Guide to Bidding

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Your crew is on the job. The purchasing agent has begun buying materials to be installed. You are spending money. When the job is done and your customer makes the final payment, do you hope and pray there is enough money to pay your crew, suppliers and keep your business running, or do you know you will have the money to meet your obligations, with money left over as profit for your labors? Estimating procedures separate contractors scrambling on a hope and a prayer versus confident successful companies with sound business practices.

When you bid a job, there are three possible outcomes:

1. You don't get the job.
2. You get the job, but bid too low and loose money.
3. You get the job, cover costs and make a profit.

Of these three potential outcomes, only one of them is good news.

As a contractor, your source of revenue is construction. You set the price for your work. Your customer decides whether to accept the proposal. If your bid is too high you will most likely loose the sale. Too low, you probably get the job, but you will most likely loose money. You need to find the sweet spot. To do that consistently it is essential that you know how much it will cost you to do the work. Each job will cost you in materials, equipment, labor, and business expenses; you may also need to hire a subcontractor.

Often at bid openings, we've heard the same thing for years. The high bidder complains about the low bidder, saying; "He can never do it for that price." Often the low bidder has that sick feeling in the stomach, wondering "What did I forget?" Some of those companies do go out of business, but some do very well. So what is the difference? Why is there a range in prices? Each estimator sees the job differently. Are differences in bids due to materials? Was there a simple mistake in getting a right price for the right item? Or was there a mistake in estimating the quantity? Perhaps the low bidder has better equipment and more productive crews. Perhaps the high bidder has a top-heavy organization so the overhead recovery rate is too high.

Typically the difference between bids is a combination of the estimate for materials, installation time, crew and equipment cost, overhead and profit.

Magic Multiplier

Some contractors use the "magic multiplier" approach to bidding; they simply take the cost of materials and multiply it by some number that will hopefully make sure the bid is competitive and still profitable. Unfortunately, this simple method has real problems.

To demonstrate the weakness in the "magic multiplier", let's see how two contactors prepare a bid to install a toilet. The customer can't decide which toilet, so they want a bid on three styles. It will take the same amount of time to install the toilet, so the installation cost would be the same.

"Contractor One", looking for a shortcut, uses the magic multiplier. Here is how he bid the job:

Magic Multipler - Material Cost x 2				
Toilet Style	Material Cost		Multiplier	Bid
A	$ 45.00	X	2	$ 90.00
B	$ 70.00	X	2	$ 140.00
C	$ 120.00	X	2	$ 240.00

"Contractor Two" uses a cost based approach. We will assume both contractors run an efficient operation and the cost to install is the same; let's use a one-hour installation time, at a cost of $50.00. "Contractor Two" takes a little more time to prepare the bid; looking at the material cost and installation cost. Here is the worksheet:

Cost Method					
Toilet Style	Material Cost	Labor Cost	Cost	15% Profit	Bid
A	$ 45.00	$ 50.00	$ 95.00	$ 14.25	$ 109.25
B	$ 70.00	$ 50.00	$ 120.00	$ 18.00	$ 138.00
C	$ 120.00	$ 50.00	$ 170.00	$ 25.50	$ 195.50

How will the customer react?

1. He may get very excited and tell "Contractor One" to install toilet A. What happens to the contractor? He looses money.
2. The customer may feel uncomfortable about difference in the bid spread and question the honesty of "Contractor One" and give the bid to "Contractor Two".
3. If all the customer is looking at is price, the time "Contractor Two" took to prepare the bid has a better chance of paying off, as he is the low bidder on style B & C.

Price Per

Another approach that is commonly used to prepare a bid is the "price per" method. A unit price list can be used to quickly prepare a bid. If a cost based approach is used to generate the unit price, this can be a useful approach. But, this approach also is filled

with pitfalls; there are many variables that affect cost. You must keep in mind that job conditions and material requirements may not be the same as the original assumptions used to prepare the unit price. Accounting for those differences using the price per method can be challenging.

Know ALL Your Costs to do a Job

The cost to do a job is different for every company. You need to know YOUR cost to do a job. Your crew has a unique skill set; they may be very proficient at some things, but lack talent in other areas. You've tailored your compensation package to your management style. You don't have the same equipment as your competition. You may have negotiated better pricing on some materials. No two organizations are the same, so overhead costs will be different and the volume of work that can be supported by the organization will be different. Your cost is your cost, not your competitors. Your bid should be based on your cost to do a job, not what it costs your competition.

