utility Relocation
Material cost forecasting	Potholing
Cost risk analysis	Preliminary soil and geotech studies
Cash flow projections/Cost control	Right of Way Demolition
Shape the project scope to meet the budget	Preliminary Surveying

Note: This list adapted from National Cooperative Highway Research Program Project 10-85 "A Guidebook for Construction Manager-at-Risk Contracting for Highway Projects"

6. Pre-NEPA Approval Procurement and Requirements

If the CMGC Contractor is procured prior to completing the NEPA approval process, Caltrans must abide by and include the following provisions in the CMGC RFQ and the CMGC Preconstruction Services Contract:

- A provision allowing unilateral termination by Caltrans if the environmental review process does not result in selecting a build alternative.

- A provision that the scope of services in the preconstruction phase includes all alternatives identified and considered in the NEPA process.

- A provision ensuring that no commitments are made to any alternative during the NEPA approval process and that the comparative merits of all alternatives identified and considered during the NEPA approval process, including the no-build alternative, will be evaluated and fairly considered.

- A provision that the CMGC Contractor must not prepare NEPA documentation or have any decision-making responsibility with respect to the NEPA approval process. However, the CMGC Contractor may be requested to provide information about the project and possible mitigation actions, including constructability information, and its work product may be considered in the NEPA analysis and included in the record.

- A provision that Caltrans will not proceed, or permit any consultant or contractor to proceed, with the development of shop drawings and fabrication plans before the completion of the NEPA approval process for the project.

- A provision that Caltrans will not proceed with the award of a construction contract (including early work packages such as advanced material acquisition or site work) and will not proceed, or permit any consultant or contractor to proceed, with construction until the completion of the NEPA approval process for the project.

Prior to completing the NEPA approval process, Caltrans may proceed, solely at the risk and expense of Caltrans, with design activities at any level of detail (including final design and preconstruction services associated with final design) for a CMGC project before completion of the NEPA approval process without affecting subsequent approvals required for the project. The FHWA, however, will not authorize final design activities and preconstruction services associated with final design, and such activities will not be eligible for federal funding until after the completion of the NEPA approval process. Caltrans may use a CMGC Contractor for preconstruction services associated with at-risk final design provided the costs of the CMGC Contractor's at-risk work are segregated from preconstruction services eligible for reimbursement during the NEPA approval process. If Caltrans decides to perform at-risk final design, it must notify FHWA of its decision to do so before undertaking such activities. It should be noted that contracting for construction activities such as the acquisition or fabrication of materials (including shop drawings and fabrication plans) is not allowed, even on an at-risk basis, before the conclusion of the NEPA approval process.

7. Work Packages

An advantage of CMGC project delivery is that it allows the flexibility to perform construction in phases with multiple work packages as project phases are identified and approved for construction. Reasons for using multiple work packages may include project phasing to match funding schedules, being able to construct a phase of the project while right of way is secured for additional phases, or releasing a utility package in advance of roadway construction to advance the project schedule.

Work packages must be a severable phase of the construction, such that Caltrans is not obligated to have the CMGC Contractor construct any other portions of the work. Each work package must obtain all required clearances, including applicable FHWA approvals, and be evaluated and awarded through the Price Proposal process. For this reason, a single package may be more efficient as the Price Proposal and contracting processes are only performed once. Furthermore, a single package helps ensure that the cost of the entire project is within budget before proceeding with construction.

An early work package is a type of work package for a portion of physical construction work (including but not limited to site preparation, structure demolition, hazardous material abatement/treatment/removal, or early material acquisition/fabrication) that is procured after NEPA approval is complete but before all design work for the project is complete. Early work packages may be used to procure long-lead time construction materials and equipment in advance of construction, thus optimizing the overall project schedule. Materials may also be procured with early work packages to avoid price escalations for volatile construction materials.

