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Using RSMeans Cost Data for Job Order Contracting

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An innovative method of contract management is being used more and more by owners who desire quick service and reasonable cost.

Purpose

The purpose of this paper is to describe a proven, but innovative method of contract management being used more and more by owners who desire quick service and reasonable cost for the maintenance and repair of their facilities. The job order contracting method has found inroads with those owners who have multiple facilities to care for in multiple locations.

Job order contracting found its genesis in the complex facilities world of the United States military. Tasked with maintaining and repairing thousands of buildings nationally and internationally, military facilities managers found the normal route of federal acquisition regulations much too slow and bureaucratic. Out of the need to solve this problem was born the idea of having an agreed-upon database of construction costs for both owner and contractor. This database would be referenced for estimating, negotiating, project control and closeout.

The authors of this paper are employed by RSMeans, a division of Reed Construction Data and provider of the most widely-utilized construction cost database in the United States. Duties of the authors include providing customer service and support for said database. Frequently this responsibility involves providing answers to questions posed by either of the parties involved in the JOC. On a fairly regular basis, the authors also lead professional training seminars, both public and private, teaching about the use of this type of contract and about the structure, makeup and application of the database.

This paper provides a short history of JOC. It walks the reader through the proposal process from the contractor's and owner's points of view, describes methods of cost prediction and analysis and concludes with points regarding how best to administer a JOC. Much of the information within the paper has been learned by the authors while serving both owners and contractors in the implementation of JOC programs.

History and justification

Job order contracts, also known as Simplified Acquisition of Base Engineering Requirements (SABER), are types of Indefinite Delivery Indefinite Quantity (IDIQ) contracts used in the United States and internationally since 1985. Billions of dollars worth of construction have been completed under JOC contracts since that time.

The primary concern in JOC contracts is time. Federal acquisition regulations require a lengthy process of design, bidding and award for all contracts above a certain dollar amount. If, for example, a roof were leaking, the process of having it replaced could take anywhere from six to nine months. By using a JOC contract, the amount of time could be reduced to as little as six to nine weeks. The use of this type of contract has been authorized by the Federal Acquisition Streamlining Act (FASA)[1] for just this reason.

Secondary to time is price and quality. Goals for JOC contracts are increasing the quality level of work performed, as well as keeping costs down. Secondary goal attainment is enhanced due to the nature of the contract. The contractor is motivated to perform quality work at a reasonable cost by the promise of continued work orders and potential extension of the contract to option years.

Contract procurement process

Those tasked with the maintenance and repair of multiple facility installations whose owners choose to use a JOC must first carefully prepare a request for proposal. Instead of the usual, highly-defined project information provided by drawings and specifications, this request defines a potential program in terms of potential dollar volume, type and size of project and contract term. For example, the RFP may state that over the next two years the contract will award a maximum of 3 to 5 million dollars worth of work.

The RFP should then give a general description of what the procedure will be for developing each job order or project that falls under the contract. The owner and contractor must follow a predetermined set of guidelines for each project. This process includes the following steps: submittal, estimating, negotiating, approval and notice to proceed.

The method of determining which company will be awarded the contract should be stated explicitly. In the past, most JOC contracts were awarded based on the lowest bid (coefficient). While this method eliminated any subjective judgment on the part of the owner, a very real problem for publicly funded projects, it proved to be less than desirable due to difficulties between owner and contractor during execution of the contract. Awarding of JOC based on a low bid replicated many of the negative incentives found in the broader low bid environment.

Contractors were motivated to submit the lowest coefficient possible (sometimes unrealistically low) and then try to "make it up" in the pricing of job orders –often taking liberties with selection of line items or inflating quantities. Most owners implementing JOC are looking for comprehensive project pricing with reduced change orders, so the trend today is to award the contract on a best value basis considering both price and qualifications. The RFP should contain criteria so that the bidder can demonstrate his or her qualifications and ability to perform the work under this contract. Qualifications such as previous JOC contract experience, letters of recommendation, financial records of the company and staff qualifications have been used for this purpose. Each qualification is given points or weighted by the owner to assist in selection of the most qualified contractor. Thus, we can see the start of the cooperative spirit involved in this type of contract. From the beginning, the owner is stating that low cost is not the only factor; rather, the owner desires to use a contractor qualified to do the work. Most owners pursuing best value selection are focused on final project costs, rather than initial bid costs. Ideally, expensive delays, change orders, conflict and litigation are avoided, and the owner is the beneficiary of higher quality construction work. The message sent is that the owner is willing to work with the contractors in order to make the attainment of goals simpler, smoother and, because of a lack of problems, in the long run less costly.

At this point, the database of choice must be addressed. The owner must specifically state the name or title of the database, the year of creation or publication, what form it takes and from where or whom it is available. Any necessary inclusions or exclusions from the database must be listed at

[1] Office of Federal Procurement Policy, Office of Management and Budget, Executive Office of the President, July 1997, *Best Practices for Multiple Award Task and Delivery Order Contracting*

this time to avoid future confusion or conflicts. Each bidding contractor should obtain a copy of the database. A thorough review and complete understanding of the database is absolutely necessary, as it will form the basis for all pricing under this contract. The database may be broken down into various columns or rows of information. The owner must specify which columns or rows are to be used for this contract. For example, RSMeans produces a database with columns entitled "bare cost total" and "total with overhead and profit" for each line item of information.[2] Most JOCs use the bare cost total as the basis for the contract; however, this is not always the case. Therefore, it must be made clear to all parties at this point whether or not the bare cost total will be the basis. The owner should also address the issue of escalation, since most JOCs are for multiple years. Most commercially available databases are produced annually. Some contracts allow for a separate coefficient for each year; some allow an escalation index; and some maintain the coefficient, but use an updated database. Others do not allow for any adjustment.

Each bidder takes the same available information and determines the coefficient they will submit. The coefficient is a multiplier used to raise or lower the unit prices found in the database. For example, if the unit price in the database is $1.00, and the coefficient is 1.25, the product of the unit price multiplied by the coefficient yields a payment amount of $1.25 for that item of work.

Unit prices in a commercially available database may vary from actual contractor costs, since costs are affected by time, temperature, position, location, quantity, resource, availability, security requirements and countless other factors that vary from project to project. Therefore, a determination of the coefficient must be performed very carefully. Each bidder should thoroughly understand what is to be included on each line item in the database, or what parts of the database are included and what the coefficient is to include.

This is the time to submit questions to the owner. It is safer for all bidders to know what is included or not included at this point rather than waiting and being surprised once work orders have been issued. From the owner's perspective, in order to avoid confrontations after the execution of the contract, the RFP should be extremely specific about what is or is not to be included. Remember that one of the goals of this type of contract is to eliminate conflict. The use of a blanket statement similar to the one below is recommended:

> *The contractor's coefficient must contain all contractor's costs inclusive of profit, all overhead (to include home office and field overhead), bond premiums, insurance, adjustments to listed prices, general and administrative expenses, subcontractor mark-up, contingencies (such as changes in wage rate, geographical location of the work), mobilization/ demobilization and all other costs including, but not limited to, compliance with environmental laws, permits, preparation of reports, correspondence and documentation required by law or these specifications, tax laws, protection or moving of Government property and engineering services. The coefficient shall also include costs described as costs to provide submittals, interface with Government representatives, coordination with occupants, every cost item not covered in the database and not specifically stated as a not pre-priced item, and other costs described elsewhere in the specification.*[3]

This statement must be read and understood completely. After reviewing a statement such as this and the remaining contract clauses that have an impact on the coefficient, the bidder should now review the database with the goal of coefficient calculation. Each cost point must be understood. One recommended practice of coefficient calculation is to build multiple spreadsheets that compare costs in the database to those available to the contractor from historical or subcontracted costs. After comparing as many items of cost as possible in all divisions of work, the bidder could use any one of a number of mathematical formulas to determine the coefficient. The average of all comparisons, the median of all comparisons, the probability that a cost will fall within an acceptable range and others will provide useful information. Another method of coefficient calculation is to prepare complete estimates for work using the contractor's "normal" estimating methods and then for the same scope of work using the database. Comparison of the normal method to the JOC method will provide a ratio or multiplier that could become the coefficient. However, the bidder's intuition may be the one most important factor.

Knowledge of the company's finances, capabilities, buying power, resources, competition and desire for this contract will assist in coefficient calculation. Other cost factors may be included in the final mathematical calculation.

Most commercially available databases use some method of adjusting the cost to a specific region. Perhaps an escalation factor will be allowed; perhaps wage rates set by Davis/Bacon will be used, or as in the case of some federal contracts

[2]RSMeans, *Facilities Construction Cost Data*, RSMeans, 700 Longwater Drive, Norwell, MA 02061
[3]RSMeans, *Facilities Construction Cost Data*, RSMeans, 700 Longwater Drive, Norwell, MA 02061

at remote base locations, an additional shipping cost for materials will be allowed. Whatever the case may be, the mathematical formula to be used should be described and explained completely. The purpose is to avoid confusion between owner and contractor and to be certain all bidders have an equal and fair chance. An example is shown in Figure 1. Given a database cost equal to $1.25, a location factor of .966 and a coefficient determined to be 1.1, the resulting pay amount per unit of measure is $1.33. This

Database cost	Multiplied by	Location factor	Multiplied by	Contractor's coefficient	equals	Pay amount per item
$1.25	X	0.966	X	1.1	=	$1.33

Figure 1.

calculation can be performed on each line item or to the total job cost, whichever method is specified by the owner. Sometimes a sample job order is part of the RFP. The bidder must prepare and submit a sample estimate using all the procedures described in the RFP. This sample may be part of the bidder evaluation process.

Estimating

Each job order is treated as a separate job. The total price could range from a few thousand dollars to a cost in the millions; however, most contracts have an upper limit. For the estimator, the basic premise is the same. The job must be broken down into its most basic tasks. The task list becomes the basis for the choice of line items. The estimator must think his or her way through each job, visualizing the process from start to finish. Having group discussions with owners, key subcontractors and multiple contractor personnel and brainstorming through this process is a valuable method of determining tasks.

Every estimator thinks differently, and the group may come up with requirements an individual did not consider or remember. Comparison of this list of tasks to line items in the database can be a time-consuming endeavor. A thoughtful, strategic owner will engage the contractor in this time-intensive task only on projects with a reasonable likelihood of moving forward; this will lower the coefficient over time as it will increase the efficiency of the contractor and, therefore, lower costs. The project development process is included in the coefficient, and the contractor should assume that some percentage of projects may not come to fruition. Most typically, the contractor absorbs those costs as part of running the JOC program.

Very often the estimator has limited guidance on project scope or specifications, and a simplified contractor-led project development process for small projects is one of the advantages owners are seeking with JOC. There must, however, be a balance, and it is a best practice for an owner to provide some formal initial documentation and direction to initiate the project. A job site visit by the estimating/project management team and owner's representative is an opportunity to further develop the scope, with the contractor using information obtained there to produce project documentation that can vary from a detailed scope of work to in-house drawings to professional design outsource to an A/E. The scope of many JOC projects is repair and remodeling work. Replacement or repairs are made with like kind and quality of existing building materials, so this streamlined level of project design and documentation makes sense.

One of the problems found in the use of JOC contracts is, given little or no direction, the experienced JOC estimator attempts to maximize the profitability for his or her company. Due to this effort of maximizing profit, incorrect or improper use of specific line items in the database can, and likely will, occur. This creates conflict between contractor and owner. The database author is often consulted to resolve these disputes. Verbal or written responses to questions posed should be saved by both the owner and contractor for future use. On the other side of the coin, the owners usually perform the same estimating function with the goal of saving money. Negotiations are held for each job order to compare quantities of materials and line items chosen. Imagine if you are in this type of negotiation on a regular basis, and you have had nothing but trouble with the person representing the other side. The spirit of the contracting method is gone. Good JOC contracting requires co-operation and flexibility on both sides.

During the estimating process, two obstacles that require attention in any JOC contract are revealed. The obstacles: small quantities of materials and items not found in the database. First, consider small quantities. The labor cost found for any item in a database is based on attaining some level of productivity. For example, a carpenter can install 200 linear feet of wood baseboard in an 8-hour day. If the carpenter's wages for the day are $200.00, then the resulting unit cost per linear foot for labor is $1.00 ($200.00 per day/200 linear feet per day). If the quantity of baseboard for the job order is very small, the contractor may lose money on this particular line item. Imagine asking a carpenter to go to a job site and install 10 linear feet of baseboard, and then offering him or her $10.00 as compensation. This issue can be addressed by allowing the use of "Minimum Labor and Equipment" line items or by setting a separate coefficient for very small projects that may entail a price premium.

The other problem is items not found in the database. Referred to as "non-pre-priced items," these will inevitably be encountered in a long term JOC program. To maintain the integrity of the JOC pricing structure, many owners will limit the use of NPP items to a maximum percentage by cost per job order, most typically 10%. Often a contractor and owner can agree that a line item in the database is a "best fit" when the scope and price are very similar.

Also, a granular database such as RSMeans (which shows the breakdown of each line item, with regard to labor, material, equipment and productivity) can be adjusted, if the contract allows, to accommodate special materials, including those not found in the database and those that might be owner supplied. This requires the use of software that supports this type of adjustment to the line items, such as JOCWorks (RSMeans JOC support software) and the contractual language that guides this kind of adjustment with owner approval. Some flexibility is important in crafting the contract language governing use of line items, but it must be balanced with rules and a disciplined, defensible process to arrive at appropriate project costs.

Advantages and disadvantages

Independent studies have shown that the use of JOC will decrease the amount of time from job order identification to completion. The decrease in time is largely due to reduced design and procurement time. Most JOC job orders can be executed with streamlined design documents. This combination of limited design and decreased time has resulted in cost savings to the owner over traditional methods of contracting.

The actual work performed in a JOC contract is often subcontracted, enhancing opportunities for minority and women-owned businesses and allowing some small companies to get their first opportunity to do government work.

Long term dependable relationships between owners and contractors can be developed. The contractor is motivated by the contractual arrangement to perform at a high level, so more work will be made available. This enables the contractor to earn a profit over many jobs rather than one at a time and incentivizes a contractor to serve the customer effectively with high quality work in order to win additional job orders. These factors have led to increased quality in construction.[4]

The primary disadvantage of Job Order Contracting is the learning curve for both owners and contractors implementing JOC for the first time. Learning the project development process and line item estimating methodology is a necessary investment for a successful JOC program, and appropriate training and support such as that provided by consultants like RSMeans is critical. Some owners can also encounter resistance from the contracting community when JOC is perceived as reducing the quantity of contract opportunities. This challenge can be addressed through appropriate contractor outreach and education and through the careful structuring of a JOC program to maximize opportunities for small and disadvantaged businesses, whether as prime or subcontractors.

Use of RSMeans cost information

Since 1942, RSMeans has been the leading provider of construction cost information in North America. Architects, engineers, developers, owners, contractors, estimators and government employees use the data provided by RSMeans everyday to predict or verify construction costs. The staff of engineers, architects and construction professionals at RSMeans has hundreds of years of experience at construction sites or in the office of construction companies. That experience translates to the most comprehensive collection of construction cost information available today.

Data produced by RSMeans is used at hundreds of locations in the United States and abroad, for the purposes of Job Order Contracting and also for cost planning and budgeting

[4] Center for Job Order Contracting Excellence, 1999, *JOC/DOC/SABER Concept (CJE), http://www.eas.asu.edu/joc/*

– contributing to industry familiarity with the data. Over the years, thousands of individuals have been trained in the use of RSMeans data; however, there is often a disconnect between RSMeans, owners and contractors when it comes to the proper selection of and use of construction cost data. Potential JOC owners and contractors should review thoroughly the following information in order to make an educated selection of cost data.

RSMeans provides cost data in multiple formats, including model, assembly and unit prices. RSMeans also provides full transparency into the structure of the unit pricing by providing a breakdown of labor and material costs, productivity data, city cost indices, wage rates, assumptions about contractor markup, etc. This level of detail builds confidence in and understanding of the cost data that contributes to a successful JOC program. In addition, the in-house research staff is available to help RSMeans users clarify what a particular line item includes or how to use a line item. Since RSMeans researches and produces cost data independently, it has no vested interest or revenue stake in increasing or decreasing job order pricing.

Format

RSMeans produces data in three formats: unit prices, assemblies and models. Assemblies and models have their place in the process of estimating, but for JOC, it is our recommendation that they not be used. The intent of assemblies and models is for preliminary cost estimating, where some details of the potential project are not known. In this case, because details are not known, the engineers at RSMeans have made some design decisions/selections. Those design decisions/selections will probably not match your conditions; therefore, some accuracy will be lost. For this reason, Job Order Contracts generally rely on unit prices for the most accurate pricing.

Wage rates

RSMeans tracks three different sets of wage rates: union or prevailing wages, open shop wages, and residential wages. It is important to understand that we separate some of the data sets by these wage rates; therefore, mixing line items with different wage rates for the same JOC is inappropriate. Our recommendation is to choose a data set that best matches your local wage rate conditions and stick with that set. The single most popular data set used for JOC is found in RSMeans Facilities Construction Cost Data. It uses union or prevailing wages, is the most comprehensive publication of its kind and is appropriate for most types of work performed under a JOC scenario.

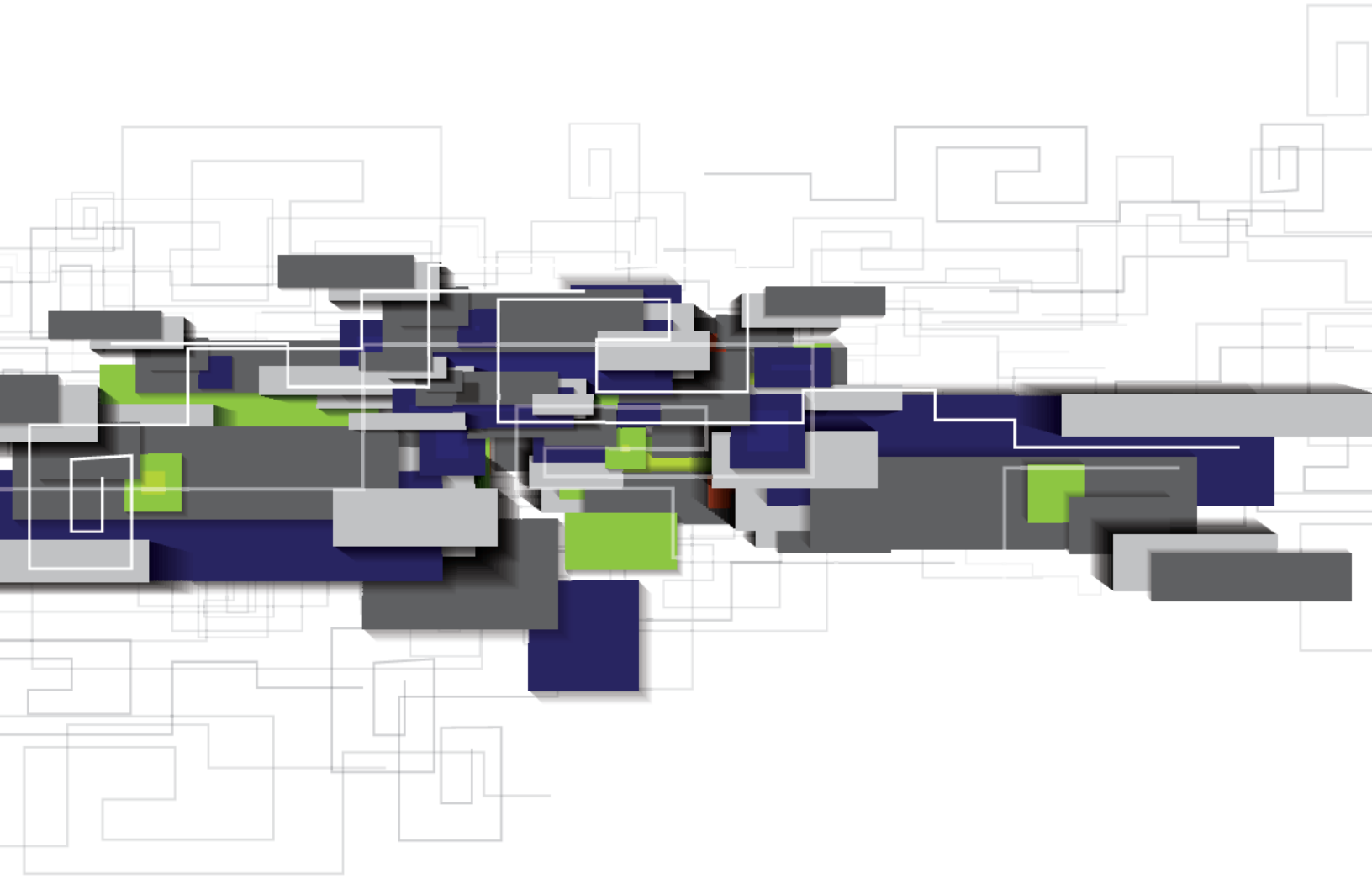
Markups

Of equal importance to the wage rates is understanding the different markups RSMeans uses for different data sets. Our names for the different markups used are: standard (Std), repair and remodeling (R&R), Residential (Resi) and Open (Opn). RSMeans unit price information will have two totals to consider. The first is a bare cost total. The bare cost total is one that represents the cost per unit of measure for the item described without any markups added on. The second is the total including overhead and profit. Included with this is a markup for labor burdens (e.g. workers' compensation insurance, social security, unemployment taxes, builder's insurances, and home office overhead) along with a provision for profit on the materials, labor and equipment. In a JOC contract, an owner must spell out which of these two columns are going to be used as the basis for costs in the agreement. If you choose the bare costs column, the contractor's coefficient (previously discussed in this paper) will reflect adding all of these costs to the unit prices. If you choose the total including overhead and profit column, the coefficient will be calculated differently since RSMeans assumptions about labor burden, overhead and profit are included in those prices.

An owner should not mix data sets with different markups or wage basis. Again, our recommendation is to use RSMeans Facilities Construction Cost Data.

Conclusion

Traditional construction delivery methods are fraught with problems. Architects and engineers spend countless hours attempting to design and specify their projects completely. Owners have reams of rules and regulations to follow in order to put a project out for bid fairly. Contractors spend millions of dollars attempting to be a low bidder. Our courts are tied up with case after case of "whose fault is it?" Job Order Contracting offers an alternative to traditional bidding processes. Based on industry-standard cost data and predefined processes that promote streamlining of project development, early contractor involvement, fewer change orders and higher quality construction, JOC is a refreshing change.



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