

MEANS

CostWorks 2007

DOE Seminar

Workbook *version 3.0*



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Reed Construction Data, Inc.

Construction Publishers & Consultants

63 Smiths Lane

Kingston, MA 02364-0800

(781) 422-5000

www.rsmeans.com

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Welcome!

Welcome to the **RSMeans CostWorks 2007 DOE Training Seminar**.

Our goal today is to increase your comfort and confidence in the *CostWorks* program.

In the morning session of this seminar, you will learn the basic functionality of *CostWorks*. We will utilize Chapters 1 through 4 of this workbook, as well as perform short exercises to increase your comfort level with the program. This will include screens that you will encounter and their components.

The afternoon session of the *CostWorks* Basic Training Seminar will wrap up the lecture part of the training and allow you to become familiar with the program by using it. This will be accomplished by giving you a variety of example projects to complete.

History of CostWorks

CostWorks was created through a joint effort between RSMeans, a unit of Reed Construction Data, of Kingston, MA and Previsionary Inc. / Wintergreen Software of Fresno, CA.

CostWorks was first introduced in 1997 as an electronic version of Means annual cost data books. *CostWorks* 1997 was released with all of the current titles except *Light Commercial*, *Square Foot*, *Residential*, *Facilities Maintenance and Repair*, *Green Building*, and *Residential Repair & Remodeling*. The *Light Commercial* and *Square Foot* titles were added in 1999, and the *Residential* and *Facilities Maintenance and Repair* titles were added in 2000. The 2001 release brought about subtle, yet useful changes to the *Settings* screen and navigation functionality. The 2002 release introduced the *CostWorks Estimator*. The Estimator allows the user to edit certain parts of Means data along with offering the ability to create custom line items and report templates. The 2005 release welcomed the addition of the Component Swapper feature of the Estimator. *CostWorks* 2006 (v10.x) updated the data and includes the ability to toggle between MasterFormat™ 95 and the new MasterFormat™ 2004. *CostWorks* 2007 (v11.x) features a redesigned Settings Screen as well as the addition of the *Green Building* and *Residential Repair & Remodeling* titles.

Chapter 1: Introduction

The *CostWorks* Basic Training Seminar has been designed to assist new and existing users in becoming more familiar with the functionality of the *CostWorks* program.

Overview



RSMeans is the industry leader in providing important cost data for the construction and design industries. Now, *CostWorks* provides access to cost data from CD-ROM, allowing you to reference many volumes of cost data for your work. *CostWorks* helps you handle large amounts of information, lets you select the information that you need, and gather it into a cumulative CostList. Finally, the CostList information can be exported for use in a spreadsheet program. All operations are accomplished with just a few clicks of the mouse.



CostWorks is a Windows™ based application that runs on personal computer systems with access to a local CD-ROM drive. *CostWorks* uses powerful database technology to achieve quick access to huge data files. Nevertheless, this application is easy to learn and use because you accomplish all operations by clicking on items in toolbars above and below the cost data display.



Menus and icons in the top toolbar perform many functions. These functions include navigating through the program, selecting the data, and providing additional information. The CostCalc toolbar at the bottom of the screen lets you enter a quantity and accumulate cost data items. Accumulated cost items are placed into a holding area called a CostList. CostLists can be exported into formats suitable for other Windows applications, which may be used for calculation and preparation of your estimates. Using *CostWorks* consists of a series of points and clicks with the mouse.

CD Titles

Each *CostWorks* CD-ROM contains 19 available RSMeans electronic titles. You activate the titles you have purchased by entering the *Serial Number* and *Authorization Code* found on the back of the CD-ROM case. You can purchase additional titles or change the titles you have with a simple phone call to RSMeans Customer Service, at 1-800-334-3509. YOU DO NOT NEED TO RETURN THE CD TO ADD OR SUBTRACT TITLES OR FEATURES.

System Description

CostWorks is an interactive application. Source data and programming are supplied via the *CostWorks* CD-ROM located in your Windows system's CD-ROM drive. Finding and using cost data with this application is as easy as reading a Means Cost Data book. Information is displayed on your computer screen in precisely the same format as it is printed in a Means Cost Data book. *CostWorks* provides access through an easy to use interface. Clicking on buttons or tabs displayed on your computer screen invokes *CostWorks* functions. Data for your calculations may be gathered easily by selecting rows, entering a quantity, and adding these line items to a holding area that we call a CostList.

When you are finished adding Line Items, your CostList may be printed or saved to a file. If the *CostWorks* Estimator has been purchased, then the Estimator may be used to make adjustments to the data held in the CostList or to run reports on the data held in the CostList. Additionally, CostList data can be exported for use with spreadsheet applications.

Starting CostWorks

From the Desktop, double-click on the *CostWorks* icon.



The program activates behind a splash screen, and the Settings screen is displayed. *CostWorks* preserves settings on the Settings screen. They remain the same as the last time the program was run.

Options at the top of the screen give you access to different functions, allowing you to set up your project. Tabs at the bottom of the screen give you access to different data sets. You can quickly access this data by selecting (clicking) a tab with the mouse.

Typical Work Session

This section gives a quick overview of *CostWorks* functions. It is intended for users who are very comfortable with Windows. A *CostWorks* session proceeds as follows:

1. From the Settings screen, a user may:
 - Open Titles of Means Cost Data to be accessed.
 - Set the Location to which cost figures are adjusted.
 - Choose between MasterFormat 95 & MasterFormat 2004.
 - Create a new Project or open an existing Project.

Note: For DOE Models/Projects, "National Average Costs" must be selected for the Location and "Union" must be selected for the Wage Rate.

2. To display cost data, the user clicks on one of the data tabs at the bottom of the screen.
3. The user navigates through the cost data to find and select information needed for the estimate. Several methods of finding and selecting information are available. These methods include:
 - Icons such as "Go To Line Number" to find information by line number, "Search Index" to find information by keyword, and "Bookmark" to find information that has been previously marked. These features are also available via options in the **Navigate** menu.
 - Division dropdown menus that allow the user to browse by Division, Sub-Division or Major Classification
 - A Search Tree that allows the user to browse by Division, Sub-Division or Major Classification using either MasterFormat 95 or MasterFormat 2004.

4. After information is located and displayed, the user selects (clicks on) a Line Item intended for inclusion in the CostList. This action will display cost data for a single unit of the selected item in the CostCalc toolbar at the bottom of the screen. To add this information to the CostList, the user specifies the desired quantity of the item and then clicks the To List button.
5. After the To List button is clicked, the CostList appears. The user may then close the current CostList and continue to select cost data. *CostWorks* automatically opens the CostList each time data is added, so that the user can confirm the information that has been added.
6. The user continues, in the same manner, to add or remove cost lines to the CostList for use in the current project. Other CostList options allow the user to save, load or export the data from the project.
7. As a final step, the user may print the CostList, save the CostList, transfer it to the Estimator (if this feature has been purchased), or export the CostList for use in a spreadsheet program.

Software Support

The RSMMeans Software Support Department provides phone assistance to current *CostWorks* customers.

Please have the following information available when calling Software Support:

- Your *CostWorks* Serial Number (click on **Help, About CostWorks**)
- Your version of *CostWorks* (click on **Help, About CostWorks**)
- Your version of Windows Operating System. (i.e. Windows 98 SE, 2000, XP)

Before calling Software Support, follow these steps:

1. Read the relevant section or topic within the electronic help file that describes the procedure you are attempting to perform.
2. Write down what you were doing when the problem occurred. Write down all the steps and procedures so that you can explain it to the software support specialist.
3. If any error messages have occurred, write them down exactly.
4. To help provide quick and accurate assistance, please position yourself at a phone near your computer. This makes your hardware and software information immediately available.


A current valid *CostWorks* Serial Number must accompany all Software Support requests. Please include this serial number in all email correspondence and have the serial number available before calling the Software Support Department.

RSMMeans Software Support via Phone:
(800) 334-3509

RSMMeans Software Support via Email:
softwaresupport@rsmeans.com

Help Files

The *CostWorks* program comes with a local HTML-based Help file system, which will open within a web browser. There are four ways to view the *CostWorks* Help files:

- From the Start menu, click **Programs** or **All Programs**, click the **CostWorks** folder, and then click **CostWorks Help File** or **Help File**.
- From within the *CostWorks* program, click the **Help** menu at the top of the screen and then choose **Help...**
- From anywhere within the *CostWorks* program, click the Help icon .
- From the Settings Screen, click the "Click Here For Help" button shown below.



Chapter 2: The Settings Screen

Overview

This chapter describes the Settings screen. The Settings screen is where the parameters of the project (e.g., Project Name, Location, Wage Rate, MasterFormat) are set.

On the **Settings** screen, you can access the different functions in a variety of ways. Clicking on the menus at the top of the screen allows you to access the functions using a standard Windows interface. This Menu Bar at the top of the screen is used throughout the *CostWorks* program. Only the functions available to the current screen are accessible.

The Title Bar

The Title Bar will exist on every screen in *CostWorks*. The Title Bar is the highest bar on the screen and will display to the user what year's data (or instead show *Seminar Version*) they are currently accessing as well as the user's project name. The following graphic shows an example of the Title Bar accessing 2007 data within a project named "Foundation Wall."



The Menu Bar

Menus on the Settings screen are used to access various functions. Not all of these functions are available on each screen or tab.

File

| | |
|----------------------------|--|
| Owners Name | Personalize the Settings screen with information that is used to connect to the <i>CostWorks</i> Homeport. |
| Open Project | Create a new project or open an existing project. |
| Open Titles | Select the Data Titles to view in <i>CostWorks</i> . |
| Open Release Update | Choose the Year and Quarterly update to be used. |
| Order New Titles | Order additional data titles. |
| Exit | Exit <i>CostWorks</i> . |

Edit

| | |
|---------------------|---|
| CostList | Open the CostList for the current Project. |
| Location | Select a Location Factor/city for the current project. |
| Wage Rate | Choose between Union and Open Shop Wage Rates. This option is available with select titles. |
| Additives | Select additives to add to Square Foot Models. Used only with Square Foot Models or Residential Square Foot Models. |
| MasterFormat | Allows for toggling between CSI numbering systems. |

| | | |
|---------------|-------------------------------|--|
| Select | Component Swapper | This option is used for the <i>CostWorks</i> Estimator and will be discussed in <i>Chapter 5</i> ; |
| | Toggle Navigation Tree | Allows you to hide/unhide the Search Tree. |
| | Settings | Access the Settings screen. |
| | Estimator | Access the Estimator screen. |

Note: The following options only appear if the purchased titles have that data available.

| | |
|---------------------------------|--|
| Unit Costs | Access the Unit Cost Data screen. |
| Assembly Costs | Access the Assemblies Cost Data screen. |
| Project Costs | Access the Project Cost Data screen. |
| Square Foot Models | Access the Square Foot Models screen. |
| General Maintenance | Access the General Maintenance Data screen. |
| Preventive Maintenance | Access the Preventive Maintenance Data screen. |
| Maintenance & Repair | Access the Maintenance & Repair Data screen. |
| Residential Models | Access the Residential Models screen. |
| Residential Assemblies | Access the Residential Assemblies Data screen. |
| Resi R&R | Access the Residential R&R data screen |

View

The options under the View menu change depending on the data you are viewing. A list of the column headings is displayed, and these columns can be turned off or on using the checkmarks on the left.

Navigate

| | |
|--------------------|---------------------------------|
| Line Number | Search the data by line number. |
| Index | Search the data by keywords. |
| Bookmark | Display the bookmark screen. |

Tools

| | |
|----------------------|--|
| References | Display reference information for the selected line. |
| Tips | Display tips for the selected line item. |
| Calculator | Launch the default Windows calculator. |
| Dictionary | Launch the "Construction Dictionary." |
| Abbreviations | Launch the "Abbreviations" dictionary. |
| Graphic | Display graphics for the selected line item. |
| Crew | Display Crew information for the selected line. |
| Components | Display the components of the selected Assembly. |
| SmartPrint | Auto-adjust the height and/or width when printing, so that the printed results use a conservative number of pages. |

Help

| | |
|-------------------------|---|
| Help | Display the <i>CostWorks</i> Help Files. |
| Means on the Web | Connect to the RSMMeans website via the default internet browser. |
| About CostWorks | Display information about <i>CostWorks</i> . |

The Hot Spots

Hot Spots are hyperlinks that only appear when the mouse pointer is placed over the bold informational headings on the *Settings* screen. When clicked, these hyperlinks will launch a dialog box that will allow the user to choose from a variety of settings for that Hot Spot's topic.

The Hot Spots available on the *Settings* screen are:

CostWorks:

Clicking on **CostWorks** located under the Menu Bar will display the "About CostWorks" screen that shows the user and copyright information.

Owner:

Clicking on **Owner** will display the "RSMean on the Internet" window. Here, you will be asked to enter your name, company name, and email address for updating your data.

Release Update:

Clicking on **Release Update** on the *Settings* screen, or clicking on the **File** menu and then **Open Release Update**, will open the "Open Release Update" window. The "Open Release Update" window displays the quarterly updates that may be accessed for the currently open release. The user can then select the update they wish to use and click **OK**. If the user clicks the button labeled **Select Year/Release**, the Open Release window will appear and the user can choose what year's data they want to access. Other Open Release options include the following.