Per the FHWA's Final Rule for CMGC, early work packages a re intended for minor elements or stages of project construction that can be accomplished during the period after NEPA approval is complete and before design of the project is sufficient to permit Caltrans and the CMGC Contractor to reach price agreement for construction of the entire project. Early work packages are not to be used to piecemeal construction. Therefore, when considering an early work package for any federally funded project, it is important that the project team consult with the FHWA to verify the early work package scope of work constitutes minor elements or stages of project construction.

If a work package is being issued, an OPCC for the entire project should be requested from the CMGC Contractor prior to awarding a contract for the work package, including an early work package. The OPCC for the entire project is used by Caltrans to confirm that the overall construction scope can be completed within the available project budget. Exact timing for requesting an OPCC for the entire project from the CMGC Contractor is evaluated on a project-by-project basis; however, it is typically requested in conjunction with an OPCC for a work package.

For federally funded projects, Caltrans is required to provide the FHWA with a total construction project cost estimate prior to the FHWA's authorization of construction services (including authorization of an early work package). No construction activities (including early work packages, even on an at-risk basis) shall be performed or contracted prior to the completion of the NEPA approval process.

8. Price Proposal Process

Once design has been completed to a level where a price may be submitted (typically at 90 to 95 percent design), Caltrans will prepare a plans and specifications package. The construction contract must include appropriate provisions ensuring that all environmental and mitigation measures identified in the NEPA documentation and committed to in the NEPA determination will be implemented.

Upon delivery of the plans and specifications, Caltrans will request a Price Proposal from the CMGC Contractor at an agreed upon date. The CMGC Contractor will develop the Price Proposal which will include the direct cost of performing the work (equipment, labor, materials, etc.), overhead and profit. Depending on the project schedule, the Price Proposal may be submitted with subcontractor prices included or with subcontractor plug values as placeholders pending solicitation of subcontractor bids. If subcontractor plugs are used, then adequate time to solicit the necessary subcontractors and to meet the DBE goals will need to be provided prior to awarding the contract. (Note, however, that subcontractor procurement must be scheduled so that the construction contract

can be awarded while the subcontractor prices remain valid. The CMGC Contractor signature on the construction contract confirms validity of the subcontractor prices for that construction contract.) DBE goals are set for and included in each construction contract. Subcontractors and suppliers must be procured using a competitive and transparent bid process in accordance with a subcontracting plan approved by Caltrans. The subcontracting plan must demonstrate how the CMGC Contractor will ensure adequate competition, how the minimum 30 percent self-performance requirement will be met, and that there will be adequate subcontracted work available to meet the DBE goal. The Price Proposal will be received and safeguarded by the CMGC Program.

The Price Proposal will then be compared to the Engineers Estimate and the ICE estimate to determine its reasonableness. A price reconciliation meeting will be held to discuss differences in the CMGC Contractors Price Proposal and the ICE estimate. Neither the ICE estimate nor the Engineers Estimate will be provided to the CMGC Contractor. After the reconciliation meeting is held, a revised Price Proposal may be requested from the CMGC Contractor and the ICE. This will then be reviewed and reconciled as necessary.

Contingency is accounted for in every contractors bid or cost proposal for every project, regardless of contracting method, and is reflective of the risks present at the time the bid/cost proposal is submitted. Typically, higher risk means higher contingency and lower risk means lower contingency. One of the major benefits of CMGC contracting is that it allows Caltrans and the CMGC Contractor to collaboratively work together during the preconstruction phase to better understand, manage, and reduce risks on the project, thereby lowering contingency costs.

For CMGC projects, risk is accounted for by two separate means: (1) in the CMGC Contractors Price Proposal for risk that the CMGC Contractor has accepted, and (2) in the Caltrans contingency (contingency and/or supplemental work) for risk that Caltrans has accepted.

Establishing a dollar amount for assigned risks is done by using a risk simulation, such as a Monte Carlo. Caltrans and CMGC Contractor must collaborate on risk assignment so that both parties understand the approach and methods used in the risk analysis.

After a number of submittals or if the price reconciliation is not progressing, the Department will make a determination to either award the construction services to the CMGC Contractor through a construction contract or to advertise the project for bids. The CMGC Contractor will be excluded from bidding on the advertised contract.

