

GORDIAN
JOC SOLUTIONS



**COUNTY OF SAN MATEO
DEPARTMENT OF ENGINEERING,
CONSTRUCTION, ROADS AND
UTILITIES
JOB ORDER CONTRACTING**

Mandatory Pre-Bid Conference

JOC - 1609

JOC - 1610

JOC - 1611

FEBRUARY 11, 2016



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AGENDA


- Part I: The Job Order Contract (JOC) Program
 - Introduction
 - JOC Background
 - JOC Contract Documents & Software
 - JOC Process
 - County of San Mateo JOC Program

- Part II: Analyzing the Bid Process
 - CTC Structure
 - Sample Project
 - Adjustment Factor Calculation & Considerations
 - Expected Events & Rewards
 - Bidding Information




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INTRODUCTION

- County of San Mateo Has Advertised:
 - Three (3), 'A' License, JOC Contracts for the Department of Engineering, Construction, Roads and Utilities with a potential maximum value of \$4,550,000 each
- Work Will Be Issued Under the Job Order Contracting Program
- Work Will Be Administered Through DPW
- The Gordian Group® Trains and Supports the County of San Mateo and JOC Contractors


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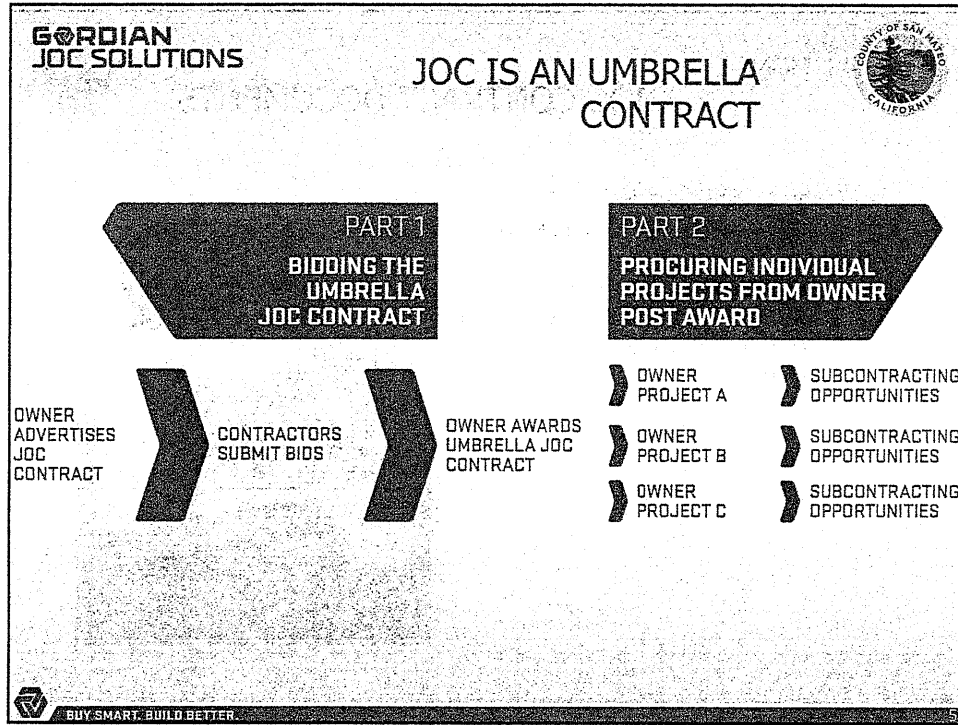
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JOC BACKGROUND

- A Job Order Contract Is a Firm, Fixed Priced, Competitively Bid, Indefinite Quantity Contract
 - JOC Is Designed to Accomplish Small-medium Size, Multi-trade, Minor Construction, Repair and Remodel Projects
 - JOC Is a Series of Individual Projects Issued As Job Orders Under the Base Contract
 - A Fundamentally Different Construction Procurement Relationship
 - Contractors are subject to different motivations and behaviors
 - Non-adversarial relationship between Owner & Contractor
- JOC Introduced in the United States in 1985
 - Dept. of Defense, USPS, NASA, etc.
- Implemented by states, counties, cities, universities, housing authorities, etc. since 1990
- Hundreds of contracts currently in use

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JOC CONTRACT DOCUMENTS


- Construction Task Catalog® (CTC)
 - Catalog of over 120,000 Pre-Priced Construction Tasks
 - Organized by CSI Master Format 2004
 - Prices Contain Local Prevailing Wages, Material and Equipment Costs Only
 - CTC Customized for County of San Mateo

SECTION	CSI MASTERFORMAT	FULL DESCRIPTION OF TASK	PRICE INCLUDES LABOR, MATERIALS, EQUIPMENT FOR YOUR LOCATION	QUANTITY	UNIT COST	UNIT COST
Exterior Improvements 32						
32 16 Curbs, Gutters, Sidewalks, And Driveways						
	32 16 13	Curbs And Gutters				
	32 16 13 13	Cast-In-Place Concrete Curbs And Gutters				
	32 16 13 13-0001	Concrete Curbs, Cast In Place				
	32 16 13 13-0002	1" x 12" Cast-In-Place Concrete Curb		4.00	7.40	3.20
		For 10' To 25' Long		2.00		
		For 25' To 50' Long		3.00		
		For 50' To 100' Long		4.00		
	32 16 13 13 0003	2" x 12" Cast-In-Place Concrete Curb		4.00	8.14	3.72
		For 10' To 25' Long		2.00		
		For 25' To 50' Long		3.00		
		For 50' To 100' Long		4.00		
		For 100' Or Longer		5.00		