- **Automatically Search for Releases** scans your computer for the *CostWorks* release information and displays the drive and location of the data.
- **Manually Search for Releases** is for network administrators to locate the COSTDATA.ID file that may not be located by the **Automatic Search**. The COSTDATA.ID file is the mechanism used to locate the directory for *CostWorks* data on your computer.
- **Cancel** exits from the **Open Release** and leaves all settings as they were previously set.
- **OK** exits from the **Open Release** and activates the settings that were selected by you. To switch between different releases or years of cost information, click on the release information you want to access and click on **OK**.

Open Titles:

Clicking on **File**, **Open Titles** or clicking on **Open Titles** on the *Settings* screen will open the Open Titles window. The Open Titles window shows a checkmark to the left of the titles that are currently open. Empty check boxes mark the titles that are available. The titles you have access to will be in **bold** print, while those titles not yet purchased will be grayed out.

- Moving the mouse over the listed title brings up information about that title. The information is displayed on the right side of the *Open Titles* window.
- In addition, clicking the mouse on the title or anywhere in the functional area enables options for that function.
 - ❖ You select titles to open or close by clicking the mouse on the title.

- ❖ You can open one title or several similar titles at once.
- ❖ Any combination of titles within the same grouping can be selected.
- ❖ All titles in a group can be selected with one click. Either select the **All of the following** line at the beginning of a listed group, or select individual titles in that group.
- ❖ Titles in separate groups cannot be opened at the same time. Selecting a title from a different group automatically un-selects any previously selected titles.
- ❖ Clicking the **Order Additional Titles** button at the bottom of the screen will display the *Order Additional Titles* window.
- ❖ Clicking the **Cancel** button will close the *Open Titles* window and no changes will be made. Clicking the **OK** button will open the data titles that are currently selected.

Note: Data tabs will appear at the bottom of the screen when titles are opened. Possible data tabs include: **Unit Costs, Assembly Costs, Project Costs, Square Foot Models, Residential Models, Residential Assemblies, Maintenance & Repair, Preventive Maintenance, General Maintenance,** and **Residential R&R**. The choice of data tabs will vary depending on the title or titles that are currently opened.

MasterFormat™:

MasterFormat

MasterFormat™ is a specification standard by which construction requirements, products and activities are organized. The purpose of such a standard is so that communications between professionals in the construction industry can have a common basis.

The MasterFormat™ option allows you to toggle between MasterFormat 95 (created in 1995 and organized into 16 Divisions) and the new enhanced MasterFormat 2004 (created in 2004 and organized into 50 Divisions). MasterFormat 2004 was created for the purpose of replacing and improving MasterFormat 95. Part of the reason for this improvement was due to the growing number of modern technologies, materials and procedures that were not already covered by MasterFormat 95.

With the release of *CostWorks* 2006, both MasterFormat numbering systems are available to the user of the *CostWorks* program. For data prior to 2006, only the MasterFormat 95 numbering system will be available to the user.

MasterFormat™ is a product of the Construction Specifications Institute (CSI) and Construction Specifications Canada, and it is published by CSI. More information on CSI and MasterFormat can be obtained by going to the CSI website, at <http://www.csinet.org>.

Location:



The **Location** option allows you to adjust the Means Cost data with regional factors. Once you have accessed a data set, you can change the Location by clicking the **National Average Costs** button (found on the upper-right portion of the screen). This will allow you to specify the project's location. This action automatically modifies costs based on the RSMeans City Cost Index (CCI), which is an adjustment to the average national cost to reflect local factors. Once you have selected a location, this button will reflect the city and state you have chosen.

Clicking on **Edit, Location** or clicking on **Location** on the Settings screen will open a "Select Location" window as it appears below.



- In the left column, choose a state or choose **Canada** and then select one of the available cities from the right column. If Canada is selected, a list of cities will be displayed along with their corresponding province.
- Enter a U.S. Zip Code to automatically select the state and city for that Zip Code. The first three digits are the Zip region, upon which the indexes are based.
- Click the **Use US National Averages** button to use the U.S. national average costs.
- Click the **Location Factor Detail** button to display a list of the index values used to adjust the U.S. national average costs to the selected locality.
- Click the **Cancel** button to close the "Select Location" window without making any changes.
- Click the **OK** button to set the Location to the city cost index for the city that has been chosen.

Wage Rate: 

Click on **Wage Rate** on the Settings screen, and if the feature is available for the open titles, a "Select Wage Rate" window will appear. The selected wages, either Union or Open Shop, will adjust the currently open title or titles to the selected labor rates. This feature can only be used with union-based wage rate cost data titles (*Assemblies, Building Construction, Concrete & Masonry, Electrical, Green Building, Heavy, Interior, Mechanical, Plumbing, Site Work & Landscape, Square Foot*) or with open shop-based wage rate cost data titles (*Open Shop and Light Commercial*).

- Selecting **Union Cost** will set the wage rates to union labor rates.
- Selecting **Open Shop Cost** will set the wage rates to open shop (non-union) labor rates.
- The **Cancel** button, at the bottom, returns you to the Settings screen, and no adjustment is made.

Project Name: 

The **Project Name** hot spot of the Settings screen displays the name of the current project. All related CostLists and notes are stored in this **Project** area automatically. Clicking on **File, Open Project** or clicking on **Project Name** on the Settings screen will open the Select Project window. Options on the Select Project window include:

- To select an existing **Project**, click on the desired project on the list of available projects displayed and then click the **Open** button.
- Clicking the **New** button creates a new project and note.
- Clicking **Copy** allows you to copy the selected project's CostLists, bookmarks, and notes to a second location on your computer.
- Clicking **Backup** allows you to backup the selected project to a new location.
- Clicking **Erase** lets you delete a project and its notes. *CostWorks* gives a warning and requests confirmation before the project is erased.
- Clicking **Folder** allows you to rename the folder with a more descriptive name than the default project folder name.
- Click the **CostLists** button to launch the CostList Viewer that can be used to view the CostList(s) contained within the active project.
- Click the **Projects Location** button to set the default location, or parent folder, for where your projects are to be saved.
- Click the **Check Spelling** button to check the spelling of the information that you typed into the Notes area.
- Click the **Print Notes** button to print the information that you typed into the Notes area.
- Clicking the **Cancel** button, at the bottom of the project area, will close the Open Project window.
- The **Open** button allows you to open the currently highlighted project.

Project Notes: 

Clicking the **Project Notes** Hot Spot will also open the "Select Project" window.

CostWorks Tips:

Displays tips and hints about the program and basic estimating concepts.

CostList Viewer

The CostList Viewer is used to view the CostLists that are contained within a project. In the event that you choose not to renew your *CostWorks* subscription, the CostList Viewer can still be used to access any saved CostLists. The CostList Viewer is accessible from the "Select Project" window.

To open the CostList Viewer:

1. Click the **Select** menu and then click **Settings**.
2. Click the **File** menu and then click **Open Project**. This will display the "Select Project" window.
3. From the "Select Project" window, click the **CostLists** button. This will display the "CostList Viewer" window.

Connect to RSMeans on the Internet

The **Connect to RSMeans on the Internet** button (located at the bottom of the Settings screen) is used to connect to RSMeans resources on the Internet.

These resources include:

- The RSMeans website (www.rsmeans.com), which is full of useful construction information, resources, and great deals for purchasing Means products.
- The Means *CostWorks* Homeport, which is an area of the RSMeans website that is reserved for *CostWorks* users. This area contains helpful hints and quarterly data updates.

To connect to these resources, use one of the following methods within *CostWorks*:

- Click the **Connect to RSMeans on the Internet** button at the bottom of the Settings screen. Type in the requested information and then click the **OK** button.
- Click the **Help** menu and then click **Means on the Web**. Type in the requested information, and then click the **OK** button.

Chapter 3: Navigation

Overview

This chapter will detail the Data Screens that appear when a specific tab has been clicked. The Data Screens may look different, but their functionality is primarily the same. First covered will be the types of Data Screens.

Data Screen Types

CostWorks consists of two types of screens:

- Line Item screens
- Model screens

Each screen will grant the user access to its specific data.

Line Item Data Screens

The screens that present data in Line Item form are:

| | |
|------------------------|------------------------|
| Unit Costs | Maintenance & Repair |
| Assembly Costs | Preventive Maintenance |
| Residential Assemblies | General Maintenance |
| Project Costs | Resi R&R |

This is an example of a block of Line Item data:

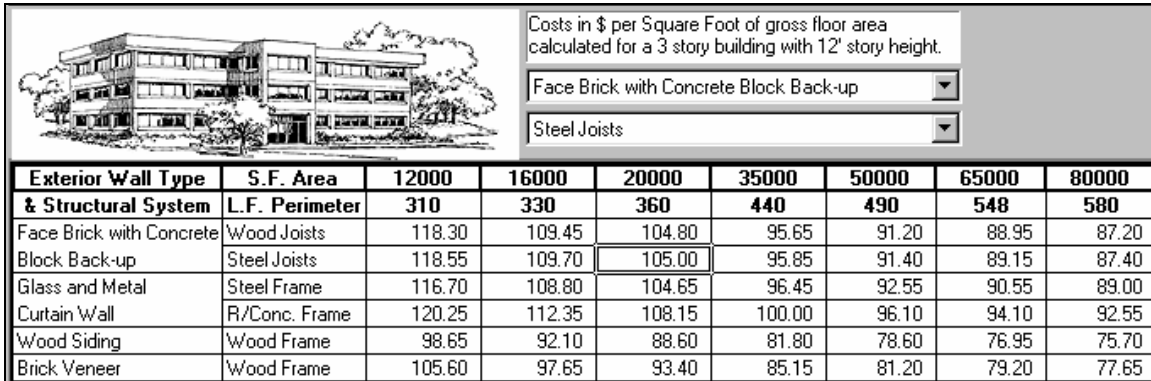
| | | 08 51 13 Aluminum Windows | Crew | Daily Output | Labor Hours | Unit | Bare Mat. |
|-----------|------|---|--------|--------------|-------------|------|-----------|
| 10 | 0010 | ALUMINUM SASH | | | | | |
| | 0100 | Fixed casement | 2 Sswk | 200 | .080 | S.F. | 12.10 |
| | 0150 | Picture window | 2 Sswk | 200 | .080 | S.F. | 13 |
| | 0200 | Projected window | 2 Sswk | 200 | .080 | S.F. | 28 |
| | 0250 | Single hung | 2 Sswk | 200 | .080 | S.F. | 14.10 |
| | 0300 | Sliding | 2 Sswk | 200 | .080 | S.F. | 18.25 |
| | 1000 | Mullions for above, tubular | 2 Sswk | 240 | .067 | L.F. | 4.75 |
| | 2000 | Custom aluminum sash, grade HC, glazing not included, minimum | 2 Sswk | 200 | .080 | S.F. | 34 |
| | 2100 | Maximum | 2 Sswk | 85 | .188 | S.F. | 44 |

Model Data Screen

The following screens will present their data in Model form.

- Square Foot Models
- Residential Models

Below is an example of Model Data:



Costs in \$ per Square Foot of gross floor area calculated for a 3 story building with 12' story height.

Face Brick with Concrete Block Back-up

Steel Joists

| Exterior Wall Type | S.F. Area | 12000 | 16000 | 20000 | 35000 | 50000 | 65000 | 80000 |
|--------------------------------|-----------------------|------------|------------|------------|------------|------------|------------|------------|
| & Structural System | L.F. Perimeter | 310 | 330 | 360 | 440 | 490 | 548 | 580 |
| Face Brick with Concrete | Wood Joists | 118.30 | 109.45 | 104.80 | 95.65 | 91.20 | 88.95 | 87.20 |
| Block Back-up | Steel Joists | 118.55 | 109.70 | 105.00 | 95.85 | 91.40 | 89.15 | 87.40 |
| Glass and Metal | Steel Frame | 116.70 | 108.80 | 104.65 | 96.45 | 92.55 | 90.55 | 89.00 |
| Curtain Wall | R/Conc. Frame | 120.25 | 112.35 | 108.15 | 100.00 | 96.10 | 94.10 | 92.55 |
| Wood Siding | Wood Frame | 98.65 | 92.10 | 88.60 | 81.80 | 78.60 | 76.95 | 75.70 |
| Brick Veneer | Wood Frame | 105.60 | 97.65 | 93.40 | 85.15 | 81.20 | 79.20 | 77.65 |

Screen Descriptions & Navigation

Tabs are your gateway to the data screens. Click on the appropriate available tab to access the data screen you are looking for.



Another way to navigate through *CostWorks* screens is to use the options in the Select menu. Click the **Select** menu and then click the name of the screen that you would like to view. *CostWorks* will display that screen.

Here is a description of what you will find on each screen:

Settings screen

The Settings screen is where you can set or change the parameters for your project. The Settings screen is described in detail in *Chapter 2: The Settings Screen*.