For Project of Division Interest (PoDI) projects, the FHWA will review the Price Proposal analysis and provide Caltrans with any comments they may have.

If an agreed price is reached, Caltrans finalizes the plans and specifications with all necessary approvals, including, but not limited to NEPA approval, right-of-way certification, railroad certification, and utility certifications. The project team submits a recommendation to award the contract to the CMGC Program.

- If the Price Proposal is within the available project budget and within 10% of the ICE estimate, no justification to award the project is required.
- If the Price Proposal is more than 10% over or less than 90% of the ICE Estimate, the project team must include in their recommendation to award memorandum justification for awarding the contract to the CMGC Contractor.

The Price Proposal Validation Process is shown in Figure 1.

9. Federal Highway Administration (FHWA)

FHWA involvement is required on projects with federal funding. FHWA's Final Rule for CMGC outlines requirements, including FHWA approvals, specific to federally funded CMGC projects. When it is determined that a CMGC contract will use federal-aid funding for preconstruction services or may use federal-aid funding for construction services, the RFQ and associated cost analysis (for preconstruction services) will require FHWA approval. Caltrans must request FHWA's authorization of preliminary engineering , including any additional costs for preconstruction services, prior to incurring such costs. If preliminary engineering has already been authorized and the cost of preconstruction services were not included, Caltrans may request a modification to the authorization to capture the additional costs. FHWA must also approve Major Addenda to the RFQ. A Major Addendum includes, but is not limited to, changes to the selection method, evaluation criteria, or significant changes to the scope of services. CMGC projects are Projects of Division Interest by default, therefore, requiring a Project Oversight Agreement (POA). Table 2 is an overview of FHWA involvement on federally funded CMGC projects. This list can be modified and tailored to each individual CMGC project through the POA. The flow chart shown in Figure 2 shows the general approval process for preconstruction and construction services.

The provisions of 23 CFR 630 and 635 apply to CMGC contracts. As discussed in Section 6, the RFQ may be issued prior to or after approval of the NEPA document. However, preconstruction services eligible for reimbursement may only be related to preliminary design until the NEPA document is approved. Upon approval of the NEPA document and FHWA authorization, preconstruction services related to final design may be eligible for reimbursement. Once design has reached a level where a Final Price can be solicited, a plans and specification package may be submitted for approval. FHWA must review and approve the price analysis and agreed price prior to authorization of construction services. Caltrans will provide FHWA a copy of the final executed contract.

Federally funded CMGC projects will follow the procedures described in this document. Any modifications to these procedures will require FHWA approval.

CALTRANS PROCEDURES FOR CONSTRUCTION MANAGER/GENERAL CONTRACTOR (CMGC) PILOT PROGRAM PROJECTS

TABLE 2 FHWA INVOLVEMENT ON FEDERAL LY FUNDED PROJECTS

Activity	Caltrans Action	FHWA Action[7]
Project Delivery Selection	Invite	Participate[8]
Potential Conflict of Interest	Notify	None
Preliminary Engineering Authorization	Prepare	Authorize[5] (5 Days)
RFQ	Prepare	Approve[3] (14 Days)
RFQ Clarifications	Prepare[2]	None
RFQ Addenda	Prepare	Review[1]
Major RFQ Addenda	Prepare	Approve[3] (5 Days)
Re-issuing Procurement	Consult	Consult
Cancelling Procurement	Notify	None
SOQ Evaluations	Invite	Participate[8]
Short-List	Prepare[2]	None
Debriefing	Invite	Participate[8]
30%/60%/90% Plans	Prepare	Review[1]
Price Variance Report	Prepare[2]	None
Price Reconciliation Meeting	Invite	Participate[8]
Proceed with At-risk Final Design	Notify	None
Plans and Specifications	Prepare	Approve (14 Days)
Plans and Specifications Addenda	Prepare	Review[1] (3 Days)
Use of Early Work Package(s)	Consult	Consult
Price Estimate for Entire Project[9] (including Early Work Package(s))	Prepare	Approve (5 days)
Price Proposal Analysis	Prepare[6]	Review and Approve
Request for Construction Authorization	Prepare[4]	Authorize (7 Days)
Request for Concurrence in Award[10]	Prepare	Concur in Award (5 Days)
Reject Price Proposal	Notify	None
Terminate CMGC Contract	Notify	None
Use Another Procurement Process	Prepare	Concur
Post-NEPA approval review of at-risk final design costs for eligibility	Prepare	Review and Approve

