Pricing Generally

Two Stages for Pricing

1. Prepare the takeoff for pricing by reorganizing the takeoff items under trade. This is referred to as recap.
   - The recap allows the estimator to consider items of similar nature (trade) one at a time.
   - It will also allow summarizing costs by trade to facilitate analysis of the estimate.
2. Price the recap list.

Possible Breakdown for a General Contractor

1. Excavation and backfill
2. Concrete work
3. Formwork
4. Concrete finishes
5. Reinforcing Steel
6. Masonry Work
7. Miscellaneous work

The Recap

- The estimator need to scan the entire takeoff list for all items of a specific trade, list them in the recap, and then move to the next trade.
- The recap can be cumbersome if done manually unless the takeoff list also contains a trade breakdown (e.g. CSI Format.; see table on next slide)
- When computer estimating software is used the recapping items from the takeoff list can be performed automatically. This is an obvious advantage for use of estimating software since it simplifies the task and assures inclusion of all takeoff items.

GENERAL REQUIREMENTS

01020. Allowances
01100. Alternatives
01200. Project Meetings
01300. Submittals
01400. Quality Control
01500. Temporary Facilities and Controls
01600. Material and Equipment
01701. Project Closeout

SITE WORK

02000. Alternatives
02010. Subsurface Exploration
02100. Clearing
02110. Demolition
02200. Earthwork
02250. Soil Treatment
02300. Pile Foundations
02350. Caissons
02400. Shoring
02500. Site Drainage
02550. Site Utilities
02600. Paving & Surfacing
02700. Site Improvements
02800. Landscaping
02850. Railroad Work
02900. Marine Work
02950. Tunneling

CONCRETE

03000. Alternatives
03100. Concrete Formwork
03150. Expansion & Contraction Joints
03200. Concrete Reinforcement
03300. Cast-in-Place Concrete
03350. Specially Finished Concrete
03360. Specially Placed Concrete
03400. Precast Concrete
03500. Cementitious Decks

MASONRY

04000. Alternatives
04100. Mortar
04150. Masonry Accessories
04200. Unit Masonry
04400. Stone
04500. Masonry Restoration & Cleaning
04550. Refractories

METALS

05000. Alternatives
05100. Structural Metal Framing
05200. Metal Joists
05300. Metal Decking
05400. Lightgage Metal Framing
05500. Metal Fabrications
05700. Ornamental Metal

LIST OF ITEMS AND CSI-BASED CODES

2000.000	SITEWORK	
2100.010	Division 2 Subtrades	Lsum
2111.010	Investigate: Soil Testing	Lsum
2141.010	Dewater: General	Lsum
2144.000	Gravel @ Slab	CY
2201.000	Earthwk: Remove Topsoil	CY
2202.010	Earthwk: Grade Site	SY
2205.000	Earthwk: Excav Trench	CY
2210.000	Earthwk: Excav Pits	CY
2215.000	Earthwk: Excav Basements	CY
2220.000	Earthwk: Bulk cut	CY
2220.400	Earthwk: Grade & Trim	sf
2220.450	Earthwk: Fine Grade	sf
2831.010	Improvmnts: Fencing	lnft
2860.010	Site Equip: PlayingFields	Lsum
2900.010	Landscape: General	SY
2921.010	Landscape: Replace Topsoil	CY
	CONCRETE	
3000.010	Division 3 Subtrades	Lsum
3110.100	Forms: Footings	sf
3112.000	Forms: Pile Caps	sf
3114.000	Forms: Grade Beams	sf
3114.500	Forms: Voids	lnft
3115.000	Forms: Walls	sf
3119.000	Forms: Pilasters	sf
3122.010	Forms: Columns	sf

Pricing the Recap

- Pricing a construction estimate entails consideration of five cost categories:
    1. Labor
    2. Material
    3. Equipment
    4. Subcontractors
    5. Job overheads
- One factor impacts all these categories ➔ Contractor's risk. We will consider Risk first and then the factors affecting pricing of each category.

Contractor's Risk

- Contractor's risk needs to be taken into consideration as it could impact any of the cost categories.
- Risk in an estimate is the risk of financial loss.
- The contractor needs to identify the sources of risk and evaluate them.
- One major source of risk is the type of contract and contract conditions.
  - For example Cost-plus vs. Lump-sum

General Reasons for exceeding Estimated Cost

- Takeoff quantities are low.
- Actual productivities are lower than anticipated by the estimate.
- Subcontractors or material suppliers fail to meet obligations.
- It may not be possible to remove risk due to inaccuracies in the takeoff totally but it can be reduced by:
  - Following a systematic procedure for takeoff.
  - Review of the estimate by experienced estimators.
  - Markup considerations
- Risk in productivities, subcontractors and suppliers will follow

Pricing Labor & Equipment

- Two methods:
  1. First Method
     - Use productivity rates to convert takeoff quantities into labor-hours or equipment-hours
     - Apply labor rates or equipment rates to estimate labor and equipment prices
  2. Second Method
     - Use unit prices and apply them directly to the quantities in the takeoff list.
- The first is preferable but could be laborious. Therefore the second is the most widely used

Risk in Labor & Equipment

- There are two factors associated with labor & equipment:
  - Labor rates and equipment rates
  - Productivity of labor and equipment
- Labor rates should include non-salary costs such as medical insurance, living quarters, travel expenses, etc.
- Risk is associated with the stability of the rates. For example for long-duration projects, rates may change. This applies to both labor and equipment.

