AACE International

Examinee Format of Definitions

Certified Estimating Professional (CEP)

The basis behind the selection of terms and definitions is as follows:

Estimating Exam Scope

The exam will include the following estimating functions:

a. Scoping
b. Quantification
c. Costing
d. Pricing
e. Change Order Estimates
f. Estimating Database Development

The end of the estimating process will be the input to the cost control budget.

The following will not be included in the examination:

a. Valuation/Appraisal Estimating
b. Estimates for economic analysis which include operating costs
c. Bid award analysis

When there were multiple terms with the same definition, the task force attempted to identify a recommended term and referenced all similar terms back to the recommendation.

All definitions considered by the task force have been included in this list.

Note: If definitions in references are different than those in this listing, this listing will be the official definition used for grading the examination.

ACCOUNT CODE STRUCTURE - the system used to assign summary numbers to elements of the work breakdown and account numbers to individual work packages.

ACCOUNT NUMBER - an alphanumeric identification of a work package. An account number may be assigned to one or more activities.

ACCESS TO THE WORK - the right of the contractor to ingress and egress, and to occupy the work site as required to reasonably perform the work described in the contract documents. An example of denial of access to the work would be on the segment of a sewer installation project where no easements or work limits are indicated, but the contractor is ordered, after contract award, to conduct operations within a narrow work corridor necessitating different or unanticipated construction methods (e.g., use of sheeting).

ACTIVITY - An operation or process consuming time and possibly resources *(with the exception of dummy activities)*. An activity is an element of work that must be performed in order to complete a project. An activity consumes time, and may have resources associated with it. Activities must be measurable and controllable. An activity may include one or more tasks. See also TASK.

ACTS OF GOD - (1) an extraordinary interruption by a natural cause, as a flood or earthquake, or the usual course of events that experience, foresight or care cannot reasonably foresee or prevent; (2) an event in nature over which neither the owner nor the contractor has any control.

ACTUAL COSTS - the actual expenditures incurred by a program or project.

ADDENDA - written or graphic instruments issued prior to the date for opening of bids which may interpret or modify the bidding documents by additions, deletions, clarification, or corrections.

ADMINISTRATIVE EXPENSE - See General & Administrative Expense

ALLOWANCES (ESTIMATING) - resources included in estimates to cover the cost of known but undefined requirements for an individual activity, work item, account or subaccount.

AMENDMENT - a modification of the contract by a subsequent agreement. This does not change the entire existing contract but does alter the terms of the affected provisions or requirements.

ANNUALLY RECURRING COSTS - those costs that are incurred in a regular pattern each year.

AUTHORIZED WORK - activity that has been approved to proceed by the client. The scope may or may not be well defined at the time authorized; it is usually defined by contract.

BACKCHARGE - a cost caused by defective or deficient work by the contractor deducted from or used to offset the amount due to the contractor.

BACKUP –supporting documents for an estimate or schedule including detailed calculations, descriptions of data sources, and comments on the quality of the data.

BASE PERIOD (OF A GIVEN PRICE INDEX) - period for which prices serve as a reference for current period prices; in other words, the period for which an index is defined as 100 (if expressed in percentage form) or as 1 (if expressed in ratio form).

BASE POINT FOR ESCALATION - cost index value for a specific month or an average of several months that is used as a basis for calculating escalation.

BASELINE - In project control, the reference plans in which cost, schedule, scope and other project performance criteria are documented and against which performance measures are assessed and changes noted.

BASIS – Written documentation that describes how an estimate, schedule, or other plan component was developed and defines the information used in support of development. A basis document commonly includes, but is not limited to, a description of the scope included, methodologies used, references and defining deliverables used, assumptions and exclusions made, clarifications, adjustments, and some indication of the level of uncertainty.

BATTERY LIMIT - comprises one or more geographic boundaries, imaginary or real, enclosing a plant or unit being engineered and/or erected, established for the purpose of providing a means of specifically identifying certain portions of the plant, related groups of equipment, or associated facilities. It generally refers to the processing area and includes all the process equipment, and excludes such other facilities as storage, utilities, administration buildings, or auxiliary facilities. The scope included within a battery limit must be well-defined so that all personnel will clearly understand it. On drawings this is often referred to as inside/outside battery limits or ISBL/OSBL. See also OFF-SITES.

BENCHMARKING - A measurement and analysis process that compares practices, processes, and relevant measures to those of a selected basis of comparison (i.e., the benchmark) with the goal of improving performance. The comparison basis includes internal or external competitive or best practices, processes or measures. Examples of measures include estimated costs, actual costs, schedule durations, resource quantities and so on.

BENEFICIAL OCCUPANCY - use of a building, structure, or facility by the owner for its intended purpose (functionally complete), although other contract work, nonessential to the function of the occupied section, remains to be completed. See also SUBSTANTIAL COMPLETION.

BID - to submit a price for services; a proposition either verbal or written, for doing work and for supplying materials and/or equipment.

BIDDER - the individual, partnership, or corporation, or combination thereof, acting directly or through an authorized representative, formally submitting a bid directly to the owner, as distinct from a sub-bidder, who submits a bid to a bidder.

BID SHOPPING - an effort by a prime contractor to reduce the prices quoted by subcontractors and/or suppliers, by providing the bid price to other subcontractors or suppliers in an attempt to get the other subcontractors or suppliers to underbid the original price quoted. The reverse of this situation is when subcontractors try to get a better price out of a prime contractor. This is known as Bid Peddling.

BIDDING DOCUMENTS - the advertisement for bids, instructions to bidders, information available to bidders, bid form with all attachments, and proposed contract documents (including all addenda issued prior to receipt of bids).

BIDDING REQUIREMENTS - the advertisement for bids, instructions to bidders, supplementary instructions and all attachments therein, information to bidders and all attachments therein, and bid form and all attachments therein.

B.L.S. -Bureau of Labor Statistics.

