



Division of Capital Asset Management and Maintenance

D · C · A · M · M

Job Order Contracting Unit Price Book

Suffolk County Massachusetts

2014

RSMeans

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How the Book Is Built: An Overview

The Construction Specifications Institute (CSI) and Construction Specifications Canada (CSC) have produced the 2012 edition of MasterFormat®, a system of titles and numbers used extensively to organize construction information.

All unit price data in the RSMMeans cost data books is now arranged in the 50-division MasterFormat® 2012 system.

This publication, developed exclusively for the Commonwealth of Massachusetts Department of Capital Asset Management and Maintenance by RSMMeans, is based on the format of the national average *RSMMeans Facilities Construction Cost Data*. However, primary county-by-county research on material prices and prevailing wage rates has been conducted by RSMMeans, resulting in a book that is localized by county. Therefore, the City Cost Index which is normally applied to localize prices will not be used. RSMMeans used a representative town for the county-wide price as follows:

County	City
Barnstable	Hyannis
Berkshire	Pittsfield
Bristol	New Bedford
Dukes	Falmouth
Essex	Lowell
Franklin	Pittsfield
Hampden	Springfield
Hampshire	Springfield
Middlesex	Lowell
Nantucket	Falmouth
Norfolk	Boston
Plymouth	Brockton
Suffolk	Boston
Worcester	Worcester

Research was based on current prevailing wage data for the relevant locality at the time of production. The wage rates used are found on the last page of this book. Prevailing wage rates are subject to change periodically. Contractors must anticipate and address these increases in their coefficient.

DCAMM's Standard Specification for Use in job order contracts (JOC) has been linked to some of the cost data items to assist them in the use of the book. The research for the cost data in this book was conducted in January and February of 2014.

A Powerful Construction Tool

A successful project is built on the foundation of an accurate and dependable estimate. This book will enable you to construct just such an estimate.

For the casual user, the book is designed to be:

- quickly and easily understood so you can get right to your estimate.
- filled with valuable information so you can understand the necessary factors that go into the cost estimate.

For the regular user, the book is designed to be:

- a handy desk reference that can be quickly referred to for key costs.
- a comprehensive, fully reliable source of current construction costs and productivity rates so you'll be prepared to estimate any project.
- a source book for preliminary project cost, product selections, and alternate materials and methods.

For the JOC contractor, the book is intended to be:

- the basis of all JOC estimates for developing fixed prices for JOC projects.
- a transparent cost resource that will help you develop a coefficient(s) for bidding the associated JOC contract.

To meet all of these requirements, we have organized the book into the following clearly defined sections.

Quick Start

See our "Quick Start" instructions on the following page to get started right away.

Estimating with RSMMeans Unit Price Cost Data

Please refer to these steps for guidance on completing an estimate using RSMMeans unit price cost data.

How to Use the Book: The Details

This section contains an in-depth explanation of how the book is arranged . . . and how you can use it to produce a JOC estimate.

Unit Price Section

All cost data has been divided into the 50 divisions according to the MasterFormat system of classification and numbering. For a listing of these divisions and an outline of their subdivisions, see the Unit Price Section Table of Contents.

Estimating tips are included at the beginning of each division.

Reference Section

This section includes information on Equipment Rental Costs, Crew Listings, Reference Tables, and a listing of Abbreviations.

Equipment Rental Costs: This section contains the average costs to rent and operate hundreds of pieces of construction equipment.

Crew Listings: This section lists all of the crews referenced in the book. For the purposes of this book, a crew is composed of more than one trade classification and/or the addition of power equipment to any trade classification. Power equipment is included in the cost of the crew. Costs are shown with bare labor rates. The total crew cost per eight-hour day and the composite bare cost per labor-hour are listed.

Reference Tables: At the beginning of selected major classifications in the Unit Price Section are reference numbers shown in a shaded box. These numbers refer you to related information in the Reference Section. In this section, you'll find reference tables, explanations, and estimating information that support how we develop the unit price data, technical data, and estimating procedures.

