

ALTERNATE FORMS OF PROJECT DELIVERY

1 INTRODUCTION

1.1 BACKGROUND

- .1 In the building industry today, conventional methods of project delivery are being challenged by Clients, Consultants and Contractors alike, in an attempt to save time, reduce costs, avoid litigation, minimize conflict or to improve the overall building quality.
- .2 All methods of project delivery can be defined to be in one of the four following primary categories:
 - .1 Traditional Method (Design - Bid - Build)
 - .2 Construction Management
 - .3 Design - Build
 - .4 P3 (Public Private Partnership)
- .3 Within each category there are optional variations, which may be preferred by the client or may be more appropriate depending on the type of project. Each method of construction delivery has advantages and limitations, which vary according to the type and conditions of the project.
- .4 Across the Alberta Construction Industry, which includes Architects, Engineers, Contractors and Owners, there appears to be a lack of consistency of opinion regarding:
 - .1 The advantages and disadvantages of each method and
 - .2 The appropriate criteria to use when selecting a method for a particular project.

1.2 AFPD WORKSHOP

- .1 In March 2003 a two-day workshop was held in Edmonton on Alternate Forms of Project Delivery.
- .2 The Joint Board of Practice of the Alberta Association of Architects (AAA) and the Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA) sponsored the Workshop.
- .3 The Workshop was attended by 53 participants representing:
 - .1 AAA,
 - .2 APEGGA,
 - .3 The Consulting Engineers of Alberta,
 - .4 The Alberta Construction Association,
 - .5 Alberta Roadbuilders and Heavy Construction Association,
 - .6 The Federal Government (PWGSC),
 - .7 Alberta Infrastructure, Alberta Transportation,
 - .8 Calgary Regional Health Authority,
 - .9 Capital Health Authority,
 - .10 City of Edmonton,
 - .11 City of Calgary,
 - .12 A Construction Insurance Firm
 - .13 Reynolds Mirth Richards & Farmer Barristers & Solicitors.
- .4 The focus of this sessions was to:
 - .1 Discuss common elements of understanding, appropriate rationale for application and general acceptability of each of the various methods of project delivery from the perspective of each section of the industry,

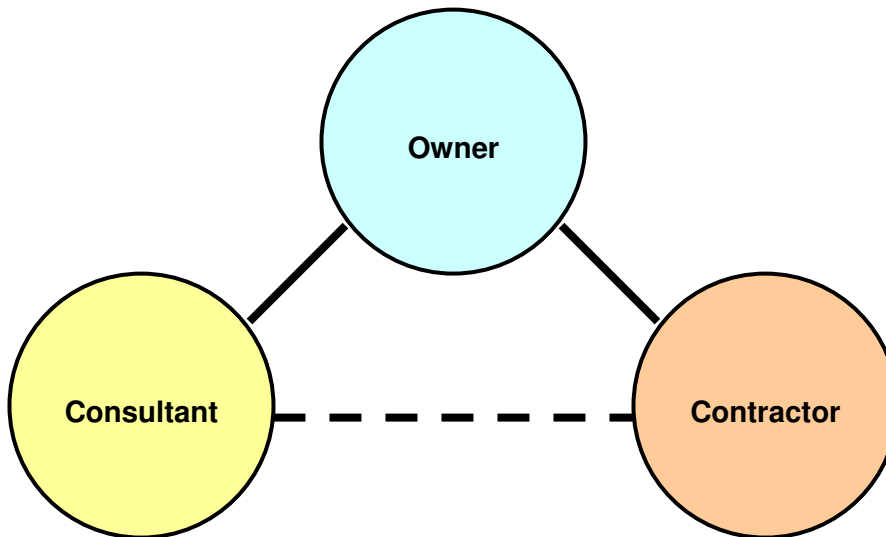
- .2 Document these perspectives to provide some clarity and guidance for both clients and younger professionals, when determining the most appropriate method for a given project.

2 TRADITIONAL METHOD

2.1 GENERAL DESCRIPTION

- .1 The traditional method involves three primary parties: Owner, Consultant and Contractor.
- .2 It is a three stage process (also referred to as “Design- Bid- Build”), where the owner contracts with the other two primary parties, under two separate contractual agreements:
 - .1 In the first contract, the Owner engages the services of a Prime Consultant (Architect or Engineer), to develop a design and prepare construction documents.
 - .2 In the second contract, the Owner issues the construction documents for competitive tender, to engage the services of a Construction Contractor to build the project.

