

## Background

Job Order Contracting (JOC) is a multi-year project delivery system where pricing is established at award and which applies over multiple projects - usually even years. JOC is also known as SABER (Simplified Acquisition of Base Engineering Requirements) and sometimes referred to simply as a Construction IDIQ, with the specification of a Unit Price Book (UPB) and coefficient being the distinguishing feature. The use of UPBs to inform the pricing of sole source contracts is also becoming increasingly common, and the process virtually replicates JOC on a smaller scale in line with sole source contracting limits, sometimes being called Mini-JOCs or POCAs (Performance Oriented Construction Activity).

Pricing, as determined by the Coefficients (also sometimes called an Adjustment Factor), is not a common estimating approach learned in school or on the job when bidding standalone projects. Estimating the correct coefficient in a highly competitive environment is a special skillset that eludes many contractors new to JOC. Applying a rigorous and systematic approach which is founded on solid historical data will minimize risk for experienced contractors and those new to the delivery method, contributing to a potentially profitable and consistent work stream that is very valuable. Many small businesses have benefitted tremendously from the long-term contract structure of JOC.

This white paper is designed to provide some guidance and a methodology successfully used by an expert JOC practitioner. Bidders on any contract must assess their own risks and decide on their own estimating methodology and the method presented relies heavily on the accuracy of historic costing data, so no warranties are made as to results.

## Only One Valid Approach

Contractors typically utilize one of four different approaches when calculating a coefficient. They are:

1. Guess
2. Bid the competition
3. Assume the UPB reflects true cost and just apply a mark-up for indirect costs, or
4. Use historical price data from representative projects

Guessing is obviously a high risk approach utilized by contractors that don't understand the risk or assume the contract terms won't apply if they're unable to achieve a desired profit. This approach can often derail JOC programs and cause negative financial impact to contractors and owners alike. Similarly, some contractors bid the competition (i.e., they are aware of the incumbent contractor's coefficients, or coefficients on another contract, and bid the same or a little lower). Their rationale is that if a competitor can make money at a certain coefficient, they should be able to do the same or better. This is also a risky strategy because may have

different productivity and processes, and the incumbent’s profitability (or loss) at the existing coefficient is unknown.

A third approach is to assume the contract specified UPB reflects current local costs to perform the work and thus the contractor only needs to apply a markup to recover their indirect costs (e.g., field overhead, profit, home office overhead). However, even a rigorously researched and trusted UPB will have some variation from a contractor’s actual costs. The UPB might be slightly out-of-date, be based on different wage rates than the contractor actually pays, survey different material price sources than those used by the contractor, use different productivity assumptions than those that the contractor achieves, or even be for a different area or based on a national average.

Contractors’ costs vary based on a number of factors. Each contractor has varying levels of self-performance of the work, and different subcontractors that they use at different costs. Some contractors negotiate material pricing discounts. Some contractors manage their projects better than others, achieving overhead efficiencies and cost savings in the process. Some contractors achieve better productivity than others. So, to accept a UPB as being reflective of direct costs, requiring just a mark-up for indirect costs is another risky approach to developing a coefficient. Such a coefficient tends to be higher than that of successful bidders because there has been no effort to identify cost-saving advantages that the contractor may have over the UPB.

A more disciplined approach that works for many successful JOC contractors is to use historical price data to determine the ratio of the direct **cost** to perform line items in the UPB as a ratio to UPB **prices**, and then markup for the contractor’s indirect costs, programmatic risk and contingencies, and target profit. Historic data removes the guesswork and allows the contractor to base his pricing on recent actual performance in the field.

*Past experience, if not forgotten, is a guide to the future.* Chinese Proverb

### The Mathematics of the Coefficient Calculation

To determine a coefficient, a contractor must first determine the ratio mentioned above, call it “A” and insert it in the following equation:

$$\text{Coefficient} = A \times \frac{\text{Annual Contract Volume}}{(\text{Annual Contract Volume} - \text{Field Overhead} - \text{G\&A} - \text{Contingency} - \text{Bond Premium} - \text{Fee})}$$

$$\text{where } A = \frac{\text{Direct cost to perform UPB line items}}{\text{UPB prices}}$$

The determination of ratio **A** (i.e., the ratio of the direct cost to perform line items in the UPB as a ratio to UPB prices) is the most critical determination, followed by the annual contract volume.

**A** can be determined in different ways, but is commonly done by *re-pricing* recent historic jobs using the UPB line items and comparing this against the known direct costs. This requires time and effort of the personnel that will be pricing future job orders if awarded the JOC. These estimators need to be educated on the research basis of the UPB and the contract terms or rules governing use of line items. This is much more detailed estimating than what is normally done by general contractors, but important if an accurate and competitive coefficient is to be developed.

#### Differences in Data and Data Governance

Unit Price Books specified in most Federal and DOD JOC contracts come in two primary varieties. Commercial Off The Shelf (COTS) estimating guides like **RSMeans data by Gordian** have historically been specified for JOC programs, and require particular caution because they are not specifically designed for JOC and require ad-hoc **data governance** that is not always well-considered or well-informed. Contract terms and conditions will typically be designed to exclude the use of certain COTS general condition line items that are intended to be included in the coefficient, but sometimes these provisions will be in misalignment with the way the cost data was researched, and can be a risk factor in developing a coefficient. In addition, every contract is different, requiring a careful reading of the solicitation or contract terms and conditions or statement of work.

Purpose-built JOC UPBs like the **Construction Task Catalog**© from Gordian reduce risk by providing procurement-specific data sets and standard data governance or “rules of the road” that are easily understood and in full alignment with the cost research enterprise. **Understanding the CTC**, also sometimes referred to as “The Big Note,” is a valuable standardized tool in evaluating this UPB and developing a coefficient.

The *actual final* direct costs to perform the work must be determined and should come from the financial records, not the original project records. Many times the field project files never get updated with *final* costs, but the complete actual final costs are necessary if an accurate coefficient is to be determined. Care must be taken that only direct costs that pertain to the re-estimated reference project are included, not any overhead costs or costs from a follow-on or nearby project. The method clearly relies on a contractor having a solid job costing and accounting system, and this should be considered a developmental precursor to successful Job Order Contract acquisition. Emergent contractors should embrace

The best comparison is done using very recent, but completed projects of a size similar to what is expected to be included in the JOC being awarded. Likewise, the type of projects (e.g., roofing, paving, window replacement, multi-trade room remodel ) expected to be subject of future job orders should be selected.

Consideration must also be paid to adjust the direct costs to reflect current pricing, and that can be done using the historic cost indexes provided by RS Means or other commercial providers. A contractor may use:

1. a singular project where the costs are known
2. multiple projects; and/or
3. a set of commonly used UPB line items where the costs are known

The more reference projects utilized to calculate ratio **A**, the higher degree of confidence there will be in the resulting coefficient. Using only a single project is a gamble. Re-estimating multiple reference projects is much more rational, but must be balanced against the amount of effort it takes to re-estimate projects and gather actual costs data. Many times a contractor has limited time and resources during the bidding phase and must settle for only a few projects to make the comparison. Wise selection of projects to reflect the anticipated scope of work is also key. The greater the number of reference projects that can be re-estimated, the better the accuracy of the coefficient.

If multiple projects are used, then the issue of how to aggregate the projects becomes important. Are all the project costs just summed together and all the reference project prices summed together, or are individual project ratios weighted by value or cost? Or, are certain projects considered more reflective of the costs of a JOC job order so they should carry more weight when calculating the overall coefficient? No method is *right*, rather a diligent contractor will calculate a coefficient in a variety of weighting approaches and observe how sensitive the final coefficient is to the weighting used. An example of five different weighting approaches is shown in the example below for four sample reference projects. The range of the overall ratio **A** varies 3% in the example.

Blending of Reference Projects	UPB Estimate (\$)	Actual Cost (\$)	Ratio A	Different Weightings				
				0.25	0.391656	0.439668	0.45	0.35
Reference Project A	331796	341110	1.028071	0.25	0.391656	0.439668	0.45	0.35
Reference Project B	363050	320476	0.882732	0.25	0.428549	0.413072	0.40	0.60
Reference Project C	14222	15800	1.110955	0.25	0.016788	0.020365	0.05	0.02
Reference Project D	138093	98450	0.712925	0.25	0.163007	0.126895	0.10	0.03
			<b>Overall Ratio =</b>	0.933671	0.915807	0.929733	0.942565	0.933071
				Equal	Est. Val.	Act. Cost	Arbitrary	Arbitrary

If insufficient actual projects are available for re-estimating, artificial sample projects can be created and attempts made to determine what actual costs would be for the SOW. This approach is better than guessing, but using actual financial data is always better than predicted.

Some general contractors with extensive experience in JOC contracting use a variation of the above approach and capture historic line item usage data of the most commonly used line items over a large number of job orders. From that data, and tracking ratio **A** for each individual job order over time, they can create an overall

ratio **A** that is significantly less sensitive to the selection of reference projects. Since the line item usage data is based on real contracts, it also will more closely reflect the type of work expected in the future.

## Preliminary Data Gathering

After receipt of JOC RFP or Bid Documents, the contractor must gather a lot of preliminary data that can have a significant impact on the accuracy of their calculations. Contract and market research by the contractor are required.

Some items to consider are:

- **Annual Contract Volume** - the amount the contractor believes will be spent on job orders on an annual basis. Very large overall contract volume drives a lower coefficient by allowing for greater contractor efficiencies in the management of the work program. Maximum contract volume can be a guide, but is not always reliable. Sometimes contracts with large maximum volume are underutilized because owners have another means of getting the work done. Sometimes contracts with lower volume are expended well before the expiration of the contract period and rebid, effectively increasing the annual volume. Sole source contracts have limited volume but might lead to follow-on contract opportunities (another sole source, or a competitive JOC). After the calculation of **A**, the determination of annual contract volume is the second most important decision the contractor must make.
- **Duration** – how long is the contract base period and option periods? The longer the guaranteed base, the lower the field overhead costs will be as some one-time costs items have a longer period to be amortized over. Normally a JOC contractor will price their bid expecting all option periods will be exercised, assuming they will perform well and the Owner will continue to have funding.
- **How is escalation handled** – Some JOC contracts have a fixed UPB where the line item prices never change, requiring the contractor to estimate inflation/deflation over the life of the a long-term contract and propose coefficients for each contract period. This is extremely risky in a volatile construction market, so most Owners now prefer the best practice methodology that incorporates regular data updates, typically annually. Sometimes contractors are expected to maintain the same coefficient throughout the contract, and sometimes they are given the option to bid different coefficients for the base and each option period.
- **Type/diversity of work** – anticipation of the type of work expected to be issued in job orders is important so the best selection of reference projects is done. Even the most thoroughly-researched UPBs will likely have some variations against actual contractor costs by CSI division, because different contractors have efficiencies and specialization that are not consistent across the trades. Therefore, \_\_\_\_\_

selecting reference projects to closely reflect the type of work expected will improve accuracy. This always involves some educated projections based on guidance provided by the owner.

- **Size of orders** – the smaller the job, the more costly they usually are to perform. Regardless of the size of the job order, each job order requires the same amount of administrative handling and oversight. If the Owner expects to issue many \$10,000 job orders in contrast to \$1,000,000 orders, this needs to be known as it will require more field staff.
- **Distribution of work (time and geographic)** – if all the job orders are issued around a fiscal year start or close (which is common in Federal work) that impacts the ability of the contractor to get the most competitive pricing from subcontractors and suppliers due to market conditions. Similarly, if the job orders are distributed relatively balanced throughout the year, it improves management and workflow and usually allows better pricing. It also affects staffing levels as peaks of work require more staff, and a higher field overhead cost. Geographically distributed work increases the costs for a contractor as they require more staffing for management, plus the time to travel between projects. Job orders that revolve around a tightly knit central location, as on a DOD installation, are usually more efficient.
- **How much design is expected** – A key feature of JOC is “incidental design,” which is usually similar to shop drawings and less than what is needed for stamping by a professional engineer. But, some Owners require stamped plans and drawings or use of professional engineers on some projects. Such requirements increase the cost of a job order, therefore the frequency and amount of such higher level design services, as well as the ability to recover these costs as a separate line item charge, is information of great importance.
- **Self-performance requirements** – Some contractors are more efficient when they self-perform certain portions of work. Others are more efficient when they can rely on specialty trade subcontractors. If there are self-performance requirements, that changes the cost structure for a company and the selected reference projects costs will need to be adjusted.

## What You Need to Know About the Owner

After gathering preliminary information from the bid documents, a contractor needs to gather information about the Owner’s intended program. Has the Owner ever had a JOC before? Does their staff have experience or have they been trained? What are their General Condition requirements? What are their payments terms and practices? Is a JOC Program Manager involved, who will provide training and support to both contractor and owner? All of these factors can impact the standup timeline and ultimate success of a JOC program and thus the volume and ultimately profit that can be realized.

Is there an incumbent JOC contractor? If so, that means some of the preliminary data mentioned in the section above can be based on a factual record. Procedures have been put in place that will likely continue on the new JOC contract. But, be observant that Owners do change requirements and occasionally a new JOC is an attempt to change procedures or reflect a different type of work selection in the future.

A successful JOC program depends on a collaborative environment between the contractor and the Owner, so evaluation of the Owner is a key component in developing contingency and profit requirements.

### What You Need to Know About the Marketplace

While preparing its pricing, a contractor needs to explore and understand the local environment as it directly affects its expected costs. If the contractor has done work in the area where the JOC will be issuing job orders, labor costs will be better known. If they have been subject to paying Davis-Bacon or prevailing wages, they should have knowledge if they have to pay higher than the prevailing wage to secure adequate labor. The key is to ensure the selected reference projects include labor costs calculated the same as the new JOC contract. If the selected reference projects were not subject to prevailing wage and are less than prevailing wage, then the contractor must increase the calculated ratio  $A$  by:

$$\text{Adjusted ratio } A = A \times (1 + \text{Labor Portion} \times \Delta\text{Labor})$$

The *Labor Portion* is the percentage expressed as a decimal that a job order's direct cost is comprised of labor costs. The range usually is 0.3 to 0.6 and varies depending on the type of work. For example, JOCs with lots of mechanical, electrical, and plumbing (MEP) work tend to be in the lower part of the range, whereas sitework, environmental remediation, and demolition work tend to be at the higher end of the range.

The  $\Delta\text{Labor}$  is the change in labor costs between the reference projects and the new contract location:

$$\Delta\text{Labor} = \frac{\text{New JOC labor costs}}{\text{Reference project labor costs}} - 1$$

Labor costs are compared by looking at a blend of the commonly used trades and their associated wage rates (include mandated fringes) to obtain an approximation of the differential in labor costs. A reasonable distribution to allow blending of labor costs calculated by one contractor is shown in Table X.

Labor Category	Weight
Bricklayer	.05
Carpenter	.13
Drywall Installer	.08
Dump truck operator/driver	.05
Electrician	.11
Glazier	.04
Painter	.10
Plumber	.10
Roofer	.06
Sheet metal worker	.08
Structural Ironworker	.05
Unskilled laborer	.15
<b>Total</b>	<b>1.00</b>

The contractor must also evaluate subcontractor productivity between the referenced projects and the local area where the work under the new JOC will be performed, if it is different. Subcontractor productivity varies across the country based on overall weather patterns, safety and other regulations like safety, building codes, and inspections, union rules, etc., so if there is a difference the ratio **A** numerator must be adjusted.

Taxes vary significantly, sometimes within a state and region, and sometimes JOC work can be tax-exempt. Again the costs experienced on the reference projects will be higher or lower depending on the difference in tax rates. Therefore the actual direct costs might need to be adjusted downward if reference projects included tax, resulting in an adjusted ratio A. Since the tax usually only affects the material and equipment portion of the work, an adjusted A can be calculated by:

$$\text{Adjusted ratio } A = A \times (1 + [0.8 - \text{Labor Portion}] \times \Delta\text{Tax})$$

where  $\Delta\text{Tax} = \text{New Tax rate} - \text{Referenced Project's Tax rate}$

The contractor must use its own nuanced understanding of tax requirements in their location and in their reference projects to adjust these calculations.

Permit costs can also affect the calculation of the coefficient. The contractor must research the impact and include a reasonable amount in their field overhead for these expected costs.

### Calculating Indirect Costs

To complete the coefficient calculation, the contractor has to determine the following indirect costs:

**Field Overhead and Startup Costs** - for the annual contract volume selected, it's an estimate of field management staff requirements, office furnishings, miscellaneous overhead costs, quality control program costs, and field safety costs. In some JOCs, there may be significant investment in IT (hardware and software) and training, including provisions for Owner needs; this is easily managed in a



percentage-of-volume fee program like those from Gordian, but where COTS UPBs are specified, the contractor must incorporate these costs into the Field Overhead. Do a detailed review of the contract specifications to ensure all costs are recognized. In contrast to normal construction projects, a JOC contract requires more full time staff that's available to respond to a varying workload, including much more scoping and pricing or estimating activities. Sometimes an Owner will indicate expected peaks and valleys of the expected workload that might allow some seasonal reduction of staffing, but normally the calculations assume immediate full staffing and a consistently level workload over the entire period of the contract. In a traditional large volume JOC, a contractor will deploy dedicated staff for the contract. Do not include the cost of self-performing labor, other than their time that cannot be directly charged to job orders (e.g., training time, vacation time, personal protective gear). As personnel salaries usually are 70-80 percent of the field overhead, it's very important the salaries are realistic and current. Salaries need to be marked-up with a fringe rate that captures all taxes, 401(k) retirement plans, healthcare, and workers' compensation rates.

- **General & Administrative Costs (G&A) or Home Office Overhead** – this should be derived from the corporate financial statements, but reviewed periodically. It covers executive oversight salaries, home office rent, contract proposal development costs, marketing costs, accounting costs and similar costs.
- **Contingency** – this should be an amount that is rigorously analyzed and challenged. It's a rational attempt to quantify unknowns, and to identify areas where risk minimization strategies can be implemented. Experienced JOC contractors will always include some internal contingency to account for unknown risks inherent in an open-ended contract where the projects are not identified at the time of bid: Some common areas for consideration are:
  - Experience with Owner
  - Experience with Subcontractors
  - Interruptions/Phasing Impacts
  - Unrealistic task order proposal completion times
  - Unrealistic task order completion times
  - Coordination with other contractors
  - Liquidated Damage provisions
  - Safety issues
  - Historic renovation
  - Moving & reinstalling Owner furnishings
  - Additional supervision/escort requirements
  - Self-performed work
  - Excessive liquidated damages
  - Tight labor availability
  - Experience with location
  - Groundwater fluctuations
  - Unique site conditions
  - Site access
  - Site security
  - Working in occupied space
  - Hazardous/contaminated
  - Marine work
  - Earth support/shoring
  - Environmental requirements
  - Work in adverse weather
  - Permits
  - Testing requirements
  - Special material hoisting

- Unbalanced/extraordinary risk transfer
- **Bond premium** - Most Sureties will calculate their payment and performance premiums on the actual total contract values, regardless if the Owner allows the penal amounts on the face of the actual bond to be a lower amount. Sometimes it's calculated on a sliding scale where an increase in annual contract volume causes the rate to decrease. Therefore when the annual contract volume is decided, the premium rate is multiplied against the annual contract revenue. Retention, warranty, or maintenance bond premiums are an additional amount if required. Normally bid bonds are no cost to a contractor.
- **Profit** - Profit is dependent on market conditions and should be a reward for satisfying the Owner. Out of this fee the corporate taxes are paid, plus reinvestment for corporate growth is done. Profit is never guaranteed, but if the coefficient is calculated correctly, contractor and owner embrace the JOC methodology, and the contractor manages the contract well, over time it should be attained.
- **JOC Program Fees** – In turnkey JOC programs, like those from Gordian, a small fee is due to the JOC Program Manger for use of the system, and it is sometimes paid by the contractor. This fee typically covers unlimited and scalable software, training, and support, and it is much easier to predict and incorporate the costs under this structure than when these items must be built into Field Overhead.

## What You Need to Know about the UPB and Contract Pricing Methodology

An examination of the RFP and JOC Bid Documents is critical to understanding how pricing of job orders will be done. In programs where COTS UPBs are specified, there are variations to how the data is specified that can have a significant impact on coefficient development, and can even imbalance coefficient application. COTS data sets typically present both “Bare Cost” and “Total Including Overhead and Profit” columns. Bare Cost presents material and installation costs without overhead, including fixed overhead. This creates a challenge in developing a single coefficient because labor has significantly more fixed overhead in the form to payroll taxes, workman’s compensation and other insurance than material items, and the overhead can even vary by trade. It can be difficult to develop a precise coefficient when there is such variation in the base costs. If the Overhead and Profit column is used, it is critical to know what level of overhead and profit is included. Sometimes this can result in a seemingly illogical negative coefficient.

In a COTS-based program, a contractor must also carefully assess what specific portions of a UPB may be excluded from use during the pricing of job orders. Some programs will exclude all of CSI Division 1, which includes key, significant costs like cranes and scaffolding, which requires a contractor to guess at how often those items might be required in delivery orders. Some contracts attempt to call out specific Division 1 line items that may be allowed. Modifiers are also sometimes disallowed, impacting cost recovery. In COTS programs, a contractor must thoroughly review the Bid Documents to understand how the owner is treating these items.

Procurement-specific JOC systems will be more consistent and effective in the inclusion and exclusion of line item costs. For instance, the **Construction Task Catalog**® includes extensive quantity and working condition modifiers, as well as key equipment and site condition cost line items. The rules for use of the UPB are clearly spelled out in *Understanding the CTC*, and are largely universal and consistent across contracts.

### Coefficients

Look to see how the Owner segregates the work to require use of different coefficients for different conditions. For example the coefficient for “other than normal hours work” or in “secure facilities”. The normal working hours are defined in the General Conditions, so anytime the Owner *requires* work to be done outside those hours the special coefficient is used. It is typically a standalone coefficient. Similarly, the secure facility coefficient is also a standalone coefficient for work to be done within a secure area.

JOC contracts can have different coefficients depending on the size of the job order, for job orders requiring design assistance from a licensed architect/engineer, for job orders a very long distance from the ordering office location, or for emergency work. Some contracts include a “stepped” coefficient based on overall contract volume, which can account for both variable JOC program fee structures and a decrease in contractor overhead as the contract reaches capacity. All of these should be accounted for in identifying a ratio **A** or adjusted field overhead that reflects the differing costs and line item pricing allowed.

When the Scope of Work requires work that is not included in the UPB line items, a non-prepriced coefficient is used for those described items. More robust UPBs like a **Construction Task Catalog**® will provide more thorough coverage of potential cost items, but it is difficult to anticipate and conduct cost research on all specialty items. So, the inclusion of a non-prepriced item coefficient provides a way to incorporate small quantities (by dollar value) assurance to a JOC contractor that out of the ordinary items will not cause them a loss. In some JOC contracts there’s a limitation on the percentage of non-prepriced items per delivery order or per contract.

Key coefficients different than the normal working hours coefficient are calculated as follows:

- **Other than normal hours** - the increased cost above the normal working hours coefficient to work after normal working hours (e.g., Monday-Friday, 7 am to 5 pm). This is not directed overtime; rather it’s a shift where work is done other than during normal hours. Since it’s not overtime, the increased costs of scheduled work at off hours is many times insignificantly higher unless union requirements mandate a premium. Contractor salaried personnel sometimes receive the same pay, but sometimes to engageworkers at off hours there must be higher pay for the hourly workers. If so, calculate the increase similar to paying above prevailing wage and calculate an adjusted ratio A.

- **Non-Prepriced (NPP)** – This is calculated by determining the percentage of revenue each of the indirect cost elements comprise and adding them to one. The NPP coefficient is multiplied against an agreed-upon subcontractor's or material supplier's provided quote. The calculation of a NPP coefficient is as follows:

$$NPP\ Coefficient = 1 + \left( \frac{Field\ Overhead - G\&A - Contingency - Bond\ Premium - Fee}{1 - Field\ Overhead - G\&A - Contingency - Bond\ Premium - Fee} \right)$$

where Field Overhead, G&A, Contingency, Bond Premium, Fee are the decimal equivalent numbers of their percentage of revenue.

- **Secure facility** – This coefficient is a standalone coefficient for work required within a secure area or site, as defined in the General Conditions. This can entail limited subcontractor or labor resources that can pass background checks or maintain security clearances, and/or waiting time for everything from security processing at a gate or entry even including tool inventories in some situations like correctional institutions. This coefficient is calculated by adjusting the ratio **A** to account for the necessary additional costs.

### An Example

Given the equations described above and explanation of terms, a simple spreadsheet can be used that calculates the coefficients for a given annual contract volume, with varying weighting of reference project ratio **A**s. Cell B2 can be changed for different annual contract volumes, along with the field overhead expense to see what effect it has on the coefficients.

	A	B	C	D	E	F	G	H	I
1	<b>Description</b>	<b>Amount (\$)</b>	<b>Percentage (%)</b>						
2	Annual estimated contract volume	500,000	100						
3	Field overhead expenses	(35,000)	7						
4	G&A expenses	(20,000)	4						
5	Fee and allowance for contingencies	(15,000)	3						
6	Cost of the Work	430,000	86						
7									
8									
9	<b>Blending of Reference Projects</b>	<b>UPB Estimate (\$)</b>	<b>Actual Cost (\$)</b>	<b>Ratio A</b>	<b>Different Weightings</b>				
10	Reference Project A	331796	341110	1.028071	0.25	0.391656	0.439668	0.45	0.35
11	Reference Project B	363050	320476	0.882732	0.25	0.428549	0.413072	0.40	0.60
12	Reference Project C	14222	15800	1.110955	0.25	0.016788	0.020365	0.05	0.02
13	Reference Project D	138093	98450	0.712925	0.25	0.163007	0.126895	0.10	0.03
14			<b>Overall Ratio =</b>		0.933671	0.915807	0.929733	0.942565	0.933071
15					Equal	Est. Val.	Act. Cost	Arbitrary	Arbitrary
16									
17			Coefficient for Normal Hours=		1.09	1.06	1.08	1.10	1.08
18	4%		Coefficient for Other Than Normal Hours=		1.13	1.11	1.12	1.14	1.13
19			Coefficient for Non-Pre-Priced=		1.16	1.16	1.16	1.16	1.16
20			(Rounded to 2 decimal places per RFP)						

Calculating JOC coefficients is not difficult, though it takes an analytical approach and depends on good historical data. The better the historical reference data, and the more reference projects that are used, the more accurate the coefficient development will be. A simple spreadsheet can make examination of varying scenarios easy for an experienced and skilled estimator, to allow the JOC contractor to see how sensitive the coefficients are to annual contract volume or other factors. A flow chart is included at Appendix A to graphical illustrate the JOC coefficient development.

*The primary author developed JOC coefficients for ten years for one of the United States’ largest JOC contractors and has extensive experience with cost databases and the operational and financial impact of JOC contract language. This information is provided as a service by Gordian for contractors interested JOC. Coefficient bidding strategy must be finally determined by the bidding contractor and no warranty as to results or accuracy using this information is provided or implied by Gordian.*

Appendix A