The cost to put a man on a job is much more than his wage. Just because the tractor is paid for does not mean there is not a cost associated with it. You need to know how much it costs to keep an employee on the job and how much it costs to have a piece of equipment working on a project. In addition to employee wages, there are taxes, insurance, down time, training and benefits. Maintenance, fuel and other related costs must be added to the purchase price for a piece of machinery. An office staff, which is part of your overhead expenses, supports your crews.

Visualize your company as two parts. One part of your company produces; they complete the work you've contracted for. The other part of your company exists to support production. You have facilities, salesmen, estimators, accountants, trucks, supervisors and many business expenses that exist to keep your production team working. This is your overhead.

Below is a list of a few of the basic things that must be considered to know all your costs:

Employees

- Overhead (support) or Field Labor (production)
- Wages & Overtime
- Benefits (insurance etc.)
- Taxes
- Productive Hours

Equipment

- Overhead or Field Equipment
- Own or Lease
- Purchase Price or Lease rate
- Taxes & Insurance
- Maintenance

Overhead
- Facilities
- Utilities
- Furnishings
- Computers, printers, etc
- Advertising
- Cell Phones
- Insurance

Production Capabilities
- Production rates for each task

Materials
- Quantities
- Price
- Taxes
- Waste

Computers are wonderful tools. They provide us with a way to organize and access vast amounts of information and execute complex calculations. Commonly used materials can be stored in computer databases. Information regarding your employees and equipment can be recorded to calculate the cost for these resources. Standard production operations can be broken down into tasks; production rates can be used to allocate the needed resources to complete the task. The process we will cover for bidding & estimating is based on the approach used by Quik-Irr Estimating Software developed and offered by Irrisoft, Inc. This process can be implemented manually, but the software simplifies the process.

Getting Organized

Taking the time to get organized and establishing a standard estimating procedure will streamline the process and minimize mistakes. Your company success is built on the estimating department. They set the price for the work to be done by your company. When the work is done the amount of money that comes in is based on the decisions made by the estimator.

Before you bid your first job you need to know the core costs associated with your business. You have overhead expenses, labor costs and costs associated with equipment. You need to take time to identify all the costs associated with keeping a person working and a piece of equipment in operation. You also need to know your production capabilities, how efficient your crews are. When you put them to work how long will it take them to complete a task? To get started, let's look at the following:

- Overhead
- Production Resources
    - Labor
    - Equipment
- Production Capabilities
- Templates

Overhead

Every company has overhead; there are basic costs that every business has regardless if they do any work. Every cost that is not directly related to completing a job is an overhead expense. There are people, facilities and tools that exist to support production. Your first step is to sit down with your accountant and identify all your overhead costs, and then develop a strategy to recover your overhead expenses.

Overhead Cost

Your general ledger should break out direct job costs separate from overhead expenses. Using your accounting system, review last year's overhead expenses to prepare an overhead budget for the coming year. The budget may need to be reviewed and adjusted on a quarterly or annual basis. The cost for your staff will change. You may make changes to your facilities and it seems like someone always wants a new computer. Rarely will utility rates go down. Business expenses change based on the business plan. Overhead costs should be allocated to several major categories, such as:

- Depreciable Property
    - Facilities
    - Vehicles and Equipment allocated as overhead
    - Electronic Equipment
    - Furnishings
- Recurring Facility expenses
    - Rent
    - Utilities
- Administrative Employee costs
- Business Expenses
    - Taxes
    - Insurance
    - Promotional
    - Consultants
    - Interest

This list should be very detailed, little expenses have a way of getting forgotten, but add up. Depreciable property expenses should consider the acquisition or replacement cost divided by the number of years of expected use. In addition, the overhead budget should

include all costs associated with administrative employment costs. Labor costs will be described later on; use the same approach defined in the employee's section to identify all costs associated with an employee. Remember, the cost is more than just paid wages.

With the exemption of direct job costs, you should know how much money you need to fund your organization, this process will help determine that amount.

Here is an example of an overhead budget:

> **Note:** I want to point out that every example used in this document is hypothetical; the numbers are arbitrary and not real examples from any organization. Using any number presented in any example would be a big mistake. All examples are meant to demonstrate how to arrive at a value. You need to go through the process for your company.