2.2 DESIGN-BID-BUILD



.1 DESCRIPTION

- .1 The owner selects Consultants (Architects & Engineers) to design and prepare construction documents, usually based on a predetermined budget and a Functional Program or at least some type of description of the project requirements.
- .2 Construction Firms bid on the work (submit tenders), based on the construction (tender) documents prepared by the Consultants. The work is generally awarded to the lowest bidder, as a fixed price (stipulated sum or lump sum) contract.
- .3 The Contractor builds the project with the Consultants maintaining a quality assurance role and providing construction administration services on behalf of the owner.

.2 ADVANTAGES

- .1 Competitive Tendering (either open or invited) is generally considered to be the fairest method of selecting and awarding construction contracts, especially on publicly funded projects.
- .2 This method normally has the lowest risk factor, since:

- .1 All design decisions have been made and
- .2 The cost of construction is generally fixed prior to starting construction, assuming that change orders are kept to a minimum.
- .3 The anticipated completion date can be fairly accurately predicted at the beginning of the construction stage to allow planning for occupancy to occur with some degree of certainty.

.3 DISADVANTAGES

- .1 This method usually takes longer to complete a project, since construction cannot start until all aspects of the design have been completed and tendered.
- .2 This method frequently results in adversarial or confrontational relations between Owners, Consultants and Contractors, due to potential problems resulting from lack of clarity or misinterpretation of the contract documents.
- .3 If the owner wishes to make any changes during construction, the costs can be expected to be high for extras and low for credits. Changes may also have an adverse impact on the schedule.
- .4 This method is not usually the best value to the owner and costs are generally higher due to:
 - .1 Not having the benefit of early input and advice from a CM or Contractor,
 - .2 The length of time required to complete the work and
 - .3 Reduced flexibility to make cost effective changes to the work once construction has started.

.4 COMMENTS

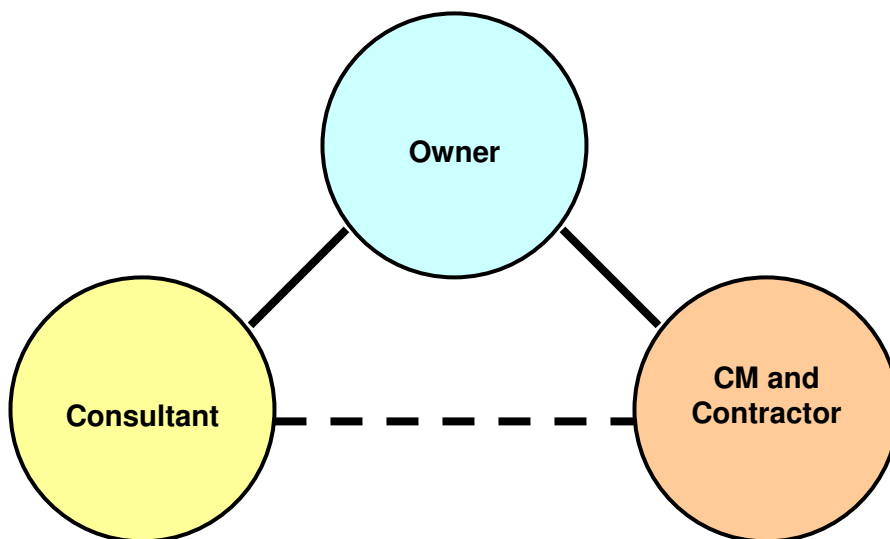
- .1 This method is usually the preferred choice on publicly funded projects, due to the limited risk factors. The predominant risk, in most cases, is the cost of the work.
- .2 Public Sector Owners normally use a Request for Proposal (RFP) process for selecting Architects and Engineers.
- .3 The contract (professional services agreement) between the Owner and the Prime Consultant is usually based on RAIC document 6 or a similar type of agreement form.

3 CONSTRUCTION MANAGEMENT (CM)

3.1 GENERAL DESCRIPTION

- .1 Construction Management is a broad term covering a variety of project delivery scenarios in which a construction manager (CM) becomes an integral part of the team, at an early stage in the project, to oversee such elements as schedule, cost, construction methodology and procurement strategy.
- .2 Construction Management may involve three or four primary parties; depending on whether the Construction Manager and Contractor are the same firm or two different firms.
- .3 CM's can serve in different capacities with varying degrees of authority as described below, depending on the nature of the project.
- .4 When selecting a CM, the Owner has several options.
 - .1 CM's may be selected by a competitive process or by direct negotiation.
 - .2 Fees may be determined on the basis of the lowest submission or may be negotiated based on services agreed upon.
- .5 The four most common methods of Construction Management are:
 - .1 **The Alberta Approach** – The Owner contracts with each of the primary parties individually, under two separate contracts. The contract with the CM is a two stage contract with the first as Construction Manager and the second as General Contractor.
 - .2 **CM as advisor** – The Owner contracts with each of the other three primary parties individually, under three separate contracts,
 - .3 **CM as agent** - The Owner contract with the CM, who then directly engages the services of a Prime Consultant and a Construction Contractor, on behalf of the Owner.
 - .4 **CM as Constructor** - In this delivery method, the CM is hired prior to completion of the design, to act as project coordinator and general contractor, assuming all the liability and responsibility of the general contractor.