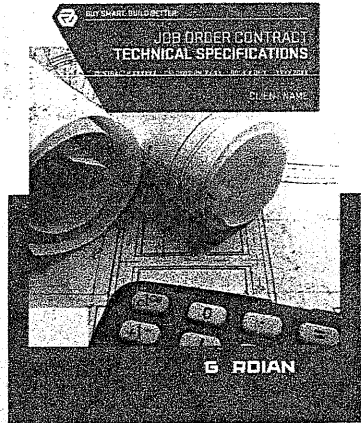
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JOC CONTRACT DOCUMENTS




- Technical Specifications
 - Specifies Quality of Materials and Workmanship
 - Organized by CSI Format
 - Specifications Linked to Tasks in CTC
 - Customized for the County of San Mateo



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JOC CONTRACT DOCUMENTS




- Project Manual
 - Bidding Requirements
 - Notice to Contractors
 - Instruction to Bidders
 - Bid Documents
 - Contract Requirements
 - Agreement
 - Bonds/Insurance
 - General Conditions
 - Supplementary Conditions
 - Ordinances
 - Equal Benefits
 - Jury Service
 - Recycling
- JOC Specific Clauses
 - Overview of Contract
 - Procedure for Ordering Work
 - Proposal Preparation
 - Issuing Work
- Other Clauses to Change
 - Scope of Work
 - Extra Work
 - Time Extensions
 - Liquidated Damages
 - Substantial Completion

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BID REQUIREMENTS



- Award Based Upon Competitive Bid
- Must Bid Two Adjustment Factors -
 - Normal Working Hours; Shift Work 8:00 AM to 4:30 PM Monday-Friday;
 - Other than Normal Working Hours; after Hours Monday-Friday; All Day Saturday, Sunday and Holidays
- Same Adjustment Factors Apply to All Tasks in the CTC
 - Adjustment Factors Must Include All Indirect Costs and Profit
 - Adjustment Factors Fixed for the Duration of Contract Term
- Lowest Adjustment Factor From a Responsive, Responsible Bidder Wins!


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WORK PERFORMED DURING
NORMAL WORKING HOURS


2

WORK PERFORMED DURING
OTHER THAN NORMAL
WORKING HOURS

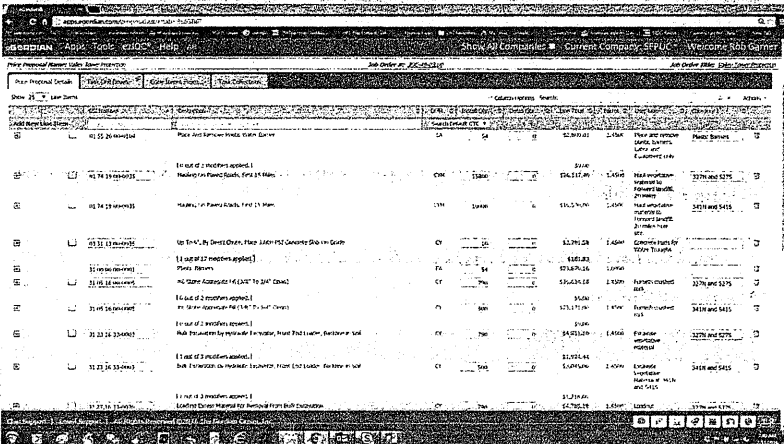
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JOC SOFTWARE



eGordian® Software Automates the Proposal Process




ID	Description	Unit	Quantity	Price	Total	Notes
11 22 24 2400001	11 out of 23 workers applied 1	HR	1500	\$24.00	\$36,000.00	11 out of 23 workers applied 1
11 22 24 2400002	11 out of 23 workers applied 2	HR	1500	\$24.00	\$36,000.00	11 out of 23 workers applied 2
11 22 24 2400003	11 out of 23 workers applied 3	HR	1500	\$24.00	\$36,000.00	11 out of 23 workers applied 3
11 22 24 2400004	11 out of 23 workers applied 4	HR	1500	\$24.00	\$36,000.00	11 out of 23 workers applied 4
11 22 24 2400005	11 out of 23 workers applied 5	HR	1500	\$24.00	\$36,000.00	11 out of 23 workers applied 5
11 22 24 2400006	11 out of 23 workers applied 6	HR	1500	\$24.00	\$36,000.00	11 out of 23 workers applied 6
11 22 24 2400007	11 out of 23 workers applied 7	HR	1500	\$24.00	\$36,000.00	11 out of 23 workers applied 7
11 22 24 2400008	11 out of 23 workers applied 8	HR	1500	\$24.00	\$36,000.00	11 out of 23 workers applied 8
11 22 24 2400009	11 out of 23 workers applied 9	HR	1500	\$24.00	\$36,000.00	11 out of 23 workers applied 9
11 22 24 2400010	11 out of 23 workers applied 10	HR	1500	\$24.00	\$36,000.00	11 out of 23 workers applied 10


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CONTRACTOR LICENSE FEE




- Access to eGordian®, Construction Task Catalog®, other proprietary materials
 - Paperless
 - Efficient
 - Tasks and prices input directly... no fishing through old files and estimating books for costs
- JOC process training
- eGordian® software training
- Follow-up process and/or software training as necessary
- 24-hour support software support.
- Included in the Contractor's Adjustment Factor
 - Consider with the Bid as an Overhead cost
 - 1% of Job Order Price after NTP issued




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PROCESS - HOW IS WORK DONE?





