

CENG 6101 Project Management

Introduction to Bidding Process

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Introduction to Bidding Process

- Process by which a contract to perform work is awarded - determines the “winner” of a contract
- Conducted by the **client** (owner) or its consultant
- **Bidders** (contractors) submit a **tender (bid)** to the owner
- A tender (bid) is a formal offer to do works based upon certain terms
- Purpose of competitive tendering is to provide competition and thereby reduce costs to owner

Introduction to Bidding Process

Steps in Competitive Bidding

1. Owner issues request for bids:
 - Advertisements: newspapers, trade journals
 - Trade Association Bulletins: ECA, ARA; weekly or monthly
 - Letters of invitation (direct invitation), esp. private sector
 - Oral requests (followed-up), esp. for subcontracts
 - Requests for prequalification
2. Contractor views/obtains tender documents - government office, ECA office, owner's office - deposit paid
3. Contractor makes decision to bid or not to bid based on several factors.



ALBERTA TRANSPORTATION & UTILITIES

SEALED TENDERS will be received by the undersigned at the Tender Deposit Counter, Third Floor, Twin Atria Building, 4999 - 98 Avenue, Edmonton, up to 11 o'clock a.m. on Tuesday, May 19, 1987, for the following work:

Construction of a steel girder bridge to carry SR 757 over the Paddle River, 9 km North of Sangudo

Contracts and Specifications may be obtained at the office of the Director - Contracts Engineering Branch, 3rd Floor, TWIN ATRIA BUILDING, 4999 - 98 Ave., Edmonton; the office of the District Transportation Engineer, Room 107, Hill Park, 2411 - 4 St. N.W., Calgary; the office of the District Transportation Engineer, Administration Building, Lethbridge; the office of the Regional Director, 4th Floor, Provincial Building, 4920 - 51 St., Red Deer; the office of the Regional Director, Provincial Building, 5025 - 49 Ave., St. Paul; the office of the Regional Director, 9621 - 96 Ave., Peace River, and will be available to individuals operating in the Province of Alberta or to partnerships or corporations registered in the Province of Alberta. A deposit of One Hundred Dollars (\$100.00), payable to the Provincial Treasurer, will be required for each copy of Contract and Specifications taken. Each bid must be accompanied by a Bond or Certified Cheque equal to 10% of the Tender. Tenders will be opened in public. The lowest or any tender not necessarily accepted.

H. M. Alton
H. M. Alton, P. Eng.
DEPUTY MINISTER
Alberta Transportation & Utilities

← location
closing date & time

← work to be done

← where to obtain
plans & Specs

← deposit required

← bid bond 10%

← public opening

← not necessarily
lowest tender

Introduction to Bidding Process

- Factors Considered in Contractor's Decision to Bid
 - volume of work on hand/need for work
 - type of work - suits company?
 - size and location of project
 - resources available - labour, equipment, supervisory, financial
 - bonding capability
 - strategic value of project
 - future opportunity with client
 - likelihood of winning project - number of competitors
 - corporate business plan

Introduction to Bidding Process

4. Contractor prepares estimate and tender submission:
 - visit site
 - prepare estimate - calling of subcontracts and supply contracts
 - assemble bid
5. Contractor submits bid - by date and time of closing at specified location
6. Owner opens bids and awards contract:
 - public bid opening
 - closed bid opening

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Types of Bid Openings

Public bid opening:

- Public sector owners: government authorities (e.g. roadworks), schools, hospitals
- Basis for award - generally lowest price if prequalified

Closed bid opening:

- Private sector (non-government) owners
- Basis for award - not necessarily lowest price (experience, capability, realistic bid, quality of subcontractors and suppliers)

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How Many Bidders?

- Objective is to provide competition
 - Too few – problems?
 - Too many – problems?
- Minimum
- Desirable number
- How do we limit number?