3.2 CONSTRUCTION MANAGEMENT - THE ALBERTA APPROACH



.1 DESCRIPTION

- .1 The owner first selects Consultants (Architects & Engineers) and engages them under a separate contract to design and prepare construction documents, usually based on a predetermined budget and a functional program.
- .2 Early in the design phase, the Owner selects a CM (who will become the Contractor) on a Request for Proposal (RFP) basis or on a negotiated fee basis for CM services. The Owner then engages their services (based on a percentage fee or fixed fee), using a Construction Management Agreement.
- .3 The Consultants complete the design and the construction documents, with input from the CM, who concurrently provides advice on scheduling, cost estimating, phasing and construction methods and systems evaluation.
- .4 The construction documents are completed in a series of 'Tender Packages' for individual trades or groups of trades, which the CM uses to obtain bids from subcontractors.
- .5 Construction usually starts well in advance of all tender packages being complete and before all subcontract prices are received.
- .6 If individual trade prices are not within the budgeted amount for the trade, the design is adjusted the price negotiated or re-tendered to maintain budget control. Alternatively, the Owner may agree to adjust the budget during the process of obtaining trade prices.
- .7 Once the majority of subcontract (trade) prices have been determined, the Owner and Contractor enter into a standard stipulated sum contract agreement. This contract incorporates all the work done to date by the CM and supercedes the original CM contract.
- .8 This method is sometimes confused with the "Construction Manager as Constructor" Method.

.2 ADVANTAGES

- .1 Better value for money than all other methods,
- .2 Less confrontational working relationship within project team,
- .3 Less complex than Design Build,
- .4 Less risky than Design Build,
- .5 Brings the expertise of the contractor to the table at an early stage, during the design phase.
- .6 Better able to manage budget and schedule than both the Traditional Method and Design Build,
- .7 Eliminates re-design time,
- .8 Able to manage and assess the quality of the building materials and program with the knowledge of the succinct construction cost estimates,
- .9 Allows opportunity to determine final costs either before construction start or very early in the construction stage. Places the responsibility for costing and value engineering in the hands of those that best understand it – the contractor,
- .10 Allows for the opportunity to fast track the design and construction,
- .11 Allows Owner and Architect to have direct relationship versus Design Build,
- .12 Allows opportunity to select constructor based on ability versus price alone,

- .13 Less litigious,
- .14 Minimizes change orders,
- .15 Places construction risk and management in the hands of the Contractor versus the Owner, while reducing the risk of loss of profit to the Contractor.