Estimator screen

The Estimator screen is an option available for purchase that allows the user to create custom line items, edit line items transferred from the Means database, create custom estimate templates, and create custom reports and report templates.

Unit Costs screen

The Unit Costs screen shows the cost per unit of measurement of a building component. The Unit Costs screen will give the user access to unit costs for thousands of building components.

Assembly Costs screen

Assembly Costs are a grouping of several trades into building components or broad building elements. The Assembly Costs screen will give the user access to assembly costs for thousands of these grouped elements.

Residential Assemblies screen

The Residential Assemblies screen will give the user access to about one hundred commonly used residential construction systems with a wide variety of alternative specifications and prices.

Project Costs screen

Project Costs are used for initial project planning and based upon historical data including cost of construction, professional compensation, land, furnishings and equipment, financing, and other charges.

Square Foot Models screen

The Square Foot Models screen is used when only the approximate size and building parameters are known. The database organizes base building costs (per square foot of floor area) for 70 model buildings. These are grouped into Commercial, Industrial, and Institutional categories.

Residential Models screen

The Residential Models screen organizes base building costs (per square foot of floor area) for 30 square foot cost models. These are grouped into Economy, Average, Custom, and Luxury categories.

Maintenance & Repair screen

The Maintenance & Repair screen will display a listing of common maintenance tasks including renewal, replacement, repair, and refinishing performed at facilities.

Preventive Maintenance screen

The Preventive Maintenance screen provides the framework for a complete PM program including a comprehensive list of equipment, actual PM steps, and budget documentation.

General Maintenance screen

The General Maintenance screen provides labor-hour estimates and costs to perform day-to-day cleaning. This data is used to estimate cleaning times, compare and assess estimates by cleaning companies, or to budget in-house staff.

Resi R&R screen

Primarily for the building contractor and remodeling contractor needing construction cost data for small repair and remodeling projects. All information is formatted by construction category and cost element breakouts/tasks. The cost breakout is by task or item basis. The format allows you to easily identify and locate the cost data required to estimate and complete the job.

What Makes up a Data Screen?

The Title Bar

The Title Bar will exist on every screen in *CostWorks*. The Title Bar is the highest bar on the screen and will display to the user what year's data (or instead show *Seminar Version*) they are currently accessing as well as the user's project name. The following graphic shows an example of the Title Bar accessing 2007 data within a project named "SAMPLE."



The Title Bar is also where the user can minimize, maximize, or close the program.

The Menu Bar

Menus on the *Settings* screen allow you access to various functions. Not all of these functions are available for every screen. The following graphic depicts the Menu Bar.



The options of the Menu Bar are detailed in Chapter 1 of this workbook, and they are the same as on the *Settings* screen.

The Icon Bar



Go To Line Number lets you move to a particular *Division*, *Sub-Division*, or *Major Classification* of data by entering a partial or complete line number.



Search Index allows the user to type a full or partial keyword and then retrieves the closest results from within the database.



Bookmark functions are analogous to placing a physical bookmark in a volume and using it later to find your place. If a bookmark exists, Bookmark is a convenient and fast search method. Once you have accessed a line item by any of the search methods, it is a good idea to immediately bookmark that line item if you intend to use that same line item often.



The **CostList** is the area where *CostWorks* stores the lines that you have selected for your project. The CostList is an itemized list with a running total. The CostList may be printed, transferred to the *CostWorks* Estimator, or exported for use in a spreadsheet program.



References: This icon will appear in the top toolbar when reference information exists for the selected line. Clicking on the *References* icon or clicking the **Tools** menu and then **References**, will display a menu of available references. The available reference information varies depending on which titles are currently opened and which screen is being displayed.



Graphics: Some line items have an associated graphic. If a graphic is present, the item record number will be shaded and *CostWorks* will display a Graphics icon in the top toolbar. Clicking on this icon or clicking on **Tools, Graphic** from the menu displays the graphic in Adobe Acrobat Reader. (See the Adobe Acrobat Reader On-Line Help for more information on using Adobe Acrobat Reader.)



Crew: If the currently selected line has a crew associated with it, click on this icon (or click on the **T**ools menu and then click **C**rew) and a "Crew Lookup" window will open. This window will display information about the composition of the work crew specified in the current line. Note: Cost information in the "Crew Lookup" window will always be displayed in U.S. National Average Costs.



Components: An assembly is a group of related line numbers or *Components* organized around a task. To show the components of an assembly, click on the *Components* button, or click on **T**ools, **C**omponents from the menu. This will display the unit price line items and their respective quantities that have been included in the development of the total assembly price.



Tips: Click this icon (or click the **T**ools menu and then click **T**ips) to provide helpful hints on how to use the system more efficiently and other estimating information.



Calculator: The system provides the user with quick access to the Windows calculator. This allows for quantifying results regarding specific job sites quickly and easily. To access the *Calculator*, click on the *Calculator* icon or click on **T**ools, **C**alculator from the menu.



Dictionary: The system provides the user with an in-depth *Dictionary*, which defines all the construction terms used by *CostWorks* and many more as well. To access the *Dictionary*, click on the *Dictionary* icon found on the top portion of the screen, or click on **T**ools, **D**ictionary from the menu.



Abbreviations: The system provides the user with a list of *Abbreviations* for all construction terms used by *CostWorks*. To access the list of *Abbreviations*, click on the Abbreviations icon found in the top portion of the screen, or click on **T**ools, **A**bbreviation from the menu.



Component Swapper: This option is used by the *CostWorks* Estimator and will be discussed in *Chapter 5: Estimator – Introduction*.



CostWorks Help: Launches a web browser screen and opens the *CostWorks* Help File. You do NOT need to be connected to the Internet to view the *CostWorks* Help File.

Working with a Data Screen

There are four ways to navigate through *CostWorks* to find a specific line item.

They are:

- Menu Bar options
- Icon Bar options
- Dropdown menus
- The Search Tree

Menu Bar Options

The ***Navigate*** option of the Menu Bar will access three options:

- Line Number (Go To Line Number icon)
- Index (Search Index icon)
- Bookmark (Bookmark icon)

Icon Bar Options



The Go To Line Number Icon

The ***Go To Line Number*** icon lets you navigate to a particular ***Division, Subdivision, or Major Classification*** of data by entering a partial or complete line number.



The Search Index Icon

Search Index (to access a line by keyword):

- a. Click on the **Search Index** icon on the top toolbar, click on **Navigate, Index** from the menu, or press CTRL-I on your keyboard and *CostWorks* will display the "Search Index" window.
- b. Enter all or part of the keyword in the dialog box as follows:
 - Enter a word or the significant part of a word.

Example: Entering **door** will find the number for the first line of information about doors. If the system cannot find the word, it will go to the closest occurrence of the word. Entering **wind** will find the first line of information about windows.

- When the keyword is found, the dialog box also displays the number, which identifies the line item within the cost data.
- Double-click on the item and *CostWorks* jumps to the line item corresponding to the keyword and code number. Highlighting the item and clicking **Enter** or clicking on the **Go To** button on the bottom right will achieve the same result.



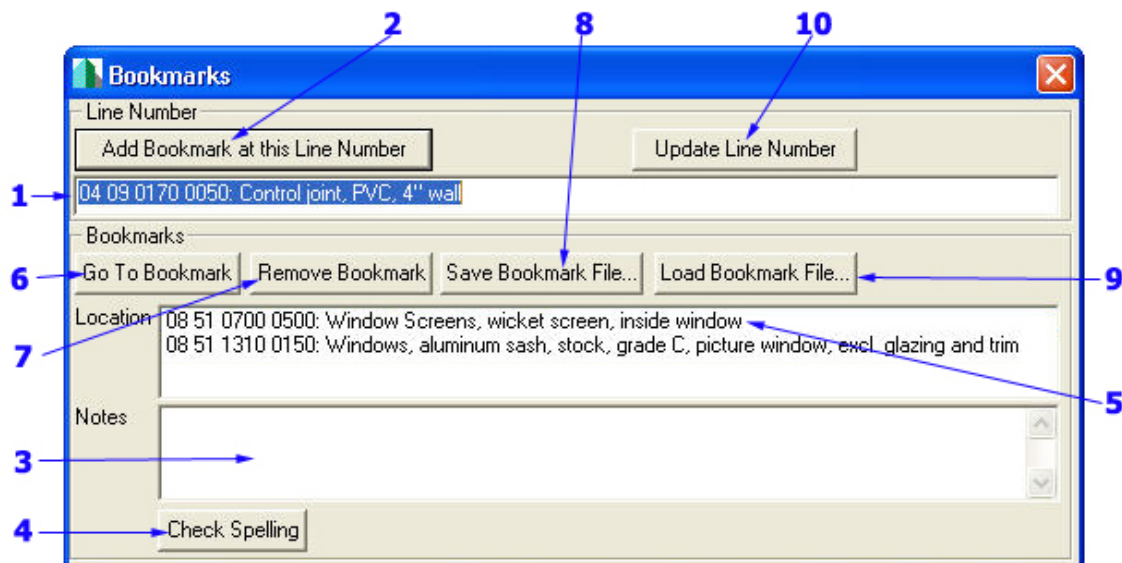
The Bookmark Icon

Setting a bookmark in *CostWorks* is just like placing a physical bookmark in a book for finding that page later. Once you have accessed a data line by a search method, creating a bookmark for that data line will make it easier to navigate to that data line in the future.

There are three ways to open the "Bookmarks" window:

- Click the **Navigate** menu and then click **Bookmark**.
- Press CTRL-B on your keyboard.
- Click on the **Bookmark** icon.

This image shows the "Bookmarks" window:



1. Current Line

This box shows the line number and description for the currently selected line or bookmark.

2. Add Bookmark button

Click this button to Add a bookmark for the current line.

Note: If the bookmark already exists, no duplicate entry will be created.

3. Notes area

The Notes area can be used to add comments about this bookmark.

4. Check Spelling button

The Check Spelling button is used to check the spelling in the Notes area.

5. Location area

The lines in the Location area are bookmarks that have been saved. Click to highlight one of these lines to activate it. When active, the bookmark will appear in the current line area.

6. Go to Bookmark button

The "Go to Bookmark" button navigates (on the data screen) to the bookmark that has been selected.

Note: The "Bookmark" window can remain open while navigating within the data screen.

7. Remove Bookmark button

The "Remove Bookmark" button deletes the selected bookmark.

8. Save Bookmark File button

The "Save Bookmark File" button is used to save the current bookmark file. *CostWorks* displays a "Save As" window that is used to save the file. Saving a bookmark file results in a file name that consists of the name you specify plus the suffix ".mrk" (example: myfile.mrk).

9. Load Bookmark File button

The "Load Bookmark File" button is used to load a saved bookmark file. *CostWorks* will display a warning window advising that the current bookmark file should be saved before proceeding. *CostWorks* asks, "Do you want to stop now so you can save the current bookmark file first?"

- Click the **Yes** button to cancel the load action.
- Click the **No** button to proceed with loading a bookmark file.



CAUTION: Loading a bookmark file without first saving the current bookmark file may result in a loss of bookmark data.

10. Update Line Number Button

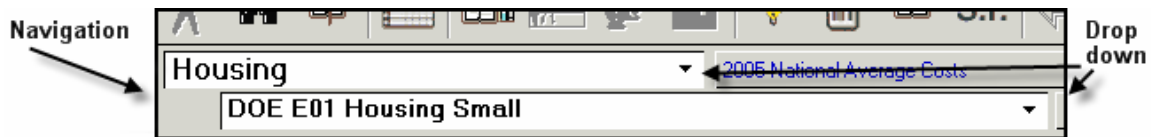
Clicking on the "Update Line Number" button will refresh the displayed information to that of the currently selected data line.

Dropdown Lists

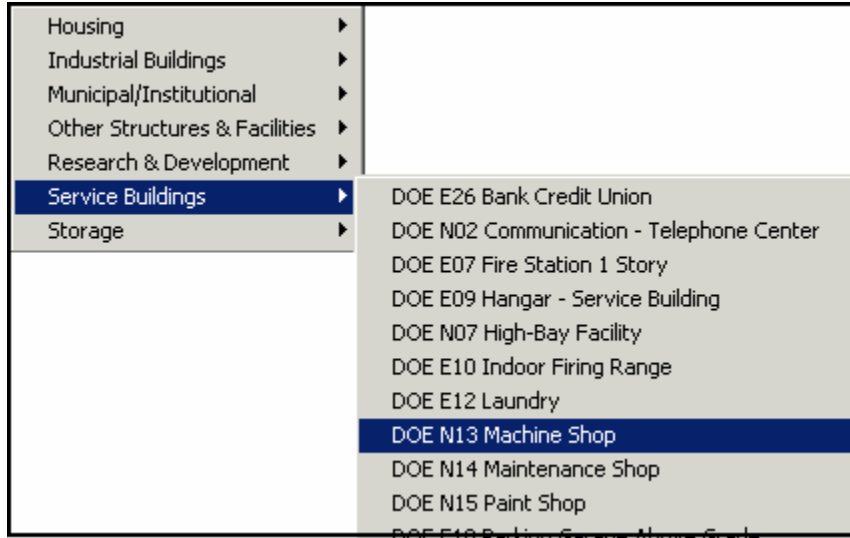
The Dropdown Lists are used to help you locate line items by leading you through Division, Groups and Subgroups. To navigate the data via Division (Level 1), Level 2, 3, & 4, click on the arrow of the appropriate title level.