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Reasons for Rejecting Bids

- Too few bids
- Substantially over budget
- Irregularities
- Qualifications lacking
- Obvious error

Introduction to Bidding Process

Methods of Tendering

- Open competitive
- Prequalified
- Invited
- Negotiated
- Joint ventures – one time

Introduction to Bidding Process

Scopes of Contracts

- Construct only
- Design and construct
- Turnkey (design, construct, manage, commission) or EPCM (engineer, procure, construct, manage)
- Management (construction or project)
- BOT or BOOT (build, own, operate, transfer) or Public Private Partnerships (P3)

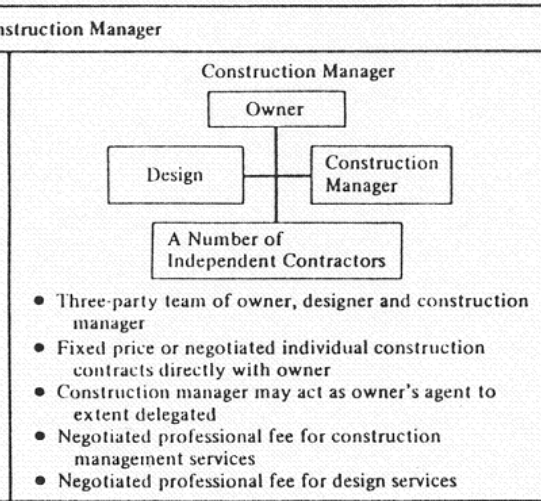
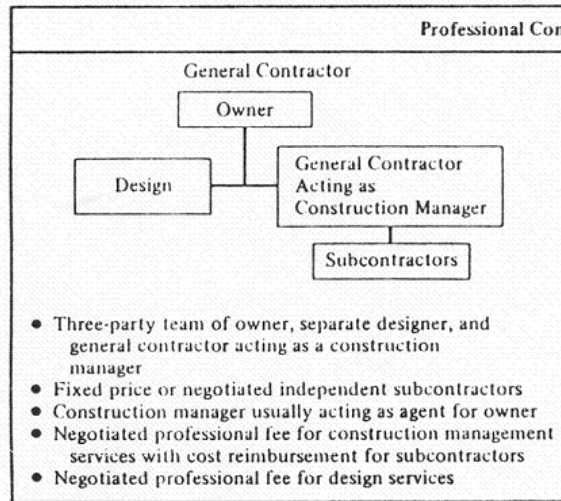
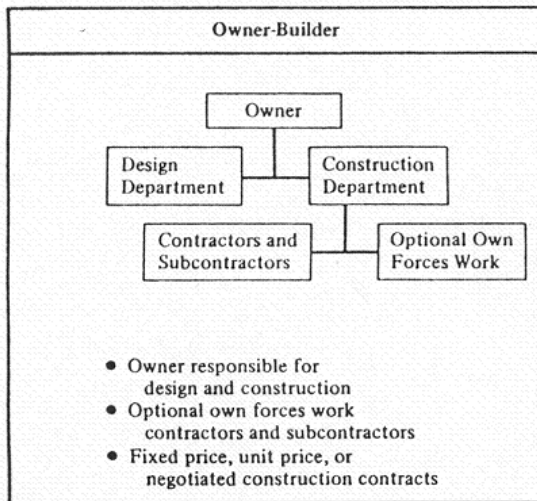
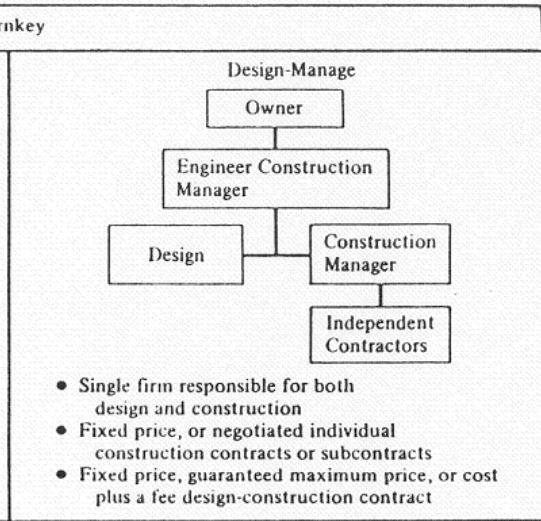
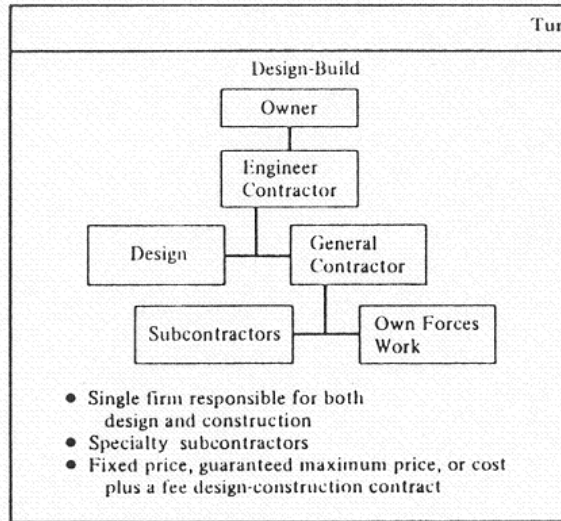
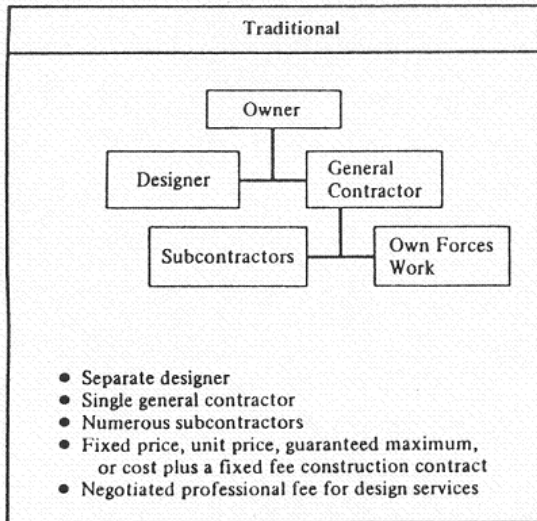
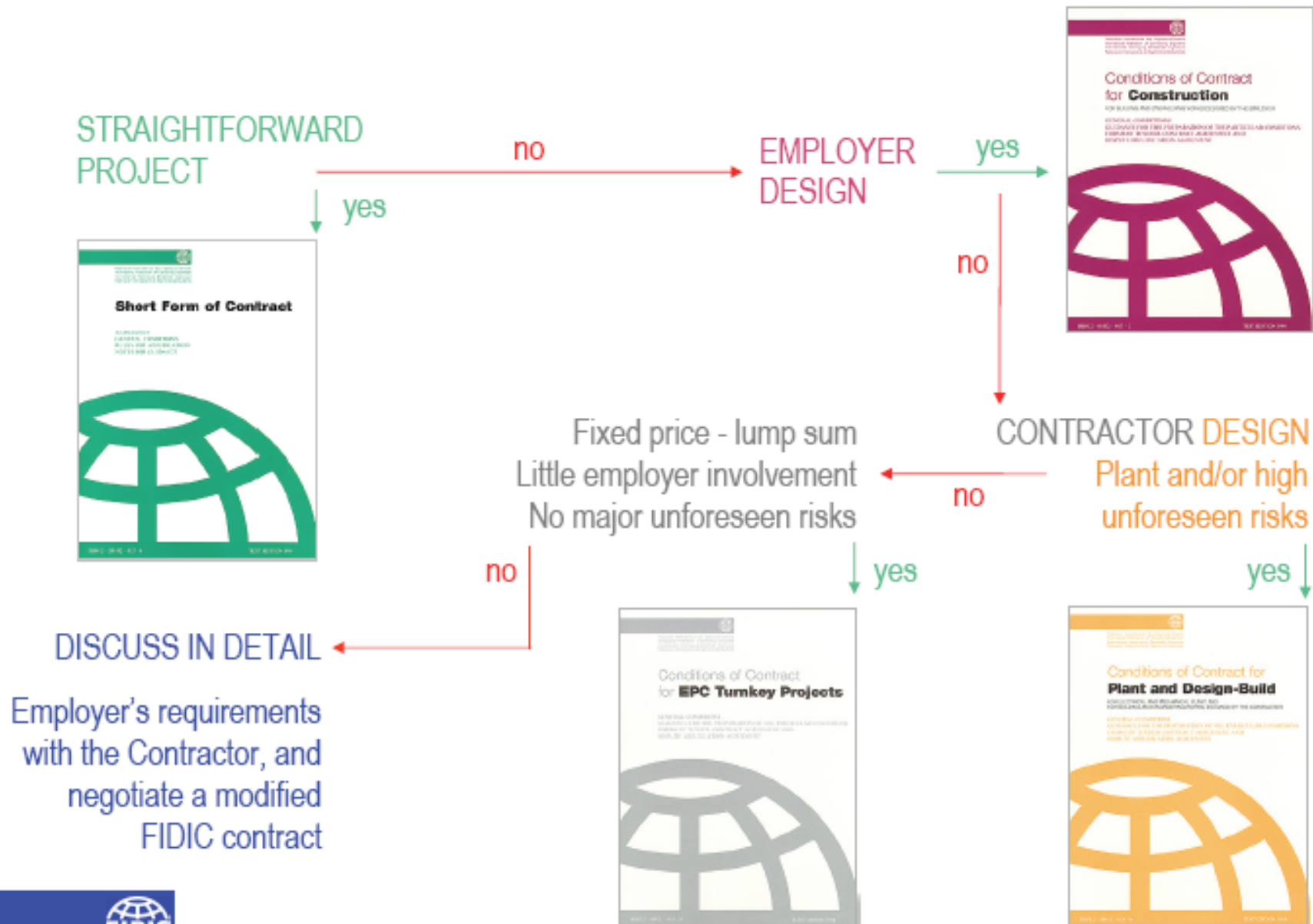


