



The Essentials of SUCCESSFUL ESTIMATING



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The content in this booklet has been excerpted by permission of the American Society of Professional Estimators (ASPE) from Standard Estimating Practice, 12th Edition—the industry’s most trusted reference for professional estimators.

Presented as part of The Elements of Successful Estimating by BNi Building News, this booklet is designed to help you strengthen your estimating skills and build a foundation for more accurate, successful projects.

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SECTION I

COMPONENTS OF THE ESTIMATE

Cover Page

The cover page of the estimate should show the following information: date, address, date of plans, name of governing entity, project name, design firm name, name of owner, codes governing project, level of the estimate (i.e., conceptual, schematic, design development, construction document, guaranteed maximum price, etc.) The Estimator should date, consecutively number, and identify by project name or number each page of the estimate.

Estimate Format

Prepare cost estimates in a uniform format that is easily read and understood by other parties with a direct interest or involvement in the project. The format should contain the following components:

- CSI section
- Work breakdown structure, when used
- Description
- Quantity
- Unit measure
- Material cost
- Labor quantity in hours
- Labor cost
- Equipment cost
- Subcontract cost, when applicable
- Total cost

Material

Developing a good material unit cost requires familiarity with the material. The unit cost should consider the cost to purchase the material, potential escalation, waste, order quantity, shipping, and sales tax. The most accurate method would be to call for pricing each time a material is included in an estimate. For practical reasons and time considerations, most estimators develop a database of product costs for items that are typical to their trade. For example, a mason may keep an internal database of costs for concrete block, joint reinforcing, ties, and weeps – items that are fairly standard from one job to the next. In fact, they may have pre-negotiated unit costs for these items that the estimator can count on for a certain period, whether it be monthly, quarterly, or annually. For atypical items or special items which vary in pricing widely such as brick or cast stone, the estimator should call the material vendor for pricing for each project. In both cases, the estimator should consider escalation by thinking ahead about the timing of the purchasing and possibly plan for some price increases.

After the quantity takeoff is prepared, most materials will need to have a waste factor applied to them such as 5% (1.05), 10% (1.1) or 15% (1.15). This may be a result of cuts, broken pieces, twisted studs, etc. that cannot be used in the actual construction. The determination of the percentage of waste or waste factor is largely a matter of experience. For example, waste factors for masonry are typically in the 3-5%

range. This percentage can easily be turned into a waste factor by dividing it by 100 and adding 1.0. In this way a waste factor can be simply multiplied by the quantity takeoff to arrive at a more accurate quantity.

Another consideration which is above and beyond the waste factor is order quantity. Most bulk materials are ordered in set packages, bundles, pallets, etc. For example, standard and modular brick are packaged 500 pieces to a bundle. This would need to be considered for each type of brick on the project. Therefore, the purchaser must round up to the nearest increment. To understand this, the estimator must have some knowledge regarding how the material is packaged.

In addition to waste and order quantities, there are costs for delivery of the material to the jobsite. Material may be shipped directly to the job (possibly even internationally), picked up at a local facility and delivered or stored in a warehouse and then delivered to the jobsite. The estimator must factor in these costs as well.

Finally, sales tax must be considered. Unless the project is tax exempt (typically, a certificate will be required), then there will be sales tax applied to the final purchase. For the estimator, there are one of two ways to handle this. The first way is to add sales tax (which varies by state and local municipality) to each material unit price. The benefit of this methodology is that the estimator will have an accurate cost breakdown for each line item in the estimate. However, this can be a burdensome step; therefore, many estimators simply sum all the materials and add the sales tax at the end of the estimate. This is the quickest method but does not allow the estimator to easily break out costs later if required. All the above considerations contribute to the overall unit cost of a material.

Labor

Labor costs are extremely difficult to predict and cannot be established with the same degree of accuracy as can most other elements of the project. The estimated price for labor is developed from the quantity of material to be installed, possible productivity, labor wage rates, and burden. Material quantification is relatively easy to establish, as are the labor wage rates. Production of a worker or crew of workers is the great variable.

LABOR UNIT COSTS

In general, the labor unit cost to install an item will be quantified in the same units as the item will be purchased. But this is not always the case. For example, the unit of installation may be in lineal feet, but the material is purchased per board foot. When installing and purchasing material in different units, make sure that the price extensions are on different lines.

Code	Exterior Rough Carpentry	Quant	Unit	Labor U/P	Labor Extension	Material U/P	Material Extension	Equip U/P	Equip Extension	Bid U/P	Bid Extension	Total	
	Inst Roof Parapet Blocking 2 piece	950	lf	10.3	9785		0		0		0	9785	
	2x12, 2x10	3657	bf		0	0.51	1865.07		0		0	1865.07	

The wage rate is the amount of money paid directly to the individual for performing a certain task or terms of specific employment. There are other costs paid by the employer above the base wage rate. This is called labor burden.

Wage rates vary significantly from region to region, primarily based on whether the work is in a union jurisdiction or is in a right-to-work state. Also, wage rates may vary depending on if the project is under Davis-Bacon Prevailing Wage Rates.

Sample Prevailing Wage Rate Schedule:

Occupational Title	Basic Hourly Rates	Total Fringe Benefits
Bricklayer	\$31.86	\$20.32
Carpenter	\$36.34	\$15.75
Cement Mason	\$30.56	\$17.30
Electrician (Inside Wireman)	\$34.20	\$10.78 + 31.5%
Elevator Constructor	\$45.09	\$30.05
Glazier	\$33.13	\$19.58 + 10.53%
General Laborer	\$30.57	\$14.02
Operating Engineer Group I	\$32.16	\$24.16
Painter	\$30.80	\$13.56
Plumber	\$37.00	\$26.68
Sheet Metal Worker	\$38.52	\$21.58
Sprinkler Fitter Fire Protection	\$40.88	\$21.30
Truck Driver Teamster	\$30.41	\$10.82
Ironworker	\$32.88	\$23.825

One of the estimator's primary duties is to determine the correct wage rates and labor burden percentages for the given project. Additionally, the estimator needs to become familiar with local work agreements and any potential labor agreements that may be renegotiated soon.

Labor cost is directly related to the production rate for a given item of work. The basic question being asked is, "How long will it take to complete this item of work, and how many workers will be required?" The variables that affect these simple questions are countless. Below are addressed several of the more common variables.

DEGREE OF DIFFICULTY

The Degree of Difficulty is directly related to the worker's ability to complete the specific item or scope of work in a timely fashion. Issues to be considered include: Have the workers performed this task on other occasions, or is the task a new endeavor? Is there room for a steep learning curve for work continuing this item? Is this a one-time complex installation?

The estimator may want to increase the unit cost by a given percentage for labor and include an increased waste factor. This would help cover the uniqueness of the item to be installed. The key to this governing factor is to look for and be aware of conditions that have not been encountered before and properly address the issues.

BUILDING CODES

The estimator's job is to anticipate what the impact of the specific building codes will be on the selection of materials and the workers' means and methods of producing the work item. The estimator should be on the lookout for revisions to the applicable building codes within the region where the project is being built. It is not that the estimator is doing an exhaustive search of non-code compliant items, but during the course of the estimating process, the estimator must make the designers aware of patent or obvious errors or issues related to codes that the estimator is aware of.

SAFETY

As a condition of estimating and the nature of construction projects, safety must be first and foremost in the development of the project. The estimator builds the project from a cost perspective prior to the project being built. Safety concerns and measures are a significant component of any item within the estimate, and these concerns and costs must be presented to the subcontractors submitting proposals for any scope of work. Additionally, the estimator needs to keep safety items in mind once a vendor or subcontractor has completed their scope of work, but the safety issue is still a concern. As an example, the structural steel erector may install safety rails in and around their work as the project goes up. However, once the steel erector has completed their work, the need for safety rails around the perimeter and open floor areas still remains. The cost of maintaining the safety railing systems and the eventual removal of the system needs to be considered and the cost included in the estimate.