This graphic shows the flow of the Dropdown menus:

This image shows the Major Category dropdown list with "Housing" selected and the Model Selection dropdown list with "DOE E01 Housing Small" selected:



This image shows the Major Category dropdown list (on the Square Foot Models screen) after it has been selected:



Accessing Cost Data

The first three lines in the Cost Data area of the screen (and of any division) identify the Division, Subdivision, and Major Classification.

- Clicking on any of these lines displays menus that list choices within that category.
- Clicking on a menu item invokes the next level of menus.
- Double-clicking on the description of a line item reveals a subset for that category. Click on the classification you wish to access.

Selecting a Line Item

After you access the particular *Division, Subdivision, or Major Classification* that contains the line item:

1. Position the cursor at the line item and click. The selected line will appear highlighted on the data screen.
2. *CostWorks* updates the CostCalc toolbar (at the bottom of the screen) with information from the selected line.

The Search Tree

When viewing the *CostWorks* data lines from either the Unit Costs screen or the Assembly Costs screen, there will appear on the left side of the screen a Search Tree. This is one of several resources used for locating particular data lines or categories of data lines.

By clicking the plus sign to the left of a category, that category's subcategories will be displayed. By "drilling down" through the subcategories in this manner, one is able to quickly locate specific subcategories. When a category or subcategory is selected from this Search Tree, that category of data is automatically displayed in the main window area to the right of the Search Tree.

This Search Tree is an example of what appears when accessing the Unit Costs screen:

| This image shows the Unit Cost screen search tree opened to "06110100 Blocking": | This image shows the Assembly Cost screen search tree opened to "C3010 235 Paint Trim": |
|--|--|
| <ul style="list-style-type: none"> ⊕ 1 General Requirements ⊕ 2 Site Construction ⊕ 3 Concrete ⊕ 4 Masonry ⊕ 5 Metals ⊖ 6 Wood and Plastics <ul style="list-style-type: none"> ⊕ 06050 Basic Wood / Plastic Materials / Methods ⊖ 06100 Rough Carpentry <ul style="list-style-type: none"> ⊖ 06110 Wood Framing <ul style="list-style-type: none"> 06110100 BLOCKING 06110150 BRACING | <ul style="list-style-type: none"> ⊕ A Substructure ⊕ B Shell ⊖ C Interiors <ul style="list-style-type: none"> ⊕ C10 Interior Construction ⊕ C20 Stairs ⊖ C30 Interior Finishes <ul style="list-style-type: none"> ⊖ C3010 Wall Finishes <ul style="list-style-type: none"> C3010 230 Paint & Covering <ul style="list-style-type: none"> C3010 235 Paint Trim ⊕ C3020 Floor Finishes ⊖ C3030 Ceiling Finishes |

The CostCalc

When you highlight a Line Item, *CostWorks* displays the line number, description and cost data from the line item in the fields of the CostCalc toolbar located at the bottom of the screen.

This image shows an example of the CostCalc area with line item 08 520 100 0100 displayed.

| | | | | | | | | | | |
|-----------------|-------|---|------|--------|--------|-------|-------|------|-------|------|
| 08 520 100 0100 | | Aluminum sash, stock, grade C, glaze & trim not incl., fixed casement | | | | | | | | |
| Qty | 1.000 | To List | Crew | 2 Sswk | Output | 200 | Hours | .080 | Unit | S.F. |
| Material | 9.10 | Labor | 1.99 | Equip. | | Total | 11.09 | O&P | 13.60 | |

Important information about the CostCalc area:

- Change the amount in the **Qty** field if more than one unit of the selected Line Item is required. If the **Qty** field is updated to a different value, the numbers in the CostCalc are updated to reflect the quantity of items specified.
- Click the **To List** button to send the line item to the CostList.
- Fields in the **CostCalc** toolbar correspond to the columns on the data screens.

Specifying Quantity of an Item

When a line is accessed (or selected), its values are automatically displayed in the **CostCalc** area. These values specify costs for one item.

The values shown initially correspond to the costs for one item. When you enter a number greater than one into the Qty (quantity) field the field values of the CostList are multiplied by that number and the quantified totals are shown on-screen.

Example: If you selected stone treads, the CostCalc fields show costs for one tread. If you enter 16 in the Qty field, *CostWorks* will revise corresponding fields in the CostCalc to show values for 16 stone treads. This information is transferred to the CostList when you click the **To List** button.

Note: Clicking on the **Qty** button of the CostCalc area resets the quantity to 1.000 and activates that cell.

Showing and Hiding Columns

To simplify viewing of the cost data, you may choose to hide some of the data fields. To hide (or show) data columns, click on corresponding field buttons in the CostCalc area. Another way to do this is to select the data column name from the View menu. Either of these actions will hide or show the columns in the cost data area of the Unit Cost Data screens.

Note: When the data from the current line is sent to the CostList it will contain all columns including any columns that may have been hidden from view.

To hide a currently visible column from view:

1. Position the cursor in the CostCalc area.
2. Click the mouse once on the button that contains information you do not wish to view.

3. *CostWorks* hides the data column for that field from view (on the current display). This enables you to check information easily.
Example: If you click once on the button labeled ***Equipment***, the cost for equipment becomes hidden, but the value of that column remains visible in the CostCalc area.
4. To switch from ***hiding*** a column to ***showing*** a column, click the mouse again on the same button.

Note: Hiding a column does not change the cost data of the items in the column. You just do not see the data in a hidden column.

Example: To display only Labor Costs on the Unit Cost Data screen, click on all the buttons in the CostCalc toolbar except *Crew*, *Labor Hours* and *Labor*. Then, *CostWorks* shows only the specified columns in the cost data area. Buttons you clicked to hide a column are grayed-out in the CostCalc toolbar.

Chapter 4: The CostList

Overview

The CostCalc area at the bottom of the data screen windows lets you enter a quantity and accumulate cost data items. Accumulated cost items are placed into a holding area called a CostList.

To create a new CostList, transfer a line item from the CostCalc area to the CostList by clicking the **To List** button. To display the currently active CostList, click the **CostList** icon or click the **Edit** menu and then click **CostList**.

CostList icon:



Note: When accessing data through a Models Screen (Square Foot Models or Residential Models), the functionality of the CostList will change. These differences will be explained in the *Preliminary Cost Report* section of this chapter.

The Title Bar

If you have saved a CostList, the path and name of that CostList will appear in the Title Bar of the CostList. If you have not saved the CostList, the word CostList will appear. This image shows a CostList title bar for a CostList that has been named "Sample" and saved in the Sample project folder.



The Menu Bar

Menus in the CostList screen allow you to **F**ile, **E**dit, **V**iew, **U**ppdate, or leave **N**otes. Each option contains various functions. They are:

File

- N**ew Clicking **N**ew will launch a new CostList.
- O**pen Clicking **O**pen will launch an Open Costlist File box, which can be used to open a previously saved CostList.
- S**ave Clicking **S**ave will save the current CostList.
- S**ave **A**s Clicking **S**ave **A**s will allow you to save a CostList with a new name or to a different folder.
- D**elete Clicking **D**elete will launch a Delete Costlist File dialog box, which is used to delete a CostList.
- M**erge Clicking **M**erge will launch a Merge Costlist File dialog box, which is used to combine two or more CostLists.
- E**xport Clicking **E**xport will launch an "Export Costlist File" window, which is used to export the CostList into a file format that can be used by a spreadsheet program.
- P**rint Clicking **P**rint will print the current CostList.

Close Clicking **C**lose will close the current CostList.

Edit

Add Current Line

Clicking **A**dd Current Line will add the currently selected line item to the currently displayed CostList. (This is the same as the clicking the **To List** button on the data screen.)

Remove Selected Line(s)

Clicking **R**emove Selected Line(s) will remove the selected line from the CostList.

Addjustments

Clicking **A**ddjustments will launch an Edit Adjustments dialog box. This dialog box can be used to change the way a percentage line is applied to a selected line.

Copy

Clicking **C**opy will bring up a dialog box with instructions on how to copy a line from the CostList and paste it into another application.

Sort

Clicking **S**ort will sort the CostList based upon the currently highlighted column.

View

Select Columns

Clicking ***Select Columns*** allows the user to toggle the display of each column in the CostList.

Update

Go to Cost Line in Title

Clicking this will browse to the current line on the data screen.

Uppdate Current Line from Title

Clicking this will update the current line to the current settings.

Uppdate Entire CostList from Title

Clicking this will update the whole CostList to the current settings.

Check the CostList

Clicking this will determine if the CostList needs to be updated.

Settings

Make Sound When Adding Line

Can be toggled on to enable a sound when a line is added to the CostList.

Check for Duplicates When Adding Lines

Can be toggled on to enable a message that prompts that the line being added already exists in the CostList.

Show CostList When Adding Line

Can be toggled to enable the CostList to appear each time a line is added.

Notes

Notes is used to enter Notes about a CostList item. These Notes are displayed in the Notes column on the CostList.

CostList Functions

Saving the CostList

The ***File, Save*** option saves the CostList to a file. The name of this file consists of the name you specify plus the suffix: ***“.udl”*** (for example ***myfile.udl***).

Printing the CostList

While viewing the CostList, click the **File** menu and then click **Print** to print your CostList. *CostWorks* will display a standard “Print Setup” window. From this window, you can choose the print options of:

- ***Portrait*** will change the orientation of the report to portrait mode, having the long edge of the report vertical.
- ***Landscape*** will change the orientation of the report to landscape mode, having the long edge of the report horizontal.
- If your computer has multiple printers available, you can choose which printer to use by clicking the “Name” dropdown list (located at the top of the “Print Setup” window).

Note: If a column is hidden or the width is adjusted, the CostList will print those columns as they appear on the screen.

Closing the CostList

The CostList does not have to be named before it is closed. *CostWorks* will automatically save the CostList.

- When the ***File, Close*** option is selected, the CostList is saved by *CostWorks*.
- The CostList window will then close and the screen will return to the currently accessed cost data screen.

Adding and Removing Items from a CostList

When the CostList is invoked, fields from the currently selected line item and information in the CostCalc toolbar are available for use by the CostList.

- When ***Edit, Add Current Line*** is clicked from the CostList screen, *CostWorks* adds the cost information contents of the currently selected line of Unit Cost data.
- To remove a line item from the CostList, select the line to be removed and click on ***Edit, Remove Selected Line(s)***.

Copy Items from CostList

To ***Copy*** information from the CostList to the clipboard:

1. You select a cell by clicking on it, a range of cells by clicking and dragging, or a column by clicking the column header.
2. After the information is selected, press ***CTRL + C*** (Copy).
3. Now activate the application where the information will be placed and use the ***CTRL + V*** (Paste) command to paste information into this application.

Sorting Items on the CostList

A CostList may be sorted on any column you desire. Click the **E**dit menu and then click **S**ort or double-click the column header to toggle between ascending and descending order. *CostWorks* performs the sort and then refreshes the CostList to show the data in its newly sorted order.

View of CostList

Clicking on **V**iew and then removing a checkmark from one of the column choices will hide that column on the CostList. This allows for the presentation of only the desired information. If a column is hidden (unchecked) and then the CostList is exported or copied, it will still have the hidden column's data. It is only when the CostList is viewed or printed from within *CostWorks* that the column will be hidden.

Update The CostList

A CostList may need to be updated when using a different title, year, or location than when the CostList was created or last updated.

- **Update Current Line from Title** will update the current line of the CostList to the current settings.
- **Update Entire CostList from Title** will update the entire CostList to the current settings.
- **Check the CostList** will determine if the CostList needs to be updated. If the settings do not match, it will prompt you to update the CostList.
- **Go to Cost Line in Title** is another method to go to a certain line item in your database.

Updated items will appear darker than items not updated. Examining the columns in the CostList labeled Zip Code Prefix, Type, or Release can further identify line items not updated within the CostList. The "Zip Code Prefix" column will identify the location to which the item was adjusted. The "Type" column will identify what title or wages that were used. The "Release" column will identify the year and quarter of the data used.

Exporting the CostList

The **F**ile, **E**xport option exports the CostList to a file. The name of a file consists of the name specified plus one of three file extensions:

- Using a ".fms" extension will create a file that can be imported into FIMS.
- Using a ".cas" extension will create a file that can be imported into CAIS
- Using a ".xls" extension will create a LifeCycle Cost file that can be read by Microsoft Excel™.
- Using a ".wks" extension will create a file that can be read by a variety of spreadsheet programs.
- Using a ".txt" extension will create a tab delimited ASCII / Text file.

The Preliminary Cost Report

The Preliminary Cost Report is the CostList for the Square Foot Model and Residential Model screens.

The Menu Bar

Each menu in the CostList contains various functions. These functions consist of:

| <u>Menu</u> | <u>Option</u> | <u>Description</u> |
|--------------------|----------------------|---------------------------|
|--------------------|----------------------|---------------------------|

File

New

Opens a new CostList.