Company Overhead Estimate

Depreciable Property	Cost	Useful Life (Years)	Annual Cost	% of Total
Overhead Equipment Yearly Cost			$180,500.00	25.07%
Office	$200,000.00	25	$8,000.00	1.11%
Computers and Software	$15,000.00	5	$3,000.00	0.42%
Furniture	$500.00	5	$100.00	0.01%
Copy Machines	$500.00	5	$100.00	0.01%
Blueprint Machines	$4,000.00	5	$800.00	0.11%
Digitizers	$2,000.00	5	$400.00	0.06%
Refrigerators/Microwaves	$300.00	5	$60.00	0.01%
Decorations – Plants, etc.	$50.00	5	$10.00	0.00%
		Total Depreciable Property	**$192,970.00**	**26.80%**

Facilities	Annual Cost	% of Total
Rent	$25,000.00	3.47%
Utilities - Phone, Internet, Water, Sewer, Gas, Trash, Etc.	$20,000.00	2.78%
Repairs and Service Contracts (Not on Equipment)	$5,000.00	0.69%
Yard Expenses - Maintaining Office and Facilities	$1,000.00	0.14%
Total Facilities	**$51,000.00**	**7.08%**

Labor and Tools	Annual Cost	% of Total
Overhead Labor Yearly Cost	$310,000.00	43.06%
Small Tools and Supplies	$2,000.00	0.28%
Telephones/Radios/Beepers/Pagers for Staff	$8,000.00	1.11%
Training and Education	$5,000.00	0.69%
Uniforms and Safety Equipment	$1,000.00	0.14%
Total Labor and Tools	**$326,000.00**	**45.28%**

Business Expenses	Annual Cost	% of Total
Property taxes	$5,000.00	0.69%
Income taxes	$20,000.00	2.78%
Asset taxes – (Other than Field Equipment)	$10,000.00	1.39%
Property Insurance	$5,000.00	0.69%
Licenses	$10,000.00	1.39%
CPA or bookkeeper	$15,000.00	2.08%
Tax preparation	$10,000.00	1.39%
Legal Fees	$10,000.00	1.39%
Interest and Bank Charges	$5,000.00	0.69%
Office Supplies	$5,000.00	0.69%
Travel and Entertainment	$15,000.00	2.08%
Advertising	$10,000.00	1.39%
Bad Debts	$25,000.00	3.47%
Dues and Subscriptions	$3,000.00	0.42%
Donations	$2,000.00	0.28%
Total Business Expenses	**$150,000.00**	**20.83%**

Total Overhead Expenses	**$719,970.00**	**100.00%**
Total Field Labor Overhead Recovery Hours	**30,000**	
Overhead Per Labor Hour	**$24.00**	

Overhead Recovery

A portion of your overhead costs should be included with every bid. There are several approaches used to determine how much overhead should be included in a bid. A frequently used approach is a percentage of material and installation cost. This method has an inherent weakness that becomes apparent from these examples. The first example uses the overhead per hour method, while the second uses a percentage. These examples demonstrate the affects of these two approaches when there are differences in material costs. Since overhead exists to support production, recovering $2,400.00 of overhead is the target. When the overhead per hour method is used the same amount of overhead is recovered. When the percentage method is used on a job with high installation costs compared to materials, the bid is too low; the estimator is not recovering enough overhead. When the materials are expensive compared with installation costs, then the bid it too high.

Overhead Method Results Comparison - Overhead Per Hour Method

Material Costs	Installation Cost	Time Hours	Overhead per Hour	Overhead	Total	15% Profit	Bid
$5,000	$5,000	100	$24	$2,400	$12,400	$1,860	$14,260
$10,000	$5,000	100	$24	$2,400	$17,400	$2,610	$20,010
$20,000	$5,000	100	$24	$2,400	$27,400	$4,110	$31,510

Overhead Method Results Comparison - Overhead Percentage Method

Material Costs	Installation Cost	Time Hours	Overhead Percent	Overhead	Total	15% Profit	Bid	
$5,000	$5,000	100	16%	**$1,600**	$11,600	$1,740	**$13,340**	**Too Low**
$10,000	$5,000	100	16%	$2,400	$17,400	$2,610	$20,010	
$20,000	$5,000	100	16%	**$4,000**	$29,000	$4,350	**$33,350**	**Too High**

When you use the overhead percentage method you will typically be more successful on bids for jobs with low material costs. You may also struggle to recover enough overhead. Your market niche is being carved out by this approach to overhead.