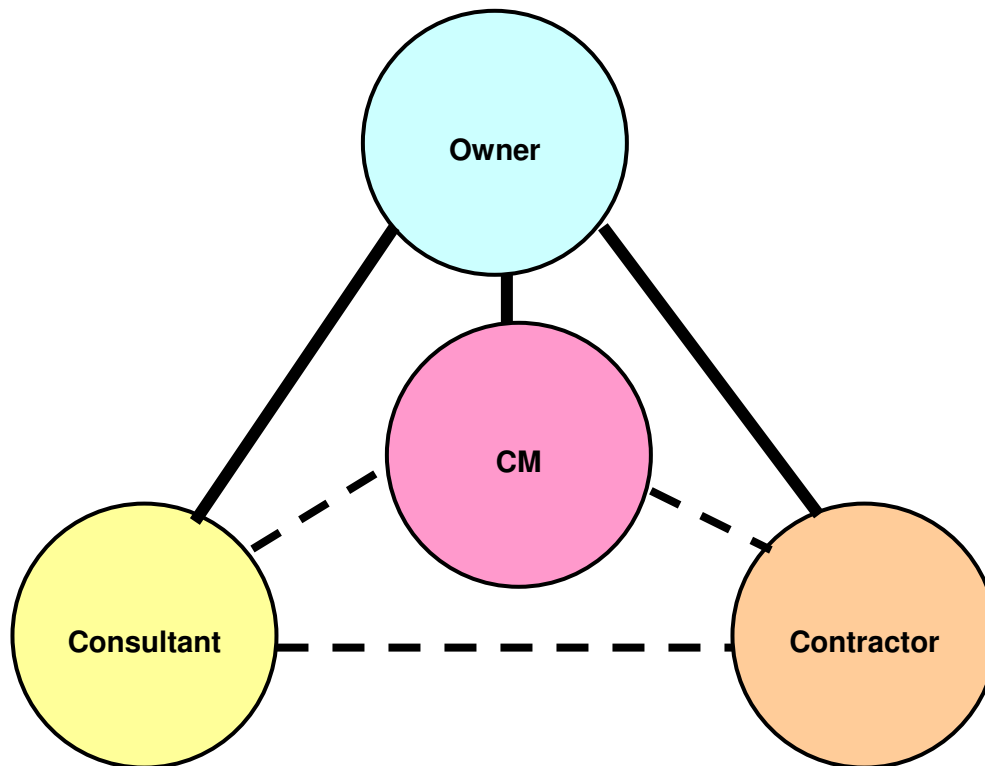
.3 DISADVANTAGES

- .1 The Owner does not have a fixed or guaranteed cost commitment at the beginning of construction.
- .2 Increased risk of unresolved design issues arising after construction has commenced, which could impact both the cost and the schedule.

.4 COMMENTS

- .1 This is the most popular application of Construction Management in Alberta, especially in the Edmonton Region. It is somewhat less commonly used in Southern Alberta.
- .2 This is the least adversarial method, which generally results in a high degree of satisfaction for all parties involved, including the Owner.

3.3 CONSTRUCTION MANAGEMENT - CM AS ADVISOR



.1 DESCRIPTION

- .1 The Consultants are selected to prepare the design and the construction documents.
- .2 The Construction Manager is selected by the owner to oversee the design in terms of its implications for cost, schedule and constructability.
- .3 Construction documents are used for construction bidding or negotiation.
- .4 A Contractor is selected to build the project, with the CM acting as advisor to the owner through to the completion of the project.

.2 ADVANTAGES

- .1 Provided that the CM is an experienced professional, the Owner has the benefit of an objective, unbiased expert advisor to help ensure that best overall value is achieved during the design and construction phases.
- .2 A good professional CM advisor can often minimize or prevent conflict between the contracting parties.

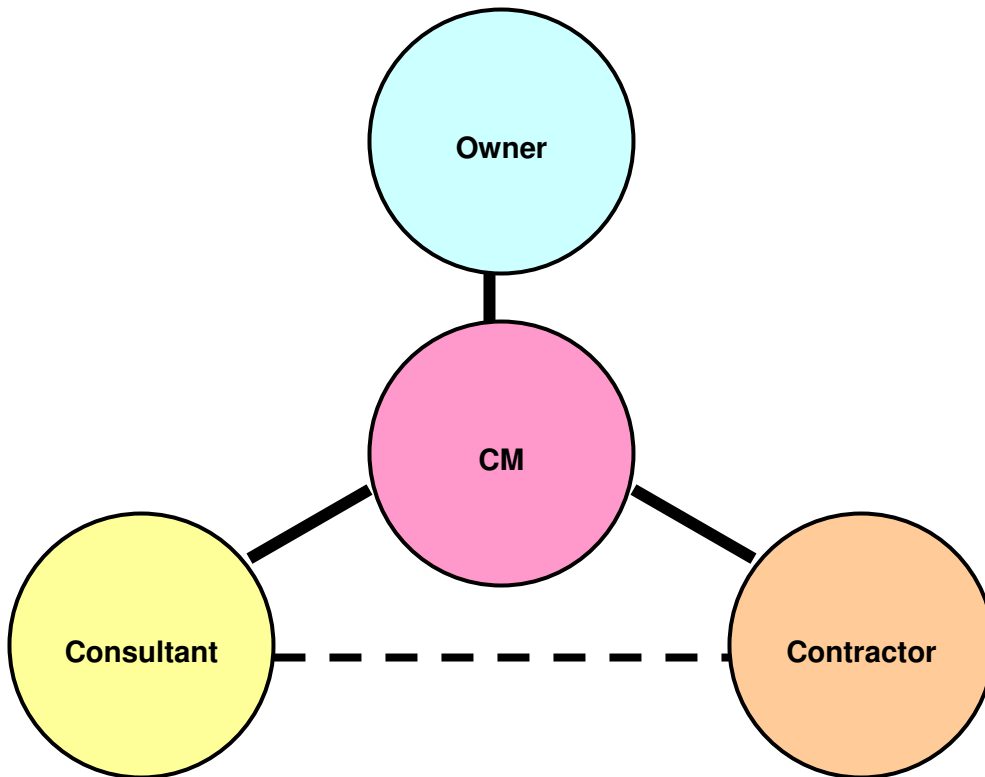
.3 DISADVANTAGES

- .1 Administrative costs are higher for the Owner.
- .2 Can cause some confusion regarding roles and responsibilities.

