New Project Delivery Model
Construction Consultant - General Contractor (CCGC)

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Outline

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Background and Description
How do we CCGC?
CCGC Scope of Work
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Introduction

Why develop a new project delivery model?

Introduction

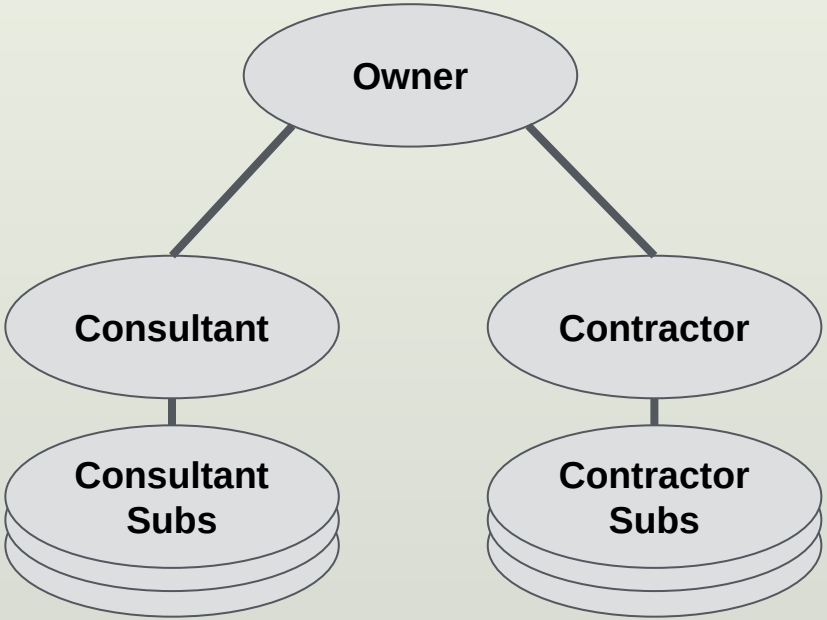
My life as Dilbert…

Introduction

Why do we typically deliver public works using lowest price?

Introduction

Typical Delivery Model



Introduction

THE CITY OF EDMONTON

A Municipal Corporation

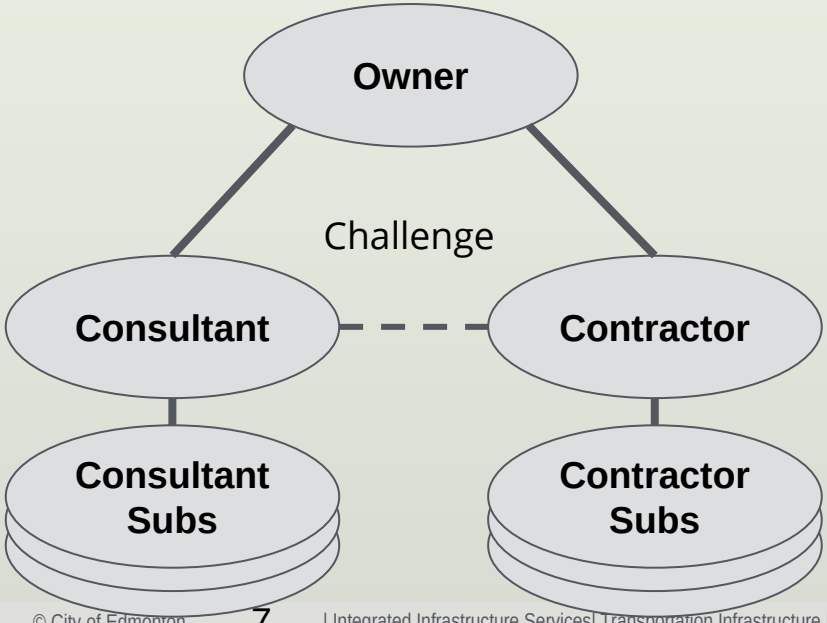
(the "City")

- and -

CLARK ENGINEERING INC.

