RECOMMENDED GUIDELINES FOR THE SELECTION OF A CONSTRUCTION PROJECT DELIVERY METHOD

July 9, 2012

Contents

Introduction

A project delivery system defines the structure of the relationships of the parties, the roles and responsibilities of the parties, and the general sequence of activities required to deliver the project. Regardless of how they are structured, all delivery methods involve three elemental parties: Owner, Consultant and Builder/Constructor.

The relationships, roles, and responsibilities of the parties involved may vary considerably under the different project delivery systems. Consequently, selection of the project delivery system is one of the most important decisions affecting the success of a project, and is therefore a decision which should be made very early in the process. Each of the major project delivery systems has its advantages and disadvantages in different circumstances and suitability should be considered separately for each particular project.

The Owner contracts responsibilities and risks to design professionals, builders and specialists, and retains some risks in-house. The main differences among delivery methods lie in:

- Contract formation and, most crucially, the parties to whom the various responsibilities and risks are assigned;
- The incentives to meet the contract requirements;
- The assignments to carry out contract administration and other project management services.

Project size, complexity, innovation, uncertainty, urgency and the degree of Owner involvement all affect delivery method selection and the difficulty of achieving the required results. However, the Owner chooses how much to be directly involved, by either assigning an in-house Project Manager or contracting this role out. The Project Manager is the Owner's representative for delivery of the project, whichever method is selected. The Owner's in-house resources – or, should they decide to contract with a single entity – are responsible for overseeing design, planning, scheduling, project accounting, and coordination and control of construction.

In examining the multitude of ways that design and construction projects are delivered, it is apparent that project delivery systems are structured in three ways. These structures include single source responsibility, dual source responsibility, and triple source responsibility. All project delivery systems can be derived from these three primary systems or structures, with a number of subsystems or hybrids available for each primary system.

Essentially, there are three recognized delivery methods. For the purposes of this guide we have chosen to limit our evaluation considerations to those delivery methods:

- Design-Bid-Build (dual source responsibility – Consultant and Builder/Constructor)
- Construction Management (triple source responsibility – Consultant, Construction Manager and Builder/Constructor, with the possibility that the Construction Manager and Builder/Constructor could be the same party)
- Design-Build (single source responsibility – Designer Builder)

It is recommended that variations from these three recognized delivery methods be made only for substantial reasons. For more information about the hybrid methods that supplement each of these delivery methods and a more multifaceted overview of the various construction delivery methods please refer to the Management of Building Projects by the BC Building Projects Committee at http://www.bcprojectsmanual.com/

Definitions

Design-Bid-Build is a project delivery method in which an Owner contracts with a single entity that performs construction work in accordance with specifications and drawings for compensation, based on a stipulated price, unit prices, or the cost of construction plus a fee.

Construction Management is a project delivery method in which an Owner contracts with a single entity to provide site management, advice, coordination and administrative and technical services for the benefit of the Owner, for a contract fee. The Owner may or may not contract directly with the Trade Contractors depending on the contractual arrangement with the Construction Manager (CM).

Construction Management Contract – For Services is a project delivery method in which an Owner contracts with a single entity as its limited agent (subject to defined authority) to provide administration and coordination of the trade contracts in the best interest of the Owner. The CM will primarily provide advisory and coordination services, and the Owner will contract directly with Trade Contractors. The Owner may request the CM to use its own forces for some minor and/or temporary construction work.

Construction Management Contract – For Services & Construction is a project delivery method in which an Owner contracts with a single entity to provide site management, advice, and administrative and technical services and will be responsible for all construction work, for a contract fee for Services and an additional fee for performing the work. The CM will initially provide advisory and coordination services and performs all the construction work in a manner similar to a general contractor. The Construction Manager may use their own forces for construction work or subcontract it out to Trade Contractors directly. This form of contract provides an option to convert from its initial default of a cost plus basis to a Guaranteed Maximum Price or Stipulated Sum contract at any point during the term of the Contract.