The key principle is; as a contractor, overhead expenses exist to support your crews. Overhead recovery should be directly related to production labor. For every hour a member of your crew works, a portion of the overhead expenses should be recovered.

The overhead per hour method is simple to estimate and implement. Once you have created the overhead budget, divide it by the total projected productive hours of all field staff. For example with an overhead budget of $720,000 and three crews of five, expected to work 30,000 hours in the year, the overhead per hour is $24.00.

$$\frac{\$720{,}000.00}{(3 \text{ crews} \times 5 \text{ people} \times 40 \text{ hours/week} \times 50) = 30{,}000 \text{ production hours}} = \$24.00$$

With an overhead per hour recovery rate and a time estimate to complete a job, overhead can be easily added to a bid.

Production Resources

A resource is defined as the labor or equipment in your company utilized to complete a job. Subcontractors are certainly a resource you may need for a job, but since they are not part of your organization, associated costs of a subcontractor are accounted for as a direct job cost.

When you put an employee on a job you are spending money. The only way to recover that money is for you to be paid for the work he or she does. The same goes for a piece of equipment. If it takes 40 hours to complete the work, how much will that cost? It is essential that you know this cost so your bid can include all the costs you will pay for that employee or to keep a piece of equipment running.

Labor

The best approach to determine the cost per hour for an employee is to base it on the costs for a year, then take the annual cost and divide it by the estimated productive hours. Start with the wage or salary, then add taxes, insurance and benefits package, next estimate the numbers of hours you expect them to work. Not all of that time will be productive. How much paid time off? With this information you can determine the cost per hour for each employee, and the total number of productive hours they can potentially work in a year.

This is a more detailed approach than a simple labor burden percentage. It is more accurate and allows you to account for all costs related to an employee. It also provides a simple means of applying efficiency (down time), paid leave and other costs such as training. Some of your key employees cost more, they are worth it, and you can make sure the benefit package is adequately covered.

Here is an example of some of the costs associated with an employee and how to calculate the cost per hour:

Employee Information		
Employee Title:		**Laborer**
Hourly or Salary?		Hourly
Field Labor or Overhead?		Field Labor
Wage and Hours Information		
Hourly Rate:		$12.00
Overtime Factor:		1.5
Regular Hours/Week:		40
Overtime Hours/Week:		15
Weeks Worked/Year:		30
Paid Time Off (Days):		4
Productivity %:		90%
Total Productive Hours		**1,445**
Employee Cost Information		
Wages:		$22,500.00
Paid Time Off:		$384.00
FICA Taxes:		$1,750.63
Social Security Taxes:		$1,418.81
Rate:	6.20%	
Limit:	$ 94,200.00	
Medicare Taxes:		$331.82
Rate:	1.45%	
FUTA Taxes:		$56.00
Rate:	0.80%	
Limit:	$ 7,000.00	
SUTA Taxes:		$68.65
Rate:	0.30%	
Limit:	$ 25,400.00	
General Liability Insurance:		$457.68
Rate:	2.00%	
Workmen's Compensation:		$343.26
Rate:	1.50%	
Medical Insurance:		$12,000.00
Dental Insurance:		$2,000.00
Life Insurance:		$5,000.00
Retirement:		
Other:		
Other:		
Yearly Employee Cost		**$46,310.84**
Employee Cost Per Hour		**$32.04**

Equipment

Here again the objective is to determine the cost per hour to use a piece of equipment. The most common approach is to estimate the life-time cost divided by the projected useful life in hours.

Equipment costs start with the acquisition cost. Some would argue for using the replacement cost instead of how much you paid the piece of equipment; this makes good

sense as it provides an allocation toward replacement. The decision is yours. In addition to the acquisition cost there may be annual ownership expenses such as insurance or registration fees. Next consider fuel consumption. Your equipment dealer can help you with a maintenance schedule and the associated costs. In the end you have estimated the total lifetime cost, which is divided by production hours to get the hourly cost for a piece of equipment.