(the "Consultant")

We create separate contracts



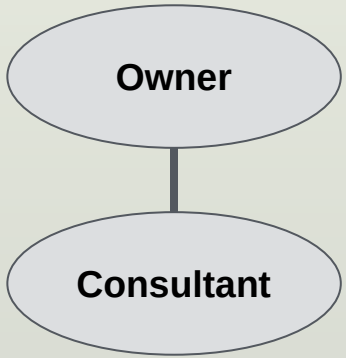
Challenges with this model:

- **Changes**
- **Disputes**
- **Combative**
- **Timing of Reliable Information for Decisions**

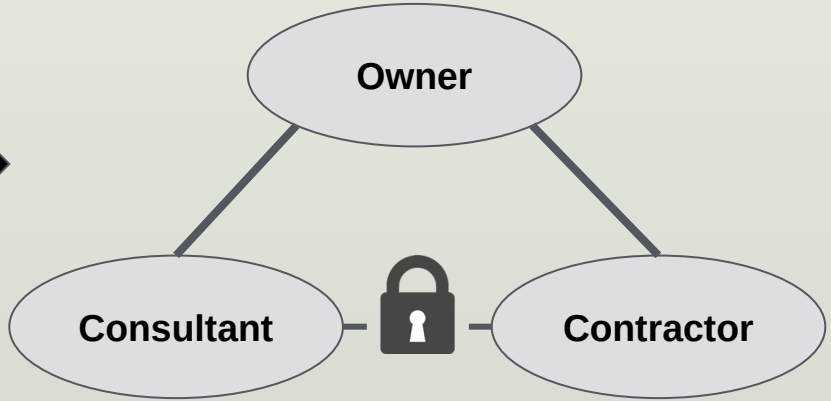
Background

If Project Communication is the “key” to success; the timing of reliable information is the “lock” that create challenges in typical delivery models.