[1] FHWA is provided an opportunity to review and submit comments to Caltrans within the specified time-frame.
[2] Caltrans will provide FHWA with a courtesy copy.
[3] The PM will submit the CMGC RFQ to FHWA for approval prior to advertising the CMGC RFQ. Major RFQ Addenda are submitted to FHWA for approval prior to posting. Early and continuous coordination is encouraged by providing a draft RFQ for FHWA review.
[4] Caltrans will submit the Request for Construction Authorization to the FHWA, for the project or a work package, after Caltrans deems the CMGC Contractor's Price Proposal to be acceptable - per the CMGC Price Proposal process.
[5] FHWA must authorize preliminary engineering (including the costs of preconstruction services) before Caltrans incurs such costs. If preconstruction services were not included in original authorization, request a modification to include those costs, if necessary.
[6] The estimate submitted to the FHWA for Price Proposal Analysis will be the ICE Estimate.
[7] FHWA actions may be modified under the Project Oversight Agreement for each individual CMGC project.
[8] Participation by FHWA will be based on time availability.
[9] Caltrans to provide price estimate for entire project prior to any construction authorizations, including early work packages.
[10] FHWA concurrence constitutes approval of the Agreed Price, scope, and schedule for the work.

FIGURE 1 - CMGC PRICE PROPOSAL VALIDATION PROCESS

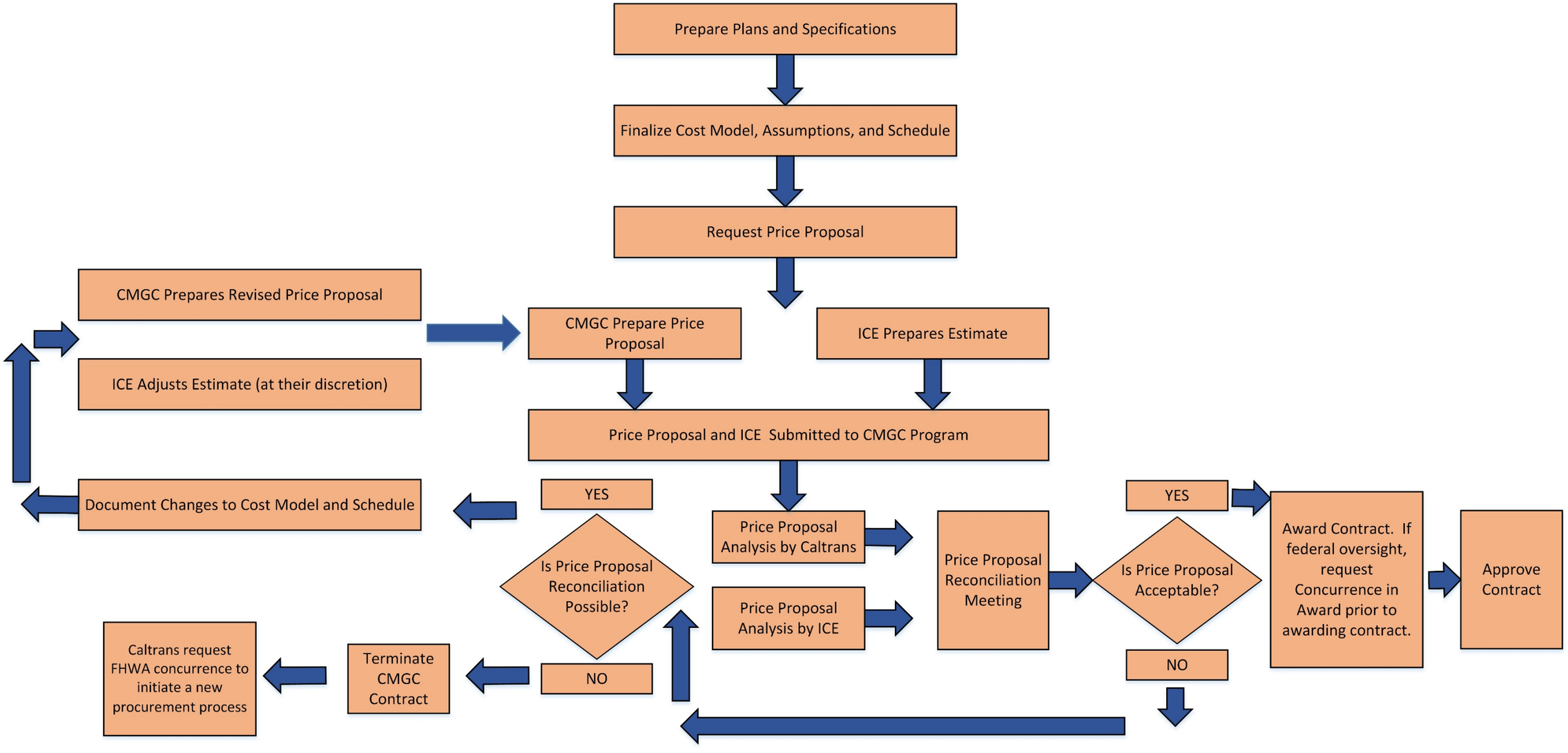
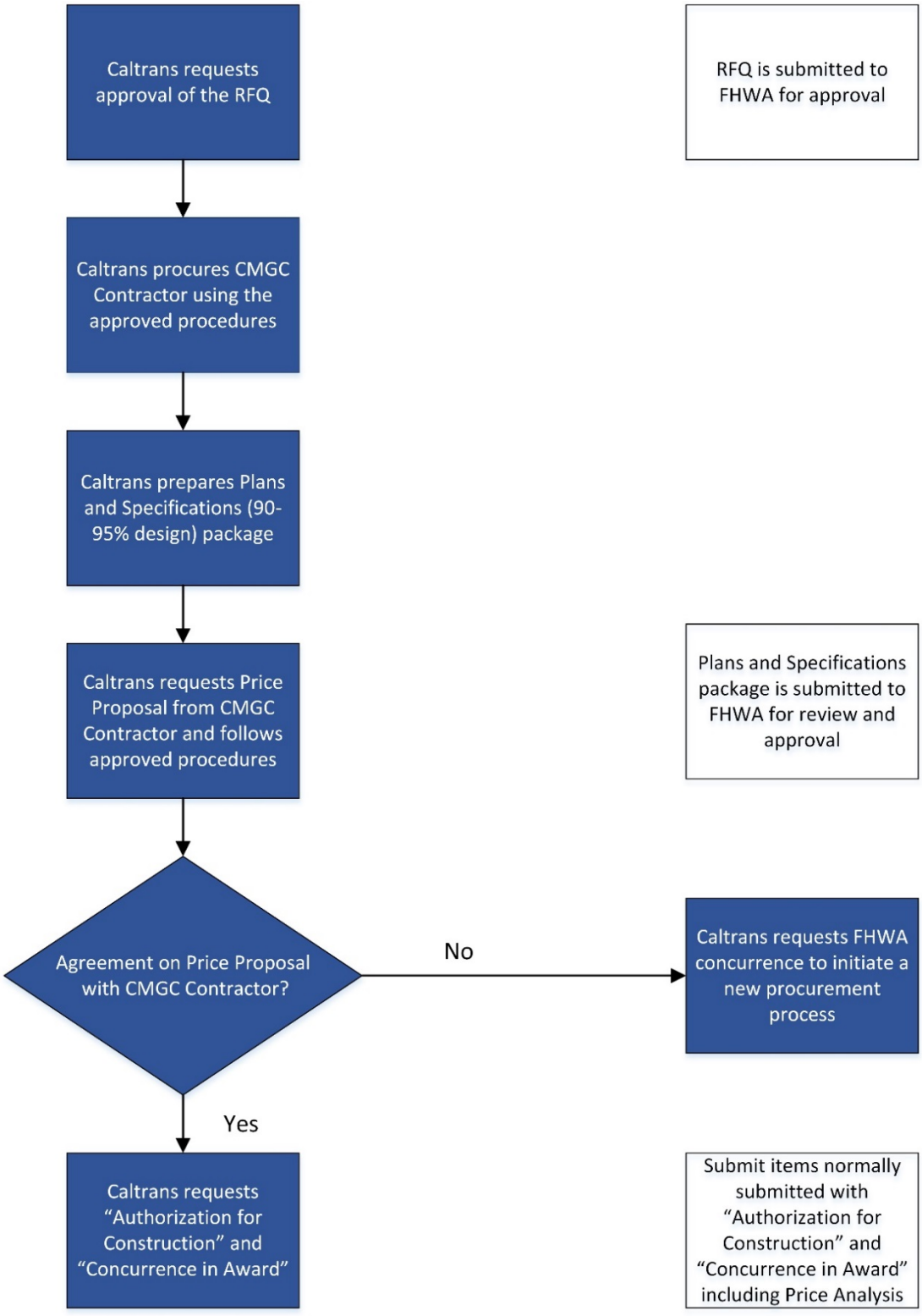