Open

Is used to open a different CostList or (optionally) open a new CostList.

Save

Saves the current CostList.

Save As

Saves a CostList with a new name or to a different folder.

Export

Exports a CostList for use in another spreadsheet or Windows application.

Print

Prints the CostList.

Close

Closes the current CostList display.

Edit

Copy

Opens a dialog box with instructions for the process of highlighting data, using Ctrl-C to copy it, and then pasting it into the desired Windows application.

View

Detail

Displays a listing of the components used for a model.

Summary

Displays only the subdivision cost information for a model.

Uppdate

Go to Cost

Shows the model in the current CostList for verification of information.

Model in Title

Updates the current CostList to the current settings.

Uppdate CostList

from Title

Check the

CostList...

Checks to see if the CostList is set to the current settings.

Notes

Allows the user to enter Notes about this model.

Exporting the CostList

Exporting the CostList works the same way in a Preliminary CostList as it does in the CostList that we have already reviewed. The ***File, Export*** option exports the CostList to a file.

The name of a file consists of the name specified plus one of three file extensions:

- Using a ".fms" extension will create a file that can be imported into FIMS.
- Using a ".cas" extension will create a file that can be imported into CAIS
- Using a ".xls" extension will create a LifeCycle Cost file that can be read by Microsoft Excel™.
- Using a ".wks" extension will create a file that can be read by a variety of spreadsheet programs.
- Using a ".txt" extension will create a tab delimited ASCII / Text file.

Saving the CostList

The ***File, Save*** option saves the CostList to a file. The name of a file consists of the name you specify plus the suffix: ".mdl" (for example ***myfile.mdl***).

Printing the CostList

Select **File, Print**, to print your CostList. The following options will appear.

- **Default** will print your CostList with your default settings and orientation.
- **Portrait** will change the orientation of the report to portrait mode, having the long edge of the report vertical.
- **Landscape** will change the orientation of the report to landscape mode, having the long edge of the report horizontal.
- You can select which printer to print your report to by clicking the down arrow beside the **Printer** list. If you have other printers loaded you can select which printer to send the report to.

Update The CostList

A CostList may need to be updated when using a different year or location than when the CostList was created or last updated.

- **Go to Model in Title:** This option will look at the model used in the *Preliminary Cost Report* and browse to that same model on the data screen.
- **Update Current Model from Title:** This option will use the current data settings to update the information shown in the *Preliminary Cost Report*.
- **Check the CostList:** This option is primarily used for verifying that the *Preliminary Cost Report* is displaying the correct information for the year (or version) of data that is currently being used. (Example: a project being updated to 2005 data)

Additives

The Common Additives screen will appear only when accessing the Square Foot Models or Residential Models. Within the *Common Additives* screen you can add costs for commonly used items to the square foot cost of the model you have selected.

This is an example of what the *Common Additives* area looks like:

| Common Additives | | | | | Note: Totals include Overhead and Profit Fees of 25.00% and Architectural Fees of 7%. |
|------------------|------|------|----------|--------|---|
| Common Additives | | | \$ Total | | |
| Description | Qty | Unit | \$ Cost | Totals | |
| Clock System | | | | | |
| 20 room | 0.00 | Each | 13000.00 | | |
| 50 room | 0.00 | Each | 31500.00 | | |

Using the mouse, click to activate the quantity (Qty) to be adjusted. Enter the quantity of the additive item and click the *Enter* key on the keyboard.

This image shows the screen after Qty 1 has been entered for a 20 Room Clock System:

| Common Additives | | | | | Note: Totals include Overhead and Profit Fees of 25.00% and Architectural Fees of 7%. |
|------------------|------|------|----------|---------|---|
| Common Additives | | | \$ Total | \$17388 | |
| Description | Qty | Unit | \$ Cost | Totals | |
| Clock System | | | | | |
| 20 room | 1.00 | Each | 13000.00 | \$17388 | |
| 50 room | 0.00 | Each | 31500.00 | | |

Clicking the **Additives** button toggles (on or off) the display of the **Common Additives** screen.
Clicking the **Clear Additives** button will reset the **Common Additives** screen.



***See Also:* Chapter 8, Exercises #1, #2, #3 and #4.**

Chapter 5: Estimator – Introduction

Overview

The *CostWorks* Estimator is the most advanced addition to the *CostWorks* program since its release in 1997. The Estimator is an option you can purchase by calling the RSMMeans Sales Department at 1-800-334-3509. The Estimator allows the user to select pre-formatted report templates, create custom reports, edit line items selected from the RSMMeans database, and create custom line items.

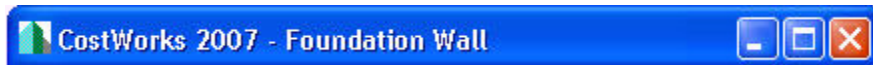
The Estimator's main screen has 5 sections:

- The Title Bar
- The Menu Bar
- The Icon Bar
- The Estimate Window
- The Tabs

To use the *CostWorks* Estimator, you must first have a CostList built within the project you are accessing. To access the CostWorks Estimator click on the Estimator tab. If you have purchased the Estimator, a blank Estimator worksheet will appear when the Estimator tab is clicked.

The Title Bar

The Title Bar will exist on every screen in *CostWorks*. The Title Bar is the highest bar on the screen and will display to the user what year's data (or instead show *Seminar Version*) they are currently accessing as well as the user's project name. The following graphic shows an example of the Title Bar accessing 2007 data within a project named "Foundation Wall."



The Menu Bar

Each menu in the Estimator contains various functions. These functions consist of:

File

| | |
|-----------------|---|
| New | Creates a new estimate. |
| Open | Opens an existing estimate. |
| Save | Saves the current estimate. |
| Save As | Saves the current estimate as a new estimate. |
| Export | Exports the estimate. |
| Template | Sets the estimate as a template. |
| Print | Prints the current file. |
| Exit | Closes <i>CostWorks</i> . |

Edit

| | |
|------------------------------------|---|
| CostList | Transfers data from a CostList. |
| Cost Item | Edits the selected line item. |
| Cost Item Type | Changes the type of the cost item. |
| Copy Cost Item | Copies the selected cost item. |
| Delete Cost Item | Deletes the selected cost item. |
| New Cost Item | Creates a new cost item. |
| Cost Item Defaults | Sets default cost item calculations. |
| Custom Fields | Adds or Edits custom fields. |
| Update Estimate from Titles | Updates the costs to the Location and titles that are currently opened (as shown on the Settings screen). |

Select

| | |
|---------------------------------|---|
| Settings | Displays the Settings screen. |
| Estimator | Displays the Estimator screen. |
| Units | Displays the Unit Cost data. |
| Assemblies | Displays the Assemblies Cost data. |
| Square Foot Models | Displays the Square Foot Models data. |
| General Maintenance | Displays the General Maintenance data. |
| Preventive Maintenance | Displays the Preventive Maintenance data. |
| Maintenance & Repair | Displays the Maintenance & Repair data. |
| Residential Models | Displays the Residential Models data. |
| Residential Assemblies | Displays the Residential Assemblies data. |
| Resi R&R | Displays the Residential R&R data. |

Note: The options on the **Select** menu are only accessible for the data types that have been purchased.

View

| | |
|-----------------------------|---|
| Column Positions | Sets default order of the columns. |
| Component Options | Sets the way that Components are displayed. |
| Recalculate Estimate | Recalculates the estimate after changes have been made. |

Reports

| | |
|--------------------|--|
| Run Reports | Opens the Estimate Report window that is used to run a report. |
| Define | Displays options for defining aspects of a report. |
| Reports | Create or edit a report template. |
| Headers | Create or edit report headers (Addresses, etc.). |
| Styles | Edit the style of a report. |
| Lookups | Edit the way the report looks for line items. |
| Markups | Edit the default markups. |















Tools




| | |
|---------------------|--|
| Calculator | Displays the Windows Calculator. |
| Dictionary | Displays the Construction Dictionary. |
| Abbreviation | Displays the Abbreviations Dictionary. |

Help

| | |
|-------------------------|---|
| Help | Displays the Help file. |
| Means on the Web | Displays links to connect to the <i>CostWorks</i> Homeport or the RSMeans website (www.rsmeans.com). |
| About CostWorks | Displays information about <i>CostWorks</i> . |

The Icon Bar

| Icon | Name | Function |
|---|---------------------------------|--|
|  | Open Estimate | Opens an existing estimate. |
|  | Save | Saves the current estimate. |
|  | Print | Prints the current estimate. |
|  | CostList Import | Transfers data from a CostList. |
|  | Edit Cost Item | Edits an existing cost item in the estimate. |
|  | Add Cost Item | Adds a cost item to the estimate from the database. |
|  | Remove Cost Item | Removes an existing cost item from the estimate. |
|  | Move Item Up | Moves the selected item up one line at a time in the estimate. |
|  | Move Item Down | Moves the selected item down one line at a time in the estimate. |
|  | Components | An assembly is a group of related line numbers or Components organized around a task. To show the components of an assembly click on the Components button or from the menu, click on <u>T</u>ools, Components . This will display the Unit Price line items and their respective quantities that have been included in the development of the total assembly price. |
|  | Recalculate the Estimate | After a cost item has been edited or a parameter has been changed for the estimate, this can be used to recalculate the estimate. |
|  | Tip | Provides helpful hints on how to use the system more efficiently and other information. Or from the menu, click on <u>T</u>ools, Tips . |
|  | Calculator | Provides quick access to the Windows calculator, which can be used to quantify results quickly and easily. |
|  | Dictionary | Provides definitions for all of the construction terms used by <i>CostWorks</i> and many more. |

| | | |
|---|--------------------------|--|
|  | Abbreviations | Accesses a list of abbreviations for all the construction terms used by <i>CostWorks</i> . |
|  | Component Swapper | Replaces individual data lines while working with the Estimator. |
|  | Help | Opens the Help file. |

Basic Estimator Functions

The basic functions of the *CostWorks* Estimator are:

- Create a New Estimate.
- Transfer Lines from a CostList.
- Component Swapper.
- Run a Report.
- Print, Export, and Save an estimate.

Create a New Estimate

From the Estimator's main screen, click on the **File** menu, and then click on **New**. A list of available templates will be displayed.

This image shows the "Unit" template selected:



The choices of templates correlate to the types of data screens. Choose the desired type of estimate and the estimate window will appear with the correct column headings for that type of estimate.

Transfer Lines from a CostList

After choosing the type of estimate to create, the next step is to import / transfer data from the CostList.

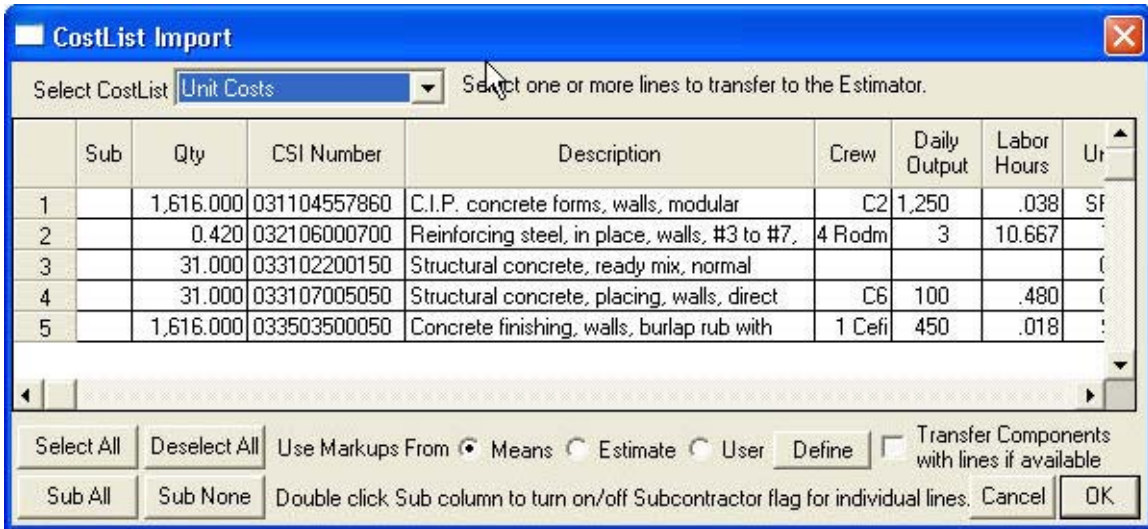
1. Click on the **CostList Import** Icon.

CostList Import icon:



2. The "CostList Import" window will appear.

This image shows the "CostList Import" window:



- Using the "Select CostList" dropdown list at the top of the "CostList Import" window, select the type of CostList to transfer.