The following example shows how this can be setup on a spread sheet:

Equipment Information	
Field or Overhead?	Field
Rent/Lease or Own?	Own
Use Miles/Hours?	Miles
	Hour
Miles Driven Per Year	10,000
Number of Years Owned	10
Total Estimated Miles	100,000
Hours Used Per Year	500
Total Estimated Hours	5,000

Base Cost	
Acquisition Cost	$40,000.00
Delivery Cost	$400.00
Other	
Other	
Total Base Cost	$40,400.00
Base Cost/Hour	**$8.08**

Annual Expenses	
Insurance	$1,000.00
Registration	$500.00
License	
Other	
Other	
Other	
Lifetime Annual Expenses	$15,000.00
Annual Expenses/Hour	**$3.00**

Fuel Costs	
Miles Per Gallon	8
Total Gallons Used	12,500
Fuel Cost Per Gallon	$3.00
Lifetime Fuel Cost	$37,500.00
Fuel Cost/Hour	**$7.50**

Maintenance				
Description	Freq. Per Miles	Unit Cost	Qty Req	Total Cost
Oil & Filters	3,000	$50.00	33.3	$1,666.67
Tires	50,000	$400.00	2.0	$800.00
Tuneup	40,000	$100.00	2.5	$250.00
Belts			0.0	$0.00
Brakes			0.0	$0.00
Clutch			0.0	$0.00
Transmission			0.0	$0.00
Blades/Teeth			0.0	$0.00
Other			0.0	$0.00
Other			0.0	$0.00
Other			0.0	$0.00
Other			0.0	$0.00
Other			0.0	$0.00
Lifetime Maintenance Cost:				$2,716.67
Maintenance Cost/Hour				**$0.54**

Summary	
Base Cost/Hour	$8.08
Recurring Expenses/Year	$3.00
Fuel Cost/Year	$7.50
Maintenance Cost/Year	$0.54
Total Cost Per Hour	**$19.12**

Performance Capabilities

There is an old expression; how do you eat an elephant? One bite at a time. How much time will it take to get a job done? Look at it "one bite at a time" Every job can be broken down into steps or operations. Your crews know how to complete those steps; they are trained professionals with the skills to do the work. But how long does it take? Obviously conditions and job requirements will vary but in most cases you, as an estimator, should be able to utilize past performance as a guide to estimate the time it takes to complete a task.

Since there are similarities from job to job, as an estimator, you need production rate tables for common tasks. You can refer to those tables as you prepare an estimate. Remember, the objective is to know how much time a given task will take and which resource you will need to complete the task. Because we have already determined the cost per hour for labor and equipment resources, determining the cost to complete the job is just around the corner.

Each operation can be broken down into steps or tasks. Let's look at how to set up an example Operation; bury a pipeline. Using our example, the required tasks might be to dig a trench, lay the pipe then fill in the trench. Think about the resources needed to complete each task. Depending on the size of the trench, it could be a man with a shovel, a trencher with an operator or a track hoe with a highly skilled operator. What resources are needed to lay the pipe? What will it take to fill in the trench?

A Performance Capability table is broken down first by Operations and then into tasks to complete the Operation. Each task has a productivity rate and associated resources; labor and perhaps equipment. Here is an example of an Operations Performance Capability table:

Operation	Tasks	Resource	Production Rate	Cost per Hour
Install Burried Pipe				
	Dig Trench		100 feet / Hour	
		Backhoe		$ 45.00
		Equipment Operator		$ 40.00
	Lay Pipe		200 feet / Hour	
		Pipe Fitter		$ 35.00
	Fill in Trench		500 feet / Hour	
		Backhoe		$ 45.00
		Equipment Operator		$ 40.00
		Laborer		$ 30.00

Job site conditions may affect production efficiency. A degree of difficulty factor to change productivity rates can be used to improve the accuracy of the time estimate and account for the risk.

You can see below how this information can be used on a specific job by adding a quantity to determine the installation cost:

Operation	Tasks	Resource	Production Rate	Cost per Hour	Quantity	Cost
Install Burried Pipe					1000 Feet	
	Dig Trench		100 feet / Hour		10 Hours	
		Backhoe		$ 45.00		$ 450.00
		Equipment Operator		$ 40.00		$ 400.00
	Lay Pipe		200 feet / Hour		5 Hours	
		Pipe Fitter		$ 35.00		$ 175.00
	Fill in Trench		500 feet / Hour		2 Hours	
		Backhoe		$ 45.00		$ 90.00
		Equipment Operator		$ 40.00		$ 80.00
		Laborer		$ 30.00		$ 60.00
			Total Man Hours		19	$ 1,255.00

Before an estimator can prepare an accurate bid overhead and resource costs should be identified and Operations table should be completed based on the work your company does.