Figure 2-6 Alternate contractual approaches

From: **Professional Construction Management, 3rd Edition, Barrie and Paulson (1992)**

Which contract to use

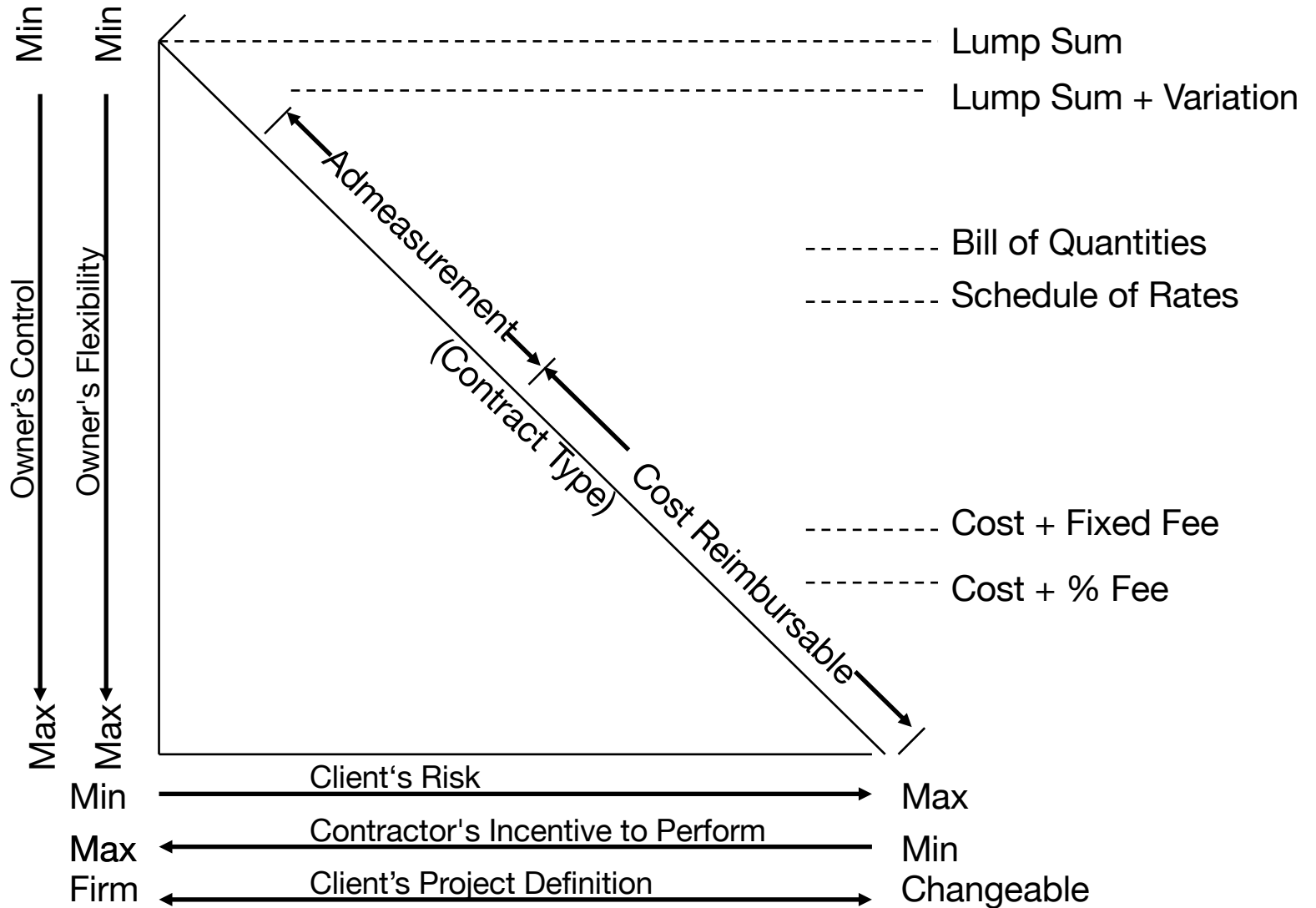


Introduction to Bidding Process

Types of Contracts

- Lump sum (stipulated price)
- Unit price (schedule of rates)
- Lump sum with schedule of rates
- Cost reimbursable:
 - Cost plus (fixed) percentage fee
 - Cost plus (fixed) lump sum fee
- Guaranteed Maximum Price

Types of Contracts



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Lump Sum Contracts

- Well defined scope
- Contractor is responsible for quantity takeoff
- Contractor is responsible for lump sum price

Unit Price Contracts

- Prices for defined units
- Approximate quantities usually provided by owner
- Payment is based on final measured quantities
- Reasons for using unit price?

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Cost Reimbursable Contracts

- For fast-track projects
- For complex work
- Large part of risk assumed by owner

Guaranteed Maximum Price

- Variation of the cost plus fixed fee by having a cap, or GMP
- The contractor assumes any additional costs after the “ceiling” point is reached
- The GMP is a defined price for an undefined product
- Variation on GMP: savings below the guaranteed maximum are shared between owner and contractor

Introduction to Bidding Process

What is Included in Bid Documents?

- Bid solicitation – notice to bid
- Instructions to bidders
- Information available to bidders (geotechnical reports, materials testing, etc.)
- Contract agreement
- Bid forms (unit rate schedule)
- Bidding addenda (as they arise)
- General conditions (contract administration: bonding, insurance, payment, dispute resolution); can use standards (FIDIC)
- Supplementary (special) conditions: special legal requirements; supersede general

Introduction to Bidding Process

What is Included in Bid Documents?

- General specifications: can use standards (CSI); generally follow standard order (e.g., Masterformat divisions)
- Project-specific specifications: supersede general
- Drawings
- Other attachments: list of subcontractors, project personnel, company information
- Rule: written quantities supersede numbers; special conditions supersede general conditions
- Bid documents become contract documents at time contract agreement signed by owner and contractor

SECTION 00002 – INSTRUCTIONS TO BIDDERS:

RECEIPT AND OPENING OF BIDS:

Bids will be received by the Owner at the time and place set forth in the Advertisement for Bids and then at said place be publicly opened and read aloud.

BID SUBMISSION:

Each bid must be submitted in a sealed envelope bearing on the outside the name of the bidder, his address, and the name of the project for which the bid is submitted, and addressed as specified in the Bid Form.

SUB-CONTRACT:

Any person, firm, or other party to whom it is proposed to award a subcontract under this contract must be acceptable to the Owner.

WITHDRAWAL OF BIDS:

Bids may be withdrawn on written or telegraphic or facsimile request received from bidders prior to the time fixed for opening. Negligence on the part of the bidder in preparing the bid confers no right for the withdrawal of the bid after it has been opened.

BASIS OF BID:

The bidder must include all unit cost items and all alternatives shown on the Bid Forms; failure to comply may be cause for rejection. No segregated bids or assignments will be considered.

QUALIFICATION OF BIDDER:

The Owner may make such investigation as he deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request.

TIME OF COMPLETION:

Bidder must agree to commence work on or before a date to be specified in a written "Notice to Proceed" of the Owner and to substantially complete the project **within 180 consecutive calendar days thereafter**.

CONDITIONS OF THE WORK:

Each bidder must inform himself fully of the conditions relating to the construction of the project and employment of labor hereon. Failure to do so will not relieve a successful bidder of his obligation to furnish all material and labor necessary to carry out the provisions of his contract.

ADDENDA AND INTERPRETATIONS:

All addenda so issued shall become a part of the contract documents. No interpretation of the meaning of the plans, specifications, or other contract documents will be made to any bidder orally.

LAWS AND REGULATIONS:

The bidder's attention is directed to the fact that all applicable State Laws, Municipal Ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the contract the same as though herein written out in full.

OBLIGATION OF BIDDER:

At the time of the opening of bids, each bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the plans and contract documents (including all addenda).

FIGURE 2.2 | Example instructions to bidders.

Source: Peurifoy and Oberlender, 2002

SECTION 00003 – BID FORM:

Place: _____ Date: _____

PROPOSAL OF _____
(hereinafter called "Bidder")

TO: The Owner.

Gentlemen:
The bidder, in compliance with your invitation for Bids for the:

**MAINTENANCE FACILITY PROJECT
1234 STREET
CITY, STATE**

having examined the plans and specifications with related documents and the site of the proposed work, and being familiar with all of the conditions surrounding the work, including the availability of materials and labor, hereby agree to furnish all labor, materials, equipment, and supplies, and to perform the work required by the project in accordance with the contract documents, within the time set forth in Instructions to Bidders, and at the prices stated below. These prices are to cover all expenses incurred in performing the work required by the contract documents, of which this bid is a part.

Bidder acknowledges receipt of the following addenda: _____.

All Bid amounts shall be shown in both WORDS and FIGURES. In case of discrepancy, the amount shown in words will govern.

BASE BID:

Bidder agrees to perform all of the work described in the plans and specifications as being in the Base Bid for the sum of: _____ Dollars.
\$ _____

The Bidder agrees to perform all of the work described in the Drawings and Specifications, which has been designated as Alternate Bids. Alternate Bids shall be add amounts to the Base Bid. Changes shall include any modifications of the work or additional work that the Bidder may require to perform by reason of Owner's acceptance of any or all Alternate Bids.

ALTERNATE NO. 1 :

Add 3" thick Type "C" asphalt paving to compacted crushed limestone as shown on Sheet C-1.
ADD: _____ Dollars \$ _____.

The Bidder hereby agrees to commence work under this contract on or before a date to be specified in a written "Notice to Proceed" by the Owner and to substantially complete the project **within 180 consecutive calendar days thereafter**. The Owner reserves the right to reject any and all bids. Bidder agrees that this bid shall be good and shall not be withdrawn for a period of sixty (60) calendar days after the opening thereof.

In the event a contract is awarded by the Owner to the Successful Bidder, it shall be executed within thirty (30) days. The Bidder shall return with his executed contract the Performance Payment Bond, Statutory Bond, and Warranty Bond as required by the Supplementary Conditions.

(SEAL) if bid is _____
corporation _____
Respectfully submitted by: _____
FEI/SS Number: _____

FIGURE 2.3 | Example bid form for lump-sum contract.

Item	Description	Quantity	Unit	Unit Price	Total
1	Mobilization	lump sum	job		
2	Water control	lump sum	job		
3	Common excavation	20,000	cy		
4	Rock excavation	12,000	cy		
5	Drilling piers	5,350	lin.ft		
6	Concrete foundation	250	cy		
7	Anchor bolts	185	each		
8	Rock anchors	17,500	lb		
9	Slope protection	260	each		
10	Compacted fill	620,000	cy		
11	Random fill	1,790,730	cy		
12	Riprap – 24 in.	3,700	cy		
13	Drainage structure #1	lump sum	job		
14	Drainage structure #2	lump sum	job		
15	Lime-treated subgrade	25,500	sy		
16	Aggregate base course	3,350	cy		
17	Asphalt pavement	40,100	sy		
18	Concrete pavement	150	cy		
19	Bermuda sodding	2,080	sy		
20	Traffic control	lump sum	job		
21	Demobilization	lump sum	job		

FIGURE 2.4 | Bid form for unit-price contract.

Source: Peurifoy and Oberlender, 2002

Work Breakdown Structures

- **Building construction projects:** generally follow Construction Specification Institute (CSI) Masterformat divisions; technical specifications organized according to Masterformat divisions
- **Heavy engineering/industrial projects:** WBS usually unique to project

TABLE 1.3 | Example of building construction project bid summary using the CSI format.

Item	Division	Material	Labor	Subcontract	Total
1	General requirements	\$ 16,435	\$ 36,355	\$ 4,882	\$ 57,672
2	Sitework	15,070	20,123	146,186	181,389
3	Concrete	97,176	51,524	0	148,700
4	Masonry	0	0	212,724	212,724
5	Metals	213,224	59,321	0	272,545
6	Wood and plastics	38,753	10,496	4,908	54,157
7	Thermal and moisture	0	0	138,072	138,072
8	Doors and windows	36,821	32,115	0	68,936
9	Finishes	172,587	187,922	0	360,509
10	Specialties	15,748	11,104	9,525	36,377
11	Equipment	0	0	45,729	45,729
12	Furnishings	0	0	0	0
13	Special construction	0	0	0	0
14	Conveying systems	0	0	0	0
15	Mechanical	0	0	641,673	641,673
16	Electrical	0	0	354,661	354,661
Total for Project		\$605,814	+ \$408,960	+ \$1,558,360	= \$2,573,144
Material tax (5%)		\$30,291			2,603,435
Labor tax (18%)			73,613		2,677,048
Contingency (2%)				53,541	2,730,589
Bonds/insurance				34,091	2,764,680
Profit (10%)				276,468	3,041,148
					Bid price = \$3,041,148

TABLE 1.4 | Division 2 estimate for sitework.

Cost code	Division	Quantity	Material	Labor	Subcontract	Total
2110	Clearing	Lump sum	\$ 0	\$ 0	\$ 3,694	\$ 3,694
2220	Excavation	8,800 cy	0	11,880	9,416	21,296
2250	Compaction	950 cy	0	2,223	722	2,945
2294	Handwork	500 sy	0	1,750	0	1,750
2281	Termite control	Lump sum	0	0	3,475	3,475
2372	Drilled piers	1,632 lin ft	14,580	2,800	4,524	31,904
2411	Foundation drains	14 each	490	1,470	0	1,960
2480	Landscape	Lump sum	0	0	8,722	8,722
2515	Paving	4,850 sy	0	0	105,633	105,633
Totals =			\$15,070	+ \$20,123	+ \$146,186	= \$181,389

Source: Peurifoy and Oberlender, 2002

TABLE 1.5 | Example of electric power construction bid summary using the WBS organization of work group-level report for total project.

No.	Group	Material	Labor and Equipment	Subcontract	Total
1100	Switch station	\$1,257,295	\$ 323,521	\$3,548,343	\$ 5,126,167
2100	Transmission line A	3,381,625	1,260,837	0	4,641,462
2300	Transmission line B	1,744,395	0	614,740	2,358,135
3100	Substation at Spring Creek	572,874	116,403	1,860,355	2,549,632
4200	Distribution line A	403,297	54,273	215,040	672,610
4400	Distribution line B	227,599	8,675	102,387	427,661
4500	Distribution line C	398,463	21,498	113,547	532,508
Total for project		\$7,985,548	+ \$1,872,215	+ \$6,453,412	= \$16,311,175

TABLE 1.6 | Division-level report for transmission line A—Code 2100.

Code	Description	Material	Labor	Equipment	Total
2100	TRANSMISSION LINE A				
2210	Fabrication of steel towers	\$ 692,775	\$ 0	\$ 0	\$ 692,775
2370	Tower foundations	83,262	62,126	71,210	216,598
2570	Erection of steel towers	0	144,141	382,998	527,139
2620	Insulators and conductors	2,605,588	183,163	274,744	3,063,495
2650	Shield wire installation	0	78,164	63,291	141,455
Total for 2100		\$3,381,625	+ \$467,594	+ \$792,243	= \$4,641,462

TABLE 1.7 | Component-level report for tower foundations—Code 2370.

Code	Description	Quantity	Material	Labor	Equipment	Total
2370	TOWER FOUNDATIONS					
2372	Drilling foundations	4,198 lin ft	\$ 0	\$25,428	\$44,897	\$ 70,325
2374	Reinforcing steel	37.5 tons	28,951	22,050	15,376	66,377
2376	Foundation concrete	870 cy	53,306	13,831	10,143	66,377
2378	Stub angles	3,142 each	1,005	817	794	2,616
Total for 2370			\$83,262	+ \$62,126	+ \$71,210	= \$216,598

Source: Peurifoy and Oberlender, 2002

Introduction to Bidding Process

Contract Documentation

Plans

Specifications

Bill of quantities / Schedule of rates

Standard specifications

- ERA Specifications
- Construction Specifiers Handbook - Construction Specifications Institute (CSI) - Masterformat
- Sweet's Canadian Construction Catalogue

Introduction to Bidding Process

Why Use Standard Specifications?

- Quality of work
- Reduces repetition
- Masterformat provides uniform approach
- Basis for the assessment of claims and change orders
- Use of estimating checklists

Assignment 2

- Assignment 2: Selection of Project Delivery Method and Associated Contract
- From the most commonly used Project Delivery Methods, i.e., Design-Bid-Build, Design-Build, BOT or P3 select one delivery method, and prepare a report, not exceeding 5 pages, discussing the following:
 - What is the main scope of the delivery contract?
 - Pros and Cons of the selected delivery method.
 - The recommended contract type for the selected delivery method?
 - Its current practice or need in developing countries.
 - Highlight two case projects, either locally or internationally, that used the selected method.
- Due date: June 1, 2018 before 9 a.m.