The choices in this menu correlate to the data screens available for the currently open data titles. Menu choices include:

| | | |
|------------------------|------------------------|--------------------|
| Maintenance and Repair | Assembly Costs | Residential Models |
| Residential Assemblies | Square Foot Models | Unit Costs |
| General Maintenance | Preventive Maintenance | |

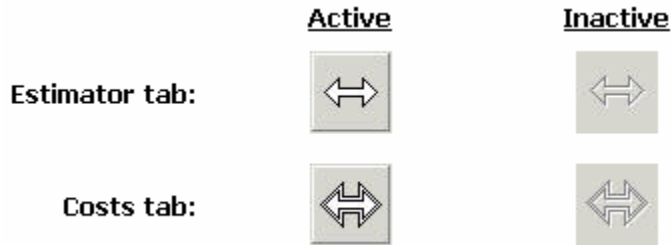
Note: Choose **Square Foot Models** in the Select CostList dropdown when working with DOE Models and their Preliminary Cost Reports.

- Once an item has been selected from this menu, the CostList line items will appear (as long as there is a corresponding CostList of the same type in the current project).
- Highlight the lines to be transferred from the CostList or click the **Select All** button to choose all data lines. This will highlight all of the available data lines from the current CostList.
Note: The Sub All / Sub None buttons are described in the *Level 2: Intermediate Functions* section.
- Now click the **OK** button and the lines will begin transferring into the Estimator.

Component Swapper

The Component Swapper is used to add or replace individual lines while working on the Estimator screen. This can be particularly useful for bringing different Unit Cost items into an Assembly estimate (that has been transferred to the Estimator with its components). Or, it could be used to save a bit of time when working with a Unit Cost or Assembly estimate that needs to have a few lines item changed.

Component Swapper icons:



Note: The Component Swapper is not intended for use with the Project Costs screen or with the "Facilities Maintenance & Repair" data title.

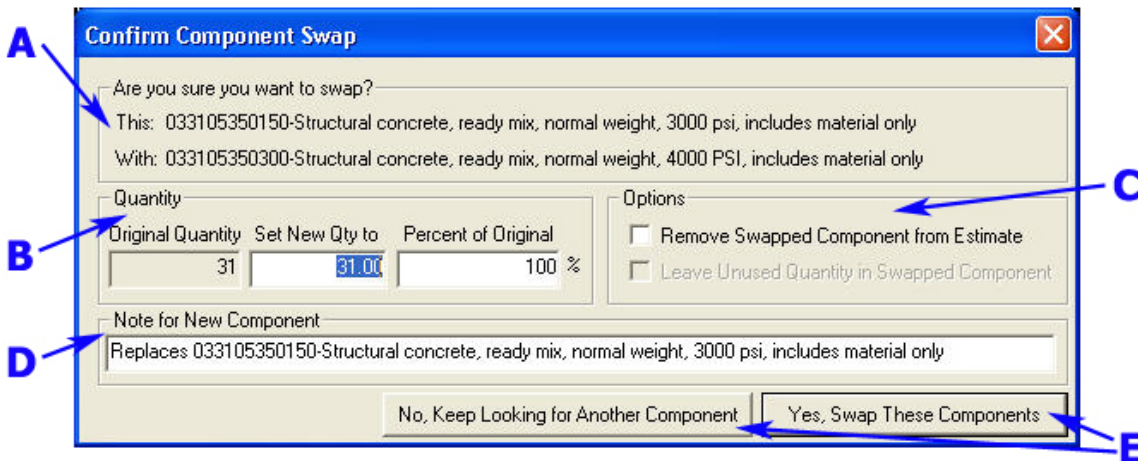
To use the Component Swapper after transferring data into the Estimator:

1. Click to highlight one of the data lines in the Estimator that you would like to swap.
2. Click the **Component Swapper** icon at the top of the screen and *CostWorks* will browse to that line in the data.

Note: *CostWorks* will look to see if the data line is accessible. If it is not accessible you will be prompted to open another data title.

3. *CostWorks* will navigate to the selected line in the Cost Data screen. Click to highlight the line item that you would like to use instead and then click on the **Component Swapper** icon at the top of the screen. *CostWorks* will display a "Confirm Component Swap" window.

This image shows the "Confirm Component Swap" window:



4. The "Confirm Component Swap" window is used to determine the quantity of the new item that you would like to use and how you would like to have it affect the line item in the Estimator screen. The different areas of the "Confirm Component Swap" window include:

- A. "Are you sure you want to swap?" (located at the top of the window)
 - "This" shows the original line that was selected in the Estimator.
 - "With" shows the alternate line that was selected in the Cost Data screen.

- B. "Quantity?" (located in the middle left of the window)
 - "Original Quantity" shows the quantity from the original line in the Estimator.
 - "Set New Qty to" can be used to enter the quantity you would like to use for the new line.
 - "Percent of Original" can be used to enter the percentage you would like to use for the new line. Note: The quantity and/or percentage need to be positive numbers.
- C. "Options" (located in the middle right of the window)
 - "Remove Swapped Component from Estimate" will remove the line that was selected in the Estimator.
 - "Leave Unused Quantity in Swapped Component" will keep the line that was selected in the Estimator, but change its quantity to the amount that is equal to the difference of its original quantity minus the new line's quantity.
- D. "Notes for New Component" (located towards the bottom of the window)
 - This field's default text indicates the line information that was selected in the Estimator. You may enter your own text into this field.
 - The contents of this field will be entered in the "Notes" field when the line is swapped into the Estimator.
- E. Buttons (located towards the bottom of the window)
 - Click "No, Keep Looking for Another Component" to close the "Confirm Component Swap" window and *CostWorks* will continue to display the Cost Data screen, so that another item may be selected.
 - Click "Yes, Swap These Components" to accept the changes and *CostWorks* will navigate back to the Estimator screen.

Run a Report

The next step is to run a report.

1. Click on the **Reports** menu and then click on **Run Reports**.
2. A list of available Report Types will appear. Choose which existing Report template to use to create the estimate and the report will be created.

Note: Information on creating a custom template is in the "Advanced Functions" area of *Chapter 6: Estimator – More Functions*.

Print the Estimate

There are three ways of printing an estimate:

1. Click on the **Print** icon in the Icon Bar.
2. From the Estimate Window (before running a report), click the **File** menu and then click **Print**. This will print out the line items as you see them in the estimate window.
3. From the "Estimate Report" window (after running a report), click on the **File** menu and click **Print**. This will print the report you have just run. You can also use the Preview button to see a print preview.

Export the Estimate

Exporting allows you to send the data out to the spreadsheet software program of your choice. There are two methods for exporting an estimate:

1. From the Estimate Window, before running a report, click on File in the menu bar and choose Export.
2. From the Estimate Report screen, after running a report, click on File in the menu bar and choose Export.

The name of a file consists of the name specified plus one of five file extensions:

- Using a ".fms" extension will create a file that can be imported into FIMS.
- Using a ".cas" extension will create a file that can be imported into CAIS
- Using a ".xls" extension will create a LifeCycle Cost file that can be read by Microsoft Excel™.
- Using a ".wks" extension will create a file that can be read by a variety of spreadsheet programs.
- Using a ".txt" extension will create a tab delimited ASCII / Text file.

Save the Estimate:

There are two methods for saving an estimate.

1. Click on the Save Icon in the Icon Bar.
2. From the Estimate window, click on the **File** menu and select **Save**.

See Also: Chapter 8, Exercise #7.

Chapter 6: Estimator – More Functions

Intermediate Functions

The Intermediate Functions of the *CostWorks* Estimator are:

- Edit Line Items.
- Create Custom Line Items.
- Subcontractor Extending.

To begin using these functions, it is necessary to understand the *Level 1: Basic Functions* section.

Edit Line Items

The Edit Cost Item window is where you are allowed to edit a line item. There are three methods of opening this window.

1. Double-click within a line item in the estimate window, before running any reports.
2. Click on **Edit** in the menu bar, and then choose **Cost Item**.
3. Click on the **Edit Cost Item** icon in the Icon Bar.

Edit Cost Item icon:



Any of these methods will display the “Edit Cost Item” window, where you can manually edit information in the input or output columns for that line item.

Create Custom Line Items:

There are two methods for creating a custom line item.

1. Click on **Edit** in the menu bar and select **New Cost Item**.
2. Click on the **Add a Line Item** icon in the Icon Bar.

Add a Line Item icon:



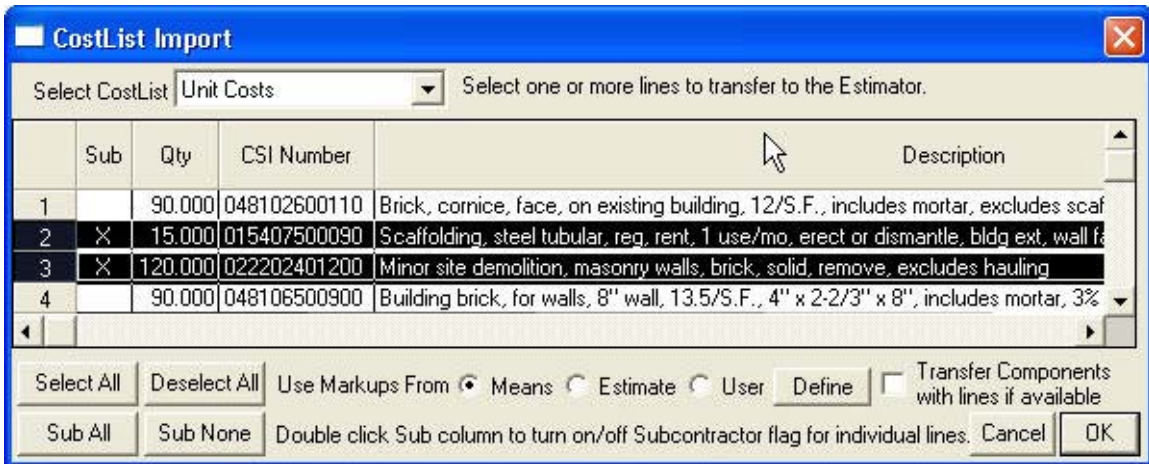
Upon using either method, the “Edit Cost Item” window will appear, but this time it will only have data that is defaulted for the estimate. Examples include: Material, Labor, and Equipment Markups. All other fields are left blank and can be filled in.

Subcontractor Extending

Subcontractor Extending is a very powerful tool. Upon transferring line items from a CostList to the Estimator, the user can choose to "Sub" out any individual line item or assembly. This is done by one of two methods.

1. Double-click on a cell within the **Sub** column on the "Transfer from CostList" window and an "X" will appear. The program will understand that the user wants to have an "Ext. Sub" notation added into the estimate window for the chosen line items.
2. Or to work with multiple lines, use the **Sub All** or **Sub None** buttons located at the bottom of the "Transfer from CostList" window.

This graphic below shows the middle lines of the CostList selected to be subcontracted:



This graphic shows the "Ext Sub" notation within a truncated estimate window:

| | Source | Line Number | Description | Crew | Daily Output | Labor Hours | Quantity | Unit |
|---|--------|----------------|---|--------|--------------|-------------|----------|--------|
| 1 | Unit | 015407500090 s | Scaffolding, steel tubular, bldg ext wall face, 1 use per mo, 1 | 3 Carp | 24.00 | 1.000 | 100.000 | C.S.F. |
| 2 | Unit | 015602500400 | Fencing, plywood, painted, 4" x 4" frame, 8' high | A4 | 110.00 | 0.218 | 100.000 | L.F. |
| 3 | Unit | 022206751200 s | Site demo, no hauling, masonry walls, blk or tile, brick, solid | B5 | 900.00 | 0.062 | 123.000 | C.F. |
| 4 | | | | | | | | |

Denotes Subcontracted Line Item (with a red arrow pointing to the 's' in line 1's Line Number)

You also have the ability to "Sub" a line after you have transferred it into the Estimator worksheet. Simply select the line from the worksheet and click the "Edit Cost Item Icon".



From the Edit screen change the "SubFactor" value to a "1" from a zero as shown below.

SubFactor

Advanced Functions

The Advanced Functions of the *CostWorks* Estimator are:

- Creating Custom Report Templates.
- Creating Custom Estimate Templates.

Note: To begin using these functions, it is necessary to understand the Introductory and Intermediate Functions.

Create Custom Report Templates:

The Report is the result of creating an estimate using the Estimator. The Report is what the customer, client, or management will see. The Estimator includes a number of formatted report templates to make this process easier. It also includes the ability for the user to create their own Custom Report Templates and save them for later use.

While there is an option for creating a blank estimate template, it is best to start with an existing template, and then alter it as needed.

To create a Custom Report Template from an existing Report template, click the **Reports** menu, then click **Define**, and then click **Reports** and the "Report Editor" window will appear. Use the "Select Report to Edit" dropdown list and select the report to edit.



While it is possible to create a blank report template (by clicking on the **New Report** button), it is often easier to work from an existing template. This is achieved by copying an existing template and altering it as need be.

Clicking on the **Copy Report** button will open a dialog box requesting a name for the new report template. Type the name for the new template and click the **OK** button. The "Report Editor" window will refresh to show the name of the new report.

We can now look at the ways changes can be made to customize this report template. The "Report Editor" window is used to choose what data to display in the report.