Templates

Some businesses take another step to improve estimating efficiency. In many trades there are typical assemblies that include many items. These materials can be grouped in a kit or template. Identify the items and how many are needed to complete one assembly. Organize these mini-materials list by name. Then, when preparing an estimate, that requires a typical assembly, you can use the template to quickly add the items to a materials list. This saves the time and possible mistakes. This is another process that can be automated with software.

The Cost of a Job

You now have a strategy to recover your overhead expenses and to know production resource costs. You know the performance capabilities of your crews in terms of production rates and resource allocations. You are now ready to prepare a job estimate. There are five key steps:

1. Understand the Scope of Work
2. Bid Form
3. Quantify Materials and Work
4. Estimate Costs
5. Finish the Bid

Understand the Scope of Work

An estimator needs to be more than a number cruncher. An estimator must start with a clear understanding of the job. A customer has an expectation of a finished product. An estimator must have a clear vision of the finished product and the effort required to get the job done.

Processes to define the scope of work will vary from job to job. In some cases it begins with a conversation with the owner. Plans and specifications provide a much better means of defining the expectations of the finished product. In some cases construction documents may be left to interpretation of the architect or owner. A pre-bid meeting and job-site visit can clarify undocumented requirements. Don't' forget local regulations, they may govern some areas of the work.

Construction documents include plans, specifications, addendums and legal notices. These should be carefully reviewed. One sentence can cost thousands of dollars. Specifications will define either a process or state a performance criterion. If a process is defined, make sure you have the resources to execute the process. A performance-based specification allows you to creatively solve the problem. Some specifications require wage scales; these will need to be applied to the estimate. Watch closely for special requirements such as inspections, material handling, bonds, cleanup requirements, project maintenance, or warranties to name a few.

A project should fit within the capabilities of the company. Bigger isn't always better. Know the type of work you do best and are most comfortable doing. Stretching into new areas can be costly. It is good for a company to be diversified, but this should be a strategic decision, not one made on a whim because the job is a big, high profile project you want to bid. Identify and profile the type of work your company does best, and then find jobs that meet the profile.

Bid Form

When preparing a cost estimate, it is important to first review the customer's requirement for a bid break down. Once the bid items are defined, the scope of work must be divided amongst the bid items. A mistake in this area can have several affects: 1) if the customer wants to negotiate the scope of work, then the quoted prices are the basis for negotiations. Prices need to be right. 2) Quotes broken down by bid item are often used to quantify

progress billing. As a means to protect cash flow, don't put all the profit, overhead or mobilization costs into a bid item that will not be invoiced until the end of the project.

Quantify Materials and Work

Estimating is a numbers game but also requires good judgment. Your next step is to quantify the work. Most work is related to installation of materials. When doing a material take-off the objective is to identify and quantify the materials and the work required to install it. There may be work that is not associated with specific materials, but is essential for preparation or completing a job, this work should also be indentified and quantified in the take-off process.

A take-off worksheet can help organize the take-off process. The worksheet will help prepare the materials list and identify and quantify the required Operations to complete the work. The worksheet may be used to prepare the detailed material list. In some cases related materials are required to complete an assembly, for example your take-off worksheet indicates 50 electrical outlets, but in addition you need the electrical box and cover-plate. These components make up the assembly and can be included in a Template. The take-off worksheet sheet may also be used to estimate installation costs; time coupled with labor and equipment costs.

Take-off Worksheet			
Quantity	Unit of Measure	Item Description	Installation Requirements

Estimate Costs

Your estimating format should include the following direct job cost groups:

1. Materials
2. Labor & Equipment
3. General Conditions
4. Subcontracts

Materials

Once you have a complete material list, organized by assemblies and bid items, work with your material supplier to get a price for the items. In some cases it may be more efficient to maintain a material price database. In many cases prices are stable for a period of time. By keeping track of what you pay for items, you can refer to those prices when preparing the next bid.

Compare the quote expiration data with the anticipated procurement time, an allowance may need to be made to account for possible changes in price. There will also be wasted materials, the cost of waste is a job cost; include a factor for waste.

Add applicable taxes, delivery and storage costs as needed.

Even though materials are typically the largest cost category, the biggest variable is the estimated cost to install it. Unless you have a significant purchasing edge over your competitor you most likely win or loose the job based on the labor and equipment estimate.

The material list should be well organized to provide good documentation and clarity. List the primary item and associated assembly items. Management, purchasing, the foreman, and accounting will use this document.

Material List			Cost	
Quantity	Item Code	Description	Unit Cost	Total
		Hose Bibs / Garden Valves		
5	34HOSEBIB	3/4 302 ARROWHEAD HOSE BIBB	$3.76	$18.80
		Galvanized Riser Assembly		
10	34GS90	3/4 GALV STREET 90 ELL	$1.54	$15.36
5	34G90	3/4 GAL MAL 90 ELL	$0.86	$4.31
5	34X6GN	3/4X6 STD GALV NIPPLE	$1.06	$5.30
5	34X18GN	3/4X18 STD GALV NIPPLE	$3.74	$18.68
		Hose Bibs / Garden Valves - Subtotal		**$62.44**
		Wilkins Backflow		
1	2975XL	2" WILKINS RPA 975XL	$238.88	$238.88
		Above Grade Galvanized Fittings		
2	2GS90	2 GAL 90 STREET ELL	$7.32	$14.63
2	2G90	2 GAL MAL 90 ELL	$5.38	$10.75
2	2X36GN	2X36 STD GALV NIPPLE	$17.58	$35.17
2	2X4PTN	2 X 4 SCH 80 PVC TOE NIPPLE	$1.75	$3.49
		Wilkins Backflow - Subtotal		**$302.92**
		Netafim Hydrometers		
1	LHM2TG01-MEL	Hydrometer 2" FPT Manual Elec 95 GPM w/ Photo Diode	$235.00	$235.00
		Hydrometer Assembly		
2	2X6PTN	2 x 6 Toe (Mipt x Spg) PVC Nipple	$2.32	$4.64
1	1220-12-3	13X19 JUMBO VALVE BOX WITH LID	$20.06	$20.06
		Netafim Hydrometers - Subtotal		**$259.70**

Total	$625.06
6% Tax	$37.50
Total Cost	**$662.56**

Labor & Equipment

In the take-off worksheet the necessary Operations should have been identified and quantified. Refer to your company Performance Capabilities or Operations tables to estimate the time and resources (labor and equipment) needed to complete the work. The result should be a report broken down by Operations, Tasks, and the time required to execute the Task. Look up the cost of assigned resources (labor/equipment) from your resource database. Time x Cost per Hour = cost. Software can be used to automate this. Run a separate total with the estimated number of labor hours; this will be needed when you add overhead.

General Conditions

We have been focusing on estimating job costs directly related to the scope of work and specific bid items. But there are indirect costs associated with a job that should not be forgotten. The crew, equipment and materials must be mobilized on the job. There are costs associated with keeping the job site clean. Make sure you are familiar with local

codes. General Conditions costs, sometimes called job overhead, could be grouped in the following areas:

- Job Administration
- Mobilization
- Vehicles and Facilities
- Permits/Licenses/Fees
- Clean Up
- Travel
- Warranties and Repairs
- Commissions
- Miscellaneous

Your General Conditions estimate should include an itemized list of all materials, labor, equipment or other costs that may fall into these categories.

General Conditions are often not a bid item. You will need to allocate or divide General conditions costs over several or all bid items. On larger projects it may make sense to apply general condition costs to bid items which will be billed early on in the project.

Subcontracts

Some work may be outsourced or subcontracted. Sub Contracts are a direct job cost and added separately. As the prime contractor it is your responsibility to define the scope of work to be completed by a subcontractor.

Finish the Bid

A few more steps and you are done. So far you have only accounted for direct job costs. Overhead needs to be added based on your overhead recovery plan. By following this process you have an estimate of the number of labor hours. If you have used the Overhead per Hour method adding the overhead cost is easily accomplished by multiplying your overhead per hour recovery value by the total estimated labor hours to complete the job.