- Joint Scope Meeting With the County, Contractor, and Others to define the Detailed Scope of Work
- The County Issues Request for Proposal for the Agreed Upon Detailed Scope of Work
- Proposal Development
 - Typical Proposal Due Date will be 2 weeks from RFP
- Proposal Review
- Issuance of Job Order
- Total Time Goal: Average 3-5 weeks



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SAN MATEO JOC PROGRAM



- This Solicitation Is for Three (3) Department of Engineering, Construction, Roads and Utilities
 - Work within County of San Mateo
- Prior to Bidding the County Will Not:
 - Identify or Commit to Any Specific Project or Location
 - Identify or Commit to Any Specific Quantities or Tasks in the CTC
- JOC Has a Fixed Term - **1 Year**
- A Pre-established Maximum Potential Contract Amount - **\$4,550,000**
- Required registration with the Department of Industrial Relations and applicable fees paid per Senate Bill 854



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SAN MATEO JOC PROGRAM




- CTC Based on the County of San Mateo Prevailing Wages
 - Contractors Must Pay Prevailing Wages
- Provide Bonds in the Following Amounts:
 - Bid Bond - \$25,000
 - Payment Bond - \$1 Million initial – Extended to \$4.55M
 - Performance Bond - \$1 Million initial – Extended to \$4.55M
- Insurance Held On Overall Contract
- Differing Site Conditions / Scope Changes
 - Treated as a Supplemental Job Order. Follows the Same Process
- Liquidated Damages
 - Determined on Each Job Order
 - Defined on the Request for Proposal



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ANALYZING THE BID PROCESS

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CTC STRUCTURE

- Bidders Must Read: Using The Construction Task Catalog
 - The Unit Prices Include
 - Complete and In-place Construction
 - The Adjustment Factors Include: Overhead, Profit, Sub Costs, Taxes, Fringe Benefits, Financing, Business Risk, 1%CLF
 - Construction Related Costs: Permit Services, Submittal Preparation, Incidental A&E, Vehicles, Temporary Utilities, Excess Waste,, Daily & Final Clean-up, Etc.
 - General Interpretations
- Non Pre-priced Items
 - Predetermined Mark-up

THE GORDIAN GROUP

Using The Construction Task Catalog

CONSTRUCTION TASK CATALOG

The Construction Task Catalog was developed and submitted by The Gordian Group, Inc. specifically for The County of San Mateo. It is intended to provide a common set of definitions and standards for the construction industry in the County of San Mateo. The Catalog is intended to be used by all bidders and is subject to the County of San Mateo's policies and procedures. The Catalog is intended to be used by all bidders and is subject to the County of San Mateo's policies and procedures.

LABOR COSTS

Labor costs include unloading equipment, materials, and take and returning the same up or down 100 stairs and 125 to reach the project site. Hand measuring and taking to be performed on the basis of extra material and time for work and travel.

Labor costs include direct labor through the working completion of all construction elements. Labor costs include fringe benefits and an allowance for Social Security and Affordable Care Act, workers' compensation, and employment insurance and program benefits.

EQUIPMENT COSTS

Equipment costs include all equipment required to accomplish the task. Installation is included for all equipment including dry equipment in g. cranes, pile drivers, bulldozers, excavators, backhoes, compactors, etc., which include mobilization.

Equipment costs include all operating expenses such as fuel, electricity, lubricants, etc.

MATERIAL COSTS

Material costs include the cost of the material, delivery, and all expenses and to remove material to the location.

Material costs include manufacturing, product, transport, and storage.

Material costs for loading, unloading, CTC, and other equipment, including all applicable taxes, insurance, and other expenses for work. This list is not intended to be all inclusive and is subject to the types of construction materials that are typically used in standard projects, labor and energy.

CONSTRUCTION RELATED COSTS

Unit prices are for labor and include construction and include all labor, equipment, and material required to complete the task as defined in the CTC.

If the Contractor uses a crane or other lifting equipment, it must be included in the unit price. If the Contractor uses a crane or other lifting equipment, it must be included in the unit price. If the Contractor uses a crane or other lifting equipment, it must be included in the unit price.