TRAFFIC CONTROL

In many instances, such as mass excavation, concrete pours, and large hoisting operations, various lanes of traffic and/or re-routing of traffic may need to occur. For projects located in downtown, high-density urban areas a “flagger” will be required. Flagger expenses are usually included in the general contractor's estimate. However, the responsibility of the general contractor does not extend to all areas of traffic control. A subcontractor must maintain the ultimate responsibility for all work associated with their own lane closure permits and procedures. Some of the costs include developing the lane closure plan, paying for the permit, setting safety cones and their eventual removal, renting flashing directional arrows, additional traffic directional signage, flagger, and possibly police escorts to facilitate large moves that block intersections while making complex turns.

JBSITE RESTRICTIONS

Many owners have jobsite and work-related restrictions that can have a negative effect on workers' productivity. If the project is in an existing, occupied facility, the owner may restrict work hours to those that do not conflict with the current occupant. This may mean that 2nd or 3rd shift work may be required, and a labor rate adjustment will need to be accounted for by the estimator. If work is allowed in an occupied facility, restrictions may include not being able to use normal tenant restroom facilities or access to occupied service spaces. Noise restrictions may be confined to specific hours of operation, as will demolition and removal of trash and excess material. Walk-off mats may be needed at the entry and exits within the premises, as well as periodic cleaning of adjacent areas. Elevator restrictions may also be required in high-rise buildings. If the building has a service elevator, the estimator needs to make sure that height restrictions are known. If the service elevator has a height limitation of 9'-0” and material to be transported is 10'-0” in height, significant labor may be needed to move materials. If passenger elevators are to be used, elevator cab pads will need to be used to protect the walls from damage, preserving the appearance and life of the elevator interior. Floor protection will also need to be considered.

EXPERIENCE OF SUPERVISION & MANAGEMENT

In addition to the normal technical application of project management and supervisory skills and knowledge, is the project management team willing and able to get to know and understand the specific needs and requirements of the field personnel? This willingness and understanding is a “soft skill” or “talent”. There is always a learning curve on every project between management and the field staff and workers. As the project staff and workers become better acquainted and familiar with each other's personalities and work traits, fewer conflicts arise. Most of these “talents” are developed and enhanced

as more experiential knowledge is gained. A superintendent who is running their first job versus a superintendent who is running their 100th project may have significantly different ways of accomplishing similar tasks based on experience in handling various types of personnel and issues. Is this project one with which the superintendent is generally familiar, or is this a completely new venture? Familiarity will lead to a certain level of confidence which will produce a more productive project and one with less problems. However, being able to select who the project manager or the project superintendent will be before the project is awarded is usually not the case. This is due to not knowing specifically when the project will be released and other project-related staffing needs.

WORKER PRODUCTIVITY & EFFICIENCY

Worker production and efficiency is directly related to jobsite conditions. Conditions to consider:

- Is parking near the project?
- Are areas of work easily accessible?
- Is the work area clean and free from accumulated debris?
- Is the jobsite safe from work-related hazards?
- Is the jobsite safe from potentially criminal activity?
- Are there appropriate lay-down areas for staging?
- Are off-loading areas near the site?
- Is the job organized?

TOOLS

Traditionally, small tools are owned, operated, and maintained by each individual worker, except for required power tools. Power tools are usually provided by the general contractor or the specialty subcontractor's ownership entity. The primary concerns are 1) is the proper tool available when needed, and 2) is the tool in good working order. Are replacement parts readily available at the jobsite? Having a power saw with an extremely dull blade is not only hazardous but decreases productivity. In the event the power saw breaks down, is there a replacement available at the jobsite, or does someone need to request or go somewhere to pick up a new power saw? The estimator needs to consider these issues while developing the estimate and when developing the general conditions portion of the estimate. If a major portion of work is about to begin – such as a significant structural concrete pour – having standby tools and equipment could mean the difference between completing the pour or shutting down the process to procure replacement parts or equipment.

WEATHER

Weather and weather patterns can be predicted somewhat. We know it will probably get very cold in certain regions. We also know that it will get very hot during certain times of year in various geographic regions. These conditions can be accounted for to a certain degree. During the development of the initial project master schedule, the general climatic conditions can be identified. If the master schedule calls for a concrete pour in the middle of February and the project is in Chicago, the estimator can reasonably anticipate that winter protection will be required. The same is true of placing concrete in dry, hot climates. If a concrete pour is scheduled for mid-July and the project is located in Phoenix the estimator will need to take into consideration when the pour starts, the batch plant will need to consider adding ice to the concrete mix design, and protection from the heat after the pour will need to be considered and possibly accounted for in the estimate.

An issue arises when the estimator includes an allowance for weather protection—either heat protection or winter protection. In a negotiated project, allowances may require an adjustment to the contract amount, either upward or downward, depending on the final accounting for the allowance. In some instances, the general contractor may exclude all weather protection from the project and request from the owner a change order based on only what protection is actually used. If the general contractor includes weather protection in the proposal but does not call out the allowance, the general contractor will be held to provide for all risk in allocating weather protection.

In a “hard bid” project, the general contractor will need to be able to anticipate weather conditions that may impact the project. Keep in mind that a general contractor may request additional time for weather delays that are “abnormal”, not normal weather patterns. As an example, if the project is in Missouri and the work is proceeding in the middle of June and a thunderstorm comes in and drops ¼” of rain, the general contractor will not be able to get additional time for the delay this may cause. This may be reasonably anticipated. Take the same condition, and this time, the thunderstorm drops 3” of rain. The general contractor may request additional time, but no additional funding for the delay. One can be anticipated, one cannot. The estimator needs to take these into consideration when estimating the project.

LABOR RELATIONSHIPS

High efficiency is directly related to good relationships with the employees because of competent and reasonable supervision. When a company is managed well and its field management staff treat workers with respect, organized labor tends to be more “user friendly.” In a union jurisdiction, labor problems and agreements tend to be resolved in a more equitable manner and quicker. An estimator needs to understand the complete labor agreement. When is the current labor agreement to be renewed? Is the general contractor current on paying benefits? Are the workers disgruntled about working conditions or site management issues? The estimator needs to listen to the workers when given the opportunity. Show an interest in how they do what they do. Ask them their opinion on how something is being done. Are there better ways to do something? Most of the time, the workers will be more than willing to assist, but make sure to preface your conversation with your intent – you are gathering information from the experts in the field.

CHANGES TO DESIGN

Changes are inevitable on construction projects. Modifications that occur during the Bidding Cycle are called Addendums. Modifications that occur after the signing of the contract are called change orders and may be owner directed or contractor directed. Changes may be directed because of a discontinuance of a specific material or the substitution of a material. Changes may be directed because of a concealed condition or a condition not previously anticipated. In any event, changes will occur. However, changes do have an impact on a construction crew's current productivity. Having to stop work in a certain area and possibly re-work prior work to accommodate the change will have a negative effect on productivity. A greater productivity effect will occur when a crew or worker is required to change the same item several times due to owner indecision. Being able to identify potential areas of change during the bidding process or being able to anticipate the “completeness” of the construction drawings during the bidding cycle allows the general contractor the opportunity to adjust their fee schedule or at least make the owner aware of the potential for future changes if necessary.

LABOR BURDEN

Labor burden is cost incurred by the general contractor that is not considered direct cost, but part of the total individual wages paid for workers on the project. In a union jurisdiction, some of these costs include health and welfare, pension plan, vacation, apprentice program, industry advancement fund, construction industry target fund, and union dues which are paid by the workers. The other amounts are included by the general contractor and are paid directly to the local union. The General Contractor would pay to the local union the above identified amounts, typically on a weekly or bi-weekly basis, depending on total payroll. The union dues are paid by the craftsman.

Additional items that are included in labor burden beyond the amounts indicated include the Employers Contribution of FICA (7.62% of wages), Medicare/Medicaid (1.72% of wages), Worker's Compensation (for carpenters in a given jurisdiction and based on the employer's history may account for up to \$3.75/\$100), City Earning Tax (1%) SUTA/FUTA (unemployment contribution).

The Union Jurisdiction percentage rate amounts to approximately 43.145%, in addition to FICA, Medicare/Medicaid, Worker's Compensation, and City Earning Tax. This totals approximately 58%. Remember, labor burden rates vary from trade to trade and from company to company AND are applied only to your self-performed work.

When calculating labor and labor burden rates, it is strongly encouraged that you use exact wages and burden per employee. Many general contracting estimators prefer to use the average burden method; however, this may give an inaccurate total amount.