.4 COMMENTS

- .1 CM as Advisor is not often used in Alberta.

3.4 CONSTRUCTION MANAGEMENT - CM AS AGENT



.1 DESCRIPTION

- .1 In this method, the construction manager is added to the team with powers of the owner. In this role, they are often called Project Managers, because they assume financial authority for the project.
- .2 The CM is selected by the owner on a negotiated fee arrangement.
- .3 The Consultants are selected, through the CM, to design the project and prepare the construction documents.
- .4 A general Contractor is selected through a negotiated or bidding process and the cost of the work is established.
- .5 The Contractor builds the building with the CM acting as the owner's agent until the completion of the project.

.2 ADVANTAGES

- .1 Similar advantages to the Alberta Approach, with the following exceptions:
 - .1 Construction risk flows through to owner.
 - .2 Administration costs increase for owner, architect and Construction Manager

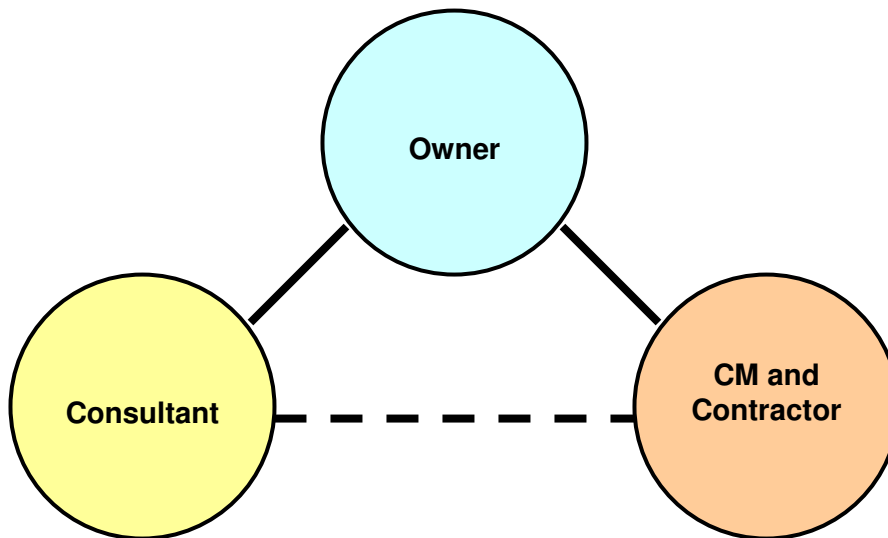
.3 DISADVANTAGES

- .1 Construction cost is not known until the completion of construction.

.4 COMMENTS

- .1 CM as Agent is not often used in Alberta.

3.5 CONSTRUCTION MANAGEMENT - CM AS CONSTRUCTOR



.1 DESCRIPTION

- .1 In this delivery method, the CM is hired prior to completion of the design, to act as project coordinator and general contractor. The CM assumes all the liability and responsibility of the general contractor and this method is often called “Construction Manager at Risk”.
- .2 The Owner selects the consultants to design the project and prepare the construction documents.
- .3 At about the 30% stage of construction documents, the project is bid on or negotiated to select a CM-Constructor. The bid is often a guaranteed maximum (with or without a bonus agreement for savings).
- .4 The CM-Constructor advises on cost, schedule, building technology and methodology until the competition of construction documents.
- .5 The CM-Constructor builds the building after re-bidding most or all of the subcontract work.

.2 ADVANTAGES

- .1 The majority of the financial risk is transferred to the contractor.

.3 DISADVANTAGES

- .1 It is generally considered to be more costly than the other CM methods.
- .2 The best contractors generally shy away from this method and the Owner may not have access to the best contracting firms if they pursue this option.