The **Project Manager** is part of the Owner's in-house resources. Alternatively, if they decide to contract with a single entity, the Project Manager is the party responsible for overseeing design, planning, scheduling, project accounting, and coordination and control of construction.

The **Owner** is the organization or body that owns or controls the land on which a project is built, and enters into a contract with a Design Bid Builder, Construction Manager or a Design Build Contractor.

The **Consultant** is the person or entity engaged by the Owner (or Design Build Contractor) as the Architect, the Engineer or entity licensed to practice in the province of British Columbia.

Design-Build is a project delivery method in which an Owner contracts with a single entity to provide both design and construction under one contract.

Design-Build Contractor is a contractor who enters into a contract with an Owner to provide design and construction services for a project.

1.0 Design-Bid-Build Delivery

Design-Bid-Build project delivery in the construction industry typically involves a Contractor who performs construction work in accordance with specifications and drawings, for compensation, based on a stipulated price, unit prices, or the cost of construction plus a fee. Construction pricing for design-bid-build may be “cost-reimbursement” or “unit-price” format or a mix of both.

One general contract covering all construction trades is awarded after design documentation is substantially complete. Ideally, a fully integrated design is in place before the contract is bid, enabling the construction costs to be reliably estimated and bidders to evaluate risks.

The contracting arrangements are well understood in the industry. When used properly, the method is relatively straightforward to implement, because:

- The bidding of all of construction in one package supports a design process in which working drawings for all disciplines are coordinated for issue in mutually consistent bid documents.
- Substantial changes may be made, or the project deferred or abandoned, before bids are invited for construction; hence, such actions do not incur costs to cancel contracts.
- If the construction start is put on hold because of financing or market conditions, the project can proceed rapidly when conditions improve.

Unrealistic budgets or schedules, or incomplete bid documents, can impact the price and quality of the Project, and potentially add to the risk of conflict. Under such market conditions, it may be challenging to conduct an orderly design-bid-build project. However, high-quality bid documents and prequalification of General Contractor and subcontractors (only when special expertise is required) are likely to lead to co-operation during construction and to a successful result.

1.1 Design-Bid-Build Delivery, Conditions for the Use Of

This delivery method is often the best choice when the Owner wants little direct involvement in the project and its contract administration, perhaps due to having little project experience.

The following conditions suggest situations where this method may be optimal:

- Prior to inviting bids, sufficient time, funds and capable coordination are available to develop complete, clear and consistent working drawings and other bid documents; also, contract award will be followed by a realistic construction duration.
- At the time when the general contract and its subcontracts are all bid together, a firm contract scope can be detailed, limits of scope division defined and the project has a relative absence of uncontrollable risks.
- Bid-shopping of subtrade prices can be prevented so that negotiation for reduction of contract prices does not become a threat to quality or predispose adversarial relations when closing trade contractor bids through the bid depository using the BCCA Electronic Bidding System.
- Changes after award should be limited to about 5% of the contract price, and will not significantly affect the project schedule.
- The Consultant has the proven ability to administer the construction contract, including prompt resolution of disputes.

The above conditions can deliver the advantages from proceeding without the overlapping of design working drawings and construction.

1.2 Challenges and Problems

In both the private and public sectors, this method may face challenges in compressing the project schedule, if required, because fast-tracking of design and construction is not compatible with this delivery method.

Actions, including realistic scheduling and bidder pre-qualification (only when special expertise is required) are recommended by this Guideline, to minimize the above concerns.

Other problems to manage or avoid:

- Owners need to ensure that bid documents have few (if any) errors or omissions, to minimize cost, schedule and dispute impacts during the Project.
- A traditional approach may require a certain level of qualification (such as bonding), especially in the public sector, which has obligations to make bidding on building work widely available.
- The construction schedule may be compressed due to prior decisions being late. There may be insufficient time for design completion, with bids being invited prematurely in order to meet deadlines. It invites disruptive changes to defer part of the main design work until the bidding period or after contract award.
- Until the general contract is awarded, a “traditional” approach may involve construction expertise only through the Consultant. However, construction expertise can be obtained sooner by retaining a construction advisor, and the Owner may value early collaboration of builders with design professionals in order to enhance the constructability of the project. This is best achieved as a concerted effort as opposed to an occasional request for advice about specific issues.

2.0 Construction Management Delivery

Construction Management is a project delivery method in which an Owner contracts with a single entity to provide site management, advice, and administrative and technical services for benefit of the Owner, for a contract fee. The Owner may or may not contract directly with Trade Contractors depending on the contractual arrangement with the Construction Manager (CM).

CM project delivery is characterized by collaboration of an Owner, Consultant, and Construction Manager working as a team to achieve efficiencies in the areas of time, constructability and cost, particularly in the preconstruction phase of a Project. The Owner contracts separately with:

(i) a Consultant for design services;
(ii) a Construction Manager to:
  - provide advice to the Owner during pre-construction (e.g. participation in the design process to ensure optimal efficiency in the selection of materials, systems, construction methods, and scheduling), and
  - administer and oversee Trade Contractors' work, including managing trade tendering and contracting with the Trade Contractors where the Construction Manager is acting as a Contractor in the construction and post-construction phases; and

(iii) Trade Contractors for construction work in the case where the Construction Manager is acting as a limited agent of the Owner.

CM is most beneficial when:

- the project is complex multi-phased renovation
- time is critical (including rapidly changing market conditions)
- design is extraordinary or innovative
- needs and requirements are unknown

This process allows construction to commence earlier, without waiting for the complete design. Trade Contractors may perform certain construction work concurrently with the design of work scheduled to be performed later. The role of Construction Manager may vary, as they may act only as a limited agent of the Owner, or may act as a Contractor contracting with all Trade Contractors (as subcontractors) and suppliers.

Therefore, there are two forms for the Construction Management method of project delivery:

- Construction Management Contract - for Services
- Construction Management Contract - for Services and Construction

Construction management requires extensive interaction among the design professionals who prepare drawings and specifications, and with the Construction Manager, who compiles and issues bid documents for construction work and for Owner-supplied equipment. A fast-track schedule is usual, which is unrealistic to attempt without superior teamwork during design documentation and construction – an especially important selection criterion for Lead Team members under this delivery method.

The Construction Manager:

- may be retained for construction advice during project development;
- is usually retained for all of the “preparation for construction” stage;
- manages construction and administers the trade and supply contracts on behalf of the Owner, through to project completion;

The Project Manager administers the service agreements by which the Construction Manager and Consultant are retained. The Construction Manager provides a professional level of service for a fee, without otherwise sharing project risks or revenues with the Owner. Hence, the Construction Manager neither guarantees nor is liable for:

- the quality of the work of Trade Contractors;
- completion according to the project schedule and budget, but makes each of these requirements more likely through applying:
    - construction expertise on behalf of the Owner, including negotiating with contractors from the strength of understanding details;
    - due diligence in carrying out the assigned management services.

After award of contracts for the major trades (civil, structural, electrical, mechanical and the building envelope), the project cost has a high degree of certainty. When contracts such as for finishing work are tendered later, their scope can be managed to suit any changes in project circumstances, such as budgets or the requirements of major tenants.

Owners should be aware that they need to meet (and not exceed) budgets in the early stages of a CM project in order not to compromise budgets at the later stages of the project.

The Construction Manager, if experienced in the locality of the project, is able to pre-qualify bidders for trade contracts, based on direct knowledge.

2.1 Construction Management Contract – For Services

Construction Management Contract – For Services (CCDC 5A) is a project delivery method in which an Owner contracts with a single entity as its limited agent (subject to defined authority) to provide administration and coordination of the trade contracts in the best interest of the Owner.

The CM will primarily provide advisory and coordination services, and the Owner will contract directly with Trade Contractors. The Owner may request the CM to use its own forces for some minor construction Work (e.g. temporary work).