B.L.S. PERIODICALS –
- CPI Detailed Report, issued monthly
- Current Wage Developments, issued monthly
- Employment and Earnings, issued monthly
- Monthly Labor Review, issued monthly
- Occupational Outlook Quarterly, issued quarterly
- Producers' Prices and Price Indexes, issued monthly (previously Wholesale Price Index)

BONDS - instruments of security furnished by the contractor and/or surety in accordance with the contract documents. The term contract security refers to the payment bond, performance bond and those other instruments of security required in the contract documents.

BOND, BID - a bond that guarantees the bidder will enter into a contract on the basis of the bid.

BOND, PAYMENT - a bond that is executed in connection with a contract and which secures the payment of all persons supplying labor and material in the prosecution of the work provided for in the contract.

BOND, PERFORMANCE - a bond that is executed in connection with a contract and which secures the performance and fulfillment of all the undertakings, covenants, terms, conditions, and agreements contained in the contract.

BREACH OF CONTRACT - failure, by either the owner or the contractor, without legal excuse, to perform any work or duty owed to the other person.

BUDGET - Estimated resource expenditures during a given period for a project or activity. Resources may include cost, hours, quantities, etc. The budget may also include a systematic plan for the expenditure of the resources.

BUDGET ESTIMATE - A budget estimate is prepared with use of flow sheets, layouts and equipment details. (This term is superseded by recommended practice 17R-97, Cost Estimate Classification System)

BULK MATERIAL - material bought in lots. These items can be purchased from a standard catalog description and are bought in quantity for distribution as required. Examples are pipe (nonspooled), conduit, fittings, and wire.

CASH FLOW - the net flow of funds into or out of a project. The sum, in any time period, of all cash receipts, expenses, and investments. Also called cash proceeds or cash generated. The stream of monetary values -- costs and benefits -- resulting from a project investment.

CHANGE IN SCOPE–A change in the defined deliverables or resources used to provide them.

CHANGE ORDER -

From an owners prospective:
A change order is a document used for total project cost control. After a project is authorized, changes often occur before the project actually gets to the field. To an owner the authorized estimate + change orders should give you a new control point in place of the authorized amount. This is also now your new indicated total cost. In actual practice, change orders (written immediately when a change is identified) are usually a high spot estimate and the actuals do not become available till the work is actually executed in the field. For this reason authorized + change orders do not necessarily end up equaling the final cost - but should be close. When an owner thinks of cost control they think "no surprises". Issuing a change order based on minimum data is important to alert management of potential changes so that they can react to the potential change by adjusting future project activities to offset this potential change or agree to accept the additional cost. (could be a reduction in some cases). Owners may have numerous contracts per project.

From a contractor’s perspective:
A change order is "An agreement between the owner and the contractor to compensate for a change in scope or other conditions." An owner would call these contract extra work orders (or something like that) which would eventually become an alteration to the purchase order contract.

CHART OF ACCOUNTS - see CODE OF ACCOUNTS.

CLAIM - a written statement requesting additional time and/or money for acts or omissions during the performance of the construction contract. The claim must set forth the facts and circumstances for which the party is responsible to be entitled to additional compensation and/or time.

CODE OF ACCOUNTS (COA) - A systematic coding structure for organizing and managing asset, cost, resource, and schedule activity information. A COA is essentially an index to facilitate finding, sorting, compiling, summarizing, or otherwise managing information that the code is tied to. A complete code of accounts includes definitions of the content of each account. Syns.: Chart of Accounts, Cost Codes.

COMMITTED COST – A cost which has not yet been paid, but an agreement has been written that it will be incurred. Eg. Signed purchase order or contract.

CONCEPTUAL ESTIMATE – An estimate made without the benefit of detailed engineering data. (This term is superseded by recommended practice 17R-97, Cost Estimate Classification System)

CONFLICT IN PLANS AND SPECIFICATIONS - statements or meanings in the contract documents (including drawings and specifications) that cannot be reconciled by reasonable interpretation on the part of the contractor and which may require the owner to provide an interpretation between alternatives.

CONSTRUCTION COST - the sum of all costs, direct and indirect, inherent in converting a design plan for material and equipment into a project ready for start-up, but not necessarily in production operation; the sum of field labor, supervision, administration, tools, field office expense, materials, equipment, and subcontracts.

CONSTRUCTION MANAGEMENT -A professional service that applies to effective management techniques to the planning, design, and construction of a project from inception to completion for the purpose of controlling time, cost , and quality, as defined by the Construction Management Association of America (CMAA).

CONSUMABLES - supplies and materials used up during construction. Includes utilities, fuels and lubricants, welding supplies, worker's supplies, medical supplies, etc.

CONTINGENCY - An amount added to an estimate to allow for items, conditions, or events for which the state, occurrence, and/or effect is uncertain and that experience shows will likely result, in aggregate, in additional costs. Typically estimated using statistical analysis or judgment based on past asset or project experience. Contingency usually excludes; 1) major scope changes such as changes in end product specification, capacities, building sizes, and location of the asset or project (see management reserve), 2) extraordinary events such as major strikes and natural disasters, 3) management reserves, and 4) escalation and currency effects. Some of the items, conditions, or events for which the state, occurrence, and/or effect is uncertain include, but are not limited to, planning and estimating errors and omissions, minor price fluctuations (other than general escalation), design developments and changes within the scope, and variations in market and environmental conditions. Contingency is generally included in most estimates, and is expected to be expended.

CONTRACTOR - One that agrees to furnish materials or perform services at a specified price.

CONTRACT DOCUMENTS - the agreement, addenda (which pertain to the contract documents), contractor's bid (including documentation accompanying the bid and any post-bid documentation submitted prior to the notice of award) when attached as an exhibit to the agreement, the bonds, the general conditions, the supplementary conditions, the specifications and the drawings as the same are more specifically identified in the agreement, together with all amendments, modifications and supplements issued pursuant to the general conditions on or after the effective date of the agreement.

CONTRACT PRICE - the monies payable by the owner to the contractor under the contract documents as stated in the agreement.