.4 COMMENTS

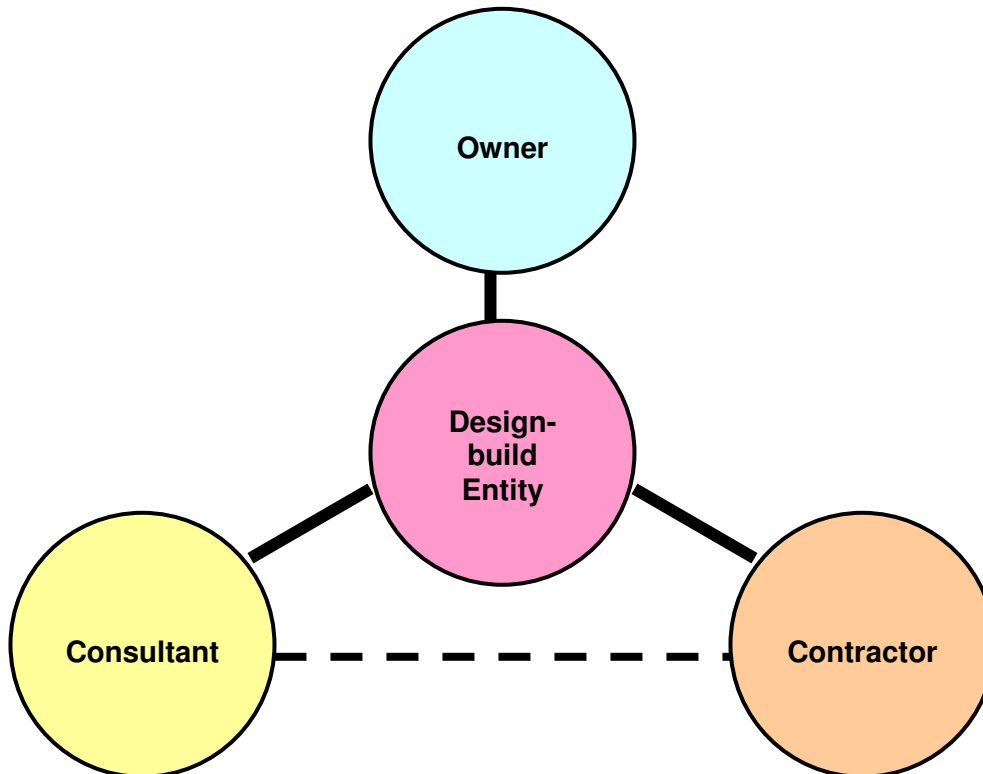
- .1 This model is seldom used in Alberta.

4 DESIGN-BUILD (DB)

4.1 GENERAL DESCRIPTION

- .1 Design-build is a form of project delivery in which the owner contracts with a single entity (design-builder), to provide both design and construction services. The design-build entity may be a single firm, a consortium of experts or a joint venture. The Contractor most often leads the design-build team.

4.2 DESIGN-BUILD



.1 DESCRIPTION

- .1 The owner specifies the general requirements for the building.
- .2 The design-build teams develop detailed schematic designs for the project along with cost and schedule. These are submitted to the owner.
- .3 The owner selects a design-build team based on the best scheme for the best price and schedule.
- .4 The design-build team executes the construction of the project.

.2 ADVANTAGES

- .1 There is a single point of responsibility
- .2 In a DB competition the contractor is more motivated to provide cost savings and value to the owner.
- .3 Usually faster than the Traditional Method.

.3 DISADVANTAGES

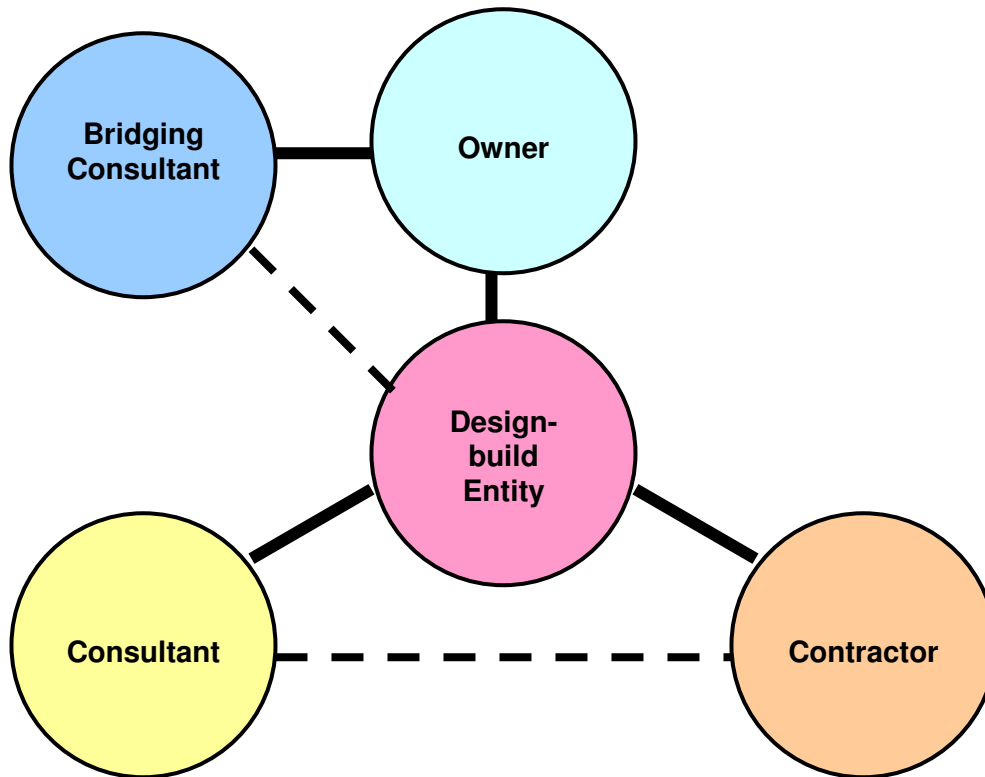
- .1 The cost savings could be in conflict with building quality and maintenance costs