Equipment Rates

- Rates may change overtime due to variations in assumptions about maintenance costs, life expectancy, salvage value.
- Rental rates may also fluctuate due to economic and market demand. Firm prices over the life of the project can be a way with dealing with this risk.

Productivity of Labor & Equipment

- Productivity of labor & equipment is impacted by many factors that can be classified into two categories:
  - Job Factors
  - Management Factors
- Some of these factors can be influenced by the contractor. Others cannot be.

Job Factors

- Weather Conditions
- Site Access
- Site Storage Space
- Nature of project (Size & Complexity)
- Distance from material and equipment sources

Management & Labor Factors

- Quality of supervisors
- Skill of labor
- Motivation and morale of workers
- Type & quality of tools and equipment at the job.
- Experience with similar projects

Use of Cost Report

- Historical data can be very useful in establishing rate ranges of work items.
- Historical cost collection must be done systematically and consistently using the same system of measurement to be effective.
- To do that an accurate and consistent cost reporting system must be developed

Developing Cost Reports

- The takeoff items are priced to establish a budget. The items are coded for monitoring and follow up.
- As work progresses, labor-time and equipment time are recorded.
- The quantity of work completed is also recorded.
- Labor rates and equipment rates are applied to the time expended to determine labor & equipment cost. Unit rates for work items are then found based on work completed.
- Cost reports should have comments by the estimator on the basis of the unit prices and from field supervisor on actual conditions that have resulted in the change in prices.

ESTIMATE SUMMARY **These items are now completed.							CURRENT MONTH							TOTAL TO DATE								
ITEM	QUANT		LABOR $	EQUIP. $	MATL. $	TOTAL $	QUANT		LABOR $	EQUIP. $	MATL. $	TOTAL $	UNDER/ (OVER) $	QUANT		LABOR $	EQUIP. $	MATL. $	TOTAL $	UNDER/ (OVER) $	PROJECTED TOTAL	UNDER/ (OVER)
STRIP																						
TOPSOIL**	500	CY	400.00	1,000.00	0.00	1,400.00	85	CY	89.25	204.85	0.00	294.10	(56.10)	499	CY	618.76	1,227.54	0.00	1,846.30	(446.30)	1,846.30	(446.30)
unit price			0.80	2.00	0.00	2.80			1.05	2.41	0.00	3.46	(0.66)			1.24	2.46	0.00	3.70	(0.90)		
EXCAV.																						
TRENCH	1,200	CY	1,500.00	2,136.00	0.00	3,636.00	890	CY	1,076.90	1,335.00	0.00	2,411.90	284.80	1,134	CY	1,008.00	1,791.72	0.00	2,799.72	636.30	3,492.00	144.00
unit price			1.25	1.78	0.00	3.03			1.21	1.50	0.00	2.71	0.32			1.33	1.58	0.00	2.91	0.12		
EXCAV. PITS	950	CY	3,182.50	4,560.00	0.00	7,742.50	702	CY	2,730.78	3,524.04	0.00	6,254.82	(533.52)	702	CY	2,730.78	3,524.04	0.00	6,254.82	(533.52)	8,464.50	(722.00)
unit price			3.35	4.80	0.00	8.15			3.89	5.02	0.00	8.91	(0.76)			3.89	5.02	0.00	8.91	(0.76)		
TRANS.																						
EQUIPMENT	4	Mo	0.00	10,000.00	0.00	10,000.00	1	Mo	0.00	2,500.00	0.00	2,500.00	0.00	2	Mo		5,000.00	0.00	5,000.00	0.00	10,000.00	0.00
unit price			0.00	2,500.00	0.00	2,500.00			0.00	2,500.00	0.00	2,500.00	0.00			0.00	2,500.00	0.00	2,500.00	0.00		
BACKFILL																						
TRENCH	872	CY	2,180.00	6,060.40	12,208.00	20,448.40	644	CY	1,635.76	4,520.88	9,048.20	15,204.84	(103.04)	861	CY	2,221.38	6,121.71	12,200.37	20,543.46	(353.01)	20,805.92	(357.52)
unit price			2.50	6.95	14.00	23.45			2.54	7.02	14.05	23.61	(0.16)			2.58	7.11	14.17	23.86	(0.41)		
BACKFILL PITS	795	CY	2,504.25	5,604.75	11,130.00	19,239.00	0	CY	0.00	0.00	0.00	0.00	0.00	0	CY	0.00	0.00	0.00	0.00	0.00	0.00	0.00
unit price			3.15	7.05	14.00	24.20			0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00	0.00		

Figure 8.1 Cost Report

Pricing Material

- In construction projects, materials fall into two categories:
  1. Material incorporated into the facility (concrete, widows, paint, etc.)
  2. Material consumed by the project (formwork, fuel, power, etc.)
- Materials of the first category are priced using unit prices as a cost element of the item using the material, as is labor and equipment
- Consumable materials are included as:
  1. Part of the permanent work (formwork: in concrete)
  2. Fuel and oil for equipment are incorporated in equipment prices
  3. Part of general expenses (project overhead)

Owner Furnished Material

- Owner furnished material is material supplied by the owner but may need to be received, stored, or installed by the contractor.
- Estimator must have information on the material (size, weight, special handling requirements, etc.) in order to be able to estimate the contractor's work.

Pricing Subcontracts

- Not all subcontractors submit lump sum bids. Some quotes come on basis of unit price or hourly rates.
- Interpretation of scope of work may be different between subcontractor and general contractor. This can be dealt with by clearly defining subcontract scope.
- A subcontractor whose bid has been selected may not be able to perform. GC can demand performance bond from subcontractors.