Design Decisions



Construction Challenges

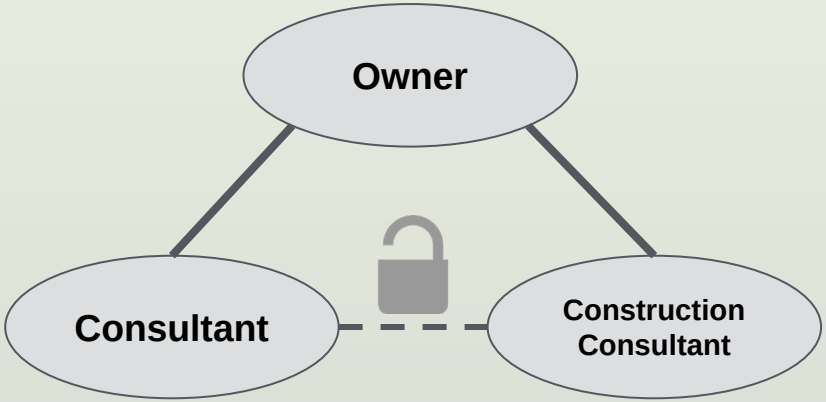


Description - CCGC

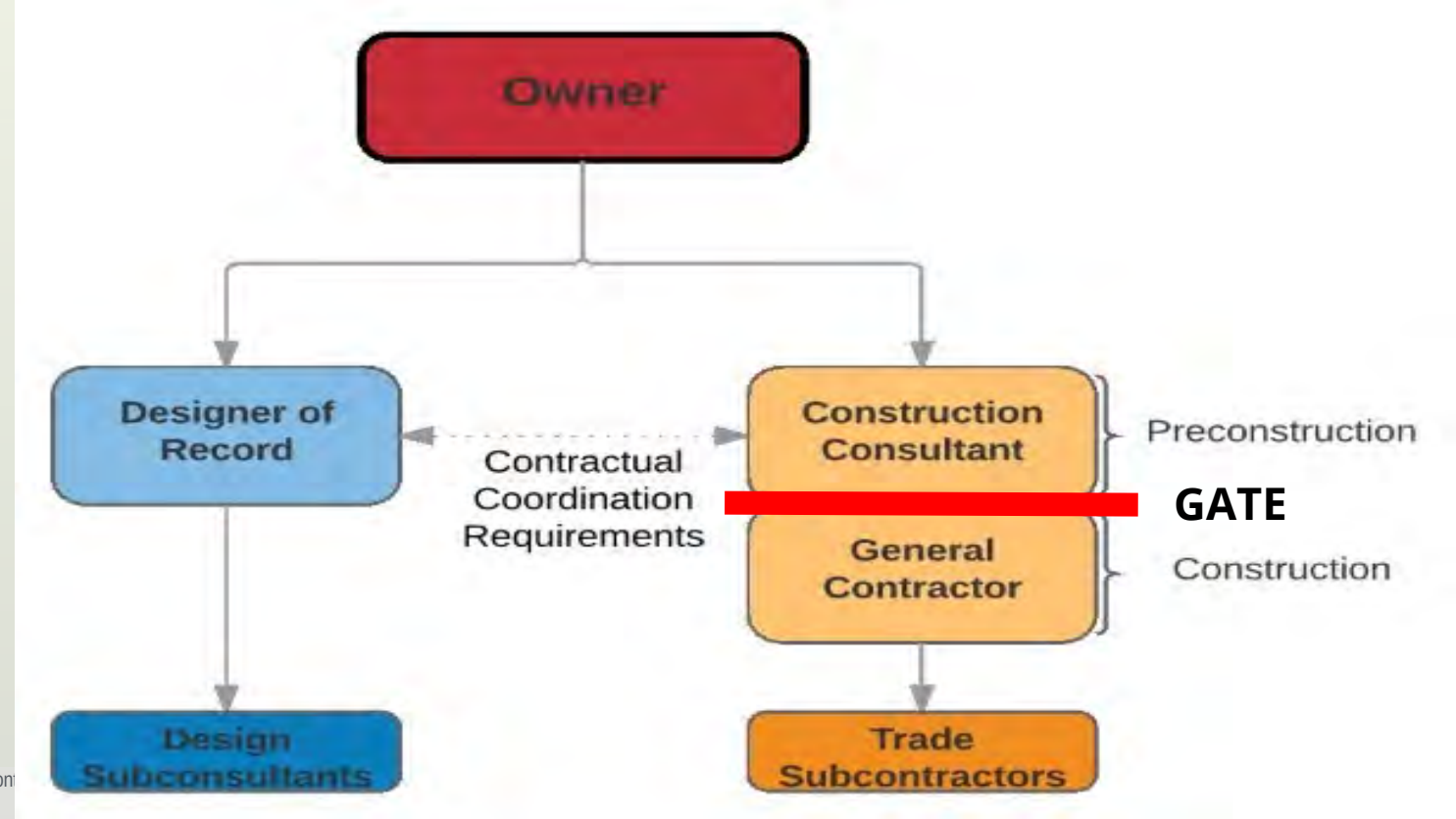
What is CCGC?

- **Construction Consultant General Contractor**
- **A form of early Contractor involvement where they act as a Construction Consultant during the Design phase of a Project.**

Design Phase



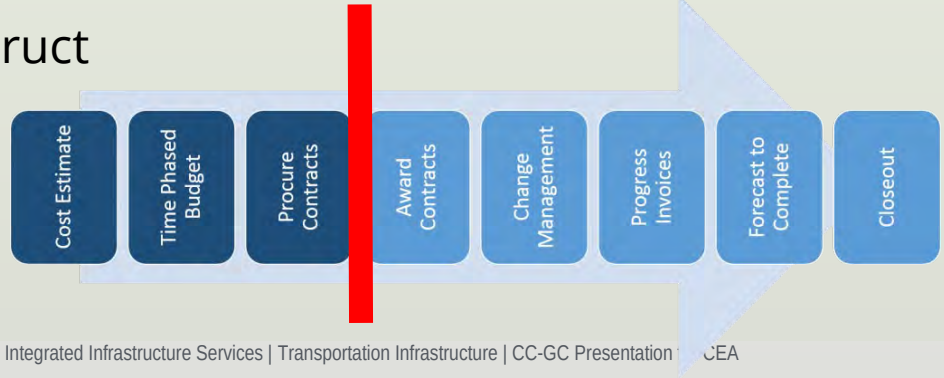
Description - CCGC



Description - CCGC

Variance from Construction Management At Risk:

- City selects Contractor only to provide the pre-construction services, not significant construction
- The work is not phased in sequential trade packages
- The City knows the construction cost and schedule before committing to construct