FIGURE 2 - FHWA CMGC APPROVAL PROCESS



CALTRANS PROCEDURES FOR CONSTRUCTION MANAGER/GENERAL CONTRACTOR (CMGC) PILOT PROGRAM PROJECTS

APPENDIX A

Glossary of Preconstruction Services Terms

CALTRANS PROCEDURES FOR CONSTRUCTION MANAGER/GENERAL CONTRACTOR (CMGC) PILOT PROGRAM PROJECTS

Adapted from National Cooperative Highway Research Program Project 10-85 "A Guidebook for Construction Manager-at-Risk Contracting for Highway Projects"

Design-Related Preconstruction Services

Validate agency/consultant design – CMGC Contractor evaluates the design as it is originally intended and compares it to the scope of work with both the required budget and schedule to determine if the scope can be executed within those constraints. A validated design is one that can be constructed within the budget and schedule constraints of the project.

Assist/input to agency/consultant design – CMGC Contractor will offer ideas/cost information to the designer to be evaluated during the design phase. Ultimately, the designer is still responsible for the design.

Design reviews – done to identify errors, omissions, ambiguities, and with an eye to improving the constructability and economy of the design submittal.

Design charrettes – CMGC Contractor would participate in structured brain-storming sessions with the designer and owner to generate ideas to solve design problems associated with the project.

Constructability reviews – review of the capability of the industry to determine if the required level of tools, methods, techniques, and technology are available to permit a competent and qualified construction contractor to build the project feature in question to the level of quality required by the contract.

Operability reviews – bringing in the agency's operations and maintenance personnel and providing them with an opportunity to make suggestions that will improve the operations and maintenance of the completed projects.

Regulatory reviews – a check to verify that the design complies with current codes and will not have difficulty obtaining the necessary permits.

Market surveys for design decisions – furnish designers with alternative materials or equipment along with current pricing data and availability to assist them in making informed design decisions early in the process to reduce the need to change the design late in the process resulting from budget or schedule considerations.

Verify/take-off quantities – CMGC Contractor verifies the quantities generated by the designer for the engineer's estimate.

Assistance shaping scope of work – CMGC Contractor generates priced alternatives from the designer and owner to ensure that the scope of work collates to the constraints dictated by the budget and/or schedule.

Feasibility studies – CMGC Contractor investigates the feasibility of possible solutions to resolve design issue on the project.

CALTRANS PROCEDURES FOR CONSTRUCTION MANAGER/GENERAL CONTRACTOR (CMGC) PILOT PROGRAM PROJECTS

Cost-Related Preconstruction Services

Validate agency/consultant estimates CMGC Contractor evaluates the estimate as it is originally intended and determines if the scope can be executed within the constraints of the budget.