Conditions for the Use of

The following elements are likely to make Construction Management delivery more feasible or attractive:

- Completion is required as soon as possible or by a defined and challenging date, needing fast-tracking of design documentation and construction, and possibly of construction and contracts commissioning.
- Early cost certainty is of less priority than cost minimization.
- The Project Manager is free to recommend the Construction Manager appointment based on qualifications and reliability, not mainly on price.
- Co-operation among the Project Manager, Prime Consultant and Construction Manager can be relied on. Construction expertise will then help achieve a design that is straightforward to build, and design expertise will be coordinated with construction progress and problems.
- The Owner or Project Manager wants control of Trade Contractor selection,
- The Owner accepts the additional in-house administration that results from multiple trade contracts.

Challenges and Problems

The Construction Management method is a wrong choice, or is not feasible, *if* the Owner:

- is reluctant to authorize a Construction Manager as agent;
- is subject to pressure to award a construction management contract for reasons that give insufficient weight to qualifications;
- wants to use the method for fast-tracking, but is required to have most or all major construction contracts, and their firm prices and completion dates, in place before financing and/or construction start are authorized;
- prefers direct relationships with a builder as General Contractor;
- requires one contractor to have overall construction responsibility.

Problems are minimized when the Construction Manager:

- is fully committed to assuring that results meet design requirements in balance with cost and progress concerns; this includes support for the Consultant in providing complete documents for trade work;
- does not carry out any work on a non-competitive basis while the work is otherwise competitively bid;
- adopts tendering procedures that are fair to all bidders, and are transparent in a manner equivalent to the practices of the bid depository closing through the BCCA Electronic Bidding System.

2.2 Construction Management Contract – For Services and Construction

Construction Management Contract – For Services & Construction (CCDC 5B) is a project delivery method in which an Owner contracts with a single entity to provide site management, advice, and administrative and technical services and will be responsible for all construction Work, for a contract fee for Services and an additional fee for performing the Work. CM will initially provide advisory and coordination services and performs all the construction Work in a manner similar to a general contractor. The Construction Manager may use its own forces for construction Work or subcontract it out to Trade Contractors. The CM will subcontract directly with Trade Contractors. This form of contract provides an option to convert from its initial default of a cost plus basis to a Guaranteed Maximum Price or Stipulated Sum contract at any point during the term of the Contract.

Conditions for the Use Of

Many of the circumstances surrounding Construction Management Contracts for Services and Construction are similar to those listed in Section 2.1 (Construction Management Contract – For Services) but there are some additional factors to consider. This method requires parties to the contact who are experienced in the applicable contractual relationships. A less experienced Owner may successfully use the method by selecting an appropriate project manager and provided that each member is adept with the delivery method. The following circumstances favour the Services and Construction Model:

- the design and construction teams are fully committed to their roles and to project coordination, and time is allowed for working through the learning processes;
- the Owner wants an optimal mix of cost minimization and early certainty that costs will be within budget;
- arrangement of timely provision of firm requirements, whether as performance specifications or in more detail;
- benefits are anticipated from availability and continuity of construction expertise, from the start of design documentation or sooner;

- project requirements and uncertainties are well understood when pricing is set; (absence of scope certainty = unreliable maximum); the later the GMP is fixed, the less likely are subsequent problems and disputes due to surprises;
- the Owner's policies allow contract awards other than to low bidders.

Challenges and Problems

Many of these potential challenges and problems are similar to those for Section 2.1 but these additional factors should be considered:

- Relationships and coordination among the Project Manager, design professional and builders are paramount, relying on good faith and mutual respect. This adds risk for the builders as well as for the success of the method, generally. On the other hand, there is opportunity for mutual benefit from savings.
- Contracts are based on negotiation, and the Project Manager has to negotiate the second contract with the pre-selected contractor after the project is in progress. With professional estimating assistance, negotiations may have an objective basis, but the Owner does not have the advantage of competitive bidding.
- The Guaranteed Maximum Price contractor has incentive to identify design refinements to save construction costs and to work within the Owner's budget. However, the incentives usually do not apply to scope refinements that add costs in order to secure greater value for the Owner, so value management may be used to optimize the design and the use of funds.

3.0 Design-Build Delivery

Design-Build Delivery is when a company or joint venture undertakes design documentation and construction of the whole project, and designer-builder teamwork is a main benefit.

The primary differences between design-build and the two delivery methods explained previously are in the method/timing of acquisition of design and construction, and the contractual relationships between the participants. Design-build is also used on a smaller scale under other project delivery methods, when a permanent system or piece of equipment is designed and built by the same company.

A design-build contract is usually based on performance specifications often called Statement of Requirements, from which the Design-Builder defines the project to a detailed level. A firm-price contract is typically awarded at the end of the project development stage.

Extended evaluation and negotiation is sometimes necessary, especially if designs are required from bidders for evaluation as part of contractor selection. The period for contract tender and award is placed between the design development and design documentation phases.

Each bidder needs to know that project funding is in place, and that the project will proceed to completion, before outlaying the substantial cost of preparing a bid. This is not compatible with the Owner giving approval only for design documentation, and deferring construction approval until later.

The Owner should compensate unsuccessful proponents for their proposal submissions at a predetermined amount (honorarium). The Owner, although compensating the unsuccessful parties for their proposal submissions, shall not be at liberty to use the design nor incorporate any part of an unsuccessful proponent's design into the project. Compensation covers only part of the proposal preparation cost, and the design ideas and innovations remain the property of the proponent.

For additional information on evaluating the suitability of a project for Design-Build refer to the Canadian Design Build Practice Manual, 100 Series, Introduction and General.

3. 1 Conditions for the Use Of

Almost any type of project may be appropriate for Design-Build. This includes all types of buildings, renovations, civil structures, roads, and utility construction. However, before determining if a project is suitable for Design-Build, an Owner should:

- be able to clearly and explicitly state his expectations – Statement of Requirements, end user needs and priorities for the project to all bidders;
- have (in house) or hire project management expertise and be prepared to commit these resources to the project;
- understand the Design-Build process, and fully understand the apportionment of risk between himself and the contractor;
- have the project financing in place and be prepared to award the contract within the tender/proposal validity period; and,
- be prepared to compensate the unsuccessful proponents with an honorarium.

To be effective, the method requires:

- authority for contract award other than to the low-price bidder;
- firm performance specifications and a relative absence of uncontrollable risks at the time bids are invited;
- availability of design-build teams able to demonstrate financial capability, teamwork and who can assure quality requirements; and
- the Project Manager must be free to follow practices itemized above, as to make the required decisions that will maintain effective fast-tracking of design documentation and construction.

If the above points apply, the method offers the following advantages.

- Its turnkey aspects provide a single firm-price contract with single-point combined responsibility for design, purchasing and construction.
- The Owner avoids involvement in design-construction disputes, provided that they are not caused by Owner's changes in performance requirements or other contract conditions, nor claimed to be so caused.
- Since both design and construction overlap, and redesign procedures are minimized, the total design and construction period can be efficiently compressed. This results in faster delivery of the project, and correspondingly, earlier occupancy of the finished project.
- The Owner benefits from co-operation between the Project Manager, Design-Builder and design-build team.

A detailed Statement of Requirements will ensure that the Designer Builder understands the desired quality or performance standards, and will be able to optimize the design accordingly. Hence, value management before award can confirm a shared view of quality requirements. During the work, the Quality Assurance Program confirms whether requirements are being met.