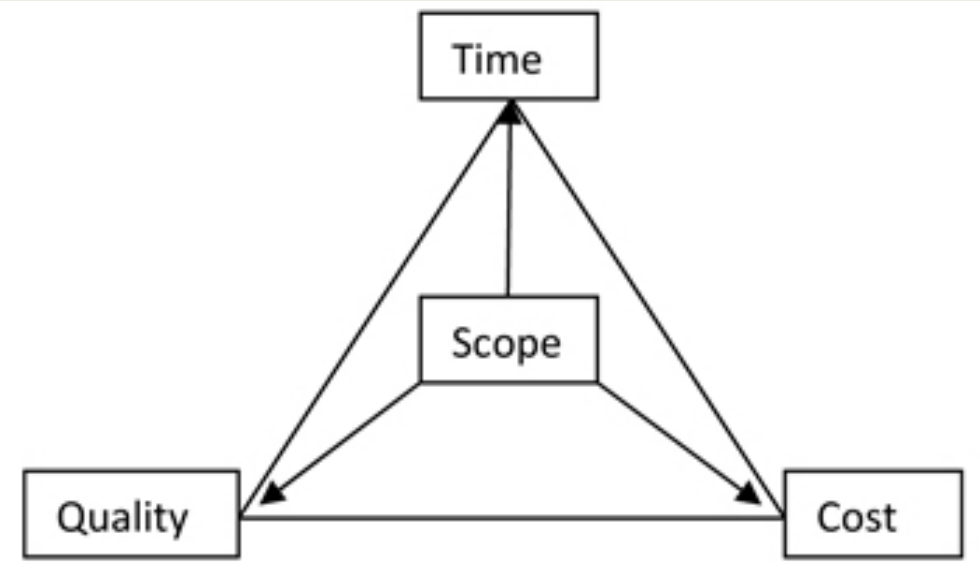
What kind of project characteristics benefit most from CCGC?

- High level of technical complexity
- High level of risk
- Complex phasing
- Budget constraints

Benefits for Owners

Improved control of:

- Scope
- Costs
- Schedule
- Quality



How does the Project benefit?

- **WE DEVELOP WORKING RELATIONSHIPS FOR MUTUAL BENEFIT**
- Close involvement throughout design phase
- Collaborative behaviours
- Combined experience and knowledge
- Improved risk identification, allocation and management
- Improved value engineering
- Improved scheduling and phasing

CCGC Roles and Responsibilities

- **CCGC IS NOT:**
  - Responsible for Design
  - Engineer of Record
- **The DESIGN CONSULTANT is:**
  - Fully in control of all engineering and design requirements
  - Is not governed by the CCGC
- **The CITY is:**
  - Responsible to oversee and audit the design and construction process
  - Act as Owner and use the resources available to make decisions
  - In control of each contract separately (all report to City independently)

How do we CCGC??? - **Proposal Process**

170 Street Bridge Rehabilitation – First CCGC Project in Western Canada

Non-Contract A / Negotiated Request (NRFP)

No. 928889
for
Construction Consulting Services for 170 Street over Yellowhead Trail (B185) – Overpass Rehabilitation

NRFP cl

Contact
Contact

B185 - 170th Street Over Yellowhead Trail Bridge Condition Assessment & Preliminary Rehabilitation Strategy

Contractor Proposal Submission

- **Evaluated Non-Financial items (Envelope 1) - 90%**
  - Bridge Rehabilitation Comprehension (15%)
  - Construction Management (30%)
  - Corporate Experience (10%)
  - Staffing/Key Personnel (30%)
  - Quality Control; Environmental Management (5%)

- **Evaluated Financial (Envelope 2) - 10%**
  - Level of Effort Table
  - Rate Table

Proposal Submissions

Financial	10%

Level of Effort Table

CONSTRUCTION CONSULTING ACTIVITIES:	Project Director	Project Manager	Superin-tendent	Cost Estimator	Scheduler	Junior PM Support Drafting	Safety	Specialists	Admin Support	Total Hours
Project intiation/start-up	4	4	4							12
Weekly progress meetings with City	40	40	20	4	4					108
Attend partering and value engineering sessions	8	8	8	8	8					40
Public information session during tender period	4									4
Develop construction management plans		40								40
Develop traffic accomadation strategies		8	8			8				24
Plan and administer construction planning meetings with subcontractors										
Conduct Field Work		4	16				8			28
Contingency (additional work as requested by the City)	**8**	**20**	**16**	**8**	**8**	**8**	**8**	**8**	**8**	**92**
Total Hours	**76**	**198**	**76**	**70**	**70**	**16**	**24**	**48**	**28**	**606**

Proposal Submissions

Financial	10%

Personnel	Rate (per hour)		Hours	Total Fees
Project Director	$		76	
Project Manager	$		154	
Superintendent	$		76	
Estimator	$		70	
Scheduler	$		70	
Junior PM Support/Drafting	$		16	
Safety	$		24	
Specialists	$		48	
Admin Support	$		28	