- .2 More complex process than CM.
- .3 The owner is disconnected from the DB Architect
- .4 More risky than CM
- .5 Architects and engineers are disconnected from the owner
- .6 Too difficult, complex and costly to properly manage risk and costs for a one-off type buildings.

.4 COMMENTS

- .1 Requires a high level of sophistication by consultant, contractor and by owner
- .2 Success is based on strong trust between owner and DB team and trust between contractor and consultant.
- .3 Access to the process, by Owner, is often restricted.
- .4 Substandard quality may result due to a wider range of interpretation of the performance specifications by the DB Team.
- .5 The conditions of the Architect's Act in Alberta make it difficult for an Architect to be a contractor, so the Architects cannot take the leading role on a DB project.

4.3 DESIGN-BUILD WITH BRIDGING CONSULTANT



.1 DESCRIPTION

- .1 The owner first hires a Bridging Consultant(s) to prepare a preliminary design and performance specifications for the project, called scope-of-the-work documents.
- .2 The project is bid or negotiated in order to select the design-build team who will complete the design and construction.
- .3 The design-build Consultant team completes the design.
- .4 The design-build Contractor constructs the project.

.2 ADVANTAGES

- .1 There is a single point of responsibility,
- .2 The contractor may be more motivated to provide cost savings and value to the owner, provided the Bridging Consultant does not insert too many restrictions in the performance requirements.

.3 DISADVANTAGES

- .1 There is risk that the bridging consultant cannot adequately define the needs, resulting in an unknown end product.
- .2 CM is often faster if Bridging is required.

.3 This extra step in the process can take considerable extra time.

.4 COMMENTS

- .1 Similar to Design-Build.
- .2 Less sophisticated Owners, who do not have in-house architectural, engineering or project management expertise, should seriously consider using a Bridging Consultant for DB projects.

4.4 DESIGN-BUILD BY DEVELOPER

.1 DESCRIPTION

- .1 In this method, the design-build entity takes on the added responsibility of acquiring the land, development permits and arranging financing. This is often called a “turn-key” operation. The owner or lessee does not take financial responsibility until the project is complete.
- .2 The owner or lessee prepares pre-selection materials and contracts with the Design-Build Developer.
- .3 The Design-Build Developer then designs and constructs the project.
- .4 The Design-Build Developer often either operates the building on behalf of the owner or as the Lessor in a lease agreement.

.2 ADVANTAGES

- .1 There is a single point of responsibility
- .2 Very beneficial form of delivery for a Design Build Developer model, providing standard and conventional buildings such as warehouses and small office buildings, parkades, etc.

.3 DISADVANTAGES

- .1 Similar to Design-Build.

.4 COMMENTS

- .1 Similar to Design-Build.

5 DEFINITIONS

- .1 The words Construction Management and Project Management are often interchanged and more often confused.

5.2 PROJECT MANAGEMENT

- .1 Project Management, as defined by the Project Management Institute is:
“The process of planning, scheduling, directing, organizing and controlling all resources (financial, physical and human) from the start to the completion of the project goals and objectives.”
- .2 In many building projects, the owner is, by default, the Project Manager (PM), but often does not have the time or experience to act as PM. He therefore, assigns responsibility, by contract or agreement, to another or several other parties, to take responsibility for specific portions of the project management process.

5.3 CONSTRUCTION MANAGEMENT

- .1 The most common form of construction management is an adaptation of the conventional form of project delivery in which an additional consultation is added to the project team. The construction manager (CM) may take on the roles and responsibilities of:
 - .1 An advisor
 - .2 An agent
 - .3 A constructor
- .2 The CM usually does not have control over the design process, except in cases where the CM is acting as the owner’s agent. In this role the CM is often called a Project Manager, even though he is not really responsible for all aspects of the project from start to finish. Construction management is most frequently confined to:
 - .1 Assisting in preliminary planning, relative to the design requirements
 - .2 Advising on, or preparing schedules, budgets and economics of various methods, material selection and detailing, during the design phase.
 - .3 Advising on and arranging for all services and trade contractors for carrying out the various phases of the work.
 - .4 Planning, scheduling, coordinating and supervising the activities of all trade contractors.
 - .5 Providing technical and clerical services for the administration of the project.

6 THE AIA DOCUMENT

6.1 THE HANDBOOK ON PROJECT DELIVERY

- .1 The California Council of the American Institute of Architects has developed an excellent reference guide, titled "*The Handbook on Project Delivery*".
- .2 The handbook was used, by permission of the AIA, as a reference document for discussion during the workshop.
- .3 It is available for purchase by contacting:
The American Institute of Architects, California Council
1303 J Street, Suite 200
Sacramento, CA 95814
Phone: (916) 448-9082
Fax: (916) 442-5346
E-mail: mail@alacc.org
Web site: www.alacc.org

7 SUGGESTED DIRECTIONS FOR PROFESSIONAL PRACTICE

7.1 TEAM BUILDING

.1 GENERAL

- .1 All forms of project deliveries are dependent on teams of construction professionals (small 'p'), however some forms are not only in need of a team approach, but in fact the very form and nature of the project encourages strong team relations to enable a successful project.
- .2 Large projects with complex or interwoven functional programs are projects which require teamwork, if they are to be accomplished within a time constraint relative to a need (political or otherwise) or timed to be a major part of another event (world sporting event and the likes).
- .3 Team building needs to be a designed process, wherein all team members must be prepared to buy-in to building a common knowledge of each discipline on the team [owner / project management, construction management, architectural, structural, mechanical and electrical consultants, major construction trades (related to the size & nature of the project)]. All team members must clearly understand and be familiar with:
 - .1 Who represents each discipline on the team
 - .2 What knowledge base each discipline brings to the team
 - .3 How your own technical knowledge relates to that of each discipline / team member.

.2 BUILDING INTER-DISCIPLINE RELATIONS

- .1 An examination of each discipline is required by the members, to determine and define:
 - .1 How the work of each discipline is interdependent on the other(s),
 - .2 What crossover input can be helpful to and between team members as an adjunct to knowing the scope of each discipline.

7.2 COMMUNICATIONS

.1 FORMAL

- .1 Formal lines of communication must be established and agreed to, as the team is formed to establish and define:

- .1 Mandatory project procedures
- .2 The process and ability to trace all documents,
- .3 The need for each form of documentation i.e., letters, memos, instructions internal and
- .4 External communications, clarifying who issues what to whom.

.2 INFORMAL

- .1 Informal lines of communication should also be agreed on to deal with:
 - .1 Non-defined communications
 - .2 Restrictions, Limitations and Policies on the use of E-mail between disciplines, until it is something that the full team should know about, because change is accomplished by a consensus process. The core area of a discipline must remain sacred, if for no other reason than the division of responsibilities and eventual liabilities.

.3 INTERNET

- .1 The Internet represents the fastest form of project communication that we have, although there are physical size limitations to the documents that can be transmitted although size reductions are possible if scale is not a consideration.
- .2 Obviously there are definitions required to keep a consistency within the work of the team, which becomes another zone of restrictions if the group is to function and record their work as a team.
- .3 The lesson here can best be found in large corporations, which maintain standards so as to keep a corporate uniformity in how material is stored and retrieved. A project team must define their own standards or acquiesce to one already defined and dominant within the team.

7.3 CHARTERS

- .1 It is highly recommended that, regardless of which method is selected, that a charter be prepared early on in the process. The Charter should be jointly developed and signed by all key representatives of the Owner, Consultant Team and the Contractor (CM).
- .2 The primary purpose of the Charter is to:
 - .1 Clarify lines of communication
 - .2 Roles and responsibilities
 - .3 Eliminate assumptions by clearly defining expectations of all parties.