These choices include:

- Report Header
- Columns
- Markups

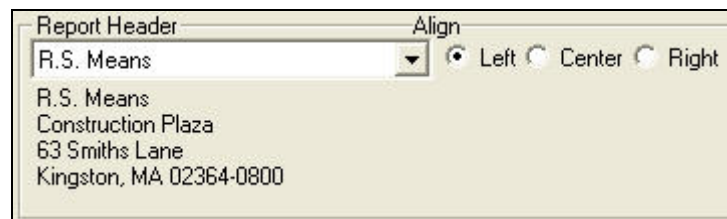
Report Header

The content and style of the text displayed within the Report Header can be changed. To do this, a custom header must first be created and then it can be assigned for use in a report.

To create custom headings:

1. Close the "Report Editor" window.
2. From the main Estimator window, click on the **Reports** menu and then choose **Define, Headers**. The "Report Header Editor" screen will appear.
3. Copy one of the existing headers by clicking on the **Copy Header** button or create a new header by clicking on the **New Header** button.
4. Enter a name for the new or copied header and use the five boxes provided to enter information about your company.
5. Click the **OK** button to close the "Report Header Editor" screen.
6. Click on the **Reports** menu and then click on **Define, Reports** and the Report Editor will appear. Use the "Select Report to Edit" dropdown list to select your custom report.

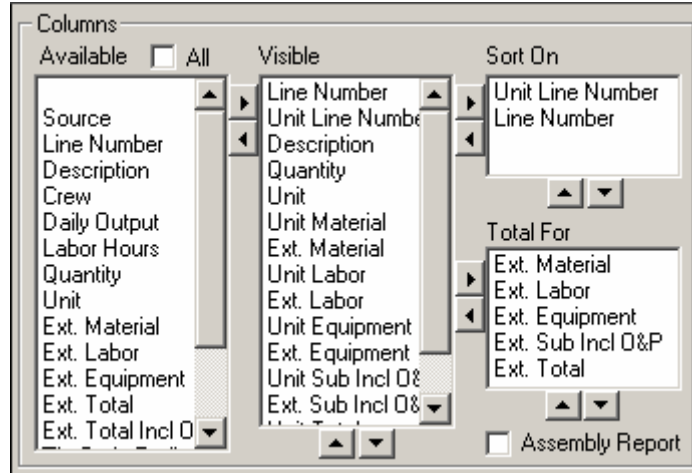
After creating a new header, it will appear in the "Report Header" dropdown list on the "Report Editor" window. Select the new header and the new information will be displayed instead of the RSMMeans information.



Columns

The Columns section is used to choose:

- The fields which will be placed in the report.
- The order those fields will be placed in.
- What field the report will be sorted on.
- The fields which will be totaled.



The choices are made using two editing features. First, the user will determine which fields are to be included by moving them from the **Available** or left side, to the **Visible**, or right side using the horizontal arrow keys. The user will then use the vertical arrow keys to determine the order of the **Visible** fields. These images show the arrow keys that are displayed on the screen:



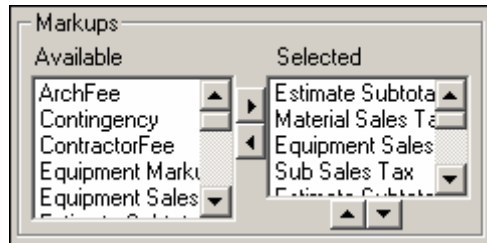
Horizontal

Vertical

Changes made to the **Sort On** and **Totals For** boxes are made in the same manner. Multi-selecting fields using the Shift and/or Ctrl keys is also an option.

Markups

The Markups section allows the user to choose which markups are applied and in what order. Changes made here are accomplished with the vertical and horizontal arrow keys.



Create Custom Estimate Templates

Along with the ability to create Custom Report Templates, the *CostWorks* Estimator also gives the user the ability to create Custom Estimate Templates. Creating Custom Estimate Templates gives the user the ability to accomplish the following:

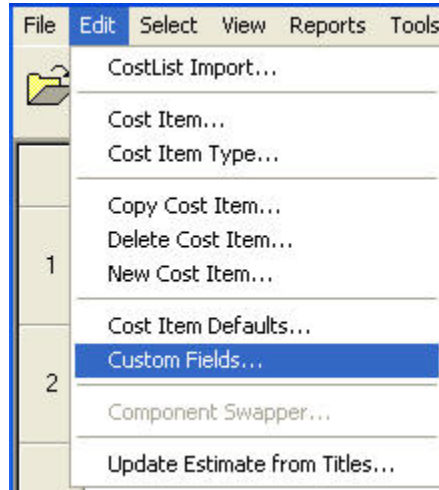
- Change the layout of the Estimate Window.
- Incorporate Line Items into the Template.
- Work with user defined Markups.

Changing the Layout of the Estimate Window

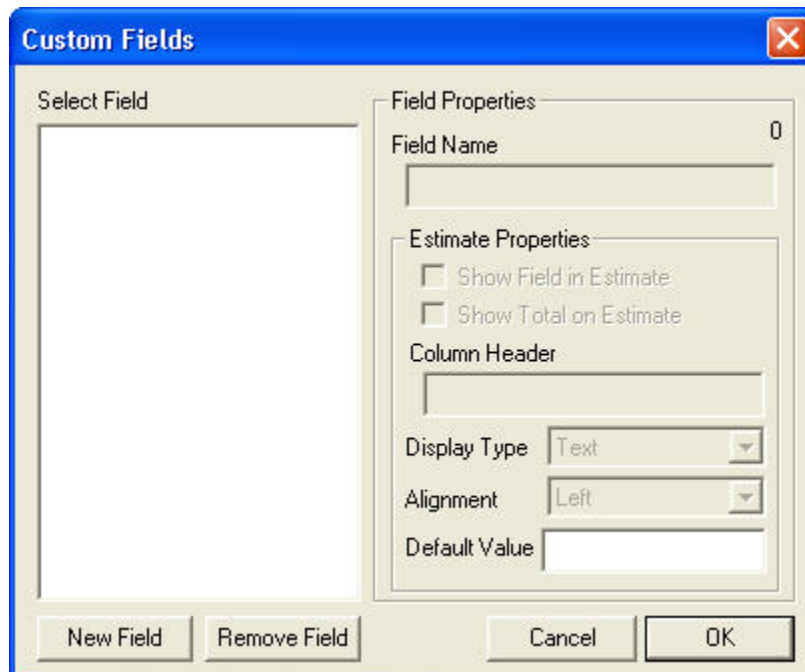
As discussed in *Level 1: Basic Functions*, a new estimate is created by clicking on the **File** menu, clicking on **New**, and then choosing one of the existing templates.

Examine all of the existing templates before attempting to make changes. Open the template that is closest to what is needed and then make the necessary changes. A variety of changes can be made. One of the choices is to create a Custom Field. This is done by going to the **Edit** menu and selecting **Custom Fields**.

This image shows the Edit menu with the Custom Fields option selected:



This image shows how the "Custom Fields" window will appear:



Custom fields can be created for a new template and properties can be set for new fields.

From the Estimator's **View** menu, choosing **Column Positions** will open the *Column Field Positions* window. The *Column Field Positions* window displays a list showing the order in which the data columns are displayed and can be used to rearrange the columns as need be.

Incorporate Line Items into the Template

Creating custom estimate templates will also allow the user to add line items into a template for later use. This is very useful if the same line items are frequently used in various estimates.

This is accomplished by selecting an existing template, then transferring the commonly used lines from a CostList into the Estimator.

From the Estimator's **File** menu, choose **Save As** and save the file with a name to be used for the new template. Then click on the **File** menu and choose **Template**.

A **Note** dialog box will be displayed, asking:

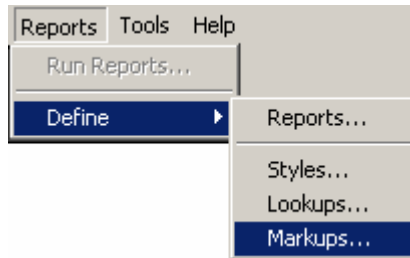
"Are you sure you want to use this estimate as a template?"

- Clicking the **Yes** button will save the file as a Template for future use.
- Clicking the **No** or **Cancel** button will exit the dialog box.

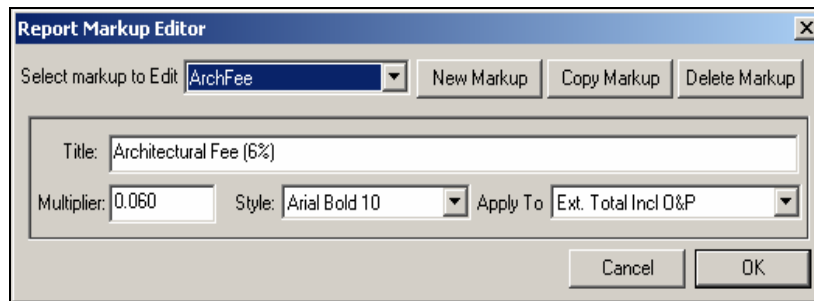
Click on the **Yes** button. Next, click on the **File** menu and choose **New**. The new template will appear as a choice in the list that is displayed.

Report Markups

The *CostWorks* Estimator allows the user to change the Markups for any given Estimate template. Choosing the **Reports** option in the menu bar, and then selecting **Define, Markups** accomplishes this.



The **Report Markup Editor** window will appear.



The Report Markup Editor window will allow the user to accomplish the following:

- Create, Copy, and Delete Markups.
- Edit the Style of the Markups as shown on the Report.
- Change where the Markup is applied.



CAUTION:

If adjustments are made to an existing Markup, then the adjustments will globally affect all reports that use that Markup. It is often more advisable to create a New Markup. When the New Markup is created, the Report Editor can be used to assign the New Markup into the desired report so that it will be displayed.

***See Also:* Chapter 8, Exercise #8.**

Chapter 7: Sustainment Calculator

Overview

Sustainment is a major element in a good maintenance management program. It identifies the maintenance and repair activities necessary to keep the inventory of facilities in good working order. This includes regularly scheduled maintenance as well as anticipated major repairs or replacement of components that occur periodically over the expected service life of facilities.

This chapter discusses estimating a sustainment cost using a calculation tool that uses the CostWorks assemblies that have been mapped to the RS Means Facilities Maintenance & Repair (M&R) Cost Data tables. The Sustainment Calculator is based on the CostWorks square foot models. The Calculator includes a cost details spreadsheet, a summary table that calculates a Sustainment cost and ratio, and a time cycle chart.

The Sustainment Calculator uses the asset's FIMS RPV model assemblies adjusted for the location of the asset to estimate the sustainment cost. The Calculator can be customized for the assembly's quantity and capacity, design life, maintenance and repair (M&R) and preventive maintenance (PM) costs, repair frequency, time cycle length, escalation rates and site cost conditions.

The DOE Sustainment software covers all buildings and other structures and facilities (OSF) plant models. Future software plans call for the development of new preventive maintenance, M&R and replacement costs for DOE models that have unique assemblies.

Calculator Development

The Sustainment Calculator can be developed from two sources:

- Creating a cost model.
- An existing RPV based CostWorks Sq.Ft. model in the Estimator or the CostList if the gross square footage equals the building under study.

Creating the Sustainment Calculator

The Calculator model created in the CostWorks Settings screen is based on an asset's RPV model in FIMS. The model development follows steps discussed in the CostWorks Workbook Chapters 2-5. Workbook Chapter 8, Exercise 1 is a step-by-step method to create a new model. The Calculator will use location factors in CostWorks to adjust for local cost conditions. The Sustainment Calculator gross square footage (GSF) must match the asset gross square footage in FIMS. The GSF impacts the quantity of the model assemblies. The quantity impacts all M&R, PM and replacement costs. The Calculator model can be saved in Estimator or in the CostList using the property identification in the file name.

Means CostWorks DOE Seminar Workbook

The screenshot shows the CostWorks 2007 DOE Version interface. The main window displays a 'Preliminary Cost Report' for a 'Seminar Machine Shop' project. The report includes project details such as Site Number (558), Area Number (xxx), Property ID (ModelTest), and Model Type (DOE N13 Machine Shop, Metal Siding / Steel Frame). It also lists stories, height, floor area, and location. A table of 'Exterior Wall Type & Structural System' is visible, showing options like Metal Siding, Tiltup Concrete Panel, and Concrete Block. A 'Common Additives' section lists various systems like solar, evaporative cooling, and fire pumps. An 'Export CostList File' dialog box is open, showing the file name 'Seminar Machine Shop MD.xls' and a list of file types, with 'Lifecycle Cost File (*.xls)' selected.

(The images above illustrate a progression of screen shots of the Machine Shop model created in Workbook Chapter 8, Exercise 1 and the export of the model to Excel.)

After selecting and opening a Preliminary Cost Report CostList file, click on File in the Menu bar of the CostList window and select Export. From this box select Lifecycle Cost File (*.xls) and click Save.

The screenshot shows the 'DOE Report Parameters - Sustainability' dialog box. It contains the following fields and values:

| | | | |
|--------------|--|-------------|--------------|
| Site Number | 558 | Year Built | 1969 |
| Area Number | xxx | Time Period | 10 |
| Property ID | ModelTest | Cost | \$ 3,681,250 |
| Model Name | DOE N13 Machine Shop, Metal Siding / Steel Frame | | |
| Model Number | N13 | | |

Buttons for 'OK' and 'Cancel' are located at the bottom right of the dialog.