Abbreviations: A listing of abbreviations used throughout this book, along with the terms they represent, is included in this section.

Index

A comprehensive listing of all terms and subjects in this book will help you quickly find what you need when you are not sure where it occurs in MasterFormat.

Absolute Essentials for a Quick Start

If you feel you are ready to use this book and don't think you will need the detailed instructions that begin on the following page, this Absolute Essentials for a Quick Start page is for you. These steps will allow you to get started estimating in a matter of minutes.

1 Scope

Be sure that you have read and understand the requirements of the Contract Documents before you start estimating.

Think through the project that you will be estimating, and identify the many individual work tasks that will need to be covered in your estimate.

2 Quantify

Determine the number of units that will be required for each work task that you identified.

3 Pricing

Locate individual Unit Price line items that match the work tasks you identified. The Unit Price Section Table of Contents that begins on page 1 and the Index in the back of the book will help you find these line items.

4 Multiply

Multiply the Bare Cost Total cost for a Unit Price line item in the book by your quantity for that item. The price you calculate will be an estimate for a completed item of work. Keep adding line items in this manner to build your estimate.

5 Coefficient

Your coefficient accounts for general conditions project overhead costs (as well as home office overhead, profit, and other factors specified in the Contract Documents) that would normally be accounted for with Division 1 line items or other markups. Division 1 is provided strictly as a reference for bidding contractors and use of line items from this division are prohibited, except as specifically allowed in the Contract Documents.

Editors' Note: We urge you to spend time reading and understanding the supporting material in the front of this book. An accurate estimate requires experience, knowledge, and careful calculation. The more you know about how we at RSMeans developed the data, the more accurate your estimate will be. In addition, it is important to take into consideration the reference material in the back of the book such as Equipment Listings, Crew Listings, and Reference Tables.

Estimating with RSMeans Unit Price Cost Data

Following these steps will allow you to complete an accurate estimate using RSMeans Unit Price cost data.

1 Scope Out the Project

- Carefully read the requirements of the Contract Documents.
- Identify the individual work tasks that will need to be covered in your estimate.
- The Unit Price data in this book has been divided into 50 Divisions according to the CSI MasterFormat 2012.
- Think through the project and identify those CSI Divisions needed in your estimate.
- The Unit Price Section Table of Contents on page 1 may also be helpful when scoping out your project.
- Experienced estimators find it helpful to begin with Division 2 and continue through completion. Contractually allowed items from Division 1 can be estimated after the full project scope is known.

2 Quantify

- Determine the number of units required for each work task that you identified.

3 Price the Quantities

- Use the Unit Price Table of Contents, and the Index, to locate individual Unit Price line items for your estimate.
- Reference Numbers indicated within a Unit Price section refer to additional information that you may find useful.
- The crew indicates who is performing the work for that task. Crew codes are expanded

in the Crew Listings in the Reference Section to include all trades and equipment that comprise the crew.

- The Daily Output is the amount of work the crew is expected to do in one day.
- The Labor-Hours value is the amount of time it will take for the crew to install one unit of work.
- The abbreviated Unit designation indicates the unit of measure upon which the crew, productivity, and prices are based.
- Bare Costs are shown for materials, labor, and equipment needed to complete the Unit Price line item. Bare costs do not include waste, project overhead, payroll insurance, payroll taxes, main office overhead, or profit.

4 Multiply

- Multiply the total number of units needed for your project by the Bare Cost Total for each Unit Price line item.
- Be careful that your take off unit of measure matches the unit of measure in the Unit column.
- The price you calculate is an estimate for a completed item of work.
- Keep scoping individual tasks, determining the number of units required for those tasks, matching each task with individual Unit Price line items in the book.

5 Apply Coefficient

- * Refer to the Contract Documents for the precise definitions of the different types of work and applicable coefficients
- Apply the appropriate coefficient for the type of work.

