CPE WORKSHOP

Week 1 Outline

1. Testing overview and proctor information
2. Fundamentals
   A. Basic Standards
   B. Levels of Estimate
   C. Scope of Estimate

Steps to Certification

Work Experience

In order to apply for CPE Certification, Candidates must gain the necessary work experience. A minimum of five (5) years of on-the-job experience must be documented on the application to the program. Paper applications* are available on the ASPE website for use by individuals who are unable to utilize the web-based application.

Application

Once the experience requirement has been met, complete and submit the application and the appropriate fees. Applicants must create an Online Profile and sign-in to apply for certification. Members of ASPE already have an Online Profile. Non-members should follow the instructions provided on the site for creating an Online Profile. All candidates must provide appropriate documentation as evidence of their eligibility.

Technical Paper

The paper is to be completed and submitted by the due date in order for the candidate to be eligible for testing. Candidates are provided, if needed, an opportunity to make revisions to their paper if their initial review is not satisfactory to the program requirements.

Exams

All Candidates are required to complete the General Estimating Knowledge Exam (GEK) and take the Discipline Specific Test (DST) for which they are seeking certification. Exams are computer based and require a Proctor. Candidates are allowed one re-sit per test if the minimum passing score is not met the first time. Most chapters have a Certification Chair that can serve as the Proctor. If a Discipline Specific Test has not been fully developed, Candidates may submit questions and problems to meet the DST requirement.

Professional Development

Professional Development is required to maintain your certified status. Each CPE must report 30 PDUs per year of their three (3) year certification cycle. A Renewal Handbook is available on the ASPE website.

*PAPER APPLICATION FEE: A paper application fee is charged for processing of all certification, certification renewal, proctor forms, or conversion paper applications.

Certification Schedule Matrix

Certification Program Schedule

Program Process		Winter Cycle	Summer Cycle
Submit Professional Evaluation Application and Fees.	*Last Day to submit application and fees for consideration.*	January 10	July 10
Review of Application by the Certification	*Completed*	February 15	August
Notification of acceptance to	*Acceptance letters sent to the candidate along with paper topic. Study materials will follow within 3 weeks.*	March 1	September

Technical Paper Due	*Paper must be submitted to the Coordinator for the candidate to be eligible to test.*	June 15	December
Technical Paper Review	Technical paper results are sent to the candidate as soon as all reviewers per paper have submitted their scoring paperwork to the Society Business Office. This time-line will vary per candidate . And is dependent upon whether the paper requires		
Certification Testing (GEK, DST, and Ques-	*Proctor Required* GEK, DST and Q&P must be completed within the testing month.*	July	March (of the following
Candidates that have met and passed these requirements of the ASPE Certification Program will receive by e-communication an informational packet pertaining to their CPE status and maintenance thereof. Successful candidates will receive a framed certificate (allow up to 6 weeks for framing/shipping), a lapel pin, and an electronic copy of their certificate.			
Re-submittal of deficient paper and/or	*Completed by*	October 15	June 15 (of following
Resit for Certification Testing (GEK	*Proctor Required* GEK, DST and Q&P must be completed within the testing month.*	November	July (of following

**Proctors must have an active CPE designation. Your testing location will be determined by your proctor. ASPE recommends Chapter Certification Chairs as local proctors. If you are a non-member or a MAL member, the Society Business Office will assist you with contact information for potential proctors near your area.*

CPE Benefits

GSA Federal Requirments:

2 estimator qualification and ethics

1 requirements

Capital project estimate submissions must be prepared by professional cost estimators unaffiliated with the design team or the Construction Manager as Contractor (CMc). Certification as a cost engineer by the Association for the Advancement of Cost Engineering (AACE), or as a certified professional estimator by the American Society of Professional Estimators (ASPE), is supporting evidence of an estimator's qualifications, although it is not required.

COV Requirments:

5.4.1 Estimator Qualifications

Capital project estimate submissions must be prepared by professional cost estimators. Certification as a cost engineer by the Association for the Advancement of Cost Engineering (AACE), or as a certified professional estimator by the American Society of Professional Estimators (ASPE), is supporting evidence of an estimator's qualifications, although it is not required.

5.4.2 Ethics

The standards of practice described in the Canons of Ethics published by the AACE and the ASPE, and available on both their Web sites, apply to all estimating services.

CESB Accredited Program

American Society of Professional Estimators

This is to certify that

Your Name

having given satisfactory evidence of the necessary qualifications as required by the Certifying Body of the American Society of Professional Estimators has achieved the highest level of recognition as a

Certified Professional Estimator

In the Discipline of

General Estimating Knowledge

1.4 General Construction

Chair, Certification Committee

President

SEAL 1957

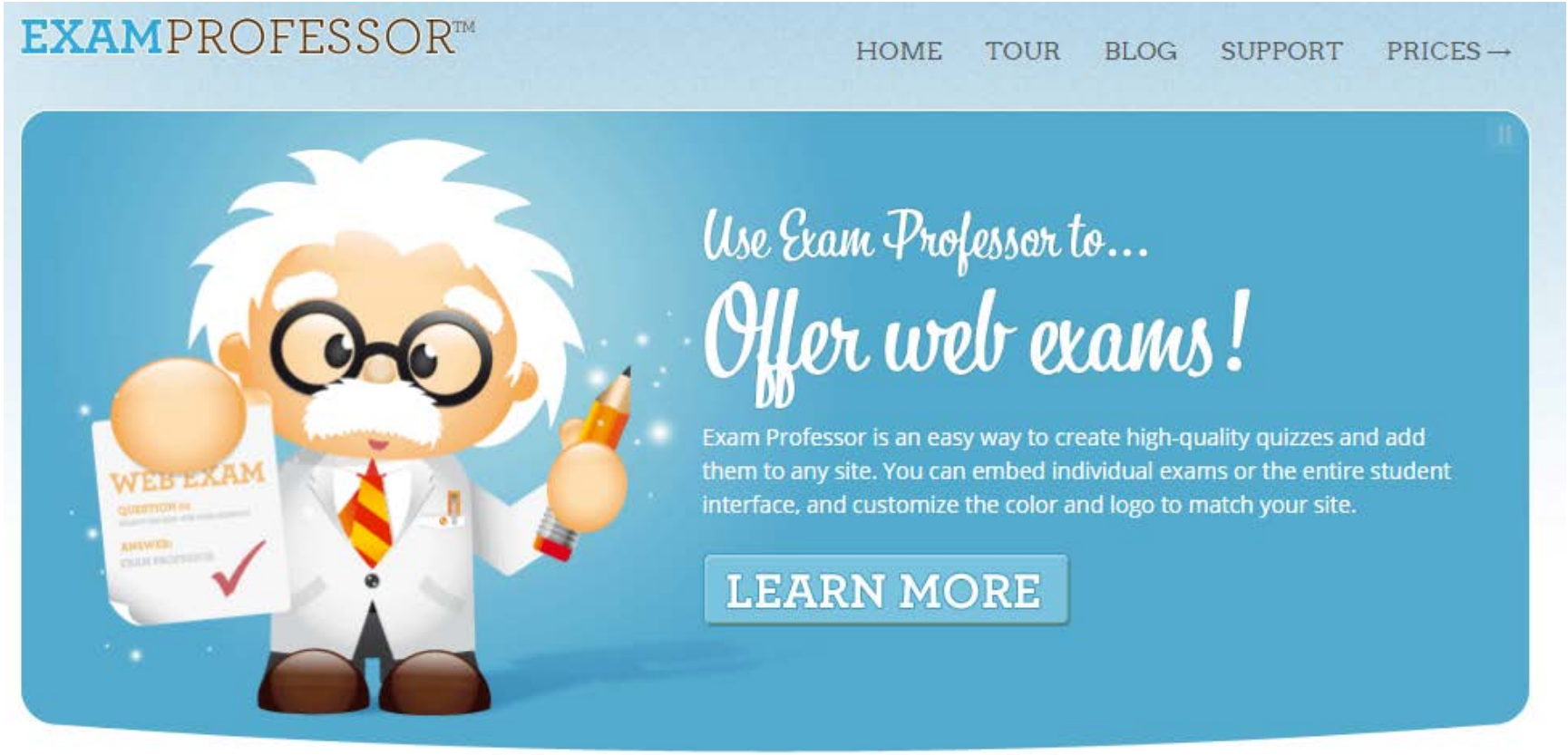
CESB Accredited Program

CPE Number 1.4-000000-2000

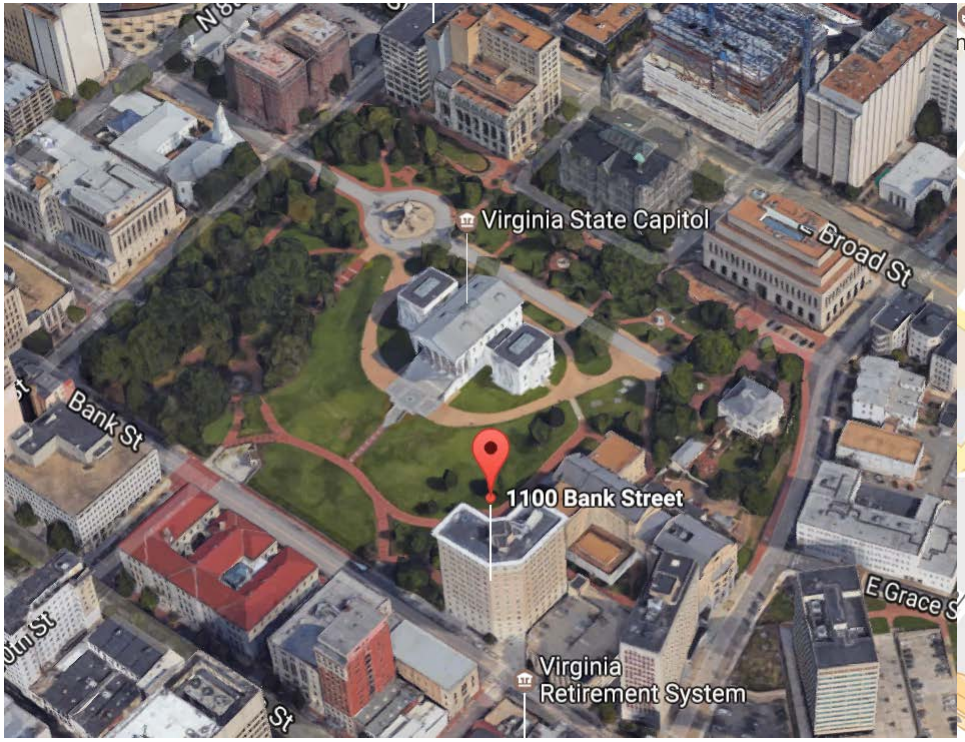
CPE Original Grant Date 20 May 2012

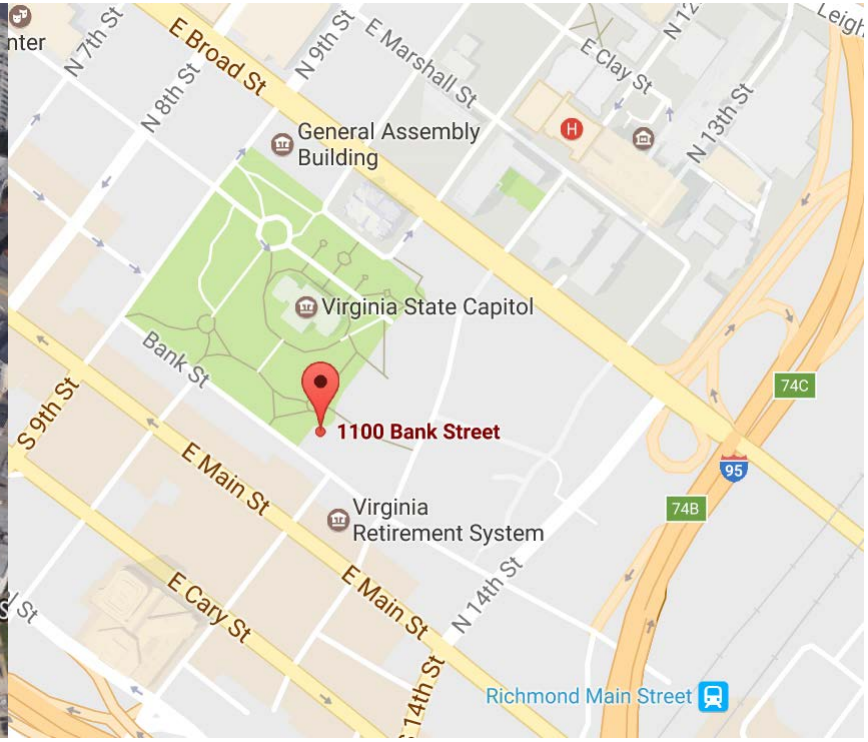
Recertify By 31 July 2016

On-line Exams



Proctor Location: BCOM





Basic Standards

BASIC STANDARDS

- Morals
- Ethics
- Technical Expertise

SECTION 1 – BASIC STANDARDS

Introduction

The practice of construction estimating is a highly technical discipline. It involves certain standards of ethical conduct and moral judgment that go beyond the technical aspects of the discipline.