CONTRACTS - legal agreements between two or more parties, which may be of the types enumerated below:

1. In Cost Plus contracts the contractor agrees to furnish to the client services and material at actual cost, plus an agreed upon fee for these services. This type of contract is employed most often when the scope of services to be provided is not well defined.

a. Cost Plus Percentage Burden and Fee - the client will pay all costs as defined in the terms of the contract, plus "burden and fee" at a specified percent of the labor costs which the client is paying for directly. This type of contract generally is used for engineering services. In contracts with some governmental agencies, burden items are included in indirect cost.

b. Cost Plus Fixed Fee - the client pays costs as defined in the contract document. Burden on reimbursable technical labor cost is considered in this case as part of cost. In addition to the costs and burden, the client also pays a fixed amount as the contractor's "fee".

c. Cost Plus Fixed Sum - the client will pay costs defined by contract plus a fixed sum which will cover "non-reimbursable" costs and provide for a fee. This type of contract is used in lieu of a cost plus fixed fee contract where the client wishes to have the contractor assume some of the risk for items which would be Reimbursable under a Cost Plus Fixed Fee type of contract.

d. Cost Plus Percentage Fee - the client pays all costs, plus a percentage for the use of the contractor's organization.

2. Fixed Price types of contract are ones wherein a contractor agrees to furnish services and material at a specified price, possibly with a mutually agreed upon escalation clause. This type of contract is most often employed when the scope of services to be provided is well defined.

a. Lump Sum - contractor agrees to perform all services as specified by the contract for a fixed amount. A variation of this type may include a turn-key arrangement where the contractor guarantees quality, quantity and yield on a process plant or other installation.

b. Unit Price - contractor will be paid at an agreed upon unit rate for services performed. For example, technical work-hours will be paid for at the unit price agreed upon. Often field work is assigned to a subcontractor by the prime contractor on a unit price basis.

c. Guaranteed Maximum (Target Price) - a contractor agrees to perform all services as defined in the contract document guaranteeing that the total cost to the client will not exceed a stipulated maximum figure. Quite often, these types of contracts will contain special share-of-the-saving arrangements to provide incentive to the contractor to minimize costs below the stipulated maximum.

d. Bonus-Penalty - a special contractual arrangement usually between a client and a contractor wherein the contractor is guaranteed a bonus, usually a fixed sum of money, for each day the project is completed ahead of a specified schedule and/or below a specified cost, and agrees to pay a similar penalty for each day of completion after the schedule date or over a specified cost up to a specified maximum either way. The penalty situation is sometimes referred to as liquidated damages.

COST - in project control and accounting, it is the amount measured in money, cash expended or liability incurred, in consideration of goods and/or services received. From a total cost management perspective, cost may include any investment of resources in strategic assets including time, monetary, human, and physical resources.

COST CATEGORY - A specifically defined division in a system of classification for estimated and/or expended money for which costs are to be summarized.

COST ESTIMATE - A prediction of quantities, cost, and/or price of resources required by the scope of an asset investment option, activity, or project. As a prediction, an estimate must address risks and uncertainties. Estimates are used primarily as inputs for budgeting, cost or value analysis, decision making in business, asset and project planning, or for project cost and schedule control processes. Cost estimates are determined using experience and

calculating and forecasting the future cost of resources, methods, and management within a scheduled time frameSee COST ESTIMATE CLASSIFICATION.

COST ESTIMATE CLASSIFICATION SYSTEM– There are numerous characteristics that can be used to categorize project cost estimate types. Some of these characteristics are: degree of project definition, end usage of the estimate, estimating methodology, and the effort and time needed to prepare the estimate. The primary characteristic used to define the classification category is the degree of project definition -- the level of project definition determines the estimate class. The other characteristics are considered secondary.

The level of project definition defines maturity, or the extent and types of input information available to the estimating process. Such inputs include project scope definition, requirements documents, specifications, project plans, drawings, calculations, lessons learned from past projects, reconnaissance data, and other information that must be developed to define the project. Each industry will have a typical set of defining deliverables that are used to support the type of estimates used in that industry. The set of deliverables becomes more definitive and complete as the level of project definition (e.g., project engineering) progresses.

For projects, the estimate class designations that follow below are labeled Class 1, 2, 3, 4, and 5. A Class 5 estimate is based upon the lowest level of project definition, and a Class 1 estimate is closest to full project definition and maturity. This “countdown” approach considers that estimating is a process whereby successive estimates are prepared until a final estimate closes the process.

CLASS 5 ESTIMATE
(Typical level of project definition required: >0% to 2% of full project definition.)
Class 5 estimates are generally prepared based on very limited information, and subsequently have wide accuracy ranges. As such, some companies and organizations have elected to determine that due to the inherent inaccuracies, such estimates cannot be classified in a conventional and systemic manner. Class 5 estimates, due to the requirements of end use, may be prepared within a very limited amount of time and with little effort expended. Class 5 estimates are prepared for any number of strategic business planning purposes, such as but not limited to market studies, assessment of initial viability, evaluation of alternate schemes, project screening, project location studies, evaluation of resource needs and budgeting, long-range capital planning, etc.

CLASS 4 ESTIMATE
(Typical level of project definition required: 1% to 15% of full project definition.)
Class 4 estimates are generally prepared based on limited information and subsequently have fairly wide accuracy ranges. They are typically used for project screening, determination of feasibility, concept evaluation, and preliminary budget approval. Class 4 estimates are prepared for a number of purposes, such as but not limited to, detailed strategic planning, business development, project screening at more developed stages, alternative scheme analysis, confirmation of economic and/or technical feasibility, and preliminary budget approval or approval to proceed to next stage.

CLASS 3 ESTIMATE
(Typical level of project definition required: 10% to 40% of full project definition.)
Class 3 estimates are generally prepared to form the basis for budget authorization, appropriation, and/or funding. Class 3 estimates are typically prepared to support full project funding requests, and become the first of the project phase “control estimate” against which all actual costs and resources will be monitored for variations to the budget. They are used as the project budget until replaced by more detailed estimates. In many owner organizations, a Class 3 estimate may be the last estimate required and could well form the only basis for cost/schedule control.