Editors' Notes:

- 1) *We urge you to spend time reading and understanding the supporting material in the front of this book. An accurate estimate requires experience, knowledge, and careful calculation. The more you know about how we at RSMeans developed the data, the more accurate your estimate will be. In addition, it is important to take into consideration the reference material in the back of the book such as Equipment Listings, Crew Listings, and Reference Tables.*
- 2) *Contractors who are bidding involved in JOC type contracts are cautioned that workers' compensation insurance, federal and state payroll taxes, waste, project supervision, project overhead, main office overhead, and profit, as well as other items specified in the Contract Documents are not included in bare costs. The coefficient or multiplier must cover these costs.*

How to Use the Book: The Details

What's Behind the Numbers? The Development of Cost Data

The staff at RSMMeans continually monitors developments in the construction industry in order to ensure reliable, thorough, and up-to-date cost information. While overall construction costs may vary relative to general economic conditions, price fluctuations within the industry are dependent upon many factors. Individual price variations may, in fact, be opposite to overall economic trends. Therefore, costs are constantly tracked and complete updates are published yearly. Also, new items are frequently added in response to changes in materials and methods.

Costs—\$ (U.S.)

All costs are given in U.S. dollars.

Material Costs

The RSMMeans staff contacts manufacturers, dealers, distributors, and contractors to determine material costs. Included within material costs are fasteners for a normal installation. RSMMeans engineers use manufacturers' recommendations, written specifications, and/or standard construction practice for size and spacing of fasteners. Material costs do not include sales tax.

Labor Costs

Labor costs are based on wage rates from your specific location. Rates are determined using data from labor union agreements or prevailing wages for construction trades for the current year. Rates are listed on the inside back cover of this book.

Note: The prevailing wage rates that you will be contractually required to pay by your Contract Documents may differ from the rates assumed in deriving the cost data in this book.

The differential between your actual rates and the assumptions made in deriving the cost data is an unknown risk that is to be covered by the Coefficient that is in your contract.

Labor costs reflect productivity based on actual working conditions. In addition to actual installation, these figures include time spent during a normal weekday on tasks such as, material receiving and handling, mobilization at site, site movement, breaks, and cleanup.

Productivity data is developed over an extended period so as not to be influenced by abnormal variations and reflects a typical average.

Equipment Costs

Equipment costs include not only rental, but also operating costs for equipment under normal use. The operating costs include parts and labor for routine servicing such as repair and replacement of pumps, filters, and worn lines. Normal operating expendables, such as fuel, lubricants, tires, and electricity (where applicable), are also included. Extraordinary operating expendables with highly variable wear patterns, such as diamond bits and blades, are excluded. These costs are included under materials.

Rental rates can also be treated as reimbursement costs for contractor-owned equipment. Owned equipment costs include depreciation, loan payments, interest, taxes, insurance, storage, and major repairs.

Equipment costs do not include operators' wages; nor do they include the cost to move equipment to a job site (mobilization) or from a job site (demobilization).

Equipment Cost/Day—The cost of power equipment required for each crew is included in the Crew Listings in the Reference Section (small tools that are considered as essential everyday tools are not listed out separately). The Crew Listings itemize specialized tools and heavy equipment along with labor trades. The daily cost of itemized equipment included in a crew is based on dividing the weekly bare

rental rate by 5 (number of working days per week) and then adding the hourly operating cost times 8 (the number of hours per day). This Equipment Cost/Day is shown in the last column of the Equipment Rental Cost pages in the Reference Section.

Mobilization/Demobilization—The cost to move construction equipment from an equipment yard or rental company to the job site and back again is not included in equipment costs. Mobilization (to the site) and demobilization (from the site) costs can be found in the Unit Price Section. If a piece of equipment is already at the job site, it is not appropriate to utilize mob./demob. costs again in an estimate.

General Conditions

Cost data in this book is presented in Bare Costs. Costs for General Conditions, subject to the terms of the Contract Documents are determined by the General Contractor and accounted for in its coefficients.

Factors Affecting Costs

Overtime—We have made no allowance for overtime. Premium time is accounted for in the appropriate coefficient.