Estimators are often the persons most familiar with the complete project. They must exercise sound moral judgment when preparing the estimate. Estimators sometimes receive pressure from other members of the construction team to make expedient short term decisions that can result in an unsound bid. Resistance to this pressure is a part of the estimator's job.

Examples of expedient behavior litter the history of construction estimating. The fruit of this shows in inaccurate estimates. Deficient estimates also can cause strife between members of the construction team, divisive litigation, and lost profits, as well as lost future work if the owner is unhappy.

For these reasons, the Society states the following ethical, moral and technical precepts as basic to the practice of estimating.

ETHICS

- Do what you know
- Expand what you know
- Promote cooperation
- Loose lips sink ~ *employers*
- Behave
- Be competent
- No peddling
- No rigging
- No bribing

Ethics

Construction estimators shall follow a high standard of ethical practice as defined by this Society. Members of this Society shall show a commitment to ethical practices by adopting a detailed code of ethics. The Society invites users of this manual and others to join in a discussion of ethical practice in the construction industry.

INTEGRITY

- **Don't engage in bid peddling**

Integrity

All estimators shall use standards of confidentiality in a manner at least equal to that of other professional societies. The estimator shall keep in strictest confidence information received from outside sources. All members of this Society shall follow the Confidentiality Standards. Certified Professional Estimators shall pledge fidelity to this standard. The practice commonly called "bid peddling" is a breach of ethics and condemned by this Society.

JUDGMENT

- **Good judgment leads to profitable projects**
- **Bad judgment leads to ..**

Judgment

Judgment is a skill gained by estimators through proper training and extensive experience. Always use sound judgment and common sense when preparing estimates. Proper use of judgment may mean the difference between profit and loss for the company or client.

ATTITUDE

- **Do what you gotta do to concentrate**

Attitude

Approach each estimate with a professional attitude and examine in detail all areas of the work. Set aside specific times each day for entry of estimate quantities and data without interruption. Total mental concentration is basic and necessary when preparing accurate estimates.

THOROUGHNESS

- **Complete the quantity survey soon after examining the details**

Thoroughness

Allow enough time to research and become familiar with the details of the project and then promptly complete the quantity survey. Review the various aspects of the project with others involved. The estimator with the most knowledge of a project has the competitive advantage.

AWARENESS

- Resources to do the job?
- Enough time?
- Alternate methods of construction
- Become familiar with the special conditions
- Become familiar with the specs
- Sufficient time to prepare bid?
- A & E coordinated?

Awareness

Review the project scope and determine, with input from superiors, if the company has sufficient financial resources, staff, and plant to complete the project. Consider the time allotted for construction of the project. Examine the general conditions of the contract and determine the effect these requirements have on indirect costs. Consider alternate methods of construction for the project. Conduct an examination of the special conditions that may alter the intent of the general condition. Review all division specifications to gain a better perspective of the total project scope. Estimate the general and special conditions similar to all other divisions of the specifications. Review the deadline for submitting the estimate and determine if there is enough time to prepare the estimate. Review all sections of the plans and find out the degree of coordination between architectural and engineering drawings.

UNIFORMITY

- Develop a system
  - Materials
  - Labor
  - Equipment
  - O'H&P

Uniformity

Develop a good system of estimating forms and procedures that exactly meet the requirements of the company. This system should provide the ability to define material, labor hour and equipment hour quantities required for the project. Material, labor and equipment unit costs are then applied to the quantities as developed in the quantity survey. Apply amounts for overhead and profit in the final summaries.

CONSISTENCY

- CSI
- Uniformat

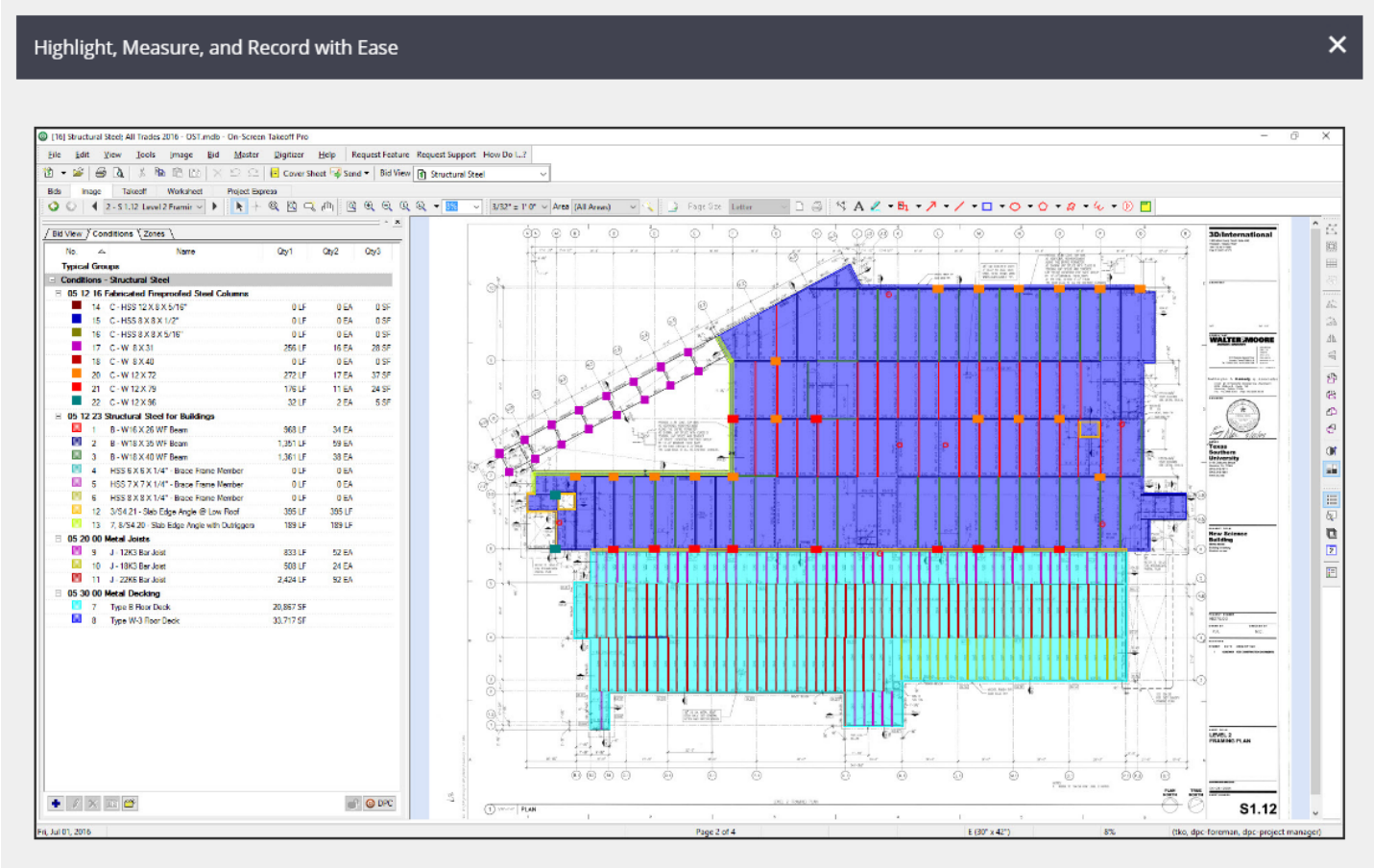
CSI Component Description	CSI DIVISION	Uniformat II Division	Uniformat II Building Component
Foundations Performance Requirements	01 82 13	A10	Foundations
Basement Construction Performance Requirements	01 82 16	A20	Basement Construction
Basement Construction Performance Requirements	01 82 16	B10	Superstructure
Vertical Exterior Enclosure Performance Requirements	01 83 16	B20	Exterior Closure
Horizontal Exterior Enclosure Performance Requirements	01 83 16	B30	Roofing

Consistency

Use methods for quantity surveys that are in logical order and consistent with the CSI numbering system. These methods also must meet the specific need of the company or client. Use of consistent methods allows several estimators to complete various parts of the quantity survey. Combine these surveys into the final account summaries. These methods also permit a second estimator to continue the quantity survey from any point where the first estimator stopped.

VERIFICATION

- **Survey logic must be transparently accurate**



On Center SOFTWARE

Verification

The methods and logic employed in the quantity survey must be in a form which can provide a method of proof of the accuracy of any portion of the survey.

DOCUMENTATION

- Neat work is:
  - Defendable
  - Reusable
  - Retractable (show an error = get out of bad bid)

Documentation

Document all portions of the estimate in a logical, consistent, and legible manner. Estimators and other personnel may need to review the original estimate when the specific details are vague. The documentation must be clear and logical or it will be of little value to the reader. Such instances may occur in change order preparation, settlement of claims, and review of past estimates as preparation for new estimates on similar projects.

EVALUATION

- Using Subs?
  - Check scope coverage
  - Verify performance
  - Determine competence

Evaluation

When the estimate involves the use of bids from subcontractors, check the bids for scope and responsiveness to the project. Investigate the past performance records of subcontractors submitting bids. Determine the level of competence and quality of performance.

LABOR HOURS

- Cost:
  - Base rate + fringes +
  - workers comp +
  - Overhead +
  - Profit
- Quantity:
  - Based on accuracy of schedule
  - Production rate of crews
- Use ASPE method during exams (see q.11) (see handout)

Labor Hours

The detailed application of labor hours to a quantity survey is primary in governing the accuracy and sufficiency of an estimate. The accuracy of project schedules and work force requirements are dependent on the definition of man hours. The combined costs for worker's compensation, unemployment insurance and social security taxes are significant factors in project costs. The most accurate method for including these costs is to define labor hours and wage rates, then apply percentages to the labor costs.

VALUE ENGINEERING (VE)

- VE options could cost more or less
- Uniformat classification system is beneficial for developing alternative methods

Level I	Level II	Level III
A Substructure	A10 Foundations	A1010 Standard Foundations
		A1020 Special Foundations
		A1030 Slab on Grade
	A20 Basement Construction	A2010 Basement Excavation
		A2020 Basement Walls
B Shell	B10 Superstructure	B1010 Floor Construction
		B1020 Roof Construction
	B20 Exterior Enclosure	B2010 Exterior Walls
		B2020 Exterior Windows
		B2030 Exterior Doors
	B30 Roofing	B3010 Roof Coverings
		B3020 Roof Openings
C Interiors	C10 Interior Construction	C1010 Partitions
		C1020 Interior Doors
		C1030 Fittings
	C20 Stairs	C2010 Stair Construction
		C2020 Stair Finishes
	C30 Interior Finishes	C3010 Wall Finishes
		C3020 Floor Finishes
		C3030 Ceiling Finishes
D Services	D10 Conveying	D1010 Elevators & Lifts
		D1020 Escalators & Moving Walks
		D1090 Other Conveying Systems
	D20 Plumbing	D2010 Plumbing Fixtures
		D2020 Domestic Water Distribution
		D2030 Sanitary Waste
		D2040 Rain Water Drainage
		D2090 Other Plumbing Systems
	D30 HVAC	D3010 Energy Supply
		D3020 Heat Generating Systems
		D3030 Cooling Generating Systems
		D3040 Distribution Systems
		D3050 Terminal & Package Units

Value Engineering

Structure the estimate to aid in researching and developing alternative construction methods resulting in cost optimization. Using the same levels of detail in value engineering as in the base estimate is important. This provides a more precise comparison of costs for proposed alternate methods.

- **Final summaries provide methods for calculating indirect costs.**

- **Project scope governs the cost of overhead (ins., home office, admin)**

Final Summaries

Provide methods for listing and calculating indirect costs. Project scope governs the costs of overhead items such as insurance, home office plant, and administrative personnel. Determine these costs in a manner consistent with quantity survey applications. Consider company work in progress that may have a bearing on projected overhead costs. Each bidder must determine amounts for performance bonding, profits, reserve funds, and shareholder returns.

ANALYSIS

- Develop a method to gauge if estimate is in the ballpark.
  - If not, why?
- Develop a method for post-bid analysis
  - Why did we not win bid?

Analysis

Develop methods for analyzing completed estimates to find out if they are reasonable. When the estimate is beyond the normal range of costs for similar projects, research the detail and determine causes or possible errors. Develop methods of analysis of post-bid estimates to find the reasons for the lack of success in the bidding process. Calculate the variation of the estimate from the low bid and low average bids. Determine from outside sources if there were subcontract or material bids provided only to other bidders. Determine if the low bidder may have made an omission in the estimate. Properly document this information for future use and guidance.

ANALYSIS

- **Comps as estimate gut-check**

		Comparative Project		
		#1	#2	#3
COMPARABLE PROJECT				
a.	Project title:	Norfolk Hall	Arlington Hall	Roanoke Hall
b.	Owner:	ABC College	XYZ College	123 College
c.	Project location:	Norfolk	Arlington	Roanoke
d.	Construction contract award date:	1/1/05	2/1/06	3/1/09
COMPARABLE PROJECT SCOPE				
e.	Gross area (GSF):	80,000	95,000	72,000
f.	Key quantity (i.e.; # of beds, cells, spaces, etc.):	1	1	1
g.	Comments:			
COMPARABLE PROJECT COST (or Database average)				
	VBCCD (database)	Enter total amount	Enter total amount	Enter total amount
h.	Total construction contract award amount:	$16,000,000	$21,200,000	$17,500,000
i.	Sitework & utilities amount (if not included above):	$1,600,000	$2,350,000	$2,800,000
j.	Subtotal per GSF:	$220.00	$247.89	$281.94
BRING COMP TO NEW LOCATION AND CURRENT DATE				
k.	HCI for comp (see tab):	124.4	146.2	155.6
l.	Subtotal per GSF, adjusted for escalation and location to today:	$311.96	$299.10	$319.63
MODIFICATIONS TO COMPARABLE PROJECT PER GSF				
Itemize modifications (plus or minus) to the comparative project's sitework, utilities, or building construction cost to make it comparable in scope, complexity, etc. to the proposed project.				
	Description:	Enter amount per GSF	Enter amount per GSF	Enter amount per GSF
m1.	Modification #1:	Add backup generator	$1.25	$1.25	included in this comp
m2.	Modification #2:				
m3.	Modification #3:				
m4.	Modification #4:				
SUB-TOTAL OF COMP WITH MODIFICATIONS, NEW LOCATION, AND CU		$313.21	$300.35	$319.63
ESCALATION OF COMP AND MODIFICATIONS				
n.	Escalation (per GSF) to bid date:	$2.67	$2.56	$2.73
o.	Escalation (per GSF) to mid-construction:	$12.15	$11.65	$12.40
TOTALS				
p.	Total comparative cost per GSF at bid date:	$315.89	$302.92	$322.36
q.	Average of all comps per GSF to bid date:	**$313.72**		

CONVERSION

- How to convert the estimate to field cost systems
- Frequent reports = more accurate production rates

Conversion

Show estimating procedures that allow conversion of the estimate to field cost systems where management can monitor and control field activities. These procedures include methods of reporting field costs for problem areas. Make reports daily or weekly rather than at some point in time after the project is complete. Field cost reporting, when consistent with estimating procedures, enables estimators to apply the knowledge gained from these historical costs to future estimates. Help train field personnel in labor hour and cost reporting that provide the level of accuracy required.

CHANGE ORDERS

- Labor & Material
  - Quantities
  - Costs
- Define overhead, profit, taxes, bonds

Change Orders

Apply the highest level of detail from information provided or available to the estimator. State quantities and costs for all material, labor, equipment and subcontract items of work. Define amount for overhead, profit, taxes, and bond. Specific itemization of change order proposals is essential in allowing the client to determine acceptability. Upon approval, use the estimate detail as the definition of the scope of the change order.

CHANGE ORDERS

- More detail = more supportable

GENERAL CONTRACTOR ESTIMATE FOR CHANGE ORDER

DGS-30-200
(Rev. 03/16)

GC-1

Project Code: _____ **General Contractor:** _____
Agency: _____ **Change Description:** _____
Project: _____

GENERAL CONTRACTOR DIRECT COSTS

Scope Description		Direct Labor				Direct Material				Direct Equipment			
Item No.	Description	Direct Labor Hours	Labor Units (Manhours, Crew Hours)	Hourly Wage Rate, Excl. Taxes & Ins.	Total Labor Cost	Quantity	Qty Units	Material Cost Per Unit	Total Material Cost	Quantity	Qty Units	Equipment Cost Per Unit	Total Equipment Cost
A	B	C	D	E	F=C x E	G	H	I	J=G x I	K	L	M	N=K x M
1.01					$0.00	1.00		$100.00	$100.00				$0.00
1.02					$0.00				$0.00				$0.00
1.03					$0.00				$0.00				$0.00
1.04					$0.00				$0.00				$0.00
1.05					$0.00				$0.00				$0.00
1.06					$0.00				$0.00				$0.00
1.07					$0.00				$0.00				$0.00
1.08					$0.00				$0.00				$0.00
1.09	Subtotal from Estimate Continuation Sheets				$0.00				$0.00				$0.00
1.97	Subtotal (S/T) Direct Costs:			Subtotal Labor	$0.00			Subtotal Material	$100.00			Subtotal Equipment	$0.00
1.98	Taxes/Insurance: FICA, FUI, SUI, & Workmens' Comp.			% of Labor	$0.00			Sales Tax 0.0%				Sales Tax	
1.99	Total Direct Costs			Total Labor	$0.00			Total Material	$100.00			Total Equipment	$0.00

SUBCONTRACT COSTS

Item No.	Subcontractor Name (List totals from attached SC-1 forms)	Total Cost
A	B	C
2.01		
2.02		
2.03		
2.04		
2.05		
2.06		
2.07		
2.08		
2.09		
2.99	**Total Subcontract Costs**	$0.00

SUMMARY

Item No.	Description		Total Cost
3.01	Total Direct Labor Cost	Item 1.99H	$0.00
3.02	Total Direct Material Cost	Item 1.99J	$100.00
3.03	Total Equipment Cost	Item 1.99L	$0.00
3.04	Subtotal	3.01+3.02+3.03	$100.00
3.05	Overhead and Profit* (%)		$0.00
3.06	Subtotal	3.04+3.05	$100.00
3.07	Subcontractor Cost	Item 2.99	$0.00
3.08	GC Markup on Subcontractors** (%)		$0.00
3.09	Subtotal	3.06+3.07+3.08	$100.00
3.10	Additional Bond Cost		
3.99	**Total Change Order Cost**	(3.09+3.10)	$100.00

Name: _____

Signature: _____

Title: _____

Date: _____

I have reviewed the costs proposed and find them to be reasonable (as proposed) (as marked).

A/E Signature: _____

Note: Mark-up is capped in conformance with the provisions of the General Conditions (CO-7).
*Limited to 15% on self-performed work.
**Limited to a total of 10%, shared (cumulative total) if multiple tier subs, on subcontracted work. See Mark-up limitations for a more detailed description.

CHANGE ORDERS

- **More detail = more supportable**

DGS-30-012
(Rev. 07/15)

CO-2.3
Sheet 3

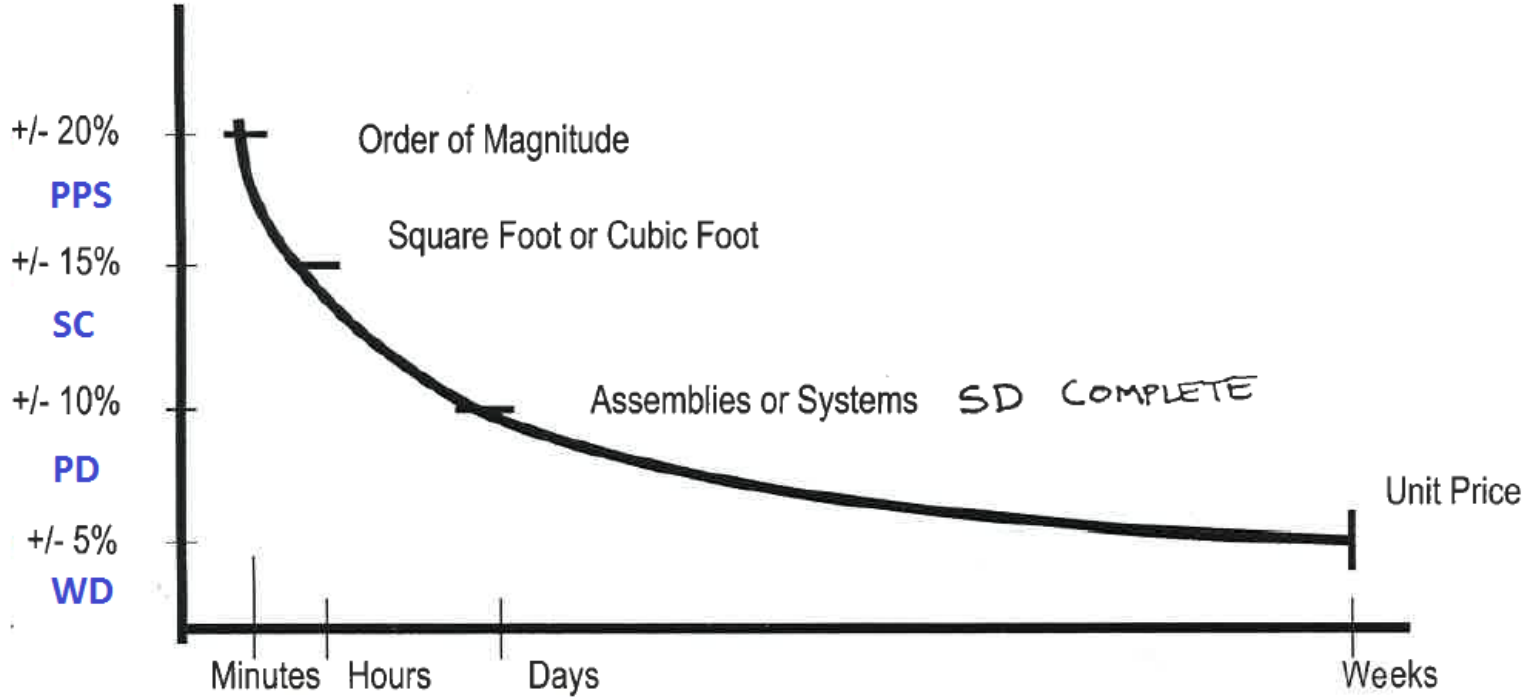
A/E FEE PROPOSAL WORKSHEET

PART E - ADDITIONAL SERVICES

1. SITE INVESTIGATION:

							SUB-CONTRACT COST		SUB-CONTRACT MARKUP	TOTAL COST
A. SUB-SOIL STUDIES:										
(1) BORINGS		LINEAL FT @	$		PER LF =		$0	x	1.10	$0
(2) MOBILIZATION								x	1.10	$0
(3) REPORT AT	$		+TESTING @	$		=	$0	x	1.10	$0
B. SURVEYS:										
(1) FIELD DATA(party rate)		DAYS @	$		PER DAY =		$0	x	1.10	$0
(2) DATA CONVERSION		HOURS @	$		PER HOUR=		$0	x	1.10	$0
(3) PLOT BASE SHEETS		HOURS @	$		PER HOUR=		$0	x	1.10	$0
C. FIELD INVESTIGATION:										
(1) PROFESSIONAL (A/E)		MAN-DAYS @	$		PER DAY =		$0	x	1.00	$0
(2) DRAFTSMAN (A/E)		MAN-DAYS @	$		PER DAY =		$0	x	1.00	$0
D. OTHER (Specify):										
A.								x	1.00	$0
B.								x	1.00	$0
C.								x	1.00	$0
D.								x	1.00	$0
E.								x	1.00	$0

Estimating Time vs. Accuracy



$2,000,000 Construction Project RSMeans

SECTION 2 — LEVELS OF THE ESTIMATE

INTRODUCTION

As a project is proposed and then developed, the estimate preparation and information will change based on the needs of the Owner/Client/Designer. These changes will require estimates to be prepared at different levels during the design with varying degrees of information provided. It should also be noted that within each level of estimate preparation, not all portions of the design would be at the same level of completeness. For example the architectural design is at 80% or 90% complete while the mechanical design is only at 50% complete. This is common through design process, but should be noted in the estimate narrative.

LEVELS OF ESTIMATE

- **Percent complete:**
  - **Order of Magnitude: 10%**
  - **Schematic Design: 20%**
  - **Preliminary Design: 40%**
  - **Construction Documents: 100%**

The levels of the estimate correspond to the typical design process and are considered standards within the industry. These levels are as follows:

Order of Magnitude

Schematic/Conceptual Design

Design Development

Construction Document

Bid

OME -1: 7 Categories + GC, O'H&P

DESCRIPTION*				COST			Comments
UNIFORMAT CATEGORY / SQ. FT. >	NEW 50,000	RENOVATION 50,000	Extent	Original Cost	Cost Adjustments	Adjusted Total Cost	
Building							
A Substructure	Spread Footings			$252,500		$252,500	
	Piles				$600,000	$600,000	
		Helical Piles			$50,000	$50,000	
						$0	
B Shell	Brick			$1,382,000		$1,382,000	
		Brick	Ren - M	$862,400		$862,400	
						$0	
						$0	
C Interiors	Standard Grade			$1,910,500		$1,910,500	
		Standard Grade	Ren - H	$1,763,000		$1,763,000	
						$0	
						$0	
D Services	Chiller(s)/Boilers			$4,942,000		$4,942,000	
		Chiller(s)/Boilers	Ren - H	$3,650,000		$3,650,000	
						$0	
						$0	
E Equipment & Furnishings				$0		$0	
						$0	
						$0	
						$0	
F Special Construction & Demolition		Demolition	Ren - H	$150,000		$150,000	
						$0	
						$0	
Site							
G. Sitework & Utilities	Sitework & Utilities			$700,000		$700,000	
		Utilities		$150,000		$150,000	
						$0	
Soil Conditions		Other – See Comments			$75,000	$75,000	Contaminated soil removal at SW corner of building
New Parking Spaces	100 Space Parking Lot			$300,000		$300,000	
Other Distinguishing Features						$0	
Z Gen'l. Cond. / OH&P (if not already included in the categories above):				$1,773,000		$1,773,000	
(Z) The last entry above is not part of the referenced ASTM Uniformat II classification standard.				**Total**		**$18,560,400**	
						$185.60 PSF	

The levels of the estimate correspond to the typical design process and are considered standards within the industry. These levels are as follows:

Order of Magnitude

Schematic/Conceptual Design

Design Development

Construction Document

Bid

OME -2: 22 Categories + GC, O'H&P

UNIFORMAT CATEGORY	DESCRIPTION* NEW (SQ. FT. > 50,000)	RENOVATION (50,000)	Extent	COST Original Cost	Cost Adjustments	Adjusted Total Cost	Comments
Building							
A Substructure							
A10 Foundations	Spread Footings			$166,000		$166,000	
	Piles				$600,000	$600,000	
		Helical Piles	New		$50,000	$50,000	
A20 Basement Construction	Concrete Walls			$86,500		$86,500	
						$0	
						$0	
B Shell							
B10 Superstructure	Steel Frame			$674,000		$674,000	
		Steel Frame		$50,000		$50,000	
						$0	
B20 Exterior Enclosure	Brick			$558,500		$558,500	
		Brick	Ren - M	$662,900		$662,900	Clean/Re-point Brick/Replace Windows
						$0	
B30 Roofing	Single Ply Memebrane			$149,500		$149,500	
		Single Ply Memebrane	New	$149,500		$149,500	
						$0	
C Interiors							
C10 Interior Construction	Standard Grade			$971,500		$971,500	
		Standard Grade	Ren - H	$971,500		$971,500	
						$0	
C20 Stairs	Standard Grade			$172,500		$172,500	
		Standard Grade	Ren - L	$25,000		$25,000	
						$0	
C30 Interior Finishes	Standard Grade			$766,500		$766,500	
		Standard Grade	Ren - H	$766,500		$766,500	
						$0	
D Services							
D10 Conveying	Holed Hydraulic			$167,000		$167,000	
		Holed Hydraulic	Ren - M	$75,000		$75,000	Upgrade existing elevators
						$0	
D20 Plumbing	Low Flow Fixtures			$1,108,500		$1,108,500	
		Low Flow Fixtures	Ren -	$500		$500	

PRELIMINARY ESTIMATE: Summary

	Summary	Sub-Total	Cost/gsf	Design Contingency	Escalation	General Conditions	Bonds & Insurances	GC OH & P	Total	% of Building Costs
				6.00%	5.41%	10.00%	1.50%	8.00%		
A10	Foundation	$170,287	$8.15	$10,217	$9,765	$19,027	$3,139	$16,995	**$229,431**	2.6%
A20	Basement Construction	$0	$0.00	$0	$0	$0	$0	$0	**$0**	0.0%
B10	Superstructure	$622,848	$29.82	$37,371	$35,718	$69,594	$11,483	$62,161	**$839,174**	9.3%
B20	Exterior Enclosure	$732,746	$35.08	$43,965	$42,020	$81,873	$13,509	$73,129	**$987,242**	11.0%
B30	Roofing	$358,764	$17.17	$21,526	$20,574	$40,086	$6,614	$35,805	**$483,369**	5.4%
C10	Interior Walls	$569,687	$27.27	$34,181	$32,669	$63,654	$10,503	$56,856	**$767,550**	8.6%
C20	Stairs	$78,800	$3.77	$4,728	$4,519	$8,805	$1,453	$7,864	**$106,169**	1.2%
C30	Interior Finishes	$619,428	$29.65	$37,166	$35,522	$69,212	$11,420	$61,820	**$834,567**	9.3%
D10	Conveying	$80,000	$3.83	$4,800	$4,588	$8,939	$1,475	$7,984	**$107,785**	1.2%
D20	Plumbing (Domestic)	$165,112	$7.90	$9,907	$9,468	$18,449	$3,044	$16,478	**$222,458**	2.5%
D30	HVAC System	$1,130,123	$54.10	$67,807	$64,808	$126,274	$20,835	$112,788	**$1,522,636**	17.0%
D40	Fire Protection	$104,445	$5.00	$6,267	$5,990	$11,670	$1,926	$10,424	**$140,721**	1.6%
D50	Power	$547,851	$26.23	$32,871	$31,417	$61,214	$10,100	$54,676	**$738,130**	8.2%
E10	Built In Equipment	$47,668	$2.28	$2,860	$2,734	$5,326	$879	$4,757	**$64,224**	0.7%
E20	Furnishings	$0	$0.00	$0	$0	$0	$0	$0	**$0**	0.0%
F10	Special Construction	$30,000	$1.44	$1,800	$1,720	$3,352	$553	$2,994	**$40,420**	0.5%
F20	Selective Building Demolition	$0	$0.00	$0	$0	$0	$0	$0	**$0**	0.0%
G10	Site Preparation	$386,800	$18.52	$23,208	$22,181	$43,219	$7,131	$38,603	**$521,143**	5.8%
G20	Site Improvements	$464,593	$22.24	$27,876	$26,643	$51,911	$8,565	$46,367	**$625,955**	7.0%
G30	Ext. Mechanical Distribution	$285,599	$13.67	$17,136	$16,378	$31,911	$5,265	$28,503	**$384,793**	4.3%
G40	Ext. Electrical Distribution	$267,850	$12.82	$16,071	$15,360	$29,928	$4,938	$26,732	**$360,879**	4.0%
	Total Construction Cost	**$6,662,601**	**$318.95**	**$399,756**	**$382,074**	**$744,443**	**$122,833**	**$664,937**	**$8,976,644**	100.0%

*** Additive Bid Items Are Not Included In BCOM Sheets**

Additive Bid Item #1, Slate Roof	**$242,715**

*** Audio/Video Numbers Are Not Included In BCOM Sheets, And Do Not Represent Any GC Markups**

Audio/Video System, Presentation Room	$33,125
Audio/Video System, Small Presentation Room	$36,922
Audio/Video System, Options V2, V3	$130,500
Audio/Video System, Options A1, A2	$17,924
Total A/V System	**$218,471**

PRELIMINARY ESTIMATE: Backup Detail

Description		Quantity	Unit	Rate	Cost	Subtotal	Total
A10 Foundation:							
Below Grade CMU Foundation Walls:							
	CMU 8"	920	sf	$16.00	$14,720		
	CMU 10"	806	sf	$18.00	$14,508		
						$29,228	
Column Footings (38 ea, 4'6"w x 4'6"w x 1'-h):							
	excavation	128	cyd	$30.00	$3,840		
	forms	684	sf	$6.00	$4,104		
	reinforcement	1,783	lbs	$1.00	$1,783		
	concrete	32	cyd	$230.00	$7,360		
						$17,087	
Column Piers (38 ea, 2'w x 2'w x 2'-h):							
	forms	608	sf	$6.00	$3,648		
	reinforcement	855	lbs	$1.00	$855		
	concrete	13	cyd	$230.00	$2,990		
						$7,493	

PRELIMINARY ESTIMATE: Notes, exclusions, disclaimers

Preliminary Design Cost Estimate

Notes

The following cost assessment for the new Admissions Building at _____ University has been developed from the PDF drawings and narrative dated October 30, 2015.

This proposed project is a 2-story (above grade) steel frame and masonry building. The exterior walls will be brick with PVC trim. There are full interior finishes and MEP.

The level of pricing of these cost assessments is representative of current day costs of construction (plus escalation) in the _____, VA metropolitan area, assuming that the project will be procured in a competitive bid environment with a minimum of four responsive bidders.

This cost estimate has been developed for comparative purposes ONLY and measurements are based on approximate quantity surveys as detailed as possible relative to the level of design and available documentation. Where quantities are not available, assumptions have been made on historical references to similar type projects recently estimated by _____

It should also be noted that this cost estimate is an opinion of probable costs based on fair market value, and is not a prediction of the anticipated low bid. _____has no control over the costs of labor, material, the GC's or any subcontractor's method of determining price or competitive bidding and market conditions.

ORDER OF MAGINTUDE ESTIMATES

- For Budget Development
- Based on SF, Cars, Cells, etc.
- Allowance for sitework/specific conditions

ORDER OF MAGNITUDE

This level is usually prepared to develop a project budget and is based on historical information with adjustments made for specific project conditions. Budgets are based on costs per square foot, number of cars/rooms/seats, etc. Allowances must be made for site work and specific project conditions. Information required for this level is a project program and desired quality level from the Owner. Estimate contingency is generally highest at this level and may range between 20% to 50%.

SCHEMATIC DESIGN ESTIMATE

- High-level estimate reflects
  - Various designs
  - Various materials
- Uniformat is ideal as it is systems based

Level I	Level II	Level III
A Substructure	A10 Foundations	A1010 Standard Foundations
		A1020 Special Foundations
		A1030 Slab on Grade
	A20 Basement Construction	A2010 Basement Excavation
		A2020 Basement Walls
B Shell	B10 Superstructure	B1010 Floor Construction
		B1020 Roof Construction
	B20 Exterior Enclosure	B2010 Exterior Walls
		B2020 Exterior Windows
		B2030 Exterior Doors
	B30 Roofing	B3010 Roof Coverings
		B3020 Roof Openings
C Interiors	C10 Interior Construction	C1010 Partitions
		C1020 Interior Doors
		C1030 Fittings
	C20 Stairs	C2010 Stair Construction
		C2020 Stair Finishes
	C30 Interior Finishes	C3010 Wall Finishes
		C3020 Floor Finishes
		C3030 Ceiling Finishes
D Services	D10 Conveying	D1010 Elevators & Lifts
		D1020 Escalators & Moving Walks
		D1090 Other Conveying Systems
	D20 Plumbing	D2010 Plumbing Fixtures
		D2020 Domestic Water Distribution
		D2030 Sanitary Waste
		D2040 Rain Water Drainage
		D2090 Other Plumbing Systems
	D30 HVAC	D3010 Energy Supply
		D3020 Heat Generating Systems
		D3030 Cooling Generating Systems
		D3040 Distribution Systems

SCHEMATIC/CONCEPTUAL DESIGN

This level is used to price various schemes as the project design develops. It may be used to price various design schemes in order to see which scheme fits the budget best or it may be used to price various materials or methods for comparison. The ultimate goal at the end of schematic design is to have a design scheme, program and estimate that are all within the budget. This estimate is often prepared in UniFormat versus MasterFormat. This allows the design team to easily and quickly evaluate systems and make informed decisions required to progress design. Information required for this level includes schematic drawings, sketches, renderings, diagrams, conceptual plans, elevations, sections and preliminary project descriptions. The estimate contingency for this level may vary from 20% to 30%.

DESIGN DEVELOPMENT ESTIMATE

- Used to verify budget conformance
- Based on final materials selected
- Based on plans, elevations, typical details

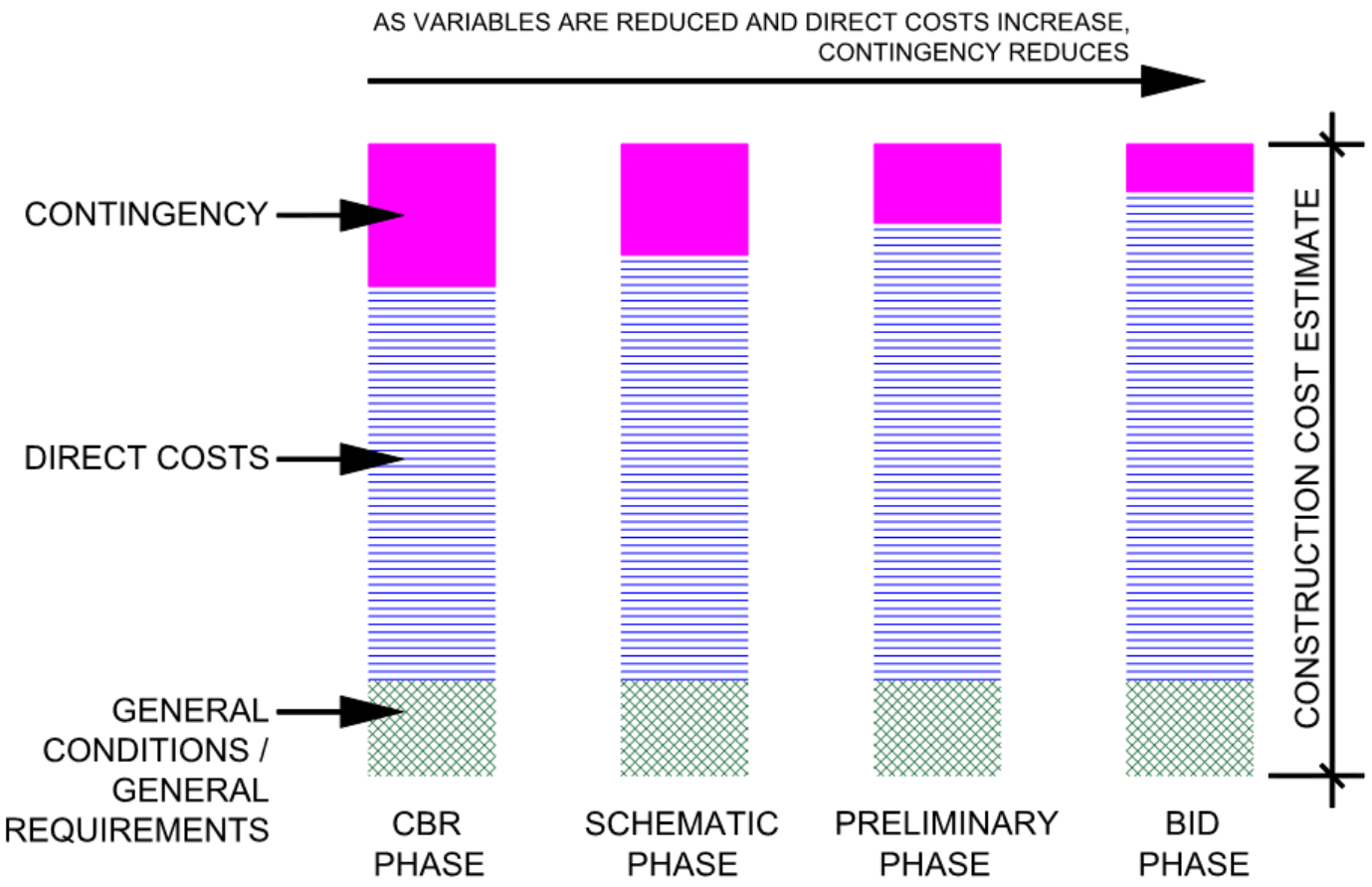
DESIGN DEVELOPMENT

Estimates prepared at this level are used to verify budget conformance as the scope and design is finalized and final materials are selected. Information required for this level includes drawings showing plans, elevations, typical details, engineering design criteria, equipment layouts and detailed outline specifications. The estimate contingency at this level may vary between 15% to 25%.

CONTINGENCY

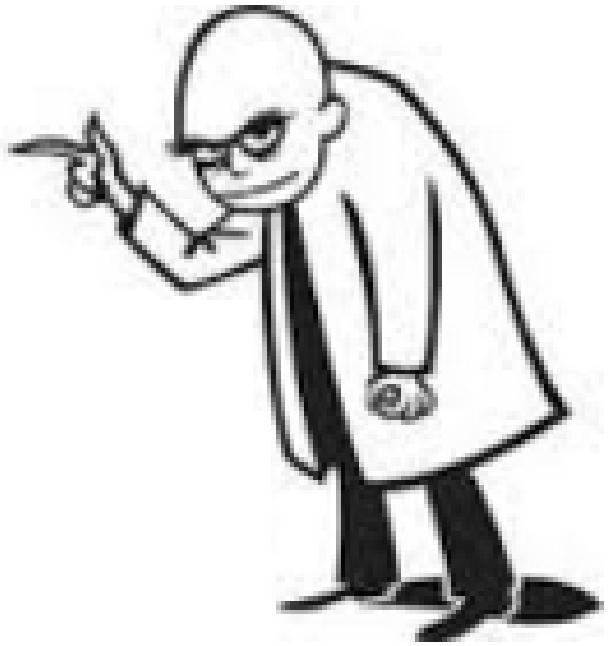
- **Reduces as design develops**

BUDGET DEVELOPMENT DIAGRAM



CONSTRUCTION DOCUMENT ESTIMATE

- Used to verify details for completed details
- Evaluate subcontractor pricing during bid phase
- Identify design creep



CONSTRUCTION DOCUMENT

This level is used to verify pricing as details are completed and design is modified and completed, and to be aware of and identify "design creep" during the completion of the design. This final construction document estimate can be used to evaluate the subcontract pricing during the bid phase. Information required for this level includes detailed drawings showing plans, elevations, sections, details, schedules, specifications and bidding criteria. The estimate contingency at this level may vary between 5% to 10%.

BID LEVEL ESTIMATE

- For submittal to owner
- Design-Bid-Build delivery system
- Based on completed documents

BID

The purpose of this level estimate is to develop probable costs in the preparation and submittal of bids for contract with an Owner. The estimate contingency at this level may vary between 0% to 5%.

In the typical "design/bid/build" delivery system, this would be with "completed" documents. In other delivery systems becoming widely used (i.e., design/build or guaranteed maximum price), the bid could actually be prepared at a previous level. If this is the case, estimates are prepared as previously described along with progressive estimates as the design is completed. It should be stressed that when preparing a bid at a prior estimate level, it is very important to have a complete and thorough "Scope of Estimate".

It should be noted that it is always good practice to review and evaluate the final cost versus the bid; however, this (final cost) is not another level of estimate, and is a cost control issue rather than an estimate.

Order of Magnitude

Prepare this level of estimate with information derived from an outline of the proposed project. The outline should provide the following information:

- ✓ General description
- ✓ Geographic location
- ✓ Quality
- ✓ Layout
- ✓ Size
- ✓ Intended use

For process areas include the following information:

- ✓ Product capacity
- ✓ Handling requirements
- ✓ Materials
- ✓ Services requirements
- ✓ Raw materials
- ✓ Process layout
- ✓ Utility requirements
- ✓ Storage required
- ✓ Flow diagrams

The purpose of this estimate level is for budgetary and feasibility determinations.

Design Development

Prepare this level estimate from no less than 25% complete preliminary design drawings and draft specifications. Information provided should include:

- ✓ General site description
- ✓ Preliminary structural design
- ✓ Site dimensions
- ✓ Elevations
- ✓ Roads
- ✓ Preliminary building equipment plans
- ✓ Impounds & fences
- ✓ Preliminary finish & door schedules
- ✓ Soil bearing condition
- ✓ General arrangements
- ✓ Preliminary plumbing drawings
- ✓ Foundation sketches
- ✓ Preliminary mechanical drawings
- ✓ Architectural construction
- ✓ Preliminary electrical drawings
- ✓ Preliminary mechanical & electrical equipment schedules

Construction Documents

Prepare this level estimate from no less than 90% complete design drawings and specifications. Use criteria provided for lower estimates with the exception of:

- ✓ Outline design
- ✓ Draft specifications
- ✓ Outline specifications
- ✓ Partial design drawings
- ✓ Preliminary design drawings

Additionally, use the following fully developed and engineered data:

- ✓ Site plans
- ✓ Detail drawings
- ✓ Topographical maps
- ✓ Building equipment
- ✓ Plumbing/mechanical/electrical drawings
- ✓ General arrangements
- ✓ Elevations
- ✓ Soil bearing reports

Bid

Prepare this level estimate for both plant and process area from complete design drawings, specifications, and bid documents.

The purpose of this level estimate is to show probable costs in the preparation and submittal of bids for contracts with an owner.

Various types of contracts are:

- ✓ Stipulated sum
- ✓ Lump sum unit price
- ✓ Cost plus a fee
- ✓ Military HERC
- ✓ 8a Small Business
- ✓ Turn key
- ✓ Design - build
- ✓ Cost plus a fee with a guaranteed maximum price (GMP)

The transfer of estimate information to field cost control systems provide management the opportunity to closely monitor and control construction costs as they occur. Computer estimating and cost control programs, whether industry specific or general spreadsheet type, are especially valuable for rapid and efficient generation of both the estimate and actual construction cost information. There are software programs which integrate schedules, cost controls and estimates.

SCOPE OF ESTIMATE

- SF
- Beds
- Parking spaces
- Prison cells
- Gallons
- MBPH
- Other

SECTION 3 – SCOPE OF ESTIMATE

Prepare all estimates in an expert and adept manner. This is consistent with standards normally expected of the estimating community.

Estimators are responsible for the quality, accuracy, and timely completion of their product.

Estimators shall follow the Code of Ethics of this Society. Private information given to the estimator shall remain private.

CLASSIFICATION SYSTEMS

CSI Component Description	CSI DIVISION	Uniformat II Division	Uniformat II Building Component
Foundations Performance Requirements	01 82 13	A10	Foundations
Basement Construction Performance Requirements	01 82 16	A20	Basement Construction
Basement Construction Performance Requirements	01 82 16	B10	Superstructure
Vertical Exterior Enclosure Performance Requirements	01 83 16	B20	Exterior Closure
Horizontal Exterior Enclosure Performance Requirements	01 83 16	B30	Roofing
Interior Construction Performance Requirements	01 84 13	C10	Interior Construction
Interior Finishes Performance Requirements	01 84 19	C20	Interior Finishes
Stair Finish Performance Requirements	01 84 19	C20	Staircases
Conveying Equipment Performance	01 85 00	D10	Conveying Systems
Fire Suppression Performance Requirements	01 86 13	D40	Fire Protection
Plumbing Performance Requirements	01 86 16	D20	Plumbiing
HVAC Performance Requirements	01 86 19	D30	HVAC

Prepare all estimates with the Construction Specification Institute Numbering System. When estimating defined areas, use the CSI Format in each area. Defined areas are specific areas of the project needing their own estimate. System estimate, work breakdown structure, or special division of work are other names for defined area.

BASIS OF ESTIMATES

- **Material / Labor hours / Equipment cost:**
  - **Used whenever possible**
- **Square foot:**
  - **Insufficient design info**
- **Allowances:**
  - **No info available but experience**

Base estimates on the highest level of detail available from design information. Whenever possible, create estimates on a "quantity times material, labor hours, and equipment cost" format. Use square foot costs or cubic foot costs only when design information is not sufficient to provide a detailed estimate.

NARRATIVE OF LEVEL OF ESTIMATE

- Define level of accuracy
- Note what sections of the estimate have different levels

HEATING, VENTILATING AND AIR CONDITIONING

A. Design Conditions:

1. Design Criteria: The systems design will be in accordance with the Virginia Rehabilitation Code, 2012 edition and applicable codes, and the Commonwealth of Virginia Construction and Professional Services Manual (CPSM 2016 edition, rev 0 – April 20, 2016).

2. Design conditions: Lorton, VA (Washington National Airport)

		Summer	Winter
Indoor, General	Temperature	75 °F	70 °F
	Humidity	50 %RH	35 %RH
Outdoor		95 $°F_{db}$, 76 $°F_{wb}$	17 $°F_{db}$

3. Building heating / cooling loads and energy modeling will be analyzed using the Trane Trace Load Analysis program.

B. Heating, Ventilation and Air Conditioning (HVAC):

1. The scope of work consists of replacing the 1970's building HVAC systems with new energy efficient equipment with updated controls and capabilities to properly condition and maintain the public exhibit areas. The existing HVAC systems consist of split-system direct expansion (DX) cooling units with interior air handling units (AHU) with electric or hot water heating coils. The units are provided with duct mounted residential grade humidifiers to maintain minimum space humidity temperatures within the exhibit areas. Several AHUs have been replaced and/or rebuilt during a 1996 maintenance project and other components have been replaced as needed. The overall systems are past their ASHRAE life expectancy and should be replaced to ensure proper operation and indoor thermal conditioning is maintained. Refer to below for a description of existing systems and units.

   a. An existing electric boiler (180 kW input rating) provides hot water to the AHU's equipped with hot-water heating coils as well as a few small general purpose hot water cabinet unit and terminal heaters. The boiler is located in the main lower level mechanical room below the kitchen area. The boiler was installed in 1996 and provides six (6) stages of capacity control at 30 kW input ratings each. The boiler is in good operating condition and shall be remain

Estimators shall provide a narrative of the level and scope of the estimate. Define the level of the estimate according to Part One, Section Two of this manual. Separately, specify sections of work with different levels of design development. This explains the relative percentages of the data available and is valuable for calculating the range of accuracy or estimate contingency.

NARRATIVE OF LEVEL OF ESTIMATE

The narrative should include the following information:

- ✓ Plans & specifications received
- ✓ Project type
- ✓ Project address
- ✓ Addenda issued
- ✓ Legal description
- ✓ Project description
- ✓ Basis of Contingency
- ✓ Owner name & address
- ✓ Estimate assumptions
- ✓ Estimate due date/time
- ✓ Project quality & size
- ✓ Designer name & address
- ✓ Project labor type
- ✓ Risk Factors

This information helps in the development of historical cost estimate systems.

ITEM OR DESCRIPTION			MATERIAL		LABOR				EQUIPMENT		SUB		TOTAL
DESCRIPTION	QUANTITY	UNIT	UNIT $	COST	HR/UNIT	HOURS	UNIT $	COST	UNIT $	COST	UNIT $	COST	COST
A	B	C	D	E	F	G	H	I	J	K	L	M	N
			E / B	B x D	G / B	B x F	I / B	H X B	K / B	J x B	M / B	L x B	M+K+I+E
FLATS	816.0	SF	$0.50	$408	0.0100	8.16	0.27	220		0.0		0	628
WINDOW TRIM	96.0	LF	$0.65	$62	0.0400	3.84	0.80	77		0.0		0	139
CORNICE	24.0	LF	$1.20	$29	0.0400	0.96	0.80	19		0.0		0	48
CORNICE	24.0	LF	$0.65	$16	0.0400	0.96	0.80	19		0.0		0	35
FLATS	816.0	SF	$0.25	$204	0.0200	16.32	0.40	326		0.0		0	530
WRAPS	96.0	LF	$0.25	$24	0.0400	3.84	0.80	77		0.0		0	101
CORNICE	24.0	LF	$0.25	$6	0.0400	0.96	0.80	19		0.0		0	25
MESH	816.0	LF	$0.18	$147		0.00		0		0.0		0	147
FLATS	816.0	SF	$0.35	$286	0.0400	32.64	0.80	653		0.0		0	938
WRAPS	96.0	LF	$0.35	$34	0.0800	7.68	1.60	154		0.0		0	187
COMIC	24.0	LF	$0.35	$8	0.0800	1.92	1.60	38		0.0		0	47
				$0		0.00		0		0.0		0	0
SCAFFOLD	3.0	TIERS		$0	6.0000	18.00	120.00	360		0.0		0	360
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
SUBTOTALS				$1,223		95.3		1,963		0.0		0	3,186
LABOR BURDEN ON LABOR	50.0%	%						981					981
SMALL TOOLS	5.0%	%						98					98
TOTAL DIRECT COST								3,042		0.0		0	4,265
OVERHEAD	10.0%	%											427
PROFIT	5.0%	%										((dir. + ov.) x prof %)	235
INSURANCE & BOND	2.0%	%										((dir. + ov. + prof %) x bond %)	99
SALES TAX ON MATERIAL	6.0%	%											73
TOTAL COST													5,099

Prepare estimates in a form that other involved parties can readily understand. The quantity times material and labor hour costs format should contain the following components (read from left to right):

Work breakdown structure	CSI number	Description
Unit measure	Quantity	Material unit
Material costs	Labor hours	Cost per hour
Labor hours	Equipment hours	Cost per hour
Equipment hours	Subcontract	Total

ITEM OR DESCRIPTION			MATERIAL		LABOR				EQUIPMENT		SUB		TOTAL
DESCRIPTION	QUANTITY	UNIT	UNIT $	COST	HR/UNIT	HOURS	UNIT $	COST	UNIT $	COST	UNIT $	COST	COST
A	B	C	D	E	F	G	H	I	J	K	L	M	N
			E / B	B x D	G / B	B x F	I / B	H X B	K / B	J x B	M / B	L x B	M+K+I+E
FLATS	816.0	SF	$0.50	$408	0.0100	8.16	0.27	220		0.0		0	628
WINDOW TRIM	96.0	LF	$0.65	$62	0.0400	3.84	0.80	77		0.0		0	139
CORNICE	24.0	LF	$1.20	$29	0.0400	0.96	0.80	19		0.0		0	48
CORNICE	24.0	LF	$0.65	$16	0.0400	0.96	0.80	19		0.0		0	35
FLATS	816.0	SF	$0.25	$204	0.0200	16.32	0.40	326		0.0		0	530
WRAPS	96.0	LF	$0.25	$24	0.0400	3.84	0.80	77		0.0		0	101
CORNICE	24.0	LF	$0.25	$6	0.0400	0.96	0.80	19		0.0		0	25
MESH	816.0	LF	$0.18	$147		0.00		0		0.0		0	147
FLATS	816.0	SF	$0.35	$286	0.0400	32.64	0.80	653		0.0		0	938
WRAPS	96.0	LF	$0.35	$34	0.0800	7.68	1.60	154		0.0		0	187
COMIC	24.0	LF	$0.35	$8	0.0800	1.92	1.60	38		0.0		0	47
				$0		0.00		0		0.0		0	0
SCAFFOLD	3.0	TIERS		$0	6.0000	18.00	120.00	360		0.0		0	360
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
SUBTOTALS				$1,223		95.3		1,963		0.0		0	3,186
LABOR BURDEN ON LABOR	50.0%	%						981					981
SMALL TOOLS	5.0%	%						98					98
TOTAL DIRECT COST								3,042		0.0		0	4,265
OVERHEAD	10.0%	%											427
PROFIT	5.0%	%										((dir. + ov.) x prof %)	235
INSURANCE & BOND	2.0%	%										((dir. + ov. + prof %) x bond %)	99
SALES TAX ON MATERIAL	6.0%	%											73
TOTAL COST													5,099

Assemble the information in this form, from the quantity takeoff and extension detail. Direct labor burden is the combined cost for:

- ✓ Workers' compensation insurance
- ✓ Employer's liability insurance
- ✓ Company fringe benefits
- ✓ Union fringe benefits
- ✓ State/federal unemployment insurance
- ✓ Employer-paid social security tax
- ✓ Subsistence

ITEM OR DESCRIPTION			MATERIAL		LABOR				EQUIPMENT		SUB		TOTAL
DESCRIPTION	QUANTITY	UNIT	UNIT $	COST	HR/UNIT	HOURS	UNIT $	COST	UNIT $	COST	UNIT $	COST	COST
A	B	C	D	E	F	G	H	I	J	K	L	M	N
			E / B	B x D	G / B	B x F	I / B	H X B	K / B	J x B	M / B	L x B	M+K+I+E
FLATS	816.0	SF	$0.50	$408	0.0100	8.16	0.27	220		0.0		0	628
WINDOW TRIM	96.0	LF	$0.65	$62	0.0400	3.84	0.80	77		0.0		0	139
CORNICE	24.0	LF	$1.20	$29	0.0400	0.96	0.80	19		0.0		0	48
CORNICE	24.0	LF	$0.65	$16	0.0400	0.96	0.80	19		0.0		0	35
FLATS	816.0	SF	$0.25	$204	0.0200	16.32	0.40	326		0.0		0	530
WRAPS	96.0	LF	$0.25	$24	0.0400	3.84	0.80	77		0.0		0	101
CORNICE	24.0	LF	$0.25	$6	0.0400	0.96	0.80	19		0.0		0	25
MESH	816.0	LF	$0.18	$147		0.00		0		0.0		0	147
FLATS	816.0	SF	$0.35	$286	0.0400	32.64	0.80	653		0.0		0	938
WRAPS	96.0	LF	$0.35	$34	0.0800	7.68	1.60	154		0.0		0	187
COMIC	24.0	LF	$0.35	$8	0.0800	1.92	1.60	38		0.0		0	47
				$0		0.00		0		0.0		0	0
SCAFFOLD	3.0	TIERS		$0	6.0000	18.00	120.00	360		0.0		0	360
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
SUBTOTALS				$1,223		95.3		1,963		0.0		0	3,186
LABOR BURDEN ON LABOR	50.0%	%						981					981
SMALL TOOLS	5.0%	%						98					98
TOTAL DIRECT COST								3,042		0.0		0	4,265
OVERHEAD	10.0%	%											427
PROFIT	5.0%	%										((dir. + ov.) x prof %)	235
INSURANCE & BOND	2.0%	%										((dir. + ov. + prof %) x bond %)	99
SALES TAX ON MATERIAL	6.0%	%											73
TOTAL COST													5,099

Show labor burden as a separate direct field cost in each estimate. Calculate using the following method: Convert hourly costs for benefits or subsistence to a percentage. Add this to the other direct labor costs and determine the total percentage. This applies to each construction craft or trade, recognizing the variation in Worker's Compensation, fringe benefits, and subsistence. Apply this percentage to the labor cost for each division (section) of work. The percentage applied should reflect expected escalation.

General and supplemental conditions are the expected costs for:

- ✓ Construction/physical plant
- ✓ Miscellaneous expenditures
- ✓ Construction equipment
- ✓ Permits, fees
- ✓ Supervision
- ✓ Licenses, testing
- ✓ Supervision service equipment
- ✓ Field engineering
- ✓ Hot/Cold weather protection
- ✓ Other miscellaneous costs
- ✓ Small/hand power tools

ITEM OR DESCRIPTION			MATERIAL		LABOR				EQUIPMENT		SUB		TOTAL
DESCRIPTION	QUANTITY	UNIT	UNIT $	COST	HR/UNIT	HOURS	UNIT $	COST	UNIT $	COST	UNIT $	COST	COST
A	B	C	D	E	F	G	H	I	J	K	L	M	N
			E / B	B x D	G / B	B x F	I / B	H X B	K / B	J x B	M / B	L x B	M+K+I+E
FLATS	816.0	SF	$0.50	$408	0.0100	8.16	0.27	220		0.0		0	628
WINDOW TRIM	96.0	LF	$0.65	$62	0.0400	3.84	0.80	77		0.0		0	139
CORNICE	24.0	LF	$1.20	$29	0.0400	0.96	0.80	19		0.0		0	48
CORNICE	24.0	LF	$0.65	$16	0.0400	0.96	0.80	19		0.0		0	35
FLATS	816.0	SF	$0.25	$204	0.0200	16.32	0.40	326		0.0		0	530
WRAPS	96.0	LF	$0.25	$24	0.0400	3.84	0.80	77		0.0		0	101
CORNICE	24.0	LF	$0.25	$6	0.0400	0.96	0.80	19		0.0		0	25
MESH	816.0	LF	$0.18	$147		0.00		0		0.0		0	147
FLATS	816.0	SF	$0.35	$286	0.0400	32.64	0.80	653		0.0		0	938
WRAPS	96.0	LF	$0.35	$34	0.0800	7.68	1.60	154		0.0		0	187
COMIC	24.0	LF	$0.35	$8	0.0800	1.92	1.60	38		0.0		0	47
				$0		0.00		0		0.0		0	0
SCAFFOLD	3.0	TIERS		$0	6.0000	18.00	120.00	360		0.0		0	360
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
SUBTOTALS				$1,223		95.3		1,963		0.0		0	3,186
LABOR BURDEN ON LABOR	50.0%	%						981					981
SMALL TOOLS	5.0%	%						98					98
TOTAL DIRECT COST								3,042		0.0		0	4,265
OVERHEAD	10.0%	%											427
PROFIT	5.0%	%									((dir. + ov.) x prof %)		235
INSURANCE & BOND	2.0%	%									((dir. + ov. + prof %) x bond %		99
SALES TAX ON MATERIAL	6.0%	%											73
TOTAL COST													5,099

Apply a percentage, based on historical data, of the direct costs for general conditions. This is a judgment based on prior detailed estimates. Show general conditions as a percentage in early estimates.

Show the cost for general conditions as a separate direct field cost in design development, construction document and bid estimates. Define each item of general conditions and its cost.

2C. Scope of Estimate

ITEM OR DESCRIPTION			MATERIAL		LABOR				EQUIPMENT		SUB		TOTAL
DESCRIPTION	QUANTITY	UNIT	UNIT $	COST	HR/UNIT	HOURS	UNIT $	COST	UNIT $	COST	UNIT $	COST	COST
A	B	C	D	E	F	G	H	I	J	K	L	M	N
			E / B	B x D	G / B	B x F	I / B	H X B	K / B	J x B	M / B	L x B	M+K+I+E
FLATS	816.0	SF	$0.50	$408	0.0100	8.16	0.27	220		0.0		0	628
WINDOW TRIM	96.0	LF	$0.65	$62	0.0400	3.84	0.80	77		0.0		0	139
CORNICE	24.0	LF	$1.20	$29	0.0400	0.96	0.80	19		0.0		0	48
CORNICE	24.0	LF	$0.65	$16	0.0400	0.96	0.80	19		0.0		0	35
FLATS	816.0	SF	$0.25	$204	0.0200	16.32	0.40	326		0.0		0	530
WRAPS	96.0	LF	$0.25	$24	0.0400	3.84	0.80	77		0.0		0	101
CORNICE	24.0	LF	$0.25	$6	0.0400	0.96	0.80	19		0.0		0	25
MESH	816.0	LF	$0.18	$147		0.00		0		0.0		0	147
FLATS	816.0	SF	$0.35	$286	0.0400	32.64	0.80	653		0.0		0	938
WRAPS	96.0	LF	$0.35	$34	0.0800	7.68	1.60	154		0.0		0	187
COMIC	24.0	LF	$0.35	$8	0.0800	1.92	1.60	38		0.0		0	47
				$0		0.00		0		0.0		0	0
SCAFFOLD	3.0	TIERS		$0	6.0000	18.00	120.00	360		0.0		0	360
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
SUBTOTALS				$1,223		95.3		1,963		0.0		0	3,186
LABOR BURDEN ON LABOR	50.0%	%						981					981
SMALL TOOLS	5.0%	%						98					98
TOTAL DIRECT COST								3,042		0.0		0	4,265
OVERHEAD	10.0%	%											427
PROFIT	5.0%	%										((dir. + ov.) x prof %)	235
INSURANCE & BOND	2.0%	%										((dir. + ov. + prof %) x bond %)	99
SALES TAX ON MATERIAL	6.0%	%											73
TOTAL COST													5,099

Overhead is the expected contract cost for all items classified other than direct field costs. The overhead cost may include:

- ✓ Home office plant capital cost
- ✓ Project management
- ✓ Home office leasing cost
- ✓ Clerical
- ✓ Accounting
- ✓ Home office plant services
- ✓ General liability & comprehensive insurance
- ✓ Finance expenses
- ✓ Support & pro-rata salaries
- ✓ Outside services

2C. Scope of Estimate

ITEM OR DESCRIPTION			MATERIAL		LABOR				EQUIPMENT		SUB		TOTAL
DESCRIPTION	QUANTITY	UNIT	UNIT $	COST	HR/UNIT	HOURS	UNIT $	COST	UNIT $	COST	UNIT $	COST	COST
A	B	C	D	E	F	G	H	I	J	K	L	M	N
			E / B	B x D	G / B	B x F	I / B	H X B	K / B	J x B	M / B	L x B	M+K+I+E
FLATS	816.0	SF	$0.50	$408	0.0100	8.16	0.27	220		0.0		0	628
WINDOW TRIM	96.0	LF	$0.65	$62	0.0400	3.84	0.80	77		0.0		0	139
CORNICE	24.0	LF	$1.20	$29	0.0400	0.96	0.80	19		0.0		0	48
CORNICE	24.0	LF	$0.65	$16	0.0400	0.96	0.80	19		0.0		0	35
FLATS	816.0	SF	$0.25	$204	0.0200	16.32	0.40	326		0.0		0	530
WRAPS	96.0	LF	$0.25	$24	0.0400	3.84	0.80	77		0.0		0	101
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MESH	816.0	LF	$0.18	$147		0.00		0		0.0		0	147
FLATS	816.0	SF	$0.35	$286	0.0400	32.64	0.80	653		0.0		0	938
WRAPS	96.0	LF	$0.35	$34	0.0800	7.68	1.60	154		0.0		0	187
COMIC	24.0	LF	$0.35	$8	0.0800	1.92	1.60	38		0.0		0	47
				$0		0.00		0		0.0		0	0
SCAFFOLD	3.0	TIERS		$0	6.0000	18.00	120.00	360		0.0		0	360
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
SUBTOTALS				$1,223		95.3		1,963		0.0		0	3,186
LABOR BURDEN ON LABOR	50.0%	%						981					981
SMALL TOOLS	5.0%	%						98					98
TOTAL DIRECT COST								3,042		0.0		0	4,265
OVERHEAD	10.0%	%											427
PROFIT	5.0%	%										((dir. + ov.) x prof %)	235
INSURANCE & BOND	2.0%	%										((dir. + ov. + prof %) x bond %)	99
SALES TAX ON MATERIAL	6.0%	%											73
TOTAL COST													5,099

Show the expected cost for overhead separately in each estimate. Calculate these using either of the following methods:

a) Define each item that applies to overhead and the expected cost.

b) Apply a percentage based on historical information and adjusted to reflect contract size and duration.

c) Adjust the percentage for company total contract volume and expected costs for additional staff requirements for a specific project.

Separately show all mark-up amounts assumed for overheads and profits. Also include profits, fees, taxes, contingencies, inflation, escalations, etc.

ITEM OR DESCRIPTION			MATERIAL		LABOR				EQUIPMENT		SUB		TOTAL
DESCRIPTION	QUANTITY	UNIT	UNIT $	COST	HR/UNIT	HOURS	UNIT $	COST	UNIT $	COST	UNIT $	COST	COST
A	B	C	D	E	F	G	H	I	J	K	L	M	N
			E / B	B x D	G / B	B x F	I / B	H X B	K / B	J x B	M / B	L x B	M+K+I+E
FLATS	816.0	SF	$0.50	$408	0.0100	8.16	0.27	220		0.0		0	628
WINDOW TRIM	96.0	LF	$0.65	$62	0.0400	3.84	0.80	77		0.0		0	139
CORNICE	24.0	LF	$1.20	$29	0.0400	0.96	0.80	19		0.0		0	48
CORNICE	24.0	LF	$0.65	$16	0.0400	0.96	0.80	19		0.0		0	35
FLATS	816.0	SF	$0.25	$204	0.0200	16.32	0.40	326		0.0		0	530
WRAPS	96.0	LF	$0.25	$24	0.0400	3.84	0.80	77		0.0		0	101
CORNICE	24.0	LF	$0.25	$6	0.0400	0.96	0.80	19		0.0		0	25
MESH	816.0	LF	$0.18	$147		0.00		0		0.0		0	147
FLATS	816.0	SF	$0.35	$286	0.0400	32.64	0.80	653		0.0		0	938
WRAPS	96.0	LF	$0.35	$34	0.0800	7.68	1.60	154		0.0		0	187
COMIC	24.0	LF	$0.35	$8	0.0800	1.92	1.60	38		0.0		0	47
				$0		0.00		0		0.0		0	0
SCAFFOLD	3.0	TIERS		$0	6.0000	18.00	120.00	360		0.0		0	360
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
SUBTOTALS				$1,223		95.3		1,963		0.0		0	3,186
LABOR BURDEN ON LABOR	50.0%	%						981					981
SMALL TOOLS	5.0%	%						98					98
TOTAL DIRECT COST								3,042		0.0		0	4,265
OVERHEAD	10.0%	%											427
PROFIT	5.0%	%								((dir. + ov.) x prof %)			235
INSURANCE & BOND	2.0%	%								((dir. + ov. + prof %) x bond %			99
SALES TAX ON MATERIAL	6.0%	%											73
TOTAL COST													5,099

Total Estimated Construction Cost (TECC) is the combined total amount for:

- ✓ Direct costs
- ✓ Performance bonding
- ✓ General conditions
- ✓ Escalation
- ✓ Other costs
- ✓ Contingency amounts
- ✓ Overhead & profit
- ✓ Applicable taxes
- ✓ Fixed fees
- ✓ Permits

ITEM OR DESCRIPTION			MATERIAL		LABOR				EQUIPMENT		SUB		TOTAL
DESCRIPTION	QUANTITY	UNIT	UNIT $	COST	HR/UNIT	HOURS	UNIT $	COST	UNIT $	COST	UNIT $	COST	COST
A	B	C	D	E	F	G	H	I	J	K	L	M	N
			E / B	B x D	G / B	B x F	I / B	H X B	K / B	J x B	M / B	L x B	M+K+I+E
FLATS	816.0	SF	$0.50	$408	0.0100	8.16	0.27	220		0.0		0	628
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CORNICE	24.0	LF	$0.25	$6	0.0400	0.96	0.80	19		0.0		0	25
MESH	816.0	LF	$0.18	$147		0.00		0		0.0		0	147
FLATS	816.0	SF	$0.35	$286	0.0400	32.64	0.80	653		0.0		0	938
WRAPS	96.0	LF	$0.35	$34	0.0800	7.68	1.60	154		0.0		0	187
COMIC	24.0	LF	$0.35	$8	0.0800	1.92	1.60	38		0.0		0	47
				$0		0.00		0		0.0		0	0
SCAFFOLD	3.0	TIERS		$0	6.0000	18.00	120.00	360		0.0		0	360
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
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TOTAL DIRECT COST								3,042		0.0		0	4,265
OVERHEAD	10.0%	%											427
PROFIT	5.0%	%										((dir. + ov.) x prof %)	235
INSURANCE & BOND	2.0%	%										((dir. + ov. + prof %) x bond %)	99
SALES TAX ON MATERIAL	6.0%	%											73
TOTAL COST													5,099

Total Estimated Project Cost (TEPC) is the combined total amount for:

- ✓ Construction management
- ✓ Design professional costs
- ✓ Inspection
- ✓ Movable furniture, fixtures, equipment
- ✓ Telecommunication equipment
- ✓ Surveys
- ✓ Testing
- ✓ Move-in costs
- ✓ Planning/in-house support
- ✓ Other reimbursables

ITEM OR DESCRIPTION			MATERIAL		LABOR				EQUIPMENT		SUB		TOTAL
DESCRIPTION	QUANTITY	UNIT	UNIT $	COST	HR/UNIT	HOURS	UNIT $	COST	UNIT $	COST	UNIT $	COST	COST
A	B	C	D	E	F	G	H	I	J	K	L	M	N
			E / B	B x D	G / B	B x F	I / B	H X B	K / B	J x B	M / B	L x B	M+K+I+E
FLATS	816.0	SF	$0.50	$408	0.0100	8.16	0.27	220		0.0		0	628
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COMIC	24.0	LF	$0.35	$8	0.0800	1.92	1.60	38		0.0		0	47
				$0		0.00		0		0.0		0	0
SCAFFOLD	3.0	TIERS		$0	6.0000	18.00	120.00	360		0.0		0	360
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
SUBTOTALS				$1,223		95.3		1,963		0.0		0	3,186
LABOR BURDEN ON LABOR	50.0%	%						981					981
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TOTAL DIRECT COST								3,042		0.0		0	4,265
OVERHEAD	10.0%	%											427
PROFIT	5.0%	%								((dir. + ov.) x prof %)			235
INSURANCE & BOND	2.0%	%								((dir. + ov. + prof %) x bond %			99
SALES TAX ON MATERIAL	6.0%	%											73
TOTAL COST													5,099

Add these to the Total Estimated Construction Cost. Include these costs in the estimate at the discretion of and in the owner's format. The estimator should state the nature of the estimate as either Total Estimated Construction Cost or Total Estimated Project Cost.

2C. Scope of Estimate

ITEM OR DESCRIPTION			MATERIAL		LABOR				EQUIPMENT		SUB		TOTAL
DESCRIPTION	QUANTITY	UNIT	UNIT $	COST	HR/UNIT	HOURS	UNIT $	COST	UNIT $	COST	UNIT $	COST	COST
A	B	C	D	E	F	G	H	I	J	K	L	M	N
			E / B	B x D	G / B	B x F	I / B	H X B	K / B	J x B	M / B	L x B	M+K+I+E
FLATS	816.0	SF	$0.50	$408	0.0100	8.16	0.27	220		0.0		0	628
WINDOW TRIM	96.0	LF	$0.65	$62	0.0400	3.84	0.80	77		0.0		0	139
CORNICE	24.0	LF	$1.20	$29	0.0400	0.96	0.80	19		0.0		0	48
CORNICE	24.0	LF	$0.65	$16	0.0400	0.96	0.80	19		0.0		0	35
FLATS	816.0	SF	$0.25	$204	0.0200	16.32	0.40	326		0.0		0	530
WRAPS	96.0	LF	$0.25	$24	0.0400	3.84	0.80	77		0.0		0	101
CORNICE	24.0	LF	$0.25	$6	0.0400	0.96	0.80	19		0.0		0	25
MESH	816.0	LF	$0.18	$147		0.00		0		0.0		0	147
FLATS	816.0	SF	$0.35	$286	0.0400	32.64	0.80	653		0.0		0	938
WRAPS	96.0	LF	$0.35	$34	0.0800	7.68	1.60	154		0.0		0	187
COMIC	24.0	LF	$0.35	$8	0.0800	1.92	1.60	38		0.0		0	47
				$0		0.00		0		0.0		0	0
SCAFFOLD	3.0	TIERS		$0	6.0000	18.00	120.00	360		0.0		0	360
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
SUBTOTALS				$1,223		95.3		1,963		0.0		0	3,186
LABOR BURDEN ON LABOR	50.0%	%						981					981
SMALL TOOLS	5.0%	%						98					98
TOTAL DIRECT COST								3,042		0.0		0	4,265
OVERHEAD	10.0%	%											427
PROFIT	5.0%	%										((dir. + ov.) x prof %)	235
INSURANCE & BOND	2.0%	%										((dir. + ov. + prof %) x bond %)	99
SALES TAX ON MATERIAL	6.0%	%											73
TOTAL COST													5,099

In some cases, at the project owner's request, the cost of land and owner's purchases outside of the contract may be added to the above list to calculate the total cost of the business endeavor. This may be requested to use in the business proforma calculation.

ITEM OR DESCRIPTION			MATERIAL		LABOR				EQUIPMENT		SUB		TOTAL
DESCRIPTION	QUANTITY	UNIT	UNIT $	COST	HR/UNIT	HOURS	UNIT $	COST	UNIT $	COST	UNIT $	COST	COST
A	B	C	D	E	F	G	H	I	J	K	L	M	N
			E / B	B x D	G / B	B x F	I / B	H X B	K / B	J x B	M / B	L x B	M+K+I+E
FLATS	816.0	SF	$0.50	$408	0.0100	8.16	0.27	220		0.0		0	628
WINDOW TRIM	96.0	LF	$0.65	$62	0.0400	3.84	0.80	77		0.0		0	139
CORNICE	24.0	LF	$1.20	$29	0.0400	0.96	0.80	19		0.0		0	48
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FLATS	816.0	SF	$0.25	$204	0.0200	16.32	0.40	326		0.0		0	530
WRAPS	96.0	LF	$0.25	$24	0.0400	3.84	0.80	77		0.0		0	101
CORNICE	24.0	LF	$0.25	$6	0.0400	0.96	0.80	19		0.0		0	25
MESH	816.0	LF	$0.18	$147		0.00		0		0.0		0	147
FLATS	816.0	SF	$0.35	$286	0.0400	32.64	0.80	653		0.0		0	938
WRAPS	96.0	LF	$0.35	$34	0.0800	7.68	1.60	154		0.0		0	187
CORNICE	24.0	LF	$0.35	$8	0.0800	1.92	1.60	38		0.0		0	47
				$0		0.00		0		0.0		0	0
SCAFFOLD	3.0	TIERS		$0	6.0000	18.00	120.00	360		0.0		0	360
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
SUBTOTALS				$1,223		95.3		1,963		0.0		0	3,186
LABOR BURDEN ON LABOR	50.0%	%						981					981
SMALL TOOLS	5.0%	%						98					98
TOTAL DIRECT COST								3,042		0.0		0	4,265
OVERHEAD	10.0%	%											427
PROFIT	5.0%	%								((dir. + ov.) x prof %)			235
INSURANCE & BOND	2.0%	%								((dir. + ov. + prof %) x bond %			99
SALES TAX ON MATERIAL	6.0%	%											73
TOTAL COST													5,099

Submit cost estimates with back-up material that shows the basis for calculating the estimated cost. The cost estimates prepared under these guidelines are based on the estimator's best judgment using information provided. This is independent of other budgets or estimates furnished for information purposes.

PRODUCTION BASED ESTIMATE

ITEM OR DESCRIPTION			MATERIAL		LABOR				EQUIPMENT		SUB		TOTAL
DESCRIPTION	QUANTITY	UNIT	UNIT $	COST	HR/UNIT	HOURS	UNIT $	COST	UNIT $	COST	UNIT $	COST	COST
A	B	C	D	E	F	G	H	I	J	K	L	M	N
			E / B	B x D	G / B	B x F	I / B	H X B	K / B	J x B	M / B	L x B	M+K+I+E
FLATS	816.0	SF	$0.50	$408	0.0100	8.16	0.27	220		0.0		0	628
WINDOW TRIM	96.0	LF	$0.65	$62	0.0400	3.84	0.80	77		0.0		0	139
CORNICE	24.0	LF	$1.20	$29	0.0400	0.96	0.80	19		0.0		0	48
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FLATS	816.0	SF	$0.25	$204	0.0200	16.32	0.40	326		0.0		0	530
WRAPS	96.0	LF	$0.25	$24	0.0400	3.84	0.80	77		0.0		0	101
CORNICE	24.0	LF	$0.25	$6	0.0400	0.96	0.80	19		0.0		0	25
MESH	816.0	LF	$0.18	$147		0.00		0		0.0		0	147
FLATS	816.0	SF	$0.35	$286	0.0400	32.64	0.80	653		0.0		0	938
WRAPS	96.0	LF	$0.35	$34	0.0800	7.68	1.60	154		0.0		0	187
COMIC	24.0	LF	$0.35	$8	0.0800	1.92	1.60	38		0.0		0	47
				$0		0.00		0		0.0		0	0
SCAFFOLD	3.0	TIERS		$0	6.0000	18.00	120.00	360		0.0		0	360
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
				$0		0.00		0		0.0		0	0
SUBTOTALS				$1,223		95.3		1,963		0.0		0	3,186
LABOR BURDEN ON LABOR	50.0%	%						981					981
SMALL TOOLS	5.0%	%						98					98
TOTAL DIRECT COST								3,042		0.0		0	4,265
OVERHEAD	10.0%	%											427
PROFIT	5.0%	%										((dir. + ov.) x prof %)	235
INSURANCE & BOND	2.0%	%										((dir. + ov. + prof %) x bond %)	99
SALES TAX ON MATERIAL	6.0%	%											73
TOTAL COST													5,099

PRODUCTION BASED ESTIMATE

LEVEL II COST SUMMARY

Building Element	Cost	Key Quantity	Unit of Measurement	Cost Per Key Quantity Unit	Cost Per Gross Sq. Ft.
A10 Foundations	$ -		SF Ground Floor Area	$ -	$ -
A20 Basement Construction	$ -		SF Basement Floor Area	$ -	$ -
B10 Superstructure	$ -	17,326	SF Gross Bldg. Area	$ -	$ -
B20 Exterior Enclosure	$ 196,517		SF Wall Surface Area	$ -	$ 11.34
B30 Roofing	$ 11,134		SF Roof Surface Area	$ -	$ 0.64
C10 Interior Construction	$ 1,556	17,326	SF Gross Bldg. Area	$ 0.09	$ 0.09
C20 Stairs	$ -		EA Total No. of Risers	$ -	$ -
C30 Interior Finishes	$ 56,772	17,326	SF Gross Bldg. Area	$ 3.28	$ 3.28
D10 Conveying	$ -		EA Total No. of Stops	$ -	$ -
D20 Plumbing	$ -		EA No. of Fixtures	$ -	$ -
D30 HVAC	$ 384,263		TONS System Capacity	$ -	$ 22.18
D40 Fire Protection	$ -	17,326	SF Protected Area	$ -	$ -
D50 Electrical	$ 290,914	17,326	SF Gross Bldg. Area	$ 16.79	$ 16.79
E10 Equipment	$ -	17,326	SF Gross Bldg. Area	$ -	$ -
E20 Furnishings	$ -	17,326	SF Gross Bldg. Area	$ -	$ -
F10 Special Construction	$ -	17,326	SF Gross Bldg. Area	$ -	$ -
F20 Selective Building Demolition	$ 63,713	17,326	SF Affected Area	$ 3.68	$ 3.68
G10 Site Preparation	$ -		SY Affected Area	$ -	$ -
G20 Site Improvements	$ 26,527		SY Affected Area	$ -	$ 1.53
G30 Site Mechanical Utilities	$ -		LF Length of Run	$ -	$ -
G40 Site Electrical Utilities	$ -		LF Length of Run	$ -	$ -
G90 Other Site Construction	$ -		SY Affected Area	$ -	$ -
Z General Requirements and OH&P	$ 672,601	(This value equates to	65.2% of total other costs listed above.)		$ 38.82
TOTAL CONSTRUCTION COST	**$ 1,703,996**				**$ 98.35**

PRODUCTION BASED ESTIMATE

General Requirements and OH&P Detail

Description	Cost	Rate	Unit of Measurement	Cost Per Key Quantity Unit	Cost Per Gross Sq. Ft.
Z00 General Staging Requirements	$ 20,000	1	LS	$ 20,000.00	$ 1.15
Z10 General Conditions	$ 240,000	$ 8	Months	$ 30,000.00	$ 13.85
Subtotal	**$ 260,000**				**$ 15.01**
Z20 Construction Contingency	$ 64,570	5.00	%		$ 3.73
Z30 Design Contingency	$ 258,279	20.00	%		$ 14.91
Z40 Bus. License/Gross Rec. Tax	$ 12,914	10.00	/1000		$ 0.75
Z50 General Liability Insurance	$ 25,828	20.00	/1000		$ 1.49
Z60 Builders Risk Insurance	$ 25,828	20.00	/1000		$ 1.49
Z70 Other:					$ -
Z80 Other:					$ -
Z90 Other:					$ -
Z100 Other					$ -
Subtotal	**$ 647,419**				**$ 37.37**
Z110 Contractors OH&P		0.00	%		$ -
Z120 Payment & Performance Bonds	$ 25,182	1.50	%		$ 1.45
Z General Requirements and OH&P	$ 672,601				$ 38.82

Total Burden Multiplier 1.62

UNIT BASED ESTIMATE

ESTIMATE - SUB CONTRACTOR

PROJECT:	Restaurant	ESTIMATOR:	Esa Mater
ADDRESS:	182 West Broad Street		
	Henrico, Virginia	DATE:	4/16/2015
SYSTEM:	Storefront		
WORK AREA:	Accessible		
DIVISION:	8		

DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	TOTAL COST
Storefront System (w/o Doors)	474	SF	$35.00	$16,590
Storefront Door 3070	1	LF	$1,500	$1,500
Storefront Door 6070	1	EA	$2,500	$2,500
SUB-TOTAL				$20,590

OVERHEAD	3.0%	%	(X Direct Cost Sub-Total)	$618
PROFIT	5.0%	%	(X Direct Cost Sub-Total)	$1,030
INSURANCE & BOND	2.25%	%	(X Direct Cost Sub-Total)	$463
TOTAL COST				$22,700

5. T F When a project is completed and the cost of the project is close to the cost given in the estimate the estimator may assume that all phases of the project went well.

6. T F Where the owner acts as his own contractor, the subcontractors are considered to be original contractors for purposes of the lien laws.

8. A contractor is bidding a job for which he has estimated his total direct cost (field cost) to be $15,500. He knows his overhead percentage is 21% of direct cost (based on current expense statements and experience) and he wants to make a net profit of 8% of total cost on this project. What must the bid for this project be (to nearest $10)?

   A. $19,990

   B. $20,260

   C. $20,550

9. Give the formula for converting cubic feet to cubic yards.

   A. CF/9

   B. SF/9

   C. CF/27

   D. CF x 27

10. Calculate the number of gallons required to apply a 10-mil thick liquid coating to 937 square feet of nonporous material. Assume one gallon will cover 400 square feet, 2 mil thick. Round to the nearest gallon. _____

11. Calculate to the nearest thousandths of an hour (0.000) required for the installation of an item if the installation time is 16 minutes. _____

12. Calculate the cost per square foot (to the nearest cent) of material applied 1.5" thick if the material weighs 68 lbs. per cubic foot and cost $283.00 per ton. _____

13. Calculate the lineal foot cost (to the nearest cent) of material that has a weight of 1.502 lbs. per lineal foot, using a waste factor of 15%, and cost of $512.50 per ton.

Sample Test Questions

17. In “Architectural Scale”

A. If 1/4" equals 1'-0 what does 1/8" equal?

1. 4"
2. 6"
3. 4-1/2"
4. 3"

18. T F Plumbing and electrical drawings are diagrammatic only.

20. T F It is the general contractor's responsibility to advise subcontractors that a addenda have been issued.

24. T F Value engineering always reduces the cost of a project.

32. Given the following data from a historical cost report:

Total Units in place:	100
Total journeymen hours expended:	7
Total apprentice hours expended:	3

What is the productivity rate achieved?

A. .1 MH/Unit

B. 10 Unit/MH

C. .01 MH/Unit

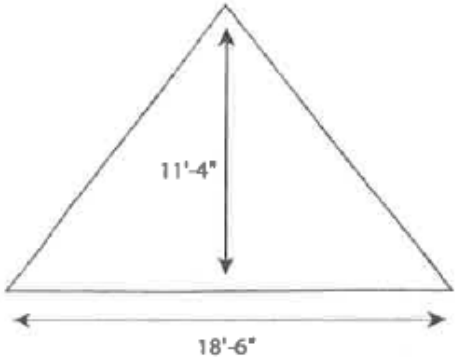
D. .07 MH/Unit

E. .03 MH/Unit

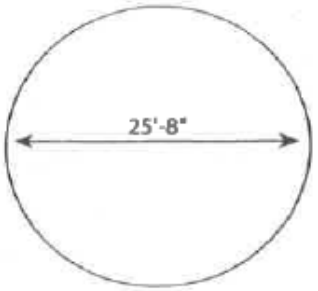
GENERAL ESTIMATING KNOWLEDGE EXAM
SAMPLE TEST ANSWER SHEET

1.	False
2.	True
3.	True
4.	False
5.	False
6.	False
7.	A
8.	B
9.	C
10.	12 Gallons
11.	0.267 Hours
12.	$1.20
13.	$0.44
14.	B
15.	C
16.	A
17.	A.2; B.2; C.2; D.1; E.1; C.2
18.	False
19.	True
20.	False
21.	A,B,C,D,E
22.	B,E,F
23.	True
24.	False
25.	False
26.	A
27.	D
28.	B
29.	False
30.	D
31.	False
32.	A
33.	True
34.	True

*Answers to two decimal places

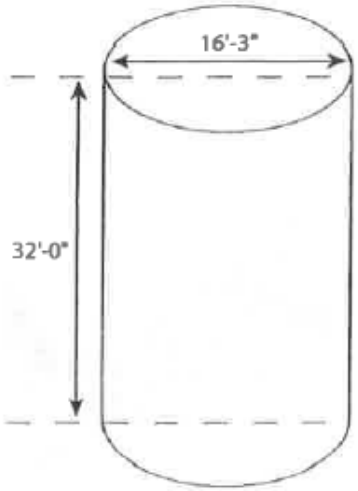


Area = _____



Area = _____

Circumference = _____



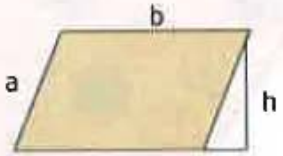
Volume = _____

Total Surface Area = _____

Volumes and Areas

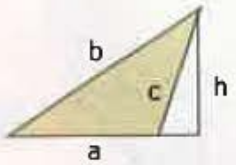
AREA

Rectangle
Perimeter = 2a + 2b
Area = a x b

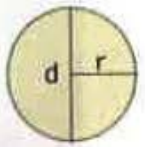


Parallelogram
Perimeter = 2a + 2b
Area = b x h

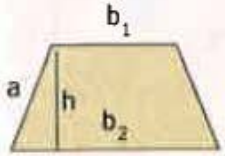
Equilateral Triangle
Perimeter = 3a
Area = (1/4) (Ö3) a^2



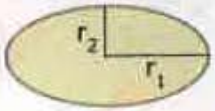
Triangle
Perimeter = a + b + c
Area = (a x h) / 2



Circle
Circumference = 2 x p x r
Area = $p r^2$



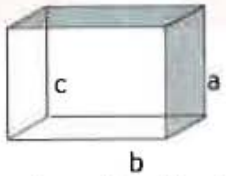
Trapezoid
Perimeter = 2a + b_1 + b_2
Area = h/2 (b_1 + b_2)



Ellipse
Area = p r_1 r_2

Diagram Problem	Answer (Answers should be truncated at two decimal places)
Triangle	Area = 104.83
Circle	Area = 517.37 Circumference = 80.60
Cylinder	Volume = 6636.61 Total Surface Area = 2048.41

VOLUME



Rectangular Block
Volume = a x b x c
Surface Area
= 2(a x b)+2(c x b)+2(a x c)

Cone
Volume = 1/3 $p r^2$ x h
Surface Area
= p x r x ($r + (r^2 + h^2)^{1/2}$)

Cylinder
Volume = $p r^2 h$
Surface Area =
(r x h) + 2 ($p r^2$)

Sphere
Volume = (4/3) $p r^3$
Surface Area = 4 $p r^2$