CLASS 2 ESTIMATE
(Typical level of project definition required: 30% to 70% of full project definition.)
Class 2 estimates are generally prepared to form a detailed control baseline against which all project work is monitored in terms of cost and progress control. For contractors, this class of estimate is often used as the “bid” estimate to establish contract value. Class 2 estimates are typically prepared as the detailed control baseline against which all actual costs and resources will now be monitored for variations to the budget, and form a part of the change/variation control program.

CLASS 1 ESTIMATE
(Typical level of project definition required: 50% to 100% of full project definition.)
Class 1 estimates are generally prepared for discrete parts or sections of the total project rather than generating this level of detail for the entire project. The parts of the project estimated at this level of detail will typically be used by subcontractors for bids, or by owners for check estimates. The updated estimate is often referred to as the current control estimate and becomes the new baseline for cost/schedule control of the project. Class 1 estimates may be prepared for parts of the project to comprise a fair price estimate or bid check estimate to compare against a contractor's bid estimate, or to evaluate/dispute claims. Class 1 estimates are typically prepared to form a current control estimate to be used as the final control baseline against which all actual costs and resources will now be monitored for variations to the budget, and form a part of the change/variation control program. They may be used to evaluate bid checking, to support vendor/contractor negotiations, or for claim evaluations and dispute resolution.

Syn.: COST ESTIMATE TYPE; COST ESTIMATE CLASS; COST ESTIMATE CATEGORY. See also AACE Recommended Practices No. 17R-97 "Cost Estimate Classification System" and No. 18R-97 "Cost Estimate Classification System – As Applied in Engineering, Procurement, and Construction for the Process Industries".

COST ESTIMATING - A predictive process used to quantify, cost, and price the resources required by the scope of an asset investment option, activity, or project. As a predictive process, estimating must address risks and uncertainties. The outputs of estimating are used primarily as inputs for budgeting, cost or value analysis, decision making in business, asset and project planning, or for project cost and schedule control processes.

As applied in the project engineering and construction industry, cost estimating is the determination of quantity and the predicting and forecasting, within a defined scope, of the costs required to construct and equip a facility. Costs are determined utilizing experience and calculating and forecasting the future cost of resources, methods, and management within a scheduled time frame. Included in these costs are assessments and an evaluation of risks.

COST ESTIMATING RELATIONSHIP (CER) - In estimating, an algorithm or formula that is used to perform the costing operation. CERs show some resource (e.g., cost, quantity, or time) as a function of one or more parameters that quantify scope, execution strategies, or other defining elements. A CER may be formulated in a manner that in addition to providing the most likely resource value, also provides a probability distribution for the resource value. Cost estimating relationships may be used in either definitive or parametric estimating methods. See DEFINITIVE ESTIMATE and PARAMETRIC ESTIMATE.

COST INDEX - a number which relates the cost of an item at a specific time to the corresponding cost at some specified time in the past.

COSTING - The application of cost and resources to a quantified scope.

COSTING – ACTIVITY BASED (ABC) - Costing in a way that the costs budgeted to an account truly represent all the resources consumed by the activity or item represented in the account.

CREW HOUR - An hour of effort for a crew of workers. For example, if a crew has 2 workers, a crew hour includes 2 labor hours.

CREW RATE - Labor cost per crew hour for a given crew. The labor cost may include only wages or wages plus benefits, burdens and other markups. The labor cost may also include an allowance for the costs of tools and equipment used by the crew in performance of their work. (See Labor Cost)

DAMAGES, LIQUIDATED - an amount of money stated in the contract as being the liability of a contractor for failure to complete the work by the designated time(s). Liquidated damages ordinarily stop at the point of substantial completion of the project or beneficial occupancy by the owner. Also can apply to contract defined output performance.

DEFINITIVE ESTIMATE - Definitive Estimate - as the name implies, this is an estimate prepared from very defined engineering data. For construction, the engineering data includes as a minimum, nearly complete plot plans and elevations, piping and instrument diagrams, one line electrical diagrams, equipment data sheets and quotations, structural sketches, soil data and sketches of major foundations, building sketches and a complete set of specifications. This category of estimate covers all types from the minimum described above to the maximum definitive type which would be made from "approved for construction" drawings and specifications. (This term is superseded by recommended practice 17R-97, Cost Estimate Classification System.)

DELAY - to cause the work or some portion of the work to start or be completed later than planned or later than scheduled.

DELIVERABLE - a report or product of one or more tasks that satisfy one or more objectives and must be delivered to satisfy contractual requirements

DIFFERING SITE CONDITIONS - subsurface or latent physical conditions at the site differing materially from those conditions indicated in the contract documents or unknown physical conditions at the site, of an unusual nature, differing materially from conditions normally encountered and generally recognized as inherent in work of the nature provided for in the contract.

DIRECT COST - (1) in construction, cost of installed equipment, material and labor directly involved in the physical construction of the permanent facility; (2) in manufacturing, service and other non-construction industries, the portion of operating costs that is generally assignable to a specific product or process area.

DISRUPTION - an action or event which hinders a party from proceeding with the work or some portion of the work as planned or as scheduled.

DISTRIBUTABLES - the portion of a construction project that can not be associated with any specific direct account. Includes the field nonmanual staff, field office, office supplies, temporary construction, utilities, small tools, construction equipment, weather protection, snow removal, lost time, labor burden, etc. When completion cost reports are prepared, the distributable costs may be distributed across the direct accounts for fixed asset accounting. (See Indirect Costs)

EFFICIENCY—see PRODUCTIVITY

ESCALATION - the provision in actual or estimated costs for an increase in the cost of equipment, material, labor, etc, over that specified in the purchase order or contract due to continuing price level changes over time.

ESTIMATE – A compilation of all the probable costs of the elements of a project or effort included within an agreed upon scope.

ESTIMATE BACKUP – Basic data, project objectives, scope, drawings, quotes, estimating data, qualifications and assumptions used in preparing the estimate and supporting the basis.

ESTIMATE-TO-COMPLETE - the estimated work hours, costs, and time and/or materials required to complete a work package or summary item (includes applicable overhead unless only direct costs are specified).