Assignment 1: Marking Rubric

Rank Category	Excellent (A+; A; A-) (80 - 100)	Very Good (B+; B; B-) (60 - 80)	Satisfactory (C+; C; C-) (40 - 60)	Marginal (D+; D) (20 - 40)	Unacceptable (F) (0 - 20)
Title page: As per ASCE CRC Format	Title, Name of students, Instructor's Name, Course Name, Semester, Date, Neatly finished-no errors	Evidence of 5	Evidence of 4	Evidence of 3 or less	Absent
Problem statement	Clearly and concisely states the paper's select delivery method	Clearly and states the paper's select delivery method	States the paper's select delivery method	Incomplete and unfocused	Absent or no evidence
Introduction	The introduction is engaging, states the main topic and previews the structure of the paper	The introduction states the main topic and previews the structure of the paper	The introduction states the main topic but does not adequately previews the structure of the paper	There is no clear introduction or main topic and the structure of the paper is missing	Absent or no evidence
Body	Each paragraph has thoughtful supporting detail sentences that develop the main idea	Each paragraph has sufficient supporting detail sentences that develop the main idea	Each paragraph lacks supporting detail sentences	Each paragraph fails to develop the main idea	Not applicable
Details on submission requirements:	The paper clearly demonstrates each of the submission requirements and subtle sequencing of the requirements through well-developed paragraphs; transitions are used to enhance organization	The paper demonstrates each of the submission requirements and some sequencing of the requirements through well-developed paragraphs; transitions are used to enhance organization	The paper presents each of the submission requirements and the requirements through well-developed paragraphs; transitions are not used to enhance organization	The paper presents each of the submission requirements without any logic and no sequencing of the requirements through well-developed paragraphs; transitions are not used to enhance organization	Not applicable
Conclusion	The conclusion is engaging and clearly explains the studied delivery method	The conclusion is clearly explains the studied delivery method	The conclusion does not clearly explain the studied delivery method	Incomplete and unfocused	Not applicable
Write up	No errors in punctuation, capitalization and spelling. No errors in sentence structure and word usage.	Almost no errors in punctuation, capitalization and spelling. Almost no errors in sentence structure and word usage	Many errors in punctuation, capitalization and spelling. Many errors in sentence structure and word usage	Numerous and distracting errors in punctuation, capitalization and spelling. Numerous and distracting errors in sentence structure and word usage	Not applicable
Citation : As per ASCE Format	All cited works, both text and visual, are done in the correct format with no errors	Some cited works, both text and visual, are done in the correct format with no errors	Few cited works, both text and visual, are done in the correct format with no errors	Absent	Not applicable
Bibliography	Done in the correct format with no errors. Includes more than 5 major references (e.g. construction journal articles, books, but no more than two internet sites)	Done in the correct format with few errors. Includes 5 major references (e.g. construction journal articles, books, but no more than two internet sites)	Done in the correct format with many errors. Includes 4 major references (e.g. construction journal articles, books, but no more than two internet sites)	Done in the correct format with many errors. Includes 3 major references (e.g. construction journal articles, books, but no more than two internet sites)	Absent or the only sites are internet sites

Project Assignment

- Project Assignment 1: WBS Items and schedule (20 marks)
- Develop a detailed work breakdown structure (WBS), and a complete CPM schedule for the project using MS Project scheduling software, including both a network diagram and a bar chart. Your schedule should be in accordance with the attached network schedule requirements and specifications attached. Submit supporting documentation showing all logic, lead/lag relationships, and calculations.
- Due date: February 5, 2016 before 5 a.m.

Project Assignment : Groups

Group	Members	Group	Members
A		B	
C		D	
E		F	

Project Assignment : Groups

Group	Members	Group	Members
G		H	
I		J	
K		L	

References:

- *CIV E 601: Project Management, Lecture Notes*, Fayek, A. R. University of Alberta, 2013.
- *Project Management: Techniques in Planning and Controlling Construction Projects*, 2nd Edition, Ahuja, Dozzi, and AbouRizk, John Wiley and Sons, 1994.
- *Estimating Construction Costs*, Peurifoy and Oberlender, 2002, McGraw-Hill.