When considering overtime work, the hourly wage and time on the job are the only increases that need to be considered. The typical overtime rate is the hourly wage rate multiplied by the overtime rate. The labor burden remains the same.

COMPOSITE CREW LABOR

Most of the work performed on construction projects is done by more than one individual and is done with a composite crew (crew-hour). One hour is the rate used to determine the cost of one worker for a period of one hour. The hour is the basis for determining the average labor rate for each member of a composite crew. *Be forewarned – it is not recommended that you use partial hours when calculating cost of production.* For example, if an item of work takes 40 minutes, use a full labor hour for determining the production rate; expect to pay the worker for the full hour of time even though they were finished in 40 minutes. The same is true of crew production. Typically, the minimum work unit will be the hour. In some jurisdictions, one may have to pay the worker or crew for a full 4-hour minimum.

COMPOSITE CREW SCHEDULE

Crew Makeup	Description
Hour	1 person working 1 hour
Day	1 person working 1 day or 8 hours
Crew Hour	1 crew (multiple workers) working 1 hour
Crew Day	1 crew (multiple workers) working 1 day or 8 hours

Equipment

Construction projects require equipment to perform the work. This equipment is utilized to build the project and does not include equipment that is permanently incorporated into the project (elevators or HVAC systems). A few examples of construction equipment are excavators, dozers, hoists, scaffolding, computers, and software. Equipment cost is broken down into three sections: Ownership, Operating, and Mobilization. Ownership cost includes the cost related to owning the equipment such as purchase price, lease, and depreciation. Operating cost is the cost that is associated with running the equipment and includes fuel, maintenance, and parts. When developing equipment costs, it is important to track actual hours worked and adjust rates as necessary. If the rate for a piece of equipment is based on 100% utilization throughout the year but the company historically averages 75% utilization, Ownership costs will never be recovered. Mobilization should not be included in the hourly rate. It is best covered in general conditions. Mobilization includes the cost of moving the equipment to the project, removing the equipment from the project when it is no longer needed, and the assembly/disassembly of the equipment.

EQUIPMENT ID AND DESCRIPTION

Well-thought-out equipment IDs and descriptions will make it easy to find, update, and insert new equipment. Descriptions should include the group of the equipment (Excavator) and the size (40K to 50K lb).

UNIT OF MEASURE

Equipment is typically tracked by the hour. Some pieces may require daily, weekly, monthly, or annual rates. Stick to hourly if possible. Adjustments can be made at the end of an estimate if a piece of equipment is estimated hourly and does not meet the minimum.

OPERATOR

The cost of the operators should not be included in the cost of the equipment. Estimators may find it helpful to identify the specific worker classification that is assigned to the equipment and include it in the equipment list. Most pieces of equipment are operated by an Operator. But there are different levels of Operator classifications. Some equipment may be operated by other trades, and some equipment requires multiple operators.

OWNERSHIP RATE AND COST

Type of Ownership

Equipment should be identified as owned or rented. Owned equipment may be purchased or leased. When organizations can keep a piece of equipment at a high rate of utilization, it is typically cheaper to own versus rent.

Time Period

To correctly calculate the rate per hour, it is important to know the period. Hourly rates are calculated from Monthly rates by dividing by 176, Weekly rates by dividing by 40, and day rates by dividing by 8.

Ownership Cost

The Ownership cost is typically provided by the accounting department. This rate should include the purchase of the equipment, financing costs, and depreciation. The rate should be developed so that the organization is able to replace older pieces with new equipment without drastic changes in equipment rates. Ownership cost is typically provided as a price per month.

Rent Cost

Rent cost is a rate provided by a rental company and is usually provided as a cost per month. Weekly and Daily rates are typically higher. The rule of thumb for rental rates is that three days are the equivalent of one week, and three weeks are the equivalent of one month.

OPERATING RATE

Fuel Type

Common Fuel Types are Diesel, Off-Road Diesel, Electric, Gasoline, and Propane.

Fuel Gal / HR

Best practice is to determine the consumption of the fuel per hour. This enables all equipment in the fleet to be easily updated due to volatile changes in fuel rates.

Lube Cost / HR

Lube Cost is the cost to provide lubricants such as grease.

Parts Cost / HR

Parts Cost is the cost of parts throughout the life of the equipment due to routine maintenance.

GEC Cost / HR

Ground Engaging Equipment (GEC) Cost is the cost for tires or tracks.

Mechanic Cost / HR

Mechanic Cost is the cost of a mechanic to perform routine maintenance.

Other Cost / HR

Other Cost is the cost to cover any additional cost not captured above. A good example of this is saw blades and teeth on a bucket or milling head.

Additional Cost

Mobilization, demobilization, and assembly of equipment should be figured on each piece of equipment. Larger pieces of equipment require special permits to move and additional equipment and mechanic time to assemble.

General Conditions/General Requirements

General Conditions/General Requirements are those costs that are required to build the project but are not labor and materials directly incorporated into the project and not considered office overhead.

Typically, these costs include all the supervision and management required to build the project, safety, clean-up, layout, temporary facilities such as offices, toilets, etc., and temporary utilities. Usually, these are costs estimated in hours, days, weeks, or months as they are directly related to the duration of the project. Sometimes, they are a percentage of the cost of the project, which is a less accurate method.

Overhead

Overhead is generally costs associated with having a home office, such as executive, administrative, accounting, and clerical staff and the cost of the home office. Each contractor has a unique method for estimating costs and determining whether they are general conditions, general requirements, overhead, or profit, so it is important to understand how the company allocates these costs. Overhead costs may also include such costs as insurance.

Profit

Profit is the amount added to the estimate or bid at the general contractor and subcontractor levels for financial gain from the use of capital. Profit may be derived by adding a percentage of the total cost or by adding a fixed, lump sum cost. This methodology should be defined in the construction contract if one exists.

Sales or Use Taxes

Sales or use tax is a legal assessment by state, county, municipal, or other governmental entity. This is usually a material tax and in some instances, an equipment tax. There are certain states that also assess this tax on the contract amount (sometimes known as a business privilege tax). The Estimator must be aware of the assessment requirements for the site of the project.

Payment and Performance Bonds

Payment and performance bonds are surety company documents that guarantee contract completion and payment for all proper claims. These costs are typically calculated using a bond table in which the bond cost is a percentage of the contract amount, and the rate is decreased as the contract amount increases. This information shall be obtained from the bonding company.

Escalation

Escalation is an increase in the costs of goods and services. Treat deflation or de-escalation conditions the same as you would escalation or inflation. Typically, escalation is added to the cost of the work as an annual percentage. For example, 4% per year. Sometimes, the escalation duration is measured from the date of the estimate to the start of construction (typically when the products and services are purchased) and sometimes, they are taken to the mid-point of the construction duration.

Contingency

There are a wide variety of contingency applications, and the following definitions are an attempt to indicate contingency items that are most appropriate. Estimates may be used and reviewed by a wide audience, including Owners, developers, accountants, and lenders. Each of these entities needs to understand and include contingencies for that part of the project for which they are responsible. As estimates are refined and more finite information becomes available, the contingency should be reduced to reflect the completeness of the documents.

Each contingency is established and defined for a specific use and purpose, and each is controlled by a different entity. If an overall Project Contingency is used instead of specific contingency items, funds will have to be reallocated from the overall contingency. Getting funds reallocated can be a divisive, acrimonious, and contentious battle amongst the team.

Contractor Contingency traditionally is only included in construction management and/or design-build projects. In the lump sum hard bid market, it would not be included. The construction manager and/or design-build team are providing a service to fill any holes in the construction documents, providing a complete project and working as a good steward of the Owners' monies. With the lump sum bid, the contractor is pricing only what is shown and/or detailed on bid documents.

ESTIMATING CONTINGENCY

The Estimating and Contracting Contingency is used for estimating accuracy based on quantities assumed or measured, unanticipated market conditions, scheduling delays and acceleration issues, lack of bidding competition, subcontractor defaults, and interfacing omissions between various work categories. This contingency may be reduced as bids, subcontracts, and bonds are received. This contingency should be for the use of the Estimator and should not be modified or reduced except by the Estimator's and project manager's concurrence, not by the Owner or others.