EQUITABLE ADJUSTMENT - a change in the contract price and/or time to compensate the contractor for expense or delay incurred due to the actions or lack of action of the owner or the owner's representatives or other occurrences, or to compensate the owner for contract reductions. The objective of an equitable adjustment is to put the contractor on the same relative financial position after the change as before the change.

ESCALATOR CLAUSE - clause contained in collective agreements or purchase orders, providing for an automatic price adjustment based on changes in specified indices.

EXEMPT EMPLOYEES - employees exempt from overtime compensation by federal wage and hours guidelines.

FEE - the charge for the use of one's services to the extent specified in the contract.

FIELD COST - costs associated with the construction site rather than with the home office.

FIELD INDIRECTS – refers to costs necessary to support the direct work. These generally include: 1) temporary Construction and Consumables; 2) field supervision and field office costs; 3) construction equipment and tools.

FIXED COST - those costs independent of short term variations in output of the system under consideration. Includes such costs as maintenance; plant overhead; and administrative, selling and research expense. For the purpose of cash flow calculation, depreciation is excluded (except in income tax calculations). In construction this includes General & Administrative Expense.

FIXED-PRICE CONTRACT - See CONTRACTS

FREE HAUL - the distance every cubic yard of excavated material is entitled to be moved without an additional charge for haul.

FRINGE BENEFITS - employee welfare benefits, ie, expenses of employment such as holidays, sick leave, health and welfare benefits, retirement fund, training, supplemental union benefits, etc.

GENERAL & ADMINISTRATIVE EXPENSE (G&A) - the fixed cost in operation of a business. G&A is also associated with office, plant, equipment, staffing, and expenses thereof, maintained by a contractor for general business operations. The cost of G&A is not specifically applicable to any given job or project. See OVERHEAD.

GENERAL TERMS AND CONDITIONS - General definition of the legal relationships and responsibilites of the parties to the contract and how the contract is to be administered. They are usually standard for a corporation and/or project.

GENERAL REQUIREMENTS - Non-technical specifications defining the scope of work, payments, procedures, implementation constraints, etc. pertaining to the contract.

HOME OFFICE COST - those necessary costs, typically not incurred at the project site, involved in the conduct of everyday business, which can be directly assigned to specific projects, processes, or end products, such as engineering, procurement, expediting, legal fees, auditor fees inspection, estimating, cost control, taxes, travel, reproduction, communications, etc.

IMPACT COST - added expenses due to the indirect results of a changed condition, delay, or changes that are a consequence of the initial event. Examples of these costs are premium time, lost efficiency, and extended field and home office overhead.

INDIRECT COSTS - (1) in construction, all costs which do not become a final part of the installation, but which are required for the orderly completion of the installation and may include, but are not limited to, field administration, direct supervision, capital tools, startup costs, contractor's fees, insurance, taxes, etc; (2) In manufacturing, costs not directly assignable to the end product or process, such as overhead and general purpose labor, or costs of outside

operations, such as transportation and distribution. Indirect manufacturing cost sometimes includes insurance, property taxes, maintenance, depreciation, packaging, warehousing and loading. (See Distributables, Field Indirects, Home Office Overheads)

INEFFICIENCY --The state of being less productive or efficient than expected or planned.

INFLATION - A persistent increase in the level of consumer prices or a persistent decline in the purchasing power of money, caused by an increase in available currency and credit beyond the proportion of available goods and services.

LABOR BURDEN – fringe benefits plus taxes and insurances the employer is required to pay by law based on labor payroll, on behalf of or for the benefit of labor. (In the US these are federal old age benefits, federal unemployment insurance tax, state unemployment tax, and worker's compensation).

LABOR COST –

BARE LABOR –	Gross direct wages paid to the worker
BURDENED LABOR –	Gross direct wages paid to the worker plus LABOR BURDEN.
ALL IN LABOR–	Gross direct wages paid to the worker, plus LABOR BURDEN, plus FIELD INDIRECTS, plus GENERAL & ADMINISTRATIVE COST, plus PROFIT.

LABOR FACTOR–see LABOR PRODUCTIVITY FACTOR

LABOR HOUR - A worker hour of effort. Syn.: WORK HOUR

LABOR PRODUCTIVITY - A measure of production output relative to labor input. In economics, industrial engineering, and earned value management, quantity/work hour measures are common (higher values reflect higher productivity or efficiency). In cost estimating, inverse measures such as work hours/quantity or unit hours are common (where lower values reflect higher productivity or efficiency). Regardless of the measure used, labor productivity (or efficiency) is improved by increasing production for a given work hour or decreasing work hours for a given production.

LABOR PRODUCTIVITY FACTOR - A value by which a labor productivity measure for a reference project or activity is multiplied or divided to obtain an adjusted labor productivity measure for the same or similar project or activity under a different set of conditions. Proper factor use requires that the user ascertain the type of labor productivity measure it will be applied against (e.g., consider whether the labor productivity measure to be factored is expressed in the form of work hours/quantity or quantity/work hours).

LABOR RATE – See labor cost.

LATEST REVISED ESTIMATE – in earned value the sum of the actual incurred costs plus the latest estimate-to-complete for a work package or summary item as currently reviewed and revised, or both (including applicable overhead where direct costs are specified).

LEARNING CURVE - a graphic representation of the progress in production effectiveness as time passes. Learning curves are useful planning tools, particularly in the project oriented industries where new products are phased in rather frequently. The basis for the learning curve calculation is the fact that workers will be able to produce the product more quickly after they get used to making it.

LETTER OF CREDIT - a vehicle that is used in lieu of retention and is purchased by the contractor from a bank for a predetermined amount of credit that the owner may draw against in the event of default in acceptance criteria by

the contractor. Also applies when an owner establishes a line of credit in a foreign country to provide for payment to suppliers of contractors for goods and services supplied.

LEVEL OF EFFORT (LOE) - support effort that does not readily lend itself to measurement of discrete accomplishment. It is generally characterized by a uniform rate of activity over a specific period of time.

LIFE CYCLE - the stages, or phases that occur during the lifetime of an object or endeavor. A life cycle presumes a beginning and an end with each end implying a new beginning. In life cycle cost or investment analysis, the life cycle is the length of time over which an investment is analyzed (i.e., study period). See also STUDY PERIOD; LIFE.