Profit

You now have a good estimate of how much a job will cost your company. At this point you have not made a dime; you have only covered your costs. There are many factors that affect the decision on how much profit to add. There is no magic rule; consider these four areas when making the decision:

1. **Work Load** - What is your current workload? It is not good to load up on cheep, low profit work, but on the other hand you may need to keep your crews working.

2. **Risk** - Every job carries some risk; some more than others. Your experience with a customer or designer should help you assess the potential risk. Is the work so technical it could challenge your crews? Your experience with the type of work provides a comfort level with the cost estimate.

3. **Market** - You need to keep an eye on local market conditions. If all the contractors are busy and there is a lot of work it is much easier to expect a higher profit margin.

4. **Opportunity** - Many contractors have bid a job with a low profit margin because they thought they could get more work. "Oh, this job will help me get my foot in the door." This may be true, but it may also result in you doing a lot of work for nothing. You don't need the practice, work to keep your company healthy; make a profit.

Pull all the numbers together and you have a price to propose to your customer. Sleep on it, review it, and make sure your math is right. Your attitude when preparing the estimate can affect the decisions you made when going through the process. Today may have been one of those perfect days, when nothing goes wrong; your crews can do anything. Be careful you may be overly optimistic, which could push the price too low. On the other hand if it has been a bad day, everything that could go wrong did, your pessimism could drive the price up.

One way to review a bid is by looking at the percent of total for each part of your bid. Areas with a high percentage warrant the closest look.

The final price is typically rounded up or down, you decide. Go get the job.

Construction Cost Estimate / Bid

						Percent of Total
Materials					$ 50,000.00	44%
Labor					$ 12,500.00	11%
Equipment					$ 8,000.00	7%
General Conditions					$ 3,500.00	3%
Subcontracts					$ 12,000.00	11%
Overhead	Labor Hours	500	Overhead per Hour	$ 25.00	$ 12,500.00	11%
Total Cost					$ 98,500.00	87%
Profit				15%	$ 14,775.00	13%
Total Bid					$ 113,275.00	100%

A quote is the beginning of a contractual relationship. Make sure the understanding between parties is clearly defined. The reason some lawyers do so well is because too

many contractors go into a job without clearly defined equitable expectations. Steer clear of assumptions! Make sure the bid documents clearly define the scope of work, if not add a clarifying letter.

Job Budget

Once you get the job and start spending money for materials, labor and equipment, your accountant steps in. The purchasing agent, project manager and the accounting department should use the cost estimate as a budget for the job. Accounting practices should follow the same format you use in cost estimating. Material, labor and equipment costs should be separated in your chart of accounts to the same level of detail. Time cards are a good place to allocate work to a job and its related tasks. These records can help refine the production rates. Only then will be you able compare the budget to the actual costs.

The crystal ball that will help you accurately estimate your costs must be kept clean and polished. The cost estimate becomes a budget to track purchasing and production costs. Performance records compared against the estimate will help you identify discrepancies in crew efficiency or inaccurate production rates. In either case your attention to the problem will help you become more successful.

The PIER philosophy suggests you Plan, Implement Evaluate then Revise the plan. The only way you can know how well you are doing is to compare the estimate to the actual costs. When there is a discrepancy, dig deeper. The closer you get to a problem the more obvious the solution becomes, so identify the discrepancies. This is important if you are over or under budget. The estimate may have been high and you got the job by luck. If you discover your crews are more efficient than you think, you may be losing jobs just because the estimate was higher than it needed to be.

When you see a discrepancy it is important to identify the cause. Was there a difference between the actual work and what you perceived the work entailed? Was there an issue with materials, a bad take-off, price changes, or more waste than expected? Did the estimator believe the job would be simple and failed to visualize what it would really take to get the job done? Crews can be very good about stretching a job out if they think they may not have another job to go to. Whatever the cause, determining what it is and correcting it will increase your success.

Conclusions

Your bidding process plays a very significant role in the success of your company. The goal is to be consistently competitive and profitable. By knowing all your costs, you can bid with confidence and ensure the long-term success of your company. Following this approach to bidding can be time consuming at first, but once you have done the initial

setup, bidding can still be fairly quick, and very accurate, and with software solutions, bidding this way becomes a breeze.

Computers are amazing tools, but they are only as good as the user and the software the user chooses to help do the work. Irrisoft's Quik-Irr Estimating Software can help you implement these principles. For more information contact Irrisoft at sales@irrisoft.net.