Proposal Submissions

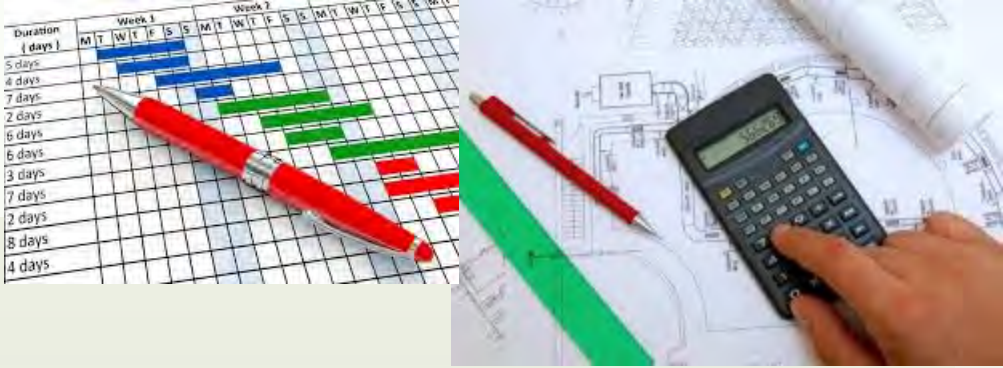
Financial	10%

Additional Items	Rate	Cost
Contingency	Lump sum	$ 10,000
Disbursements	5%	
Field Work Allowance	Lump sum	$ 30,000

Description of Work - Construction Consultant

- Preconstruction Phase Services
  - **Management and Administration**
    - Attend weekly design meetings, value engineering sessions and public information sessions
    - Develop traffic and pedestrian accommodation strategies
  - **Construction Expertise**
    - Provide constructability expertise throughout the design phase.
  - **Procurement**
    - Review and provide input for the construction procurement documents (bid items, work packages, M&P clauses etc..)

Description of Work



- Preconstruction Phase Services
  - **Estimating**
    - Provide input to develop Project cost estimates for various design alternatives.
  - **Scheduling**
    - Provide input for developing Project schedules for various design alternatives
  - **Quality Control**
    - Review design documents and specifications for adequacy in achieving the desired level of construction quality.
  - **Risk Management**
    - Provide expert input on construction risks (cost, schedule, quality, claims etc)
  - **Field work**
    - Provide equipment, labour and materials to perform additional investigation

Construction Pricing

- **Independent 3rd Party Estimate**
  - The City will also retain an independent 3rd Party Cost Consultant to provide a price based on Tender documents developed during the preconstruction phase.
  - The independent cost consultant will be provided the same “tender documents” and drawings and will be requested to submit a sealed bid form with pricing at the same time as the Construction Consultant.
  - The bids will be opened at the same time by the City and costs compared.
  - If the bid provided by the Construction Consultant is within an acceptable range (0-15%) when compared with the independent third-party cost consultant estimate, the City will award the Construction Contract to the CC.

Transition to General Contractor

- The Construction Contract will be similar to a standard City design-bid-build contract where the CC becomes the General Contractor, the Design consultant transitions to resident engineer on behalf of the City, and a City representative acts as the Owner.

THE CITY OF Edmonton

INTEGRATED INFRASTRUCTURE SERVICES
TRANSPORTATION INFRASTRUCTURE

Bridge Rehabilitation Project

CONTRACT NO. 16XX

Addenda (for Working Copy only)
Invitation to Bid
Instruction to Bidder
Additional Instructions to Bidders
Bid Form
Bid Bond Form
Certificate of Insurance
Performance Bond Form
Labour and Material Payment Bond (If applicable)
Contract Form
Contract Definitions
General Conditions
Supplementary General Conditions
Special Provisions

CCGC - 170 Street Bridge Rehabilitation

So did it actually work?

CCGC - 170 Street Bridge Rehabilitation

CCGC Breaks Silos and Builds Teams!!

……It also adds tremendous value!