LIFE-CYCLE COSTING - Consideration of all costs when designing a project's product including costs from concept through implementation and startup to dismantling. It is typically used for making decisions between alternatives.

LOCAL COST - The cost of local labor, equipment taxes, insurance, equipment, and construction materials incorporated in a construction project, with local currencies. This includes the finishing of imported goods using local labor and materials, the cost of transforming imported raw or semi-finished products using local labor and plant facilities and the marketing of locally produced products.

LOCATION FACTOR - An instantaneous (current-has no escalation or currency exchange projection) overall total project factor for translating the summation of all project cost elements of a defined construction project scope of work from one geographical location to another. Location factors include given costs, freights, duties, taxes, field indirects, project administration and engineering and design. Loction factors do not include the cost of land, scope/design differences for local codes and conditions and the cost for various operating philosophies.

LOSS OF PRODUCTIVITY/EFFICIENCY - see INEFFICIENCY.

LOST PRODUCTIVITY - see INEFFICIENCY.

LUMP-SUM - the complete in-place cost of a system, a subsystem, a particular item, or an entire project. Also see CONTRACT, FIXED PRICE.

MAINTENANCE AND REPAIR COST - the total of labor, material, and other related costs incurred in conducting corrective and preventative maintenance and repair on a facility, on its systems and components, or on both. Maintenance does not usually include those items that cannot be expended within the year purchased. Such items must be considered as fixed capital.

MANAGEMENT RESERVE - An amount added to an estimate to allow for discretionary management purposes *outside* of the defined scope of the project as otherwise estimated. Use of management reserve requires a change to the project scope and the cost baseline, while the use of contingency reserve funds is within the project's approved budget and schedule baseline.

MANUFACTURING COST - the total of variable and fixed or direct and indirect costs chargeable to the production of a given product, usually expressed in cents or dollars per unit of production, or dollars per year. Transportation and distribution costs, and research, development, selling and corporate administrative expenses are usually excluded. See also OPERATING COST.

MARK-UP - as variously used in construction estimating, includes such percentage applications as general overhead, profit, and other indirect costs. When mark-up is applied to the bottom of a bid sheet for a particular item,

system, or other construction price, any or all of the above items (or more) may be included, depending on local practice.

MATERIAL COST - the cost of everything of a substantial nature that is essential to the construction or operation of a facility, both of a direct or indirect nature. Generally includes all manufactured equipment as a basic part.

MATERIAL DIFFERENCE - a change that is important to the performance of the work or that will have a measurable influence or effect on the time, cost of, or procedures for the work under the contract.

MAXIMUM OUT-OF-POCKET CASH - the highest negative cash balance during project life.

MERIT SHOP - see OPEN SHOP.

METHOD OF PERFORMANCE - the manner in which the specified product or objective is accomplished, which is left to the discretion of the contractor unless otherwise provided in the contract. If the owner or the engineer orders the contractor to modify the construction procedure, this constitutes a change in method. If the imposition of this modification results in additional cost to the contractor, the contractor may be entitled to recovery under the changes clause.

MONTE CARLO METHOD - a simulation technique by which approximate evaluations are obtained in the solution of mathematical expressions so as to determine the range or optimum value. The technique consists of simulating an experiment to determine some probabilistic property of a system or population of objects or events by use of random sampling applied to the components of the system, objects, or events.

NONEXEMPT EMPLOYEES - employees not exempt from overtime compensation by federal wage and hours guidelines.

NOTICE TO PROCEED - a written notice issued by the owner to the contractor authorizing the contractor to proceed with the work and establishing the date for commencement of the contract time.

OFFSITES –General facilities outside the battery limits of all process units, such as Field Storage, Service facilities, Utilities, Main Electric Substation or other Administrative Buildings, Rail tracks and storage yard etc.

OPEN SHOP - an employment or project condition where either union or non-union contractors or individuals may be working. Open shop implies that the owner or prime contractor has no union agreement with workers. Also referred to as merit shop. (11/90)

OPERATING COST - the expenses incurred during the normal operation of a facility, or component, including labor, materials, utilities, and other related costs. Includes all fuel, lubricants, and normally scheduled part changes in order to keep a subsystem, system, particular item, or entire project functioning. Operating costs may also include general building maintenance, cleaning services, taxes, and similar items. See MANUFACTURING COST.

ORDER OF MAGNITUDE ESTIMATE – An estimate made without detailed engineering data. (This term is superseded by recommended practice 17R-97, Cost Estimate Classification System)

ORGANIZATIONAL CODES - numerical or alphabetized characters that the user specifies for the system to associate with a particular activity for sorting purposes.

OVERHEAD - a cost or expense inherent in the performing of an operation, ie, engineering, construction, operating or manufacturing, which cannot be charged to or identified with a part of the work, product or asset and, therefore,

must be allocated on some arbitrary base believed to be equitable, or handled as a business expense independent of the volume of production. Plant overhead is also called factory expense. See General & Administrative Cost.

OVERRUN (UNDERRUN) - the value for the work performed to date minus the actual cost for that same work. When value exceeds actual cost, an underrun condition exists. When actual cost exceeds value, an overrun condition exists.

OWNER - the public body or authority, corporation, association, firm or person with whom the contractor has entered into the agreement and for whom the work is to be provided.

PARAMETRIC ESTIMATE - In estimating practice, describes estimating algorithms or cost estimating relationships that are highly probabilistic in nature (i.e., the parameters or quantification inputs to the algorithm tend to be abstractions of the scope). Typical parametric algorithms include, but are not limited to, factoring techniques, gross unit costs, and cost models (i.e., algorithms intended to replicate the cost performance of a process of system). Parametric estimates can be as accurate as definitive estimates.

PAYROLL BURDEN - See LABOR BURDEN.

PHASED CONSTRUCTION - as most commonly used today, implies that construction of a facility or system or subsystem commences before final design is complete. Phased construction is used in order to achieve beneficial use at an advanced date.

PLAN - a predetermined course of action over a specified period of time which represents a projected response to an anticipated environment in order to accomplish a specific set of adaptive objectives.