Prepare project estimates CMGC Contractor provides real -time cost information on the project at different points in the design process to ensure that the project is staying within budget.

Cost engineering reviews review that includes not only the aspects of pricing but also focuses on the aspect that time equals money in construction projects.

Early award of critical bid packages CMGC Contractor determines which design packages should be completed first to ensure that pricing can be locked in on the packages.

Life-cycle cost analysis CMGC Contractor provides input to design decision that impact the performance of the project over its lifespan.

Value analysis process that takes place during preconstruction where the CMGC contractor identifies aspects of the design that either do not add value or whose value may be enhanced by changing them in some form or fashion. The change does not necessarily reduce the cost; it may actually decrease the life-cycle costs.

Value Engineering systematic review by a qualified agency and/or contractor personnel of a project, product, or process so as to improve performance, quality, safety, and life-cycle costs.

Material cost forecasting CMGC Contractor utilizes its contacts within the industry to develop estimates of construction material escalation to assist the owner and designer make decisions regarding material selection and early construction packages.

Cost risk analysis furnishing the agency with information regarding those cost items that have the greatest probability of being exceeded.

Cash flow projections/Cost control CMGC Contractor conducts earned value analysis to provide the owner with information on how project financing must be made available to avoid delaying project progress. This also may include an estimate of construction carrying costs to aid the owner in determining projected cash flow decisions.

Shape the project scope to meet budget CMGC Contractor recommends scope modifications to assist in managing the project budget.

Schedule-Related Preconstruction Services

Validate agency/consultant schedules CMGC Contractor evaluates if the current scope of work can be executed within the constraints of the schedule.

Prepare and manage project schedules CMGC Contractor prepares and manages schedules throughout the design phase to ensure that dates will be met, and notifies the owner when issues arise.

Develop sequence of design work CMGC Contractor sequences the design work to mirror the construction work, so that early work packages can be developed.

Construction phasing – CMGC Contractor develops a construction phasing plan to facilitate construction progress and ensure maintenance of traffic.

Schedule risk analysis/control – CMGC Contractor evaluates the risks inherent to design decisions with regard to the schedule and offers alternative materials, means and/or methods to mitigate those risks.

Administrative-Related Preconstruction Services

Coordinate contract documents – CMGC Contractor evaluates each component to the construction contract against all other components and identifies conflicts than can be resolved before award of the construction phase contract.

Coordinate with third-party stakeholders – CMGC Contractor communicates with third parties involved in the project including but not limited to utilities, railroads, and the general public.

Attend public meetings – CMGC Contractor can organize and attend public meetings to answer questions from the public about the construction of the project.

Biddability reviews – CMGC Contractor reviews the design documents to ensure that subcontractor work packages can be bid out and receive competitive pricing. This action reduces the risk to the subcontractors because they are given the specific design product they need for their bids; not just told to find their work inside the full set of construction documents.

Subcontractor bid packaging – CMGC Contrac tor coordinates the design work packaging to directly correlate with subcontractor work packages so that early packages can be easily bid out and awarded.

Prequalifying subcontractors – CMGC Contractor develops a list of qualified subcontractors that are allowed to bid on packages as they are advertised.

Assist in right-of-way acquisition – CMGC Contractor assists the designer in identifying options for right-of-away acquisitions by providing means and methods input. The primary purpose is to minimize the amount of right-of-way actions that must be undertaken.

Assist in permitting actions – CMGC Contractor is empowered to meet with resource agencies and develop permit applications with assistance from the designer.

Study labor availability/conditions – CMGC Contractor furnishes advice during design with regard to the availability of specialty trade subcontractors and the impact of that availability on project budget and schedule constraints.

Prepare sustainability certification application – When certificatio n for sustainability is desired, the CMGC Contractor is empowered to prepare the necessary paperwork to submit for certification

Coordinate site visits for subcontractors – CMGC Contractor coordinates site visits for subcontractors to facilitate the subcontractor procurement process.