3.2 Design-Build Challenges and Problems

Design-Build should **not** be utilized where:

- the Owner has had detailed drawings and specifications prepared and is merely transferring risk to the contractor;
- the Owner is not prepared to commit the necessary resources to fairly prequalify bidders, prepare a comprehensive Request for Proposals, or fairly evaluate the proposals received;
- the Owner is not prepared to compensate the unsuccessful proponents with an honorarium;
- the Owner does not divulge all evaluation criteria for prequalification and proposal submissions to all bidders, or is not prepared to provide the evaluation results to bidders;
- the Owner intends to incorporate concepts submitted in Design-Build proposals into a subsequent re-tender (Design-Build or traditional);
- the Owner will not provide the bidders with adequate information regarding the site, the proposed functions of the project, or any other pertinent information;
- the contract award is contingent upon subsequent approvals from other authorities which are beyond the ability of the proponent to control the outcome (e.g. development permits, environmental permits, voter referenda);
- the Owner does not have the project financing in place and is not prepared to award the contract within a reasonable time period.

Success with this method requires high-quality communication among the three parties (Project Manager, Owner's Consultant, and Design-Builder) to define the project and economically reflect the Owner's requirements in the design, and to review detail where needed.

Compared to other delivery methods, the Project Manager has a smaller direct role after the design-build contract is awarded, and the Design-Build Manager has a correspondingly larger role. This makes the Project Manager role before award more crucial.

By their nature, bids for a design-build contract are costly to prepare. Sourcing of a successful design-build team depends on clear and firm performance requirements, as well as clear evaluation criteria, being defined in the bid invitation.

Because the Design-Builder assumes full responsibility for design and construction, the processes used to qualify and evaluate proponents are crucial for minimizing problems.

These elements should be considered:

- Pre-qualification may be based on statements of qualifications from proponent design-build teams and via in-depth interviews to test technical capabilities. Hence, team effectiveness has to be evaluated for the specific designer-builder relationship proposed.
- The Project Manager needs fully specified performance requirements to avoid problems.
- Protection of intellectual property. The Project Manager will not take ideas from an unsuccessful design-build proposal for use on the project or elsewhere, even ~~if~~ though an honorarium has been paid. Although terms of invitations could establish the Owner's right to do this, it would reduce the value of what bidders are willing to include in proposals.
- Clear bidding instructions and evaluation criteria. This eliminates a "lottery element". If a bidder is successful by guessing best or by assuming requirements that turn out to be the most attractive to the Owner, bidding can be a poor investment for design-build proponents, and is unlikely to achieve the best result for the Owner.
- Owner commitment to proceed to project completion, with financing and development approvals already in place.
- Well-defined initial requirements that do not restrict design optimization, and that have been developed with constructability in mind. This involves broad design management experience and construction advice during the project development stage.
- Plan and specify responsibilities; disclose and apply evaluation criteria:
    - specify full and clear assignment of responsibilities and related risks, including external risks to be carried by the Owner and/or the Design-Builder;
    - confirm, prior to award, that the members of the design-build team are financially capable;
    - use evaluation criteria, with a pre-determined weighting of categories such as cost, value, design, management, past schedule performance, and design-build teamwork, and with a process for combining numerical and subjective measures.
- Select honorarium provisions, whether for a design competition or for proposals, to compensate for some or all of the substantial design effort typically needed to bid.
- Arrange a value analysis of potentially successful bids received, to test whether they cover the design intent. This addresses the problem that, by definition, performance specifications omit most details, but the precise project scope and cost are determined by details.

4.0 Post-Selection Resource Information

When a method of construction has been selected refer to the following resource information when procuring construction services (

- Management of Building Projects by the BC Building Projects Committee
  at http://www.bcprojectsmanual.com/
- CCDC Documents
  at http://www.ccdc.org/documents/index.html
  - CCDC 23: A Guide to Calling Bids and Awarding Contracts
  - CCDC 45: A Guide to CCDC 5A – Construction Management Contract – For Services
  - CCDC 46: A Guide to CCDC 5B – Construction Management Contract – For Services and Construction
- BCCA Recommended Guidelines and Standard Documents
  at http://www.bccassn.com/page/standard%20documents.aspx
  - BCCA Recommended Guidelines for the Use of Construction Management as a Project Delivery Method
  - BCCA Recommended Policy and Procedure for Design Build Projects
- Canadian Design Build Institute Practice Manual