PLANT OVERHEAD - those costs in a plant that are not directly attributable to any one production or processing unit and are allocated on some arbitrary basis believed to be equitable. Includes plant management salaries, payroll department, local purchasing and accounting, etc. Syn.: FACTORY EXPENSE.

PRELIMINARY ENGINEERING - includes all design-related services during the evaluation and definition phases of a project.

PRICE - the amount of money asked or given for a product (eg, exchange value).

PRICING - In estimating practice, after costing an item, ~~or~~ activity, or project, the determination of the amount of money asked in exchange for the item, activity, or project. Pricing determination considers business and other interests (e.g., profit, marketing, etc.) in addition to inherent costs. The price may be greater or less than the cost depending on the business or other objectives. In the cost estimating process, pricing follows costing and precedes budgeting

PROCUREMENT - the acquisition (and directly related matters) of equipment, material, and nonpersonal services (including construction) by such means as purchasing, renting, leasing (including real property), contracting, or bartering, but not by seizure, condemnation, or donation. Includes preparation of inquiry packages, requisitions, and bid evaluations; purchase order award and documentation; plus expediting, in-plant inspection, reporting, and evaluation of vendor performance.

PRODUCTIVITY - A measure of output relative to input. Productivity (or efficiency) is improved by increasing output for a given input or decreasing input for a given output. If the input is specifically work hours, the term commonly used is LABOR PRODUCTIVITY.

PRODUCTIVITY FACTOR–see LABOR PRODUCTIVITY FACTOR

PROFIT –

(1) Gross Profit - earnings from an on-going business after direct and project indirect costs of goods sold have been deducted from sales revenue for a given period.

(2) Net Profit - earnings or income after subtracting miscellaneous income and expenses (patent royalties, interest, capital gains) and federal income tax from operating profit.

(3) Operating Profit - earnings or income after all expenses (selling, administrative, depreciation) have been deducted from gross profit.

PROFIT MARGIN - A ratio of profit to either total cost or total revenue. Usage often varies depending on the type of company. Retail companies generally use the profit to revenue ratio. Wholesale companies and contractors generally use the profit to cost ratio.

PROJECT - a temporary endeavor with a specific objective to be met within the prescribed time and dollar limitations and which has been assigned for definition or execution.

PROJECT DURATION - the elapsed duration from project start date through project finish date.

PROJECTED FINISH DATE - the current estimate of the calendar date when an activity or project will be completed.

PROJECTED START DATE - the current estimate of the calendar date when an activity or project will begin.

PROJECT MANAGEMENT - the utilization of skills and knowledge in coordinating the organizing, planning, scheduling, directing, controlling, monitoring and evaluating of prescribed activities to ensure that the stated objectives of a project, manufactured product, or service, are achieved.

PROJECT MANAGER - an individual who has been assigned responsibility and authority for accomplishing a specifically designated unit of work effort or group of closely related efforts established to achieve stated or anticipated objectives, defined tasks, or other units of related effort on a schedule for performing the stated work funded as a part of the project. The project manager is responsible for the planning, controlling, and reporting of the project.)

PROJECT PHASES - the major phases of a project, which include preplanning, design, procurement, construction, start-up, operation, and final disposition.

PROJECT SUMMARY WORK BREAKDOWN STRUCTURE (PSWBS) - a summary WBS tailored by project management to the specific project, and identifying the elements unique to the project.

QUALIFICATIONS & ASSUMPTIONS –Items that are not completely defined in the project documents for which the estimator was required to use judgment in developing the estimate.

QUANTIFICATION - In estimating practice, an activity to translate project scope information into resource quantities suitable for costing. In the engineering and construction industry, a take-off is a specific type of quantification that is a measurement and listing of quantities of materials from drawings. Syn.: TAKE-OFF. (1/03)

QUANTITY RATIO - a ratio which measures, for a given commodity, its quantitative shift between alternative baskets.

QUANTITY SURVEY - In traditional terms means using standard methods measuring all labor and material required for a specific project or a building or a structure - and itemizing these detailed quantities in a book or bill of quantities.

RENTAL (LEASED) EQUIPMENT COST - the amount which the owner of the equipment (lessor) charges to a lessee for use of the equipment.

REQUIREMENT - an established requisite characteristic of a product, process, or service. A characteristic is a physical or chemical property, a dimension, a temperature, a pressure, or any other specification used to define the nature of a product, process, or service.

RESOURCE - any consumable, except time, required to accomplish an activity. From a total cost and asset management perspective, resources may include any real or potential investment in strategic assets including time, monetary, human, and physical. A resource becomes a cost when it is invested or consumed in an activity or project.

RESOURCE CODE - the code for a particular labor skill, material, equipment type; the code used to identify a given resource.

RESOURCE DESCRIPTION - the actual name or identification associated with a resource code.

RETENTION - usually refers to a percent of contract value retained by the purchaser until work is finished and testing of equipment is satisfactorily completed. Also referred to as retainage.

RISK - An ambiguous term that can mean any of the following:

- all uncertainty (threats and opportunities);
- downside uncertainty (a.k.a., “threats”); or
- the net impact or effect of uncertainty (threats - opportunities).

The convention used in any work should be clearly stated to avoid misunderstandings.

SALVAGE VALUE - (1) the cost recovered or which could be recovered from a used property when removed, sold, or scrapped; (2) the market value of a machine or facility at any point in time (normally an estimate of an asset's net market value at the end of its estimated life); (3) the value of an asset, assigned for tax computation purposes, that is expected to remain at the end of the depreciation period.

SCALING FACTOR – An exponential used to adjust the size of one item, commodity, or project to another.

SCHEDULE OF VALUES – A detailed statement furnished by a construction contractor, builder or others apportioning the contract value into work packages. It is used as the basis for submitting and reviewing progress payments.

SCOPE - Generally limited to that which is agreed to by the stakeholders in an activity or project (i.e., if not agreed to, it is “out of scope”). In contracting and procurement practice, includes all that an enterprise is contractually committed to perform or deliver. Syn.: PROJECT SCOPE.