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HOW TO CALCULATE ADJUSTMENT FACTORS



Recommended Method

- **Use Historical Project Data**
 - Select a Completed Project
 - You Know Scope and Direct Costs
 - Price Project From CTC
 - Add on Overhead and Profit
 - Calculate the Adjustment Factor
- **Create a Representative Project**
 - Create a Scope of Work
 - Get Sub Quotes or Estimate Cost
 - Price Project From CTC
 - Add on Overhead and Profit
 - Calculate the Adjustment Factor




SAMPLE PROJECT - DETAILED SCOPE OF WORK




- Administration Building and Shop Renovation
 - Doors and Hardware
 - Replace 12 interior doors, hinges and hardware
 - Doors shall be 3x7, solid core wood doors
 - Grade 2 locksets with knobs
 - Replace 2 push bar exist devices and door closers on exit doors
 - Interior Lighting
 - Replace all lay-in troffer fixtures on first and second floors. 48 in total
 - Replace 4 exit fixtures
 - Replace 12 industrial fixtures in shop area
 - Plumbing Fixtures
 - Replace 8 bathroom sinks, 8 faucets, and 8 toilets in men's and women's bathroom in admin building and shop area
 - Replace 4 water fountains
 - Replace Boiler
 - Demo existing boiler and as much piping and venting to accommodate new boiler. Install a new 1028 mbh oil fired cast iron boiler. Weil-McLain Model 88. No access for packaged boiler. Must field assemble sections. Provide new piping as required.







SAMPLE PROJECT – PRICE PROPOSAL VS. QUOTES




Direct Cost of Work from CTC	Direct Cost of Work from Quotes or Estimates
• Replace Boiler \$ 39,488.59	• Replace Boiler \$ 37,225.00
• Doors and Hardware \$ 8,186.93	• Doors and Hardware \$ 8,750.00
• Lighting \$ 16,611.09	• Lighting \$ 15,725.00
• Plumbing \$ 12,468.17	• Plumbing \$ 11,590.00
• TOTAL = \$ 76,754.78	• TOTAL = \$ 73,290.00

*Quotes are less expensive than price from CTC, but you need to cover overhead & make a profit







SAMPLE PROJECT – OVERHEAD ITEMS TO INCLUDE IN ADJUSTMENT FACTOR




- Overhead Costs - 6% to 12%
 - Scoping
 - Proposal Development
 - Submittals
 - Project Management
 - Site Superintendence
 - Bonds
 - Insurance
 - Vehicles
 - G&A Costs
 - Profit for Prime and Subcontractors
 - Adjustment to the Unit Prices
 - 1% CLF




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SAMPLE PROJECT – PUTTING IT ALL TOGETHER

- Cost
 - Direct Cost = \$ 73,290.00
 - CM Costs @ 12% = \$ 8,794.80
- Profit
 - @ 10% (of Direct Cost) = \$ 7,329.00
- Total Value \$ 89,413.80
- CTC Cost \$ 76,754.78
- Total Value Divided by CTC Cost
 - $(89,413.80 / 76,754.78 = 1.1649)$
- Adjustment Factor = 1.1649
 - For This Example Only

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NON PRE-PRICED ITEMS


Definition: Item required by the Detailed Scope of Work, but is not in the Task Catalog. Examples include custom work; new technology; proprietary equipment; exotic materials; specialized trade work


The price for Contractor-performed Non Pre-priced Tasks is according to this formula:

A=CTC Labor Rates (preferred), or current prevailing wages base+fringe
 B=direct material costs (supported by three independent quotes for all materials)
 C=direct equipment costs (supported by official posted state rental rates other than small tools)
 D=allowable overhead costs = A x 25% (i.e. workers compensation insurance)
 E= allowable profit = (A + B + C) x 10%


The price for Subcontractor-performed Non Pre-priced Tasks is according to this formula:
 F=Subcontractor costs (supported by three quotes)
 G=Contractor allowance for Subcontractor costs = F x 15%


Total Cost of Non Pre-priced Task = (A+B+C+D+E+F+G) (Only if A & B cannot be priced out of the CTC)

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GORDIAN JOC SOLUTIONS **FILLING OUT THE BID FORM – ACF EXAMPLE** 

Line 1.	Normal Working Hours	1. 1.1649
Line 2.	Multiply Line 1 by 80%	2. 0.9319
Line 3.	Other than Normal Working Hours	3. 1.2300
Line 4.	Multiply Line 3 by 20%	4. 0.2460
Line 13.	Add Lines 2 and 4 (This is the Award Criteria Figure)	ACF = 1.1779


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GORDIAN JOC SOLUTIONS **CALCULATING THE ADJUSTMENT FACTOR** 

- Importance of Adjustment Factors
 - Determines winning bidder AND
 - Used to price individual Job Orders
 - Price proposal total becomes the lump sum Job Order amount


UNIT PRICE × QUANTITY × ADJUSTMENT FACTOR = TOTAL FOR TASK
 UNIT PRICE × QUANTITY × ADJUSTMENT FACTOR = TOTAL FOR TASK
 UNIT PRICE × QUANTITY × ADJUSTMENT FACTOR = TOTAL FOR TASK

TOTAL JOB ORDER PRICE


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**RISKS OF LOW ADJUSTMENT
FACTOR**




- Leads to Disagreements in Proposal Review Process
 - Unsupportable Tasks
 - Exaggerated Quantities
- Leads to Delays in Job Order Development
 - Takes Longer to Review Proposals
- Can Create an Adversarial Relationship
 - May Lead to Reduced Volume of Work
 - Will Shorten Contract
 - Lost Profitability
- No Second Chance to Improve Margin. Changes to the Work are Priced the Same as the Original Job Order


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BID CONSIDERATIONS



- Contractors Should Expect To
 - Prepare incidental drawings or sketches for some projects
 - Justify Quantity Calculations
 - Explain Detail of Work
 - Prepare proposals for some projects that may be canceled
 - Receive some projects that are more profitable than others
 - Maintain a fully functioning office
 - Maintain a fully functioning staff
 - Hold required licenses
 - Meet local subcontractor (trades and materials) participation goals
 - 1% of each Job Order is a Contractor-paid License Fee for eGordian® software access

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REVIEW / KEY POINTS

- Focus on Total Potential Value of Contract
 - Maximum Contract Value
- Evaluate Construction Task Catalog®
 - Analyze Unit Prices
 - Understand the “Using the CTC” section
- Contractor Performance Drives Volume
 - Responsive Service
 - Accurate Proposals
 - Safe and Clean Project Sites
 - High Quality Construction
 - On-Time Completion
 - On-Time Close Out



HOW TO OBTAIN BID PACKAGE

- (1) Construction Task Catalogs® and Specifications for these Job Order Contracts for Engineering, Construction, Roads and Utilities Project No. JOC-1609, Project No. JOC-1610, and Project No. JOC-1611, including forms of proposal and Contract, must be purchased from the County of San Mateo Department of Public Works for bidding.

See Page 3 of the Notice to Contractors for full instructions.



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QUESTIONS?



Bids Due

February 16, 2016

2:30 PM

Clerk of the Board of Supervisors
Hall of Justice and Records,
400 County Center, (formerly 401 Marshall Street)
1st Floor,
Redwood City, California



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Using The Construction Task Catalog®

CTC Information:

- ☑ This Construction Task Catalog® was developed and customized by The Gordian Group, Inc. specifically for **The Gordian Group's Client**, priced locally using current labor, material and equipment costs, and published in 2016.
- ☑ The Gordian Group, Inc. licenses the use of this CTC and other proprietary information and software for the sole purpose of providing Job Order Contracting services to **The Gordian Group's Client**. Use of The Gordian Group's CTC and other proprietary information and software for any other purpose or any other entity is expressly prohibited without the express written consent of The Gordian Group, Inc.

MasterFormat™

- ☑ The tasks in this Construction Task Catalog are organized using CSI's *MasterFormat*.



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The Unit Prices Include:

LABOR COSTS:

- ☑ Labor costs include unloading equipment, materials, and tools, and transporting the same up or down 2 1/2 stories and 125' to reach the project site; layout; measuring and cutting to fit; performing the task; disposal of excess material; and time for lunch and breaks.
- ☑ Labor costs include direct labor through the working foreperson level at straight-time prevailing wage rates including fringe benefits and an allowance for Social Security and Medicare taxes, worker's compensation, unemployment insurance and employee benefits.

- ☑ Labor costs are based on workers familiar with and skilled in the performance of the task following OSHA requirements.

EQUIPMENT COSTS:

- ☑ Equipment costs include all equipment required to accomplish the task. Mobilization is included for all equipment except large equipment (e.g. cranes, pile drivers, bulldozers, excavators, backhoes, bobcats etc.), which exclude mobilization.
- ☑ Equipment costs include all operating expenses such as fuel, electricity, lubricants, etc.

MATERIAL COSTS:

- ☑ Material costs include the cost of the material, delivery, and all incidentals and accessories integral to the installation.
- ☑ Material costs include manufacturer's and/or fabricator's shop drawings.
- ☑ Material costs for roofing, drywall, VCT, carpet, wall covering, ceiling tile, pipe, conduit, concrete, etc. include an allowance for waste. This list is not intended to be all inclusive, but descriptive of the types of construction materials that are typically sold in standard lengths, sizes and weights.

Complete and In-Place Construction:

- ☑ Unit prices are for complete and in-place construction and include all labor, equipment and material required to complete the task as described in the CTC.
- ☑ If the Contractor uses a crane or other lifting equipment (except a truck mounted boom lift or other equipment as part of the delivery process) to lift material onto a roof, even if that roof is less than 2 1/2 stories, the contractor will be paid for such crane or lifting equipment as a separate task.

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- ☑ Unit prices for imported materials (e.g. aggregate, sand, soil, etc.) include delivery up to 15 miles from the closest approved source.
- ☑ Unit prices include all fasteners such as anchor bolts, lag bolts, screws, adhesive, wedge anchors, expansion bolts, roofing clips (excluding hurricane clips) that are required. Fasteners listed separately in the CTC are for use with Owner furnished material and equipment or relocating or reinstalling existing material and equipment.
- ☑ Unit prices exclude more substantial mounting material such as threaded rod or angle iron unless the task description states otherwise.
- ☑ Unit prices for doors and windows, duct work, plumbing fixtures, seamless floors, countertops, flashing, pitch pockets, skylights, curbs, roofing, etc. include sealant and caulking.
- ☑ Unit prices include testing, calibration, balancing and the like required to ensure proper installation, construction and performance (e.g. compaction test for backfill, balancing of heating ventilation and air conditioning, pneumatic or hydrostatic testing, soaping of joints, disinfection and flushing, others as required). Use of owner supplied materials, equipment or tying into existing equipment/piping may justify testing, balancing, etc.

Demolition:

- ☑ Unit prices for demolition include all labor, equipment and material required for the complete removal of the items; clean-up of the area; and transporting the demolished items up or down 2 ½ stories into a truck, dumpster, or to an owner designated area, located within 125' of the project site.
- ☑ Unit prices for demolition exclude costs for hauling (See 01741900), dump fees (See 01741900), dumpsters (See 01741900), and trash chutes (See 01741900).
- ☑ If the item being demolished is attached to another item being removed and can be removed as one item, then that item shall not be priced as a separate demolition task, unless the component alone must be

demolished to accomplish the task (e.g. demolition of pipe includes pipe fittings unless the fitting must be demolished separately to accomplish the task; demolition of a wood door includes hinges, hardware, closures, kick plates, etc.).

- ☑ The description "replace" includes the demolition of the existing item and the installation of the new item.
- ☑ The descriptions "remove and relocate" or "remove and reinstall" includes the removal, cleaning of item and installation of the existing item in either the same location or another location.
- ☑ The description "reinstall" includes the cleaning and installation of the existing item.
- ☑ Salvageable materials remain the property of the Owner and shall be turned over as directed when specified in the Job Order.

The Adjustment Factors Include:

BUSINESS COSTS:

- ☑ Overhead costs, including, unless specifically excluded in the Contract Documents, but not limited to:
 - home office overhead
 - insurance, bonds, and indemnification
 - project meetings, training, management and supervision
 - mobilization and close-out for the contract and each Job Order
 - project office staff and equipment.
- ☑ Profit.
- ☑ Subcontractor's overhead and profit.
- ☑ All taxes for which a waiver is not available including material sales tax and equipment rental.
- ☑ Employee or Subcontractor's wage rates that exceed the prevailing wage rates.
- ☑ Fringe benefits, payroll taxes, worker's compensation, insurance costs and any other

payment mandated by law in connection with labor that exceeds the labor rate allowances.

- Cost of financing the work.
- Business risks such as the risk of a lower than expected volume of work, smaller than anticipated Job Orders, poor Subcontractor performance, and inflation or material cost fluctuations.

CONSTRUCTION RELATED COSTS:

- Services required to obtain filings and permits.
- Preparation and modification of proposals and associated documents to include sketches, drawings, submittals and as-built drawings. Medium may include CADD, microfilm, and other project records formats.
- Incidental Scope Definition Services.
- Office trailer and portable toilets for Contractor's use.
- Construction vehicles such as pick-up trucks, utility trucks, vans, flat bed trucks, tractors, trailers, etc.
- Storage devices or items such as gang boxes and containers for Contractor's tools, equipment and materials.
- Basic safety and warning signage, minor barricades (e.g., construction tape, etc.) and personnel safety equipment (e.g., hard hats, safety harnesses with lifeline or cabling, protective clothing, safety glasses, face shields, etc.).
- Meeting Owner's basic security requirements: Badges, Sign In/Out, Initial Site Security Meeting/Briefing, Securing Tools, Material and Equipment.
- Excess waste including roofing, drywall, VCT, carpet, wall covering, ceiling tile, pipe, conduit, siding, concrete, etc. This list is not intended to be all inclusive, but descriptive of the types of construction materials that are typically sold in standard lengths, sizes and weights.
- Removing to and returning from an adjacent area or relocating within work area Owner's furniture and furnishings (e.g. chairs, tables, pictures, etc. but excluding modular furniture, wall or ceiling attached

or fastened devices or furnishings, safes or other furniture requiring disassembly).

- Basic protection and security of all work in place, on site, adjacent existing work and new work during construction and until final acceptance.
- Daily clean-up.
- Final professional project clean-up.
- Costs resulting from inadequate supply of building materials, fuel, electricity, or skilled labor.
- Working in extreme temperatures (below or above normal) or adverse conditions such as excessive rain, wind, sleet or snow.
- Differences in project size; complexity and location.
- All costs for other than discreet items of work specifically required to complete a particular Job Order.

PRICE VARIATIONS:

- Contractors may find differences in labor, equipment and material costs due to certain economic factors. Variations in labor cost can also result from labor efficiency, labor restrictions, working conditions and local work rules. Variations in material costs can also result from the quantity of material purchased, the existing relationship with suppliers, and because the materials have been discontinued or have become obsolete.
- While diligent effort is made to provide accurate and reliable up-to-date pricing, it is the responsibility of the Contractor to review and analyze the unit prices, and to calculate their Adjustment Factors accordingly, prior to bidding.

GENERAL COSTS:

- This list is not exhaustive and is intended to provide general examples of cost items to be included in the Contractor's Adjustment Factor as defined in the Contract.
- The only compensation to be paid to a Contractor for the unit price tasks will be:

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Published Unit Price	X	Installation (or Demolition) Quantity	X	Appropriate Adjustment Factor
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- No additional payments of any kind whatsoever will be made. All costs not included in the unit prices must be part of the Adjustment Factors.

General Interpretations:

WORKING HEIGHT:

- Typical working height for work other than masonry is up to 14' above the finished floor or stationary working surface. The Contractor will not be paid for scaffolding, lifts, or similar equipment for work below 14'.
- Typical working height for masonry work is up to 4' above the finished floor or stationary working surface. The Contractor will not be paid for scaffolding, lifts, or similar equipment for masonry work below 4'.

FIELD ENGINEERING:

- Surveying tasks shall be used only when the Owner requests the Contractor to perform topographic surveys, property line surveys or to establish horizontal and vertical controls. If the Owner provides horizontal and vertical control points within or adjacent to the project site, any other surveying required to complete the work is considered construction staking or layout and the cost thereof is included in the appropriate task.

ASSEMBLIES:

- Assembly unit prices take precedence over individual component pricing.

TESTING:

- Contractor will be paid for testing existing material, as required by the technical specifications and as directed by the Owner (record tests) at the unit price for the appropriate task. The cost of process quality control testing routinely performed by the Contractor is included in the unit prices for the individual tasks.

MISCELLANEOUS:

- For the purpose of calculating the quantity of a task, quantities are calculated on a per project basis. The quantity so determined shall be used for the task and all appropriate modifiers, unless the task states otherwise.
- Whenever there are alternative tasks that may be selected to complete work the Contractor shall select the most practical and economical tasks available (e.g. rental of equipment by weeks or months rather than days or painting by roller or spray rather than brush).
- Restricted Working Space is defined as any area with less than 3' vertical or horizontal clearance and includes areas such as crawl spaces, ceiling plenums where the grid is not removed, narrow piping tunnels, and equipment rooms where the space to install the new work is congested as a result of equipment and piping placement that meet these dimensional restrictions. A Restricted Working Space modifier is available for certain mechanical piping and piping accessories tasks and for certain electrical conduit and conduit accessories tasks. Only those tasks with a modifier for Restricted Working Space are eligible for a price adjustment, and then only if the modifier applies to the contemplated tasks. A non pre-priced task will not be allowed because of Restricted Working Space for any CTC task.
- Confined Working Space is defined according to the OSHA definition 29 CFR 1926.21(b)(6)(i): "Any space having limited means of egress, which is subject to accumulation of toxic or flammable contaminants or has an oxygen deficient atmosphere, including, but not limited to, storage tanks, process vessels, bins, boilers, ventilation and

exhaust duct, sewers, underground vaults, tunnels, pipelines and open top spaces more than 4 feet in depth such as pits and tubs." The Contractor shall conform to all OSHA and Owner requirements for working in Confined Working Spaces. Required ventilation and air monitoring equipment tasks shall be priced from the CTC.

- ☑ Whenever a material, article or piece of equipment is identified in the CTC or in the specifications by reference to manufacturers' or vendors' names, trade names, catalogue numbers, or make, the identification is intended to establish a standard. Any material, article or equipment of another manufacturer or vendor which performs satisfactorily the duties imposed by the general design may be considered equally acceptable provided that, in the opinion of the Owner, the material, article or equipment so proposed is of equal quality, substance and function. The Contractor shall not provide, furnish or install any proposed material, article or equipment without the prior written approval of the Owner. The burden of proof and all costs related thereto concerning the "or equal" nature of the substitute item, whether approved or disapproved, shall be borne by the Contractor.

SPECIFICATIONS:

- ☑ Specifications for tasks shall be interpreted as follows: All labor, material, equipment, spare parts, services, and work required by a specification shall be considered part of the unit price, unless the task description or technical specifications state otherwise.

Useful Information:

UNIT OF MEASURE DEFINITIONS:

ACR – Acre, **BAG** – Bag, **BBL** – Barrel, **BCY** - Bank (In-place) Cubic Yards, **BF** - Board Foot, **BOX** - Box (each), **BTU** - British Thermal Units, **C** - One Hundred, **CCF** - One Hundred Cubic Feet, **CCY** - Compacted Cubic Yards, **CF** - Cubic Foot, **CFM** - Cubic Feet Per Minute, **CLF** - One Hundred Linear Feet, **CSF** - One Hundred Square Feet, **CSY** - Hundred Square Yards, **CWT** - Carton Weight, **CY** - Cubic Yard, **CYM** - Cubic Yard Miles, **DAY** – Day, **DRM** - Drum (each), **EA** – Each, **FLR** - Floor (Per Floor), **FT** – Foot, **GAL** – Gallon, **GSF** - Ground Square Foot, **HR** – Hour, **HWT** - Hundred Carton Weight, **IN** – Inch, **JOB** – Job, **LAN** – Lane, **LB** – Pound, **LCY** - Loose (Excavated) Cubic Yards, **LF** - Linear Foot, **LFD** - Linear Feet Per Day, **LIT** – Liter, **MBF** - One Thousand Board Feet, **MBH** - One Thousand British Thermal Units, **MF3** - One Thousand Cubic Feet Per Minute, **MGL** – One Thousand Gallons, **MI** – Mile, **MLF** - One Thousand Linear Feet, **MO** – Month, **MSF** - One Thousand Square Feet, **MSY** - One Thousand Square Yards, **MT** – Metric Ton, **NTE** – Note, **OPN** – Opening, **OUT** - Outlet or Output (each), **OZ** – Ounce, **PKG** – Package, **PNT** – Point, **PR** – Pair, **QT** – Quart, **ROL** - Roll (each), **ROM** – Room, **ROW** – Row, **RSR** - Riser (Per Rise), **SEA** – Seat, **SET** – Set, **SF** - Square Foot, **SI** - Square Inch, **STP** - Stop (each), **SQ** - Square or One Hundred Square Feet, **SY** - Square Yard, **TNM** - Tons per Mile, **TON** – Ton, **UI** - United Inch, **VLF** - Vertical Linear Foot, **WK** – Week, **YR** – Year

MATERIAL WEIGHTS:

EARTHEN MATERIAL

- ☑ The following engineering values for establishing shrink/swell factors shall be used unless otherwise directed by the Owner.

	Material Weight (Lbs Per CY)
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Using The Construction Task Catalog®

Material	In-place (Bank)	Loose (Excavated Materials)	Compacted
Earth, Common (Average)	3170	2536	3520
Sand	2880	2590	3240
Earth, Rock Mix. (75% E/ 25% R)	3380	2370	3720
Earth, Rock Mix. (50% E/50% R)	3750	2710	4000
Earth, Rock Mix. (25% E/ 75% R)	4120	3140	3680
Gravel (Average)	3280	2730	3570
Limestone	4380	2690	3220
Riprap Rock (Average)	4500	2610	3150
Granite	4540	2640	3170
Basalt	4950	3020	3640
Clay	3220	2150	3570
Gneiss	4550	2720	3180

1 Kilometer = 0.6214 Miles = 3280 Feet

1 Meter = 100 Centimeters = 3.2808 Feet

1 Mile = 5280 Feet = 1.6093 Kilometers

1 Pound = 0.4536 Kilograms

1 Square Foot = 144 Square Inches = .0929 Square Meters

1 Square Meter = 1.1960 Square Yards = 10.7639 Square Feet

1 Square Yard = 9 Square Feet = 0.8361 Square Meters

1 Ton = 2000 Pounds = 907.185 Kilograms

1 Yard = 3 Feet = 0.9144 Meters

BULK FACTORS FOR DEMOLITION:

- The following bulk factors shall be used to calculate the volume of demolished material to be transported from the project site.
- **Asphalt = 1.25**
 - **Concrete = 1.40**

CONVERSIONS:

1 Acre = 43,560 Square Feet = 4046.8 Square Meters

1 Board Foot = 12" x 12" x 1" = 144 Cubic Inches

1 Centimeter = 0.3937 Inches = 0.0328 Feet

1 Cubic Foot = 0.03704 Cubic Yards = 0.02832 Cubic Meters

1 Cubic Meter = 1.3080 Cubic Yards = 35.3147 Cubic Feet

1 Cubic Yard = 27 Cubic Feet = 0.7646 Cubic Meters

1 Foot = 12 Inches = 0.3048 Meters

1 Inch = 2.54 Centimeters = 0.0254 Meters

1 Kilogram = 2.2046 Pounds

Sheet Metal Thickness (inches)				
Gage No.	Steel Sheet	Galvanized Steel Sheet	Stainless Steel Sheet	Aluminum Sheet
10	.135	.138	.141	
11	.120	.123	.125	
12	.105	.108	.109	
13	.090	.093	.094	.072
14	.075	.079	.078	.064
15	.067	.071	.070	.057
16	.060	.064	.063	.051
17	.054	.058	.056	.045
18	.048	.052	.050	.040
19	.042	.046	.044	.036
20	.036	.040	.038	.032
21	.033	.037	.034	.028
22	.030	.034	.031	.025
23	.027	.031	.028	.023
24	.024	.028	.025	.020
25	.021	.025	.022	.018
26	.018	.022	.019	.017

STANDARD GEOMETRY:

Circle

- Circumference = 2 π radius = π diameter

- Area = $\pi \text{ radius}^2 = \pi (\text{diameter}^2 / 4)$

Cylinder

- Volume = $(\pi \text{ radius}^2)\text{height}$
- Surface Area = $2 \pi \text{ radius}^2 + (2 \pi \text{ radius})\text{height}$

Sphere

- Volume = $(4 \pi \text{ radius}^3) / 3$
- Surface Area = $4 \pi \text{ radius}^2$

$\pi = 3.14159$

Board Foot

- BF = L (in) x W (in) x T (in) / 144

United Inch

- The industry standard for measuring windows is the United Inch or UI. The UI is determined by adding the width and the height in inches.

TRADEMARKS

- Gordian JOC Solution, JOC Complete Solution, JOC Complete Solution Plus, PROGEN, eGordian, ezIQC, Construction Task Catalog, Catalog of Construction Tasks, DMAP, The Standard for Job Order Contracting and 6 Phase Development and Implementation Process are either registered trademarks or trademarks of The Gordian Group, Inc. The names of actual companies and products mentioned herein may be the trademarks of their respective owners

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