Productivity—The productivity, daily output, and labor-hour figures for each line item are based on working an eight-hour day in daylight hours in moderate temperatures. For work that extends beyond normal work hours or is performed under adverse conditions, productivity may decrease. (See "How RSMMeans Data Works" for more on productivity.) Contractors must account for productivity variations in their coefficient.

Size of Project—The size, scope of work, and type of construction project will have a significant impact on cost. The contractor's coefficient must accommodate anticipated project size.

Other Factors——

- season of year
- contractor management
- weather conditions
- local union restrictions
- building code requirements
- availability of:
 - adequate energy
 - skilled labor
 - building materials
- owner's special requirements/restrictions
- safety requirements
- environmental considerations

Rounding of Costs

In general, all unit prices in excess of \$5.00 have been rounded to make them easier to use and still maintain adequate precision of the results. The rounding rules we have chosen are in the following table.

Prices from . . .	Rounded to the nearest . . .
\$.01 to \$5.00	\$.01
\$5.01 to \$20.00	\$.05
\$20.01 to \$100.00	\$.50
\$100.01 to \$300.00	\$1.00
\$300.01 to \$1,000.00	\$5.00
\$1,000.01 to \$10,000.00	\$25.00
\$10,000.01 to \$50,000.00	\$100.00
\$50,000.01 and above	\$500.00

Important Estimating Considerations

The “productivity,” or daily output, of each craftsman includes mobilization and cleanup time, break time and plan layout time, as well as an allowance to carry stock

from the storage trailer or location on the job site up to 200’ into the building and to the first or second floor. An allowance has also been included in the piping and fittings installation time for leak checking and minor tightening. Equipment installation time includes the following applicable items: positioning, leveling and securing the unit in place, connecting all associated piping, ducts, vents, etc., which shall have been estimated separately, connecting to an adjacent power source, filling/bleeding, startup, adjusting the controls up and down to ensure proper response, setting the integral controls/valves/ regulators/thermostats for proper operation (does not include external building type control systems, DDC systems, etc.), explaining/training owner’s operator, and warranty. RSMean assumes a breakdown of the labor costs is as follows:

1. Movement into building, installation/ setting of equipment 35%
2. Connection to piping/duct/power, etc. 25%
3. Filling/flushing/cleaning/touchup, etc. 15%
4. Startup/running adjustments 5%
5. Training owner’s representative 5%
6. Warranty/call back/service 15%

Note that cranes or other lifting equipment are not included on any lines in the Mechanical divisions. For example, if a crane is required to lift a heavy piece of pipe into place high above a gym floor, or to put a rooftop unit on the roof of a four-story building, etc., it must be added. Subject to the Contract Documents, these are among the group of Division 1 line items that are allowed under the contract. When using equipment rental from RSMean, remember to include the cost of the operator(s).

Estimating Labor-Hours

The labor-hours expressed in this publication are based on Average Installation time, using an efficiency level of approximately 60%–65% (see item 7), which has been found reasonable

and acceptable by many contractors. The book uses this national efficiency average to establish a consistent benchmark. The unit labor-hour is divided in the following manner. A typical day for a journeyman might be:

1. Study Plans	3%	14.4 min.
2. Material Procurement	3%	14.4 min.
3. Receiving and Storing	3%	14.4 min.
4. Mobilization	5%	24.0 min.
5. Site Movement	5%	24.0 min.
6. Layout and Marking	8%	38.4 min.
7. Actual Installation	64%	307.2 min.
8. Cleanup	3%	14.4 min.
9. Breaks,		
Nonproductive	6%	28.8 min.
	100%	480.0 min.

If any of the percentages expressed in this breakdown do not apply to the particular work or project situation, then that percentage or a portion of it may be deducted from or added to labor-hours.

Final Checklist

Estimating can be a straightforward process provided you remember the basics. Here’s a checklist of some of the steps you should remember to complete before finalizing your estimate.

Did you remember to . . .

- read the background information on techniques and technical matters that could impact your project time span and cost?
- include all components of your project in the final estimate?
- make use of Minimum Labor/Equipment Charges for Small Quantities?
- double check your figures for accuracy?

After you have executed a Contract with the Awarding Authority, if you have any questions about your estimate . . . about the costs you've used from this book . . . or even about the technical aspects of the job that may affect your estimate, feel free to call the RSMMeans editors at 1-800-334-3509. Please note, however, that the Awarding Authority will not be bound by communications to you from RSMMeans.

Using Minimum Labor/Equipment Charges for Small Quantities

Estimating small construction or repair tasks often creates situations in which the quantity of work to be performed is very small. When this occurs, the labor and/or equipment costs to perform the work may be too low to allow for the crew to get to the job, receive instructions, find materials, get set up, perform the work, clean up, and get to the next job. In these situations, the estimator should compare the developed labor and/or equipment costs for performing the work (e.g., quantity × labor

and/or equipment costs) with the "*minimum labor/equipment charge*" within that Unit Price section of the book. (These minimum labor/equipment charge line items appear only in *RSMMeans Facilities Construction Cost Data* and *RSMMeans Commercial Renovation Cost Data*.)

If the labor and/or equipment costs developed by the estimator are LOWER THAN the "*minimum labor/equipment charge*" listed at the bottom of specific sections of Unit Price costs, the estimator should adjust the developed costs upward to the "*minimum labor/equipment charge*." The proper use of a "*minimum labor/equipment charge*" results in having enough money in the estimate to cover the contractor's higher cost of performing a very small amount of work during a partial workday.

Estimating Items not Priced in the Unit Price Book

Refer to the terms contained in your Contract Documents.

A "*minimum labor/equipment charge*" should be used only when the task being estimated is the only task the crew will perform at the job site that day. If, however, the crew will be able to perform other tasks at the job site that day, the use of a "*minimum labor/equipment charge*" is not appropriate.

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How RSMeans Unit Price Works

All RSMeans unit price data is organized in the same way.

It is important to understand the structure, so that you can find information easily and use it correctly.

The information shown here may not match the data in your specific publication. Cost data and crew information is shown on these pages for informational purposes only.

RSMeans **Line Numbers** consist of 12 characters, which identify a unique location in the database for each task. The first 6 or 8 digits conform to the Construction Specifications Institute MasterFormat® 2012. The remainder of the digits are a further breakdown by RSMeans in order to arrange items in understandable groups of similar tasks. Line numbers are consistent across all RSMeans publications, so a line number in any RSMeans product will always refer to the same unit of work.

RSMeans engineers have created **reference** information to assist you in your estimate. If there is information that applies to a section, it will be indicated at the start of the section. In this case, R033105-10 provides information on the proportionate quantities of formwork, reinforcing, and concrete used in cast-in-place concrete items such as footings, slabs, beams, and columns. The Reference Section is located in the back of the book on the pages with a gray edge.

RSMeans **Descriptions** are shown in a hierarchical structure to make them readable. In order to read a complete description, read up through the indents to the top of the section. Include everything that is above and to the left that is not contradicted by information below.

For instance, the complete description for line 03 30 53.40 3550 is "Concrete in place, including forms (4 uses), Grade 60 rebar, concrete (Portland cement Type I), placement and finishing unless otherwise indicated; Equipment pad (3000 psi), 4' x 4' x 6" thick."

When using **RSMeans data**, it is important to read through an entire section to ensure that you use the data that most closely matches your work. Note that sometimes there is additional information shown in the section that may improve your price.

There are frequently lines that further describe, add to, or adjust data for specific situations.

03 30 Cast-In-Place Concrete

03 30 53 – Miscellaneous Cast-In-Place Concrete

03 30 53.40 Concrete In Place

0010	CONCRETE IN PLACE	R033105-20
0020	Including forms (4 uses), Grade 60 rebar, concrete (Portland cement	R033105-70
0050	Type I), placement and finishing unless otherwise indicated	R033105-80
0300	Beams (3500 psi), 5 k p per L.F., 10' span	
0350	25' span	
0500	Chimney foundations (5000 psi), over 5 C.Y.	
0510	(3500 ps), unde 5 C.Y.	
0700	Columns, square (4000 psi), 12" x 12", less than 2% reinforcing	
3450	Over 10,000 S.F.	
3500	Add per floor for 3 to 6 stories high	
3520	For 7 to 20 stories high	
3540	Equipment pad (3000 psi), 3' x 3' x 6" thick	
3550	4' x 4' x 6" thick	
3560	5' x 5' x 8" thick	
3570	6' x 6' x 8" thick	

Crews include labor or labor and equipment necessary to accomplish each task. In this case, Crew C-14H is used. RSMMeans selects a crew to represent the workers and equipment that are typically used for that task. In this case, Crew C-14H consists of one carpenter foreman (outside), two carpenters, one rodman, one laborer, one cement finisher, and one gas engine vibrator. Details of all crews can be found in the reference section.

Crews							
Crew	Crew Qty	Bare Costs	Unit	Cost	Per Laborer		
1 Carpenter Foreman (outside)		\$47.85	\$382.80	\$78.60	\$628.80	\$45.15	\$73.68
2 Carpenters		45.85	733.60	75.35	1205.60		
1 Rodman (reinf.)		50.65	405.20	83.10	664.80		
1 Laborer		36.65	293.20	60.20	481.60		
1 Cement Finisher		44.05	352.40	69.50	556.00		
1 Gas Engine Vibrator			33.00		36.30	.69	.76
48 L.H., Daily Totals			\$2200.20		\$3573.10	\$45.84	\$74.44

The **Daily Output** is the amount of work that the crew can do in a normal 8-hour workday, including mobilization, layout, movement of materials, and cleanup. In this case, crew C-14H can install thirty 4' x 4' x 6" thick concrete pads in a day. Daily output is variable, based on many factors, including the size of the job, location, and environmental conditions. RSMMeans data represents work done in daylight (or adequate lighting) and temperate conditions.

Bare Costs are the costs of materials, labor, and equipment that the installing contractor pays. They represent the cost, in U.S. dollars, for one unit of work. They do not include any markups for profit or labor burden.

Crew	Daily Output	Labor Hours	Unit	2014 Bare Costs			Total
				Material	Labor	Equipment	
C-14A	15.62	12.804	C.Y.	325	835	55	1,215
"	18.55	10.782		345	705	46.50	1,096.50
C-14C	32.22	3 476		151	219	1.18	371.18
"	23.71	4 724		177	298	1.61	476.61
C-14A	11.96	16 722		365	1,100	71.50	1,536.50
	2200	.026		.82	1.56	.37	2.75
	31800	.002			.17	.03	.14
	21200	.003			.16	.04	.20
C-14H	45	1 067	Ea.	45.50	70	.84	116.34
	30	1.600		68	105	1.26	174.26
	18	2.667		122	175	2.11	299.11
	14	3.429		164	225	2.71	391.71

The **Total column** represents the total bare cost for the installing contractor, in U.S. dollars.

The figure in the **Labor Hours** column is the amount of labor required to perform one unit of work—in this case the amount of labor required to construct one 4' x 4' equipment pad. This figure is calculated by dividing the number of hours of labor in the crew by the daily output (48 labor hours divided by 30 pads = 1.6 hours of labor per pad). Multiply 1.600 times 60 to see the value in minutes: $60 \times 1.6 = 96$ minutes. Note: the labor hour figure is not dependent on the crew size. A change in crew size will result in a corresponding change in daily output, but the labor hours per unit of work will not change.

All RSMMeans unit cost data includes the typical **Unit of Measure** used for estimating that item. For concrete-in-place the typical unit is cubic yards (C.Y.) or each (Ea.). For installing broadloom carpet it is square yard, and for gypsum board it is square foot. The estimator needs to take special care that the unit in the data matches the unit in the take-off. Unit conversions may be found in the Reference Section.