SCOPE CHANGE - See CHANGE IN SCOPE.

SITE PREPARATION - an act involving grading, landscaping, drainage, installation of roads and siding, of an area of ground upon which anything previously located had been cleared so as to make the area free of obstructions, entanglements or possible collisions with the positioning or placing of anything new or planned.

SPECIFICATION, DESIGN - a design specification providing a detailed written and/or graphic presentation of the required properties of a product, material, or piece of equipment, and prescribing the procedure for its fabrication, erection, and installation.

SPECIFICATION, PERFORMANCE - a statement of required results, verifiable as meeting stipulated criteria, and generally free of instruction as to the method of accomplishment.

SPECIFICATIONS - A detailed, exact statement of particulars, especially a statement prescribing materials, dimensions, and quality of work for something to be built, installed, or manufactured.

STANDARD INDUSTRIAL CLASSIFICATION (SIC CODE) - a classification system of the Office of Management and Budget which provides the framework for the industry-sector index classification scheme. Product indexes are aggregated to five-digit product classes and four-digit industries. Industry indexes can be aggregated to three- and two-digit levels as well.

STARTUP AND TESTING – The activities that take place between the completion of physical construction and commercial operation to make the project ready to begin production. This may include control system configuration, systems flush and clean, initial fills, temporary operating staff, etc.

STOCHASTIC - the adjective "stochastic" implies the presence of a random variable, probabilistic.

SUBCONTRACT - A contract that assigns some of the obligations of a prior contract to another party.

SUBCONTRACTOR - One that enters into a subcontract and assumes some of the obligations of the primary contractor.

SUBSTANTIAL COMPLETION - The time when the project is available to operate safely for the intended purpose.

SUNK COST - a cost that has already been incurred and which should not be considered in making a new investment decision.

SURETY - a bonding company licensed to conduct business, which guarantees the owner that the contract will be completed (Performance Bond) and that subcontractors and suppliers will be paid (Payment Bond).

SUSPENSION OF WORK, CONSTRUCTIVE - an act or failure to act by the owner, or the owner's representative, which is not a directed suspension of work or work stoppage, but which has the effect of delaying, interrupting, or suspending all or a portion of the work.

SUSPENSION OF WORK, DIRECTED - actions resulting from an order of the owner to delay, interrupt, or suspend any or all portions of the work for a given period of time, for the convenience of the owner.

SYSTEM - a collection of hardware (equipment and facilities) and related software (procedures, etc) designated to perform a unique and useful function. A system contains everything necessary (except personnel and materials or supplies) to perform its defined function.

TAKE-OFF - a take-off is a specific type of quantification that is a measurement and listing of quantities of materials from drawings in order to support the estimate costing process and/or to support the material procurement process. Syn.: QUANTIFICATION.

TEMPORARY CONSTRUCTION COST - includes costs of erecting, operating, and dismantling non-permanent facilities, such as offices, workshops, etc, and providing associated services such as utilities.

TOTAL COST MANAGEMENT - the effective application of professional and technical expertise to plan and control resources, costs, profitability and risks. Simply stated, it is a systematic approach to managing cost throughout the life cycle of any enterprise, program, facility, project, product, or service. This is accomplished through the application of cost engineering and cost management principles, proven methodologies and the latest technology in support of the management process. Can also be considered the sum of the practices and processes that an enterprise uses to manage the total life cycle cost investment in its portfolio of strategic assets.

UNBALANCING - A technique used in the pricing process to allocate estimated costs to accounts whose definitions do not fully reflect the nature of the cost being allocated. The purpose of unbalancing is to achieve a desired business result such as improved cash flow. For example, a disproportionate amount of overhead costs may be allocated in a contract bid to early project activities so that early income is maximized.

UNCERTAINTY - unknown future events which cannot be predicted quantitatively within useful limits, eg, accidents which destroy invested facilities, a major strike, a competitor's innovation which makes the new product obsolete.

UNIT COST - The cost of a given unit of a product or service.

UNIT HOURS - Work hours per unit of production.

UNIT RATE – see UNIT COST

UNION - An organization of wage earners formed for the purpose of serving the members' interests with respect to wages and working conditions.

VARIABLE COSTS - those costs that are a function of production, eg, raw materials costs, by-product credits, and those processing costs that vary with plant output (such as utilities, catalysts and chemical, packaging, and labor for batch operations).

WAGE RATE –Labor cost per work hour where the labor cost includes only wages and not benefits, burdens or other markups. (See LABOR COST)

WASTE ALLOWANCE – The additional material beyond that measured from the drawings required to construct the item. For example: 1) The additional concrete left in the truck or spilled over the sides of the formwork, 2) The additional length of electrical wire cut for splicing and termination.

WORKS - any and all obligations, duties, responsibilities, labor, materials, equipment, temporary facilities, and incidentals, and the furnishing thereof necessary to complete the construction which are assigned to, or undertaken by the contractor, pursuant to the contract documents. Also, the entire completed construction or the various separately identifiable parts thereof required to be furnished under the contract documents. Work is the result of performing services, furnishing labor, and furnishing and incorporating materials and equipment into the construction, all as required by the contract documents.

WORK BREAKDOWN STRUCTURE (WBS) - a product-oriented family tree division of hardware, software, facilities and other items which organizes, defines and displays all of the work to be performed in accomplishing the project objectives.

1. Contract Work Breakdown Structure (CWBS) - the complete WBS for a contract developed and used by a contractor in accordance with the contract work statement. It extends the PSWBS to the lowest level appropriate to the definition of the contract work.

2. Project Summary Work Breakdown Structure (PSWBS) - a summary WBS tailored by project management to the specific project with the addition of the elements unique to the project.

WORKHOUR -A worker hour of effort. Syn.: LABOR HOUR

WORK PACKAGE - a segment of effort required to complete a specific job such as a research or technological study or report, experiment or test, design specification, piece of hardware, element of software, process, construction drawing, site survey, construction phase element, procurement phase element, or service, which is within the responsibility of a single unit within the performing organization. The work package is usually a functional division of an element of the lowest level of the WBS.