



## CANADIAN DESIGN-BUILD INSTITUTE

---

400-75 Albert Street  
Ottawa, Ontario K1P 5E7  
Tel: (613) 236-9455  
Fax: (613) 236-9526  
www.cdbi.org

The Risk Management Committee of the Canadian Design Build Institute will continue to circulate articles of this nature to members as they become available. We trust this will be found to be of interest and beneficial.

### **Design-Build Problems – Design Growth**

by Steve Panciuk, P.Eng., Assistant Vice-President, Construction Claims  
Encon Group Inc.

This Bulletin was prepared following identification of a source of new claims being reported involving design-build projects where the contractor is claiming costs associated with “design growth.” These claims develop as a result of design changes between preliminary drawings and construction drawings. The Bulletin deals with the contractor-led (consultant contracts with contractor) guaranteed maximum price design-build projects. It is intended to assist engineers/architects avoid, or at the very least reduce, the extent to which they find themselves exposed to such claims.

#### **Introduction**

The design-build model has been in the construction marketplace for centuries and has gained recent popularity in the North American market. It is being touted by both public and private owners as a cost saving model for projects. There are estimates which show that with design-build, the end-cost to owners can be as much as 30 per cent lower than the traditional design-bid-build scenario.

The design-build model is suffering the inevitable growing pains, however, as design consultants and contractors become more familiar with their respective roles and responsibilities, the process will become smoother. In the meantime, several trends have begun to appear as conflict arises between contractors and design consultants. The Contractor may make decisions based on economics whereas the design consultant has a duty to base design decisions on public safety and sound engineering principles. The usual conflict between the contractor and the design consultant relates to the design consultant’s decisions being based upon the quality of the design, including long term performance, durability and lower maintenance objectives which may not be shared by the design-build contractor. Further, the contractor will not usually be prepared to offer anything more than minimum design standards whereas the design consultant will recognize that minimum standard does not necessarily offer the best product.

In the early days of design-build, the owner was not involved in preliminary engineering; that is no longer the case. The owner is often involved with some “conceptual” designs so that, when tenders are submitted, the basic requirements track and the owner can compare apples to apples. For example, in the early stages of design-build, the owner would generically specify a sports arena. Now, with current design-build models, some preliminary work is done by an owner-retained consultant to outline general Project requirements, e.g. seating capacity, rink size concession space and HVAC specs. The design-build team then further develops a detailed price proposal and design to deliver the project.

For a high risk and low initial reward, the design consultant is providing documents upon which the contractor is basing its tender, a tender which has a guaranteed maximum price (“GMP”). In other



words, no price increases will be considered post award, as control of all aspects of the bidding process is in the hands of the contractor. The contractor has based its GMP on the design consultant's preliminary drawings.

If the contractor is awarded the project, the design consultant then proceeds to prepare detailed design drawings. Inevitably, when the final "ready for construction" drawings are produced, there are changes to the preliminary design. Previously, this hasn't been a major problem as the contractor in the traditional model had not yet tendered its price. In the design-build model, the price has been fixed and the contractor usually has no recourse to recover any additional monies to cover the cost of the enhanced design.

Since this is not a joint venture and it is likely that the design consultant has no control over how the contractor prepares the tender and most likely has no control over the use of any contingency fund set aside for design changes, there is strong motivation for the contractor to sue for any "design growth" that occurs between preliminary and final design.

### **An Example**

An owner has prepared a conceptual design for a 1650m bridge across a deep ocean channel. Although the approach layout and traffic requirements are dictated by the owner, the design-build teams are left to consider the different options, e.g., cable stayed/suspension/pre-cast post-tensioned.

A contractor teams up with a design firm and together they submit a tender for the construction of a large multi-span bridge. The contractor offers to pay the design consultant \$60,000 to prepare preliminary drawings. The design consultant responds with an estimate of \$140,000 for preliminary sketches. They negotiate and agree on \$77,000.

Preliminary sketches are produced by the design consultant, many without dimensions and containing broad specifications. In fact, some aspects of final design of the project will be dependent on selections that will be made during the final detailed design by the contractor. The tender is submitted at \$48,750,000.

One key component in determining the ultimate price for the job was the selection of a particular construction technique. The preliminary design was based on dry dock caisson construction, but part way through the tender process, the contractor also considered a floating caisson construction as an alternative.

The choice of the technique affected the design of a major portion of the work. At the time of tender, it was known to both the contractor and design consultant that both methods were being considered. It was also known that the design and, subsequently, the tender quantities and pricing would be affected. The design consultant was under the assumption that the contractor was taking all of these factors into account. The contractor states that it was relying on the design consultant to warn of cost ramifications of the Alternate versus the original design.

The contract was awarded to the design-build team that was \$7,200,000 lower than the one other bidder.

The final detailed design is completed. The contractor has opted for a floating caisson design utilizing their own barges. The project went over budget to a total of \$3,400,000. In the whole scheme of things, this represents only a 7 per cent increase, which does not seem unreasonable. But on



individual items, the increase was 200-300 per cent and, in one case, over 10 times the original price tendered.

The contractor cannot claim back against the owner for any aspects of the over budget items except owner-requested changes. The contractor brings a claim against the design consultant, alleging design growth.

### **Facts**

#### **The Design Consultant did not:**

- recommend design contingency
- did not advise of the completeness of the drawings
- did not guarantee prices
- did not participate in use of contingency fund

#### **The Contractor:**

- is experienced in bridge building
- is the country's largest bridge builder with
- engineers on staff
- could have actually designed the project in-house

There are steps that can be taken in order to minimize exposure to such claims.

#### **Negotiate a written agreement that includes:**

**Price:** The contractor is fully responsible for pricing and the tender.

**Drawings:** The contractor assumes full responsibility for interpretation of drawings.

**Design:** The contractor is aware that the preliminary design is subject to change as new information is developed/discovered.

**Contingency:** The design consultant is not recommending the contingency amount or rate.

**Control:** The design consultant retains joint control of the contingency fund.

Since the design consultants are not joint venture partners in this scenario and do not share in the construction profits, they should not be exposed to the risk assumed by the contractor in determining project costs.

Design changes between preliminary and construction drawings are almost certain to occur. It is up to the contractor who has the experience and knowledge to determine an adequate contingency fund. It is imperative that a written contract exists between the parties that limits the risk to the design consultant based on their input. As always with loss prevention techniques, communication is the cornerstone upon which foundations are built. When initial contact is made between the contractor and the design consultant, the roles of the two players must be clearly defined and understood by each party. These responsibilities must be built into the contract in order to provide control of exposure to risk for the design consultant.