DESIGN CONTINGENCY

The Design Contingency is used for increased scope due to additional space, added quantities of materials, enhanced quality of materials, code revisions, owner-requested items, and additional equipment and capacity. This contingency is for items during the design process and should be reduced to 0% at the construction documents stage. For example, the design contingency may be 10% at the Schematic Design Phase, reduced to 5% at the Design Development Phase, and zero at the conclusion of the Construction Documents.

OWNER'S CONSTRUCTION CONTINGENCY (CHANGE ORDER CONTINGENCY)

The Owner's Construction Contingency is used for Architect and Engineer constructability issues, code interpretations, scheduling delays, acceleration issues, hidden and unforeseen underground conditions, and Owner-requested items. This contingency is used for the construction phase of the project. Typically, this may range from 3-5% depending upon the complexity of the project and may be required by the lender. The percentage is applied to the cost of construction.

OWNER'S PROJECT CONTINGENCY

The Owner's Project Contingency is used for amounts required for additional scope and other items in the total budget. This contingency is for items beyond construction-related work, such as fixtures, furnishings, equipment, moving and relocation allowances for tenants, or other non-construction-related items. This type of contingency is applied to the total project cost.

CONSTRUCTION CONTINGENCY

The Contractors' Construction Contingency is for the contractor to use for items omitted during the estimating or bidding process, change in materials after specifications are finalized by the design team, schedule recovery costs caused by weather, the loss of a material supplier or a subcontractor before execution of a written contract. This contingency is not to be used by the Owner to fund design change orders. Any of the contractor's contingency remaining at completion of the project may return to the Owner by change order depending upon the type of project and whether the contingency was spelled out in the project documents. Typically, it is up to the contractor to determine the amount of contingency required based upon the complexity of the project.

ASPE ESTIMATE CONTINGENCY FOR PRECONSTRUCTION RECOMMENDATIONS BASED ON LEVEL OF DESIGN DOCUMENTS INFORMATION			
Estimate Type	Design Documents Completion Percentage	Description of Design Information Documents	Estimate Contingency Ranges
CONCEPTUAL ESTIMATE	0% to 34% Complete	Estimate Based on Early Conceptual Design Drawings and or Narrative Documents.	Design 10% to 20%
			Construction 10% to 20%
(SD) SCHEMATIC DESIGN ESTIMATE	35% to 64% Complete	Estimate Based on Schematic Design Drawings and Specifications Developed Documents	Design 5% to 10%
			Construction 5% to 10%
(DD) DESIGN DEVELOPMENT ESTIMATE	65% to 94% Complete	Estimate Based on Design Development Drawings and Specifications Developed Documents.	Design 2.5% to 5%
			Construction 2.5% to 5%
(CD) CONSTRUCTION DRAWINGS ESTIMATE	95% to 100% Complete	Estimate Based on Construction Drawings and Specifications Developed Documents.	Design 0%
			Construction 2.5% to 5%

Note: This chart is a reliable example of how contingency may be used on estimates. You will need to review and adjust according to your project's scope of work requirements.

This chart does not include owner project contingency or FF&E costs that should be added if needed in addition to the design and construction contingency shown on this chart.

This chart does not include escalation, which varies from year to year based upon market forces.

Allowances

Allowances, either issued by the design team or the contractor, are to incorporate a price for an undefined scope or quantity of material in the project cost for items, conditions, or services that are not yet defined or yet to be designed. Allowances are also used on projects to deal with undetermined quantities to create a level playing field for all bidders. Allowances can be either unit price or lump sum. Allowances should also be descriptive and note whether the allowance is for material, labor, or both so there is no misunderstanding.

Example unit price – The finish schedule was not created, but the design team has determined that carpet will be installed in selected rooms. An allowance for the cost of the carpet material is to establish a standard for the cost of the carpet. 100 sy @ \$35/sy (allowance) = \$3,500.

Example lump sum – The documents show a fountain located at the entrance of an office park, but the final design is not complete. 1 fountain @ \$50,000 = \$50,000.

With each type of allowance, its value will be adjusted either up or down after the scope is defined by a change order to the contract. How the changes in cost related to General Conditions/General Requirements and fee as the allowances are adjusted is defined in either the project specifications or contract for the project.

Depending on the terms of the contract, any remaining unused contingency may flow to the Owner, but they could also flow to the general contractor as well. The contract should stipulate who the beneficiary of unused contingency funds is.

Additional Items That Impact the Estimate

Some of these items are consistent from one estimate or bid to another, but most are unique to specific projects. The Estimator must rate the indirect impact items to determine the impact on a specific estimate or bid. The Estimator should create a checklist of these and other items for each project with justification for inclusion or exclusion in the estimate or bid. Examples of indirect impact items needing attention:

- Dates of all union contract renewals that will occur during the project. Contract negotiations may result in work slowdowns or strikes. Even when the company is signatory to a union contract, slowdowns and strikes of various trades affect the entire project. The Estimator should research any labor contract changes that may occur during construction and adjust the estimate or bid accordingly.
- Seasonal weather conditions typical for the locale of the project. Rely on historical data in adjusting this item.
- Present and forecast economic conditions for the construction industry in the region of the project. This is by far the broadest item of consideration since its effects are extreme and in opposing directions. The law of supply and demand causes upward and downward variations in the costs of materials and the availability of labor.
- The volume of construction projects planned and in progress is another consideration. When the volume is small, profit margins decrease due to increased competition for the work, but an available workforce is ensured. When the volume increases, profit margins increase, but the availability of a qualified workforce diminishes.
- Possible delays in progress payments due to deliberate or accidental cash flow problems.
- Proposed federal, state, or local wage determinations that may become effective during construction.
- Seasonal variations in the available workforce and legal holidays that hinder or delay the progress of the project.
- Other construction projects in progress starting during construction that are in the immediate vicinity. Determine whether these projects will interfere with accessibility to the project by the workforce and the delivery of materials and equipment.

SECTION II

BID DAY PROCEDURES

The success of a general contractor's business in a competitive bidding situation lies in the completeness of the estimate on bid day. This involves opportunities and a good degree of risk management for the general contractor. The purpose here is to present a procedure developed over a period of years. It is an efficient and effective method for assuring a complete estimate at bid opening. The procedure relies on oral and written communication among the estimating team members. These people are the players who determine the outcome of the bid day success.

Today's construction estimating procedures evolved from a rich history of experience in competitive bidding. Estimators must be well organized on bid day to ensure a complete estimate with reduced stress and emotional behavior. Each firm is unique in its techniques of operation. However, the basic mechanics of bid preparation are similar among contractors, with some slight variation.

An estimating procedure well-developed over a period of years can be an efficient and effective method for ensuring a complete estimate at bid opening. It involves the workings of bid preparation and the techniques of operation.

All the members of the estimating team should know the ins and outs of bid preparation. Each person has a specific function on bid day. Every participant must be aware of the whole picture for the group to perform effectively as an estimating team.

An experienced estimating team that takes the time to properly prepare and "Know the Job" has a distinct advantage over other firms that do not take the time to prepare.

Organizing the Bid Team

Determine the job functions of each team member. The estimating team may consist of the following:

- Receptionist directing the incoming calls to the estimating team.
- Staff to print emailed bids.
- Lead Estimator analyzing the quotations and entering the proper information on the estimating spreadsheet.
- Estimator(s) to be available to the Lead Estimator for questions, quantity takeoffs, and clarification calls to subcontractors and suppliers. The Estimator may also be the Lead Estimator.
- Computer operator, another estimator, or Lead Estimator entering information into a computerized estimating spreadsheet as directed by the Lead Estimator. The computer operator may be either a bid taker or takers, as well as the Lead Estimator. One person is assigned the sole task of keeping the estimate current and, depending on the complexity of the project and closing procedures, should be a single individual and is oftentimes the Lead Estimator.
- In a hard bid closing (one that has a specific place and time that the bid occurs), a bid runner may also be utilized. The bid runner is the one assigned to take the pre-filled specified signed bid documents to the bid opening. The runner also calls the office to receive and transcribe onto the bid form the final bid amount and any other data. The runner also reports information back to the Lead Estimator.
- Top management interfacing directly with the Lead Estimator to decide the project fee.

Combine or expand the various job functions of the estimating team members described above as necessary. For smaller or simpler estimates, the Estimator may do some or all of the Lead Estimator's function. For large or more complex estimates, expand the estimating team in bid-taking and bid

analysis. For example, separate bid takers with discipline- specific knowledge may handle specific divisions or a group of divisions, such as Divisions 05 (Metals), 09 (Finishes), 22 (Plumbing), 23 (Heating, Ventilating and Air Conditioning), 26 (Electrical), 27 (Communications), 28 (Electronic Safety and Security), 31–35 (Site and Infrastructure Subgroup), and 48 (Electrical Power Generation). The bid takers can perform a comprehensive analysis or comparison.

This analysis is often done with the Scope of Work or Bid Package defined as the basis for review. It is common to have the Scope of Work or Bid Package fully estimated prior to bid day by the general contractor.

The person assigned to a CSI Division section may take off quantities and price it out, or this could be the product of the Estimating Department. Therefore, the scope of work or bid package author is not important. What is important is that the analysis represents a complete accounting of the scope. This pricing out of the job is done so that if one receives quotes from several subtrades and they each exclude work, then to accurately compare the work, one needs to balance that which is missing in each quote. Failure to do this properly can create “holes” in the bid, which is a scope of work that is not priced and can lead to the general contractor covering the “holes” with fees. The resulting low subcontractor or material supplier bid is then given to the Lead Estimator for final review. However, in a complex and time-sensitive closing, this may not be possible and underscores the importance of the entire team being prepared and knowing their roles.

The job functions may vary, but there must be an adequate number of team members to prevent chaotic conditions. This is usually the decision of the Lead Estimator, who is the estimating team captain.

The Bid Room

Make sure the physical setup meets the needs of the team. Items to consider include:

- Office layout sized for the estimating team to function effectively. The location of the bid takers, Estimators, and Lead Estimator is important. Other considerations are locations of the telephones, calculators, computers, projection screen, etc.
- A central place to assemble the estimate. This is for completing the estimating spreadsheet. It is also the location of the bid box for receiving the emailed and printed quotations.
- The telephone system, computer, and email are essential ingredients because the receipt of many quotations from subcontractors is by phone, email, or website. There may be other business activities during the day also to consider.
- Bid day should consist of a dedicated room, called the Bid Room. This is the room in which the estimating team interacts throughout bid day. The bid room must be quiet so a person can think clearly without distraction.
- The Lead Estimator analyzes each quotation taken from the bid box. Set up a coordination station for organizing the quotations into the Construction Specification Institute Divisions. Subdivide these divisions into sections of work. For instance, Division 9 consists of various finish trades – plaster, drywall, carpet, painting, etc. Segregating these trade groups will aid the Lead Estimator in comparing the telephone quotation forms and printed quotations within each trade group. This coordination station may consist of a file folder labeled for each trade. This will help the Lead Estimator quickly find and file the information throughout bid day.

Preparing Scope Checklists/Bid Tabulation Forms

The third step in setting up successful procedures is the use of specialized prepared scope checklists or bid tabulation forms. Every construction company should have its own unique format. The basic information of firm name, telephone number (or cell number), email address, and date are on the forms. Also listed are the work description, inclusions, exclusions, and bid amount. The completeness of the telephone quotation depends on the form and how effective the bid takers are at filling in the form.

There should be a checklist of clarification items on the telephone quotations to give the Lead Estimator a better understanding of the analysis. This checklist also serves as a communication tool to the individual writing the subcontract as well as the people constructing the project. The Estimator or Lead Estimator usually develops the checklist. However, the Lead Estimator may assign the task to the individual assigned to a specific CSI section.

During the bidding process, Estimators must analyze every bid used on the spreadsheet. The bid must pass two tests:

1. Is the bid per plans and specifications without unauthorized substitutions?
2. Is the bid covering their section complete?

It is necessary to note that some bidders will answer yes to questions. An excellent procedure to follow is to request from your subtrade pool their “Scope Letters.” A scope letter sets the “How” and “What” they are proposing to the general contractor even before a price is submitted.

Request Scope Letters from Trade Contractors

The purpose of a scope letter is to inform the contractor of the intent of the bid. This allows the general contractor to be sure of subcontractor bid completeness, and the subcontractor has a form with which to educate the general contractor. A good scope letter will include four categories:

1. Items normally covered by this trade
2. Items specifically covered in this bid
3. Items normally excluded by this trade
4. Items specifically excluded in this bid

A section-complete bid will have no exclusions but might have some clarifications such as “no taxes included.”

Questions for Bidders

With the information from the scope letters, the general contractor should produce a set of questions. Have the subcontractors answer the questions when they email or phone in their bids. Sort the questions by CSI number for easy access. They should contain a mini scope of work and acceptable exclusions for any section that needs proof. Include questions developed by subcontractors not answered by addenda. Structure the questions for a “yes” or “no” answer, thus avoiding ambiguous answers.

Read the questions to the bidder and rewrite them on the scope checklist/bid tabulation sheet in short form with a “yes” or “no” answer. When there are many questions, make copies of the question sheets and attach the sheet with the marked answers to the quote or checklist. This procedure will provide the Lead Estimator with the information necessary for a quick and accurate analysis. Email is an excellent tool for talking to subcontractors even as late as bid day. Use the same question bid tabulation sheet/checklist and have the subcontractor email it back, marked appropriately. Through the questioning process, the Estimator receives the information needed to rate the bids of a given trade. The answers may even prompt further questions. These questions should avoid double coverage or lack of coverage. Also, the process will prompt subcontractors to note inclusions, exclusions, and clarifications in their bids to other general contractors. This process will cause the other contractors to improve their cost estimates. This removes any unfair advantage they may have due to ignorance.

Bid Preparation Techniques

Once the estimating team learns the mechanics of bid preparation, the group can start to perform effectively. The next step is to learn the techniques of operation to assure a complete estimate at bid opening. There are essential techniques of operation that the estimating team must be aware of and focus on to assure a complete estimate at bid opening.

Create a spreadsheet in the form of a scope checklist/bid tabulation form of all cost items of the bid. Below is a step-by-step approach:

- Read each specification section. List any items that are subject to exclusion by subcontractors bidding on that section. List these items as separate line items on the spreadsheet. Also prepare a “plug” number in case there is no bid for that item on bid day. Prepare a detailed scope checklist for each trade and specification section. List the acceptable exclusions (these extra line items will be scratched at bid time if they are covered on another line). For items not listed in the specification book, write a list of items not mentioned in that specification section required for a complete job. Question the subcontractors at bid time about these items.
- Add items not mentioned in the specification section to the spreadsheet. During the estimating process of company performed work, make notes of special items for this project. Check the specifications for a listing of these special items.
- Add items to the spreadsheet found in the drawings and not found in the specifications. Next, examine the vague areas. Find items on the plans that are either not noted with size or nomenclature or are not in the specifications. However, experience may show these items are necessary to complete the structure. Question the design professional in writing and request an answer by addendum.
- Add items to the spreadsheet that are not on the drawings or found in the specifications necessary for a complete job. Advise the design professional with written questions or the Estimator’s

interpretation of the plans and specifications. Also, state this is the basis of the bid if they choose not to answer in an addendum.

- Add items to the spreadsheet needed for compliance to code. Mention of these codes may be on the plans or in the specifications. There may be a requirement to build a complete functioning project “to code.” The design professional may not identify all code requirements. They will not allow an extra and require the contractor to furnish everything to satisfy the codes. This is usually at no increase in contract amount. Again, write questions for the subcontractors and ask the design professional for clarifications of undefined terms.
- Some companies also request subcontractors and vendors to upload their proposals into a bid solicitation portal. Furthermore, some programs also allow for bid tabulation forms to be included and filled out by the subcontractor and vendors as an aid for bid leveling. If this tool is utilized, it requires that the estimator (s) prepare these leveling sheets/bid tabs in advance so that the bidders can properly fill them out.

ADDITIONAL BID DAY PREPARATION

- Use professionals in each discipline. Have them analyze the sections to determine if the specified materials will operate as a complete system.
- Check items missed on previous jobs. Have the project reviewed by other experienced personnel.
- Review the drawings and implications of all notes on the plans.
- Complete an analysis of the construction schedule, takeoff, and pricing of work by contractor’s own forces. Analyze differences in subcontractor scope of work/quotation sheets received in the mail before bid day, and pricing of general condition items.
- Prepare all bid documents, including the signatures and other required information. For large submissions requiring a copious amount of paperwork, prepare a checklist of all submission requirements with assigned responsibilities for each at least one week or more before bid day. At least one day prior to bid day, prepare a “mock” bid submission for review by the Lead Estimator to ensure all bid submission documents are accounted for. To the extent possible, have all information completed except for the final bid price and alternates to help alleviate bid day stress.
- Develop a bid day strategy of the estimating team, their functions, and communication of any important information. The Estimator should prepare a brief written set of instructions for bid takers, which includes:
 - a) the number of addenda and the subcontractors affected by each addendum
 - b) the unit price or alternate bid information required from each subcontractor
 - c) a list of questions for the material suppliers and subcontractors at bid time

The Estimator usually has the responsibility of preparing the above documentation. However, other company departments may share these tasks. For instance, the prospective project manager and superintendent may provide input in the analysis. The legal and/or accounting department may review the contract documents for bonding, insurance, and liability requirements. These departments must evaluate the risk factors prior to bid day.

BID DAY COMMUNICATION

Communicate effectively early in the bid day process. Some of the key items for maximizing efficiency include developing a system for:

- Continuing the bid process during mealtime. Discuss the meal orders and mealtimes early in the day.
- Each estimating team player to be available on bid day to concentrate only on the estimating process. It is essential to prioritize one's time on bid day in order to become an effective team player.
- Handling visitors or questions from subcontractors and material suppliers during the bid day process. The flow of communication starts with the call screening process and controlling the disruptions of other business calls. Get the telephone number of the caller because there may not be another opportunity to get the quotation if the caller hangs up. Handle interruptions on bid day in such a way that the estimating process is not jeopardized.

EFFECTIVE TEAMS

Develop organizational cohesiveness within the estimating team. Some of the guidelines include:

- Working together as professionals
- Communicating openly without unnecessary conversation
- Writing legibly and communicating clearly

Know who your other team members are and anticipate if they require assistance with their assigned work sections. A positive approach in developing estimating team cohesiveness is for each member to be supportive of each other for the success of the bid. The discipline of the estimating team should be responsive to the needs of the Lead Estimator. Written or oral information must be concise and understandable.

Unnecessary conversation in the bid room can cause a loss of concentration, jeopardizing the potential success of the entire bid day operation. Working together is being considerate of each other.

The implementation of these operating techniques will help determine the outcome of a complete bid package. However, there are factors that put these techniques of operation to the test. The Estimator has the important task of preparing the estimate before bid day. There may already be an estimating team set up and working on the estimate before bid day. In any event, assemble, review, and have the pre-bid day information ready when bid day arrives. Otherwise, there will be more stress on the estimating team.

Bid day is a compressed period in which all the various parts of the estimate come together. The compilation of the estimate becomes a race against time. The fewer the number of members on the estimating team, the more difficult it becomes to complete the bid without holes or overlaps. The intensity on bid day is the reason for having enough help on that day. Bid day can be a stressful time when there are many callers and few bid takers. It puts a burden on the Estimator and the Lead Estimator when callers wait until the closing hours of bid day. One suggestion is to have the bid takers start calling the prospective subcontractors early on bid day. During the bidding process, Estimators must analyze every bid on the spreadsheet to determine the lowest responsive bid.

The communication techniques used during the bid process become essential during the final hours of the bid closeout. Good organizational behavior is key to good decision-making. The Lead Estimator depends on the full cooperation of the other estimating team members, especially during the last closing

hour. This involves an organizational cohesiveness within the team built on trust, loyalty, and intestinal fortitude. Otherwise, there is more stress on the estimating team.

The attitude of each team member can reduce or increase stress. Members should be supportive of each other as a group. Listen and take directions from the team captain. Stress will be there on bid day.

Recognize the cause of the stress and deal with it effectively before it stifles the estimating process.

After the bidding is over, the estimating team can decompress and discuss the estimate. This post-bid period is a good time to re-evaluate the estimate. Confirm the bid analysis, reorganize the quotations, clarify areas of concern, and prepare for the bid results.

There is one last decision that the estimating team makes on bid day. Who will give out the subcontractor bid results? The decision must be consistent with company policy. It is usual to hold all information in confidence until the company receives the final bid results from the general contractors quoting the job. Sometimes this is at the bid opening; other times it is when the final decision makers can review and note the winner.

The estimating team determines the success of an estimate. A successful estimate is one that is complete. This does not mean that the estimate is the low bid. The success of a general contractor's business in a competitive bidding situation lies in the completeness of the estimate on bid day. The careful implementation of bid day procedures is essential to ensure a complete estimate at bid opening.

Bid Submittal by Hand Delivery, Email, or Website

The adherence to a uniform code of practice when submitting and receiving bid proposals, transmitted by hand, email, or website is required to promote proper communication among the parties involved in Bid Day.

- **Hand Delivery** – When delivering bids by hand, designate both a driver and a scribe, especially when delivering to an area with limited parking, such as an urban area. Often, the final bid number will not be completed before the driver leaves the office. The driver and scribe should be advised on all items that require filling out, preferably with removable flags on each page. Be sure to have multiple phones charged up. Leave twice as much time to drive as typically required and avoid roadways that are typically congested, instead seeking more reliable, alternative routes. Leave enough time to get into the building and through security checkpoints, if applicable. The delivery person may also need identification if it is a secure building. Upon arrival at the building, find out how long it will take to get to the bid delivery location and check the clock at that location since that will be the clock that matters. The driver should alert the office upon arrival of the situation. Always bring extra blank copies of the bid form and additional writing utensils. Be cautious to ensure privacy when translating bid figures. Always read back the figures on the bid form to ensure accuracy. Upon delivering the bid, a time stamp receipt should be requested to prove the bid was successfully delivered on time. If bids will be read aloud, the bid delivery person shall remain and take notes of the bid results. In some cases, it is also advisable to ask to inspect the winning bid for any irregularities that might be cause for disqualification. Refer to Part Three - Advanced Topics in Estimating, Section 4 – Legal Considerations in Construction for a variety of sample letters regarding protests and other bid remedies.
- **Email Delivery** – Assign a team member to be responsible for sending the email transmission in advance. Read the Bid Instructions for email addresses of all bid recipients, as there may be more

than one. Leave extra time prior to the bid due time (perhaps 10-15 minutes) to ensure the bid goes through in time. Be cautious of large file submissions. It is recommended to find out in advance the file size that can be accepted and break the bid down into smaller pieces (multiple emails), if required. Always check for completeness one last time before hitting the send button. Request a “read receipt” and follow up with a phone call if needed to ensure receipt of bid.

- **Website Delivery** – Assign a team member to be responsible for uploading the website submission in advance. Review and upload as much information in advance as the website permits. Be sure to look at the clock in the website portal to ensure it is in the time zone expected. Leave extra time prior to the bid due time (perhaps 15 minutes) to ensure the bid is uploaded in time. Be cautious of large file submissions. It is recommended to find out in advance the file size that can be accepted so that it is not rejected by the website. Always check for completeness one last time before hitting the submit button. Typically, a computer-generated “receipt” will follow from the website; if not, follow up with a phone call to ensure receipt of bid.

Prime Contractor Responsibilities

- Maintain the computer in good working condition with proper supplies.
- Monitor all incoming emails; promptly deliver/forward proposals to the individuals responsible.
- Keep all proposals confidential.
- Notify sub-bidder if the transmission is incomplete or not legible.
- Request all transmissions be completed at least three hours prior to the time prime bids are due.

Subcontractor or Vendor Bidder Responsibilities

- Use standard transmittal forms and completed bid forms, including alternates showing required bid information.
- Email scope and terms a minimum of 24 hours prior to bid deadline.
- Transmit only modifications to scope and/or price on bid day (do not retransmit the entire proposal).
- Verify receipt of transmissions.
- Send an email confirmation of all verbally transmitted bids.
- Refrain from transmitting scope and/or price modifications during the last three hours prior to bid time (or as requested by the General Contractor or Construction Manager). Make all late modifications by verbal communication.

- Some general contractors and construction managers are requesting that subcontractor and vendor bids be submitted electronically via a website portal. Be sure to look at the clock in the website portal to ensure it is in the time zone expected. Leave extra time prior to the bid due time (perhaps 15 minutes) to ensure the bid is uploaded in time. Be cautious of large file submissions. It is recommended to find out in advance the file size that can be accepted so that it is not rejected by the website. Always check for completeness one last time before hitting the submit button. Typically, a computer-generated “receipt” will follow from the website; if not, follow up with a phone call to ensure receipt of bid.
- Ensure that transmitted bids:
 - a) Show the bidder’s name, address, phone number, etc.
 - b) Show project name, bid date, and bid time.
 - c) List technical specification sections and addenda included.
 - d) Clearly list exclusions and/or exceptions of the bid.
 - e) State alternate bids as adds or deducts from the base bid and number them consistently with the bid documents.
 - f) Note terms of proposal (F.O.B. jobsite, furnished and installed, installation labor only, etc.).
 - g) Note if bid includes or excludes sales or use taxes.
 - h) Note if bid includes or excludes performance and payment bond premiums.
 - i) List any unique contractor status (MBE, SBE, WBE, Contractors License number(s) and bond rate).

The proper use of email can improve the accuracy and efficiency of bid day communications.

SECTION III

PRESENTATION OF THE BID/ESTIMATE

Guidelines

The form of the estimate presentation can be defined to the use of specific bid forms that are issued as part of the bid documents, especially when involved in a formal governmental entity requesting proposals. However, at other times, less formal means may be employed. The Estimator may be responsible for providing a document that reflects upon “Clarifications & Assumptions”. This approach is often unique and in the form of a general contractor's brand. This format is often in the format of a business letter, with a narrative of the level and scope of the estimate/bid. The definition of the level of the estimate shall be according to Part One, Section Two of *Standard Estimating Practice*, often referred to as the Construction Specifications Institute (CSI) MasterFormat®. Development of the architectural and engineering sections of work may be at various levels. Individually identify the varying levels of these sections in a status evaluation. The evaluation defines the approximate percentages of data available to determine the range of specific or overall contingency for the estimate. The narrative also should include:

- Date of receipt of plans and specifications
- Date and time estimate is due
- Project address, legal description
- Project description
- Architect/Engineer's name and address
- Owner's name and address
- Brief description of the project type
- Any addenda issued
- Project quality, size, labor type
- List of assumptions used

Include this information to better define the project and help in the development of historical records of estimated and bid cost systems.

Example Construction Document Narrative

The following is an example for clarifying an estimate submittal; it is imperative that the estimator coordinate this response within the firm's own policies:

- This estimate is at _____ Level according to *Standard Estimating Practice* of the American Society of Professional Estimators. See *Levels of the Estimate* and *Scope of the Estimate* for additional information.
- Per your request, this estimate was prepared to show reasonable expected construction costs for the above project.
- We base the estimate on information available within the construction documents. The plans are dated ____, and the specifications are dated _____. These documents represent the development of the project to date. The design professional team provided the documents.
- The Construction Specifications Institute MasterFormat® is used to organize estimate information. We will segregate the estimate information into a Work Breakdown Structure (WBS) upon prior request. This provides a special basis for estimating the construction costs.

Recommendations

The estimate is prepared from the specifications and contract drawings. Additional definition of the project requirements will affect the total estimated project costs. EXERCISE CAUTION in using these figures. Design, Owner, and regulatory requirement changes can cause costs to vary significantly from those contained in this estimate. Use this estimate to determine bid alternates, if any, in checking bids, preparing schedules, or other project control applications.

General Assumptions**COMPETITIVE BIDDING**

This project is subject to competitive bidding, with four to six prime contractors submitting bids. Bidders outside this range may cause significant differences between estimated amounts and actual bid amounts.

This estimate is based on the assumption that the prime contractor submitting the successful bid will furnish _____ with his own forces. Subcontractors will perform the balance of the work. The anticipated subcontractor overhead and profit margin percentages are included in the division/subdivision schedule.

QUANTITY SURVEY

Quantities are from direct takeoff of items, when possible, according to ASPE-recommended *Standard Estimating Practice*. The construction drawings are the basis for determining these quantities.

MATERIALS

Materials are from project area supplier price lists or established reference sources.

LABOR

The estimate includes _____ labor rates throughout. Labor rates are per the cost index schedule. Costs for full-time supervision are in the General Conditions. Federal government funding requiring the use of prevailing wage labor rates and certified payroll records do not affect this project. The wage rates for the project are from sources in the project area. We add to this fringe benefits and labor burdens at the subdivision Direct Cost level for payroll taxes and insurance. We also include estimated craft labor settlements in the labor rates for the overall base wage period. The labor used within the estimate is our opinion of what it will take to perform the work as shown and described. The size and type of project, as it relates to our experience, provide the basis for this estimate.

WE SPECIFICALLY EXCLUDE:

- Permits, fees, and taxes

WE SPECIFICALLY INCLUDE:

- Applicable costs, if any, for sewer connection and user fees
- Applicable state and city sales or use taxes
- Testing costs

CONTRACTOR OVERHEAD AND PROFIT

General Conditions costs are a Direct Cost item as opposed to an overhead cost. For the prime contractor, overhead and profit are in the final account summary report. Subcontractor overhead and profit costs are included in each respective section of work for which they are quoting.

ESCALATION AND CONTINGENCY

Escalation, or cost growth, and estimating contingency are included in the final account summary report. Escalation is calculated at an annual rate of ____%. Contingency is calculated at ____%.

OTHER COSTS TO THE OWNER

We exclude certain other costs to the Owner from the construction estimate. These may include acquisition costs, design fees, finance expenses, administration expenses, furniture, fixtures, and equipment.

ESTIMATE SUMMARY

Refer to the Project Total Summary Report for listing Direct Costs that include markups. Refer to the final account summary report for general contractor Direct Costs, etc.

SECTION IV

POST-BID PROCEDURES

Introduction

Immediately after a competitive bid is submitted, everyone in a general contractor's office will ask the Estimator one of the following questions: "How did it go?" "How do you feel about it?" "How did we do?" Estimators will have opinions, but until the post-bid procedures are complete, they cannot be sure that the bid was "good." "Good" does not mean that the bid was low. A low bid may not be in the company's best interest if bidding errors erode expected profits. This section discusses post-bid procedures that help the Estimator confirm the effectiveness of bid day procedures.

Bid document requirements and the type of bid opening can affect post-bid procedures. For example, a public bid opening or a requirement for listing of subcontractors may force the Estimator to accelerate or change the normal process. The Estimator should perform basic post-bid procedures before filing the job away and starting the next one. The following guide addresses post-bid procedures that apply to most situations.

An Estimator's first priority after the bid should be to relax and take some time to relieve the stress generated by the bidding process. This lets them start the post-bid review with a clear mind. The Estimator should take this time to thank the rest of the estimating team for their help. This includes the receptionist, the bid takers, the bid runner, and top management. Bid day is a team effort, and all team members deserve recognition. The post-bid process ensures that proper record-keeping is used. A project pursuit may not be one that results in a contract award, but the information created is very valuable for use in future pursuits.

As-Bid Analysis

The focus of the period immediately after the bid is on the "as-bid" analysis. The term "as-bid" refers to the Estimator's review of the compilation of the project bid. The Estimator will recompile the bid to confirm that the decisions made on the bid day were correct and that the arithmetic was accurate. The Lead Estimator on the project must take responsibility for this task and personally perform the analysis.

- The first step is to put copies of the completed forms, qualifications, summary, and bid bond in a clearly identified file folder, envelope, or binder for the documents that are paper-based. When the bid summary is on a computer, print it out and place it in the file.
- The next step is to collect all the telephone bid forms, scope letters, emailed bids, and add/deduct sheets and organize them by trade. When using a checklist or scope card to analyze subcontractor bids, attach the related paperwork to each checklist.
- Place the apparent low bid quotation at the top. Separate bid takers may do the analysis of specific disciplines of work, such as mechanical or electrical. Those individuals must organize the information and clarify their notations before giving the package to the Estimator.
- The as-bid analysis may take a day because the Estimators will re-bid the project at their own pace. Carefully review each subcontractor bid to be sure there was a correct analysis on bid day. Estimators may concentrate on the apparent low bidder in each trade, but they also must read the other bids. One reason for this requirement is that occasionally, on bid day, a subcontractor qualification or exclusion is misunderstood or missed. Quotations with alternates or extensive breakdowns may not have received proper analysis.
- The Estimator also may find bids inadequately reviewed at bid time due to time constraints. During the as-bid, check the arithmetic on each quotation. Compare qualifications or exclusions

to the scope the Estimator expected for that trade. An unexpected qualification by a third bidder may require a review with the apparent low bidder. The Estimator must pay particular attention to the analyses performed by the separate bid takers mentioned above. These individuals may be qualified to review bids but depend on the Estimator's broader knowledge of the entire project. This may provide a different perspective to the bid analysis.

- With the review of each bid, the Estimator must show the accurate transfer of information to the bid summary or spreadsheet for the trade. When using a spreadsheet for the analysis of each trade, confirm all entries. Check all arithmetic on the sheet. Upon finding discrepancies, the Estimator should note them on a separate piece of paper or on the spreadsheet. Spreadsheet notations should show that they occurred after the bid. Enter any bid omissions due to lack of time on bid day onto the spreadsheet, with a note about the addition. Erasures or changes to subcontractor bid forms are not appropriate. Do not alter the bid day paper trail.
- Confirm that the initial information on the spreadsheet is correct and then check the accuracy of the transfer of numbers to the bid summary. Upon checking the initial transfer, trace all later changes. Use the example of an apparent low price changing twice during the bid. See if the summary matches the spreadsheet. There should be “add” or “deduct” paperwork that tracks the changes.
- During the as-bid, the Estimator must pay attention to all notations on the subcontractors' bids. Do they show whether the low subcontractors' bids were per plans and specifications? When Estimators knowingly use bids not per plans and specifications, they must recognize the cost exposure.
- Particular attention should be paid to the instances when a subtrade proposes alternative materials that have not been vetted prior to bid day through the “Substitution Instructions” and the specifics of that process. Otherwise, one may end up the low, responsive general contractor with subtrades that have offered a competitive edge due to pricing on materials that may not be accepted by the Owner's Architect.
- Maintain a list of suggested substitutions for materials and suppliers. Owner or Architect decisions on substitutions can affect subcontractor selection. Ask for cost-saving suggestions from subcontractors, since Owners may ask for cost-saving suggestions after the bid. This is especially true when the bids are over budget. Address value engineering and substitutions as soon as possible to get a decision. The timely completion of the job may depend on the proper processing of these changes at the start.
- At the end of the review, the Estimator should prepare a new bid summary. Label it “as-bid.” This reflects all the potential savings or losses identified by the as-bid analysis. A loss may occur when the scope of a subcontractor's bid does not match the scope on the spreadsheet. The general contractor may lose money by having to use a higher, complete bid. The analysis also may identify a “hole,” or item not covered by any subcontractor. Savings may occur if the Estimator finds a “double-up,” or item covered twice. For example, the HVAC and electrical bidders may both include the same motor starters. The Estimator may also find that purchasing some scopes of work may differ from bid day assumptions. “Plug numbers” in the bid may eventually result in a saving or a loss. The Estimator should try to firm up the plug numbers during the as-bid.

- Sometimes a subcontractor other than the one used on bid day actually has a more complete number or lower bid. This may be a result of a hectic bid day. There may be receipt of the number without proper recording or recognition. The Estimator should note these issues on the spreadsheet as a reminder to improve the receipt and recording of information on bid day.

Late Bids

Frequently, late bids are received. Company policy must address the disposition of late bids. The best policy is to disregard late bids. Late telephone bids should not be acceptable. The Estimator should carefully document the analysis. This makes the subcontracting process easier for the individuals involved with that process. When a project manager awards the subcontracts, the Estimator's notes must clearly identify the status of each trade and his recommendations. Before making an award, the project manager should review the final selection with the Estimator. With the issue of subcontractor selection comes the question of when and how to release information to the subcontractors. Keep subcontractor bid results in confidence until the final general contractor results are available. If there is a public bid opening, the unsuccessful bidders may release results immediately. The successful bidder will want to complete the as-bid analysis before releasing information.

Releasing Bid Results

Regardless of the status of the bid results, direct all questions from subcontractors to the Estimator. Until Estimators complete the analysis, they should advise subcontractors that the bid result tabulation is incomplete. The Estimator's goal should be to have all apparent low bids confirmed in writing before completing the as-bid review. Occasionally, the confirmation alters the information received at bid time. When this happens, the Estimator (and bid taker, if applicable) must resolve the discrepancy immediately.

Company policy must be clear on who releases bid results and when to do it. There is always pressure by subcontractors on the bid takers to provide information. In spite of this, members of the estimating team must direct the calls to the Estimator. Simple comments like, "You're in the running," may lead to misunderstandings. There is always room for personal judgment. However, the best way to let subcontractors know that everyone receives fair treatment is to have clear company policies and procedures.

When a contractor is the successful bidder, the Estimator or project manager usually releases bid results. This depends on who awards the subcontracts. Notification of subcontractor standings should follow the award of the subcontract. Complete the subcontract awards promptly, usually within thirty days. This is for the contractor's benefit as well as the subcontractors. Subcontractors need feedback so they can adjust for the next job. When a subcontractor is out of contention, the Estimator may choose to convey this information early in the process. The Estimator should do this without revealing facts about the other bids. Ideally, advise subcontractors of their competitive position as to price and scope. Sometimes, the release of exact figures and subcontractor names may create problems.

General contractors may analyze the scope of bids in different ways. A subcontractor may misinterpret exact figures and names if they receive contradictory information from another general contractor. Another option is to give results to a subcontractor on a percentage variance or standing basis, or both. For example, advise the subcontractor that they were the third bidder and four percent high. Handle the process to prevent or discourage bid peddling and bid shopping in the marketplace.

Release bid results over the telephone, by email or by other written notification to bidders or by posting the information in the plan room. The method chosen by the Estimator depends on the timing of the release and on the time available to put it in a publishable format. The procedure should be consistent from job to job within the company. The as-bid review provides other important information to the Estimator for future bids and for historical purposes.

Gathering Information for Future Bids

A competitive bid will frequently identify new subcontractors for the Estimator. Listing the subcontractor, the contact, and the telephone number provides important information. Use this to update the telephone numbers and contacts on the subcontractor list. Also, use this to identify subcontractors for addition to the permanent list. The relative bid order may also provide an indicator of which subcontractors are most competitive at that period. The subcontractor with the second bid may be the one to watch on the next bid.

The as-bid will highlight errors that the estimating team may have made during the bid. Review the mistakes with the team at a pre-bid meeting before the next bid.

The as-bid also gives the Estimator an opportunity to develop historical information. This includes unit prices or cost-per-square-foot figures for various trades. Every piece of information can be helpful for the next project. The contractor should have a historical cost database in place for various building types, systems costs, etc. The Estimator then assembles information for the database during the as-bid period. This provides the company with up-to-date historical information.

Additional Post-Bid Tasks

The Estimator may have additional items to take care of after the bid. An apparent low bidder should tell their bonding company that they will be receiving the contract. An unsuccessful bidder should also contact the bonding company immediately to maintain the contractor's bonding capacity.

When the contractor is the apparent low bidder, use the post-bid period to address scheduling, bonding, and contract conditions with the proposed subcontractors. Resolution of these issues may affect subcontractor selection. The Estimator also must note any supplier or subcontractor qualifications that restrict their bid or material pricing to a limited time. The Estimator may give preliminary verbal notification or letters of intent to subcontractors before contract award. Use this to tie down prices for materials and to start the submittal process for long-lead items.

During the buyout and job set-up period, the Estimator should communicate frequently with the project manager. This will ensure the most effective buyout of the job. The Estimator may request the use of specific cost accounts to track important costs during the job. At the completion of the job buyout, provide a list of the final subcontractors and suppliers to the Estimator.

When Estimators complete the post-bid procedures, they will know if the bid meets expectations. “Win or lose,” they can put that bid aside and start work on the next one. The post-bid procedures will have provided valuable feedback to make operations more effective for future pursuits.