A window similar to the one shown above appears. The FIMS Year Built field and the time cycle or period you want to estimate the sustainment costs must be entered. The FIMS Site, Area and Property ID are populated when the CostWorks model is developed. The Cost field represents the geographic adjusted base costs of the model. After clicking OK on this window, the CostList, or Preliminary Cost Report, will be exported out to Excel, and a message box will appear that states "Excel file has been created. Would you like to open this file now?" Click "Yes" to open the Excel file.

Existing Model

Any existing DOE model can be selected from the CostWorks Settings screen by accessing the city or zip code location, selecting the existing model/project name and clicking on Estimator or Square Foot Models on the CostWorks Select menu. On the Estimator screen a list of models that have been saved in Estimator should appear. Select the model that applies to this asset. The GSF of the model must match the size of the asset. In addition, model structural and building parameters and component capacities should match the existing building as much as possible. Follow the instructions for "Creating a New Model" to complete and export the Calculator to Excel.

Sustainment Calculator Operation & Report

This report is generated on an individual asset basis. Depending upon the cycle length this report can become quite lengthy.

You are now ready to open the Sustainment Calculator. The Calculator consists of three sheets. Sheet 1 is the Cost Details sheet where most of the customization takes place and the various costs are entered by year. Sheet 2 is a summary table of the sustainment cost elements by year. This data is linked to the Cost Details sheet. These costs are tabulated by year at current year cost and indexed costs. Sheet 3 is a graphical representation of the sustainment costs over the number of cycle years.

Cost Details - Sheet 1

This report is the source of all sustainment cost information. The first five columns are taken from the CostWorks building model. These are identified in the image below by the numbers 1 through 5. Again, the "Replacement Cost" for each assembly is the geographic base cost.

| Quantity | Unit | Line Number | Description | Replacement Cost | Freq. | Last R&R | M&R Task | M&R Task Cost | PM Task | Annual Cost |
|----------|------|--------------|---|------------------|-------|----------|----------|---------------|---------|-------------|
| 1200.00 | L.F. | A1010103100 | Strip footing, concrete, reinforced, load | \$ 46,260 | | | | | | |
| 103.95 | Ea. | A10102103350 | Spread footings, 3000 PSI concrete, load | \$ 55,821 | | | | | | |
| 1066.88 | L.F. | A10103101100 | Foundation underdrain, outside only, PVC | \$ 13,101 | | | | | | |
| 960.00 | L.F. | A10103205000 | Foundation damp proofing, asphalt coated | \$ 7,411 | | | | | | |

The asset model assemblies have been mapped to the RS Means Facilities Maintenance & Repair cost book. The mapping results in M&R and PM task numbers; and the M&R, PM and replacement costs of the building assemblies. The costs are incurred annually or at scheduled maintenance intervals or and when the life cycle of the component is reached. The time period is referenced by calendar year and year count.

The user can customize the following fields:

Time Period

This is identified in the image above by the number **6**. The default period is ten years to facilitate NNSA's Ten Year Site Plan reporting demands. The maximum time period for estimating sustainment costs is one hundred (100) years. For the first year of the cycle, the sustainment cost equals the FIMS annual required maintenance cost.

Replacement Plant Value

This is identified in the image above by the number **7**. This cost is taken from FIMS and **MUST** be entered. It is used to estimate the sustainment ratios. These ratios are an indicator to determine if adequate maintenance is being performed to "sustain" the building.

Frequency

This is identified in the image above by the number **8**. This is a time interval that indicates when repairs and replacement tasks should occur for an assembly. Users can customize this interval based on their own historical experience. The default values are based on RS Means FM&R information.

Last R&R

This is identified in the image above by the number **9**. This is the last year the last repair or replacement took place. The initial or default year is set to the year built that was entered in the dropdown box. This is automatically set when the model is exported. This date is not visible on the sheet. M&R tasks schedules are based on the Last R&R value. When a replacement is made in the current year, the M&R costs must also have the same Last R&R value. This is required to establish the new schedule for the M&R task.

M&R Task Cost

This is identified in the image above by the number **10**. This is the cost of the maintenance tasks based on the RS Means Facilities Maintenance and Repair Cost Data and the quantity specified in the Quantity column. This cost can be customized based on a site's historical experience. The M&R Task number is a reference number in the RS Means FM&R Cost Data that lists the common maintenance tasks performed under this reference. This reference information is available in the CostWorks Open Titles listing of cost books on the Settings screen.

Preventive Maintenance Cost

This is identified in the image above by the number **11**. These planned actions undertaken to retain a piece of equipment at a specified level of performance by providing repetitive scheduled tasks which prolong system operation and useful life; i.e., inspection, cleaning, lubrication and part replacement. The default unit costs are from the RS Means Facilities Maintenance and Repair Cost Data. These costs can be customized to agree with site historical experience. The sustainment model assumes they occur on an annual basis. The Preventive Task number is a reference number in the RS Means FM&R Cost Data that lists the common PM tasks performed under this reference. This reference information is available in the CostWorks Open Titles listing of cost books on the Settings screen.

Summary Cost Table - Sheet 2

This table estimates the sustainment cost and ratio for the number of years covered by the time period. The sustainment cost equals the sum of the M&R, PM and Replacement costs. The sustainment ratio is the sustainment cost divided by the replacement plant value. The table has current year cost and indexed costs. Inflaters for labor and replacement (material) are based on the DOE Chief Financial Officer recommendations. There are three factors used to estimate the site maintenance and repair, preventive and replacement costs, and are identified in the image

below by the numbers **1**, **2** and **3** respectively. These factors have a default value of 1.000. They can be provided from the site planning, estimating and maintenance personal. The factors are dependent on whether in-house or contractors complete the various tasks; contract administration and inspection services are needed; escorts are required; the complexity of the project, and whether A&E services and environmental specialists are required.

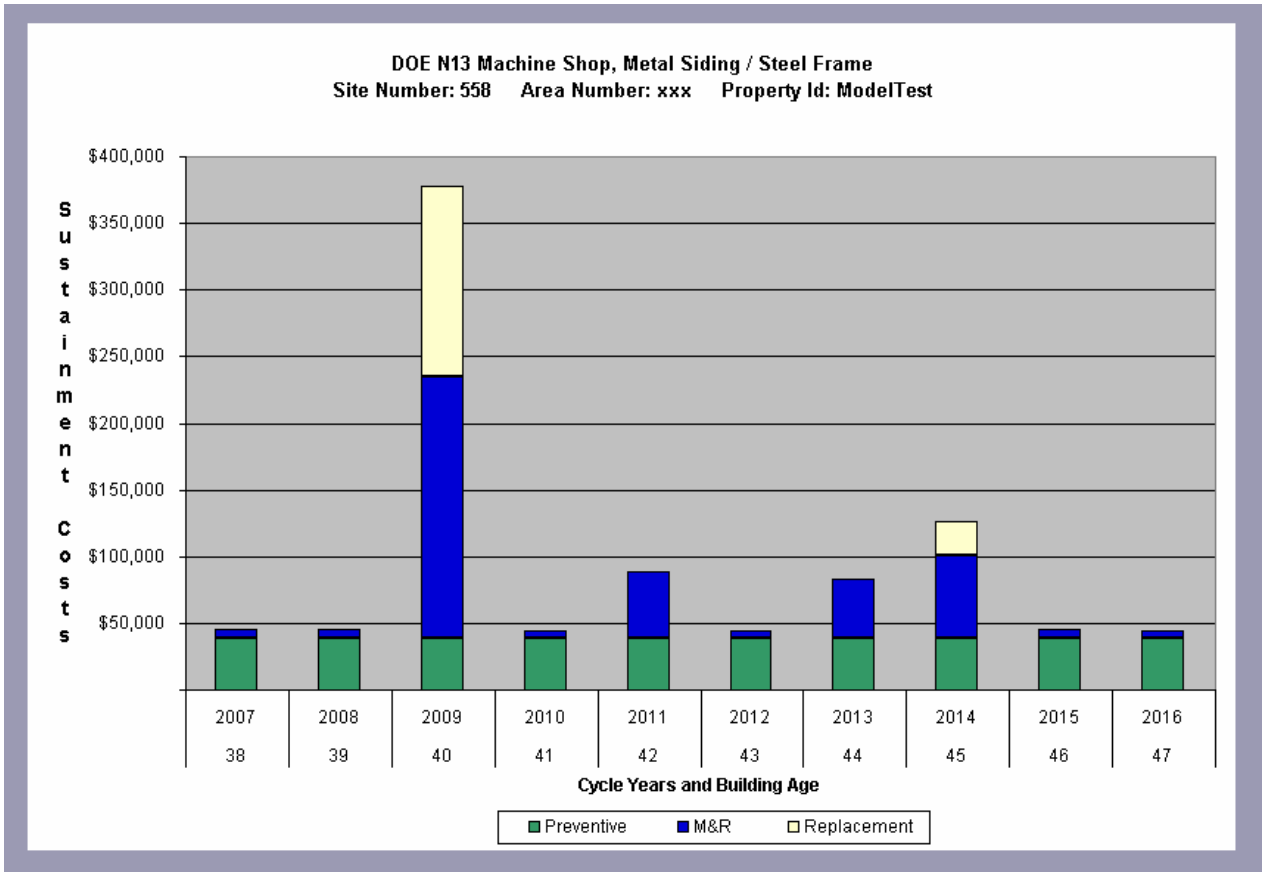
| | A | C | D | E | F | G | H | I |
|----|---|--------------------------------------|---|-----------------------------------|--------------------|---------------------------------------|--------------------------|--------------|
| 1 | | Sustainment Model - N13 | | | | | | |
| 2 | | Source: | CostWorks 2007 DOE Version 3.0 - Seminar Machine Shop | | | | | |
| 3 | | Site Number: | 558 | Area Number: | xxx | Property Id: | ModelTest | |
| 4 | | Model: | DOE N13 Machine Shop, Metal Siding / Steel Frame | | | | | |
| 5 | | Year Built: | 1969 | Stories: | 1 | | | |
| 6 | | Start Year: | 2007 | Story Height: | 14 | | | |
| 7 | | RPV: | \$1 | GSF: | 21,000 | | | |
| 8 | | Labor Inflation | 3.500% | Replacement Inflation | 5.000% | | | |
| 9 | | Preventive Sustainment Factor | 1.000 | M&R Sustainment Factor | 1.000 | Replacement Sustainment Factor | 1.000 | |
| 10 | | | | | | | | |
| 11 | | CURRENT YEAR COSTS | | | | | | |
| 12 | | Year | Maintenance & Replacement Costs | | | Sustainment Costs | Sustainment Ratio | Preve |
| 13 | | | Preventive | M&R | Replacement | | | |
| 14 | | | | 2007 | Dollars | | | |
| 15 | 1 | 2007 | \$ 39,125 | \$ 5,889 | | \$ 45,014 | 4501421.594% | \$ |
| 16 | 2 | 2008 | \$ 39,125 | \$ 5,775 | | \$ 44,900 | 4489991.294% | \$ |
| 17 | 3 | 2009 | \$ 39,125 | \$ 195,726 | \$ 148,240 | \$ 378,091 | 37809125.486% | \$ |
| 18 | 4 | 2010 | \$ 39,125 | \$ 5,703 | | \$ 44,829 | 4482851.294% | \$ |

1
2
3

Sustainment Cost Chart - Sheet 3

This chart provides a good visualization of the peak sustainment costs and when they are predicted to occur. The chart is color coded to illustrate the three cost variables that make up the sustainment cost. The year built is reflected in the age of the facility on the X-axis along with the cycle year. The age of the asset is a good indicator when to anticipate large sustainment costs.

The image on the next page shows an example of the Sustainment Cost Chart. The X-axis of this chart plots the age of the asset, and the year, from left to right. The Y-axis signifies the costs. One can see that the green bars, which signify the predicted Preventive costs, are fairly constant over time. The blue bars signify the predicted Maintenance and Repair costs, and are only prominent in 4 of the 10 years shown in this example. The light colored bars represent Replacement costs, and are only indicated in 2 of the 10 years displayed in this example. While Preventive costs are ongoing and fairly constant from year to year, Maintenance and Repair costs as well as Replacement costs are predicted based on the age of the asset.



Chapter 8: Exercises

Overview

The exercises in this chapter are designed to increase the user's level of comfort and confidence with the program. In class, the exercises covered will correlate to the products the attendee's company or organization has purchased. Each exercise will have its own set of parameters. The user will be directed as to which title, screen, location, and wage rate to use.

Exercise #1: "Seminar Machine Shop" – Square Foot Models Project

Exercise #2: "Foundation Wall" - Unit Costs Project

Exercise #3: "Cornice Repair" - Unit Costs Project

Exercise #4: "Garage" - Assembly Costs Project

Exercise #5: "Preliminary Hospital Costs" - Project Costs Project

Exercise #6: "Office Building" - Square Foot Models Project

Exercