

Bid Documents, Bid Analysis, Cost Control

Construction Estimation, Planning
and Control
CE4333

Bid Documents

- Invitations to bid
- Instructions to bidders
- Bid forms
- Drawings
- Specifications
- Requirements for bonds and insurances
- Appendices

Contract Documents

- Bid documents *after* contract has been signed
- + Change orders during the construction process
- + Signed agreements, bonds, insurances, plans, specs. (CSI, DOT etc)

Players

- Owner (Provides the money: Project financing!!)
- Architects/Engineers (Provides all plans/specs.: contract documents)
- Contractors (Builds in accordance with the contract)
- Sub-contractors

Types of Contracts

- Lump sum
- Unit-price
- Cost + Fee
- Incentive Contracts
- Guaranteed Maximum Price (GMP)

Bid Forms

- Lump-sum Contracts
 - Base bid prepared for entire project (At-Risk)
 - When quantity of work to be performed is definite and well defined
- Unit-price Contracts
 - Specify unit costs for necessary work
 - Be careful to specify all work units
 - Direct cost +

Bonds

- Surety: financial stability, experience
- Bid Bonds
- Performance Bonds
- Material and Labor Payment Bond
 - (Project Close-out, releasing liens)

Insurances

- Read Text

Other Docs.

- Drawings
- Change orders
- Addendum
- Alternates

Division	Materials	Labor	Equipment	Total
1. General Requirements	105,217	392,857	0	498,074
2. Site Construction	189,565	480,000	91,304	760,869
3. Concrete	406,957	322,857	26,087	755,901
4. Masonry	695,652	837,143	156,522	1,700,317
5. Metals	730,435	466,429	69,565	1,266,429
6. Wood and Plastics	122,609	52,143	0	174,752
7. Thermal and Moisture	216,522	127,143	0	343,665
8. Doors and Windows	166,957	58,571	0	225,528
9. Finishes	146,087	112,857	0	258,944
10. Specialties	13,043	7,143	0	20,186
11. Equipment	257,391	123,571	0	380,962
12. Furnishings	0	0	0	0
13. Special Construction	36,522	4,286	0	40,808
14. Conveying Systems	92,435	35,714	0	128,149
15. Mechanical	863,478	510,000	17,391	1,390,869
16. Electrical	1,130,435	414,286	17,391	1,562,112
Total Field Costs	5,173,305	3,965,000	378,260	9,516,565
Taxes on Materials (5%)				258,665
Taxes on Labor (2.5%)				99,125
Insurance and Bonds				265,000
Overhead and Profits (15%)				1,654,722
Total Bid Price				12,086,202

Figure 2.2: An Example of a Detailed Estimate at the Division Level
Source: Construction Cost Estimating for Decision Makers, (Manuscript)
Eddy M. Rojas, University of Washington

Bid Analysis

- CSI Format (slide)
- Conversion ratio (CR):
 - Ratio by which raw materials are converted to the finished product

$$CR = [TB - MC]/MC$$

TB: Total Bid Price

MC: Material Cost including taxes

Payment Schedules

- Working on borrowed money
- Payments made on % completion
- An agreed schedule of payment:

Owner's Bid Price (pre O&P)/Division Reqmt. =
Cost Allocation per division (CA/div)
CA/div x Contractor's estimate = Division
payment sched.
- Balanced/Un-balanced bids

Division	Owner's Estimate	Cost Allocation	Payment Schedule	Contractor's Estimate
1. General Requirements	619,216	5.6	630,444	625,342
2. Site Construction	908,014	8.2	924,478	1,125,342
3. Concrete	874,630	7.9	890,488	965,896
4. Masonry	1,976,052	17.9	2,011,881	2,423,400
5. Metals	1,437,225	13.0	1,463,283	1,632,564
6. Wood and Plastics	211,585	1.9	215,421	216,432
7. Thermal and Moisture	403,944	3.7	411,267	405,643
8. Doors and Windows	266,185	2.4	271,012	175,543
9. Finishes	312,129	2.8	317,798	234,609
10. Specialties	40,291	0.4	41,021	45,321
11. Equipment	442,391	4.0	450,413	450,000
12. Furnishings	0	0	0	0
13. Special Construction	61,372	0.6	62,484	60,654
14. Conveying Systems	159,366	1.4	162,256	158,765
15. Mechanical	1,579,210	14.3	1,607,844	1,339,543
16. Electrical	1,739,872	15.8	1,771,418	1,372,445
Bid Price before O&P	11,031,480	100	11,231,499	11,231,499
Overhead and Profits (15%)	1,654,722			
Total Bid Price	12,686,203			

Figure 2.3: An Example of a Payment Schedule Calculation

Cost Control

- Controlling on-going expense
- Information required:
 - % Completion
 - Estimate of cost of material stored on-site
 - Accrued expense (so far, independent of payment)
 - Estimated cost
- Check Accrued Expenses so far vs. Estimated Expense

Cost Control

- Accrued expense/div
 - +Cash expenditures
 - - Inventory valuation
 - + Accounts payable
- Estimated expense/
As-planned expense:
 - % completion x
Estimated expense/div.