CC Preliminary Design Review

170 Street over YHT - Bridge Rehabilitation

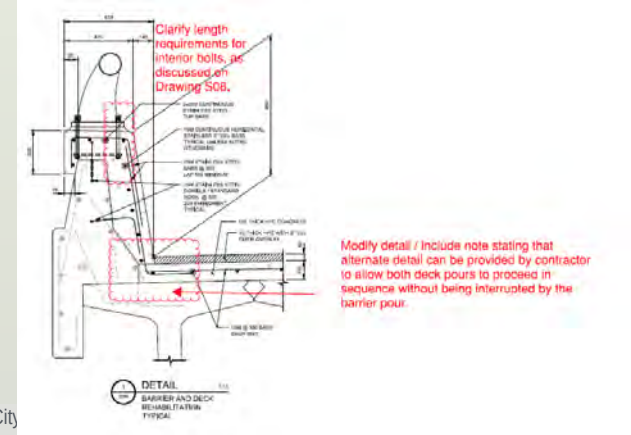
Prelim Design Report vs. Construction Consultant Assessment:

Item	Preliminary Design Report	Construction Consultant
Cost	$5.0M	$3.9 M
Schedule	189 Days (1 season)	274 days (2 seasons)
Traffic	3 traffic switches	2 traffic switches

Conclusion: Large risk to the City for potentially "over promising and under delivering" if we assume the work can be completed in 1 year.

B170 Rehabilitation - CCGC Input

- The Construction Consultant provided valuable input on design options to improve constructability and also meet the City's cost and schedule requirements.



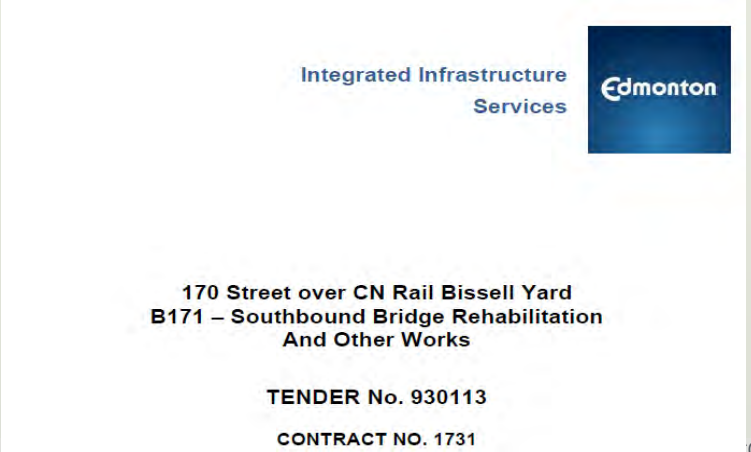
Areas of Uncertainty

The following items have been identified during preparation of the 60% Cost Estimate as requiring clarification prior to this project being released for tender in order to ensure clear and accurate pricing; this listing includes suggestions on how the bid form may also be modified for clarity at the tender stage:

- A.4 Utility Work: Added bid item to cover off utility work requirements. Should confirm in SP's what aspects will be in GC scope. Will there be a separate bid item for this scope?
- B.1 Remove Asphalt Course: It is assumed that this is for removal of asphalt on the approaches. This could be combined with structural demolition of the approach slabs, as the asphalt will likely be demolished along with the concrete. Not sure that there is a benefit to listing this as a separate unit-price bid item.
- B.2 Class B Concrete Base: Is this bid item required? Approach slabs will be replaced, with new slabs extending further out, and pavement for tie-ins.

B170 Rehabilitation - CCGC Input

- CC helped develop Detailed Design and Tender documents and was able to bid as they performed very well.
- CC provided a competitive price and was awarded the work to act as General Contractor



B170 Rehabilitation - CCGC Construction

- Construction Phase went extremely well, on time and on budget!
- Contractor was well prepared and had fully planned all aspects of the work before starting.
- Very few surprises, minimal change orders for unknowns, no claims, no disputes.

Lessons Learned

- **CC is best utilized during (or beginning) of the preliminary design stage:**
  - Having the CC review preliminary design options and offer construction perspective before selecting a prefered alternative provides the most value to the owner.
  - CC can offer additional information regarding realistic cost and schedule information in order to choose a preferred design.
  - Decisions made at the beginning of a project have a cumulative effect! It is important to have as much information at the beginning of a project in order to select an alternative that meets the requirements of all stakeholders.

Lessons Learned

- **Effective Risk Management:**
  - CC offer a different perspective in terms of risk when reviewing design options. Although a design may appear to be more preferable in terms of performance, constructability of that design may actually create difficulty in achieving the costs/quality/schedule project goals.
  - Risks to each party can be discussed and mitigated or transferred accordingly. Risk should be transferred to the party who is best able to manage and absorb the potential effects and the CCGC procurement method does this very well.
  - Drawings, specifications, and measurement and payment clauses are collaboratively produced, therefore, all parties fully understand their risks before tendering and construction.

Lessons Learned

- **Designs balance both performance and constructability:**
  - Design engineers have the construction input early and can consider many different constructability options before making detailed engineering analysis. ie, the RFI process starts much sooner and various alternatives can be considered.
  - Design engineers are still fully in control of what they are willing to accept, but the CC does offer potential solutions early that can save costs and schedule.
  - Potential solutions offered by the CC are factored into the design and the owner still gets the benefit of having the cost and schedule gains factored into a competitive bid price.

Lessons Learned

- **Independent Cost Consultant Risks**
  - It is difficult for independent cost consultants (ICC) to get actual subcontractor pricing. Subcontractors do not want to share their price with someone who isn't actually going to construct the work.
  - Owners should publicly explain the CCGC process during the tender period in order to get competitive subcontractor pricing.

Lessons Learned

- **CCGC Perceived Cost Premium for Public Works**
  - It is difficult to justify not using the “lowest bid price” when using tax dollars to deliver public infrastructure. The CCGC model used for the 170 Street project allowed a 15% variance between the CC bid price and the ICC price, thus appearing to accept a “premium cost” for the delivery of the Work.
  - The CCGC model likely provides significantly more value as the costs savings are realized during the design process and competitive pricing process instead of a lowest price bid tender process.
  - The CCGC variance in pricing allows the CC to select “quality” subcontractors instead of just “low ball offers” from inexperienced subcontractors.
  - The allowable variance should be reviewed by senior management and approved before tender. This variance should depend on the size of the project, ie. 15% of a $100M project is likely not going to get approved….

Other City of Edmonton CCGC Projects

50th Street Over CP Rail - Transportation

Other City of Edmonton CCGC Projects

Some items from the 50th Street Bid Form

PART A - GENERAL REQUIREMENTS		
PART A1 - MOBILIZATION AND SITE ESTABLISHMENT		
A.1.1	00.001, SP	Bonding & Insurance
A.1.2	00.010, SP	Mobilization and Demobilization
A.1.3	00.020, SP	Site Facilities and Temporary Utilities
A.1.4	00.030, SP	Site Supervision and Administration
A.1.5	00.040, SP	Construction Progress Camera
PART A2 - SITE OCCUPANCY AND LANE RENTAL		
A.2.1	00.052 SP	Site Occupancy #1 (First Bridge Structure)
A.2.2	00.052 SP	Site Occupancy #2 (Second Bridge Structure)
A.2.3	00.054 SP	Lane Rental (50 Street)
PART A3 - CP RAIL REQUIREMENTS		
A.3.1	SP	CP Signals/Bungalow Grading and Pad
A.3.2	SP	CP Track Monitoring
A.3.3	SP	CP Flagging
PART A4 - TRAFFIC ITEMS		
A.4.1	SP	Traffic Accommodation Maintenance
A.4.2	SP	Load, Haul, and Install City F-Shape Barriers
A.4.3	SP	Contractor Supply and Install F-Shape Barriers
A.4.4	SP	Temporary Traffic Barrier - Relocate On Site
A.4.5	SP	F-Shape to Single Slope Transition Barriers (Custom)
PART A5 - ENVIRONMENT PROTECTION AND MANAGEMENT		
A.5.1	00.080 SP	Environmental Construction Operations (ECO) Plan
PART A6 - UTILITY PROTECTION AND COORDINATION		
A.6.1	SP	Hydrovac Daylighting of Utilities
A.6.2	SP	Coordinating Utilities
PART A7 - PUBLIC COMMUNICATIONS		
A.7.1	SP	Construction Bulletins
A.7.2	SP	Project Signs
PART A8 - GENERAL CONTINGENCY ALLOWANCE		
A.8.1	99.999 SP	General Contingency Allowance

Other City of Edmonton CCGC Projects

Jasper New Vision - Transportation

Other City of Edmonton CCGC Projects

Terwillegar Stage 2 - Transportation

Other City of Edmonton CCGC Projects

Strathcona Footbridge - Transportation

Other City of Edmonton CCGC Projects

Lewis Farms Rec Center - Facilities

Other City of Edmonton CCGC Projects

Coronation Rec Center - Facilities

Thank You

Edmonton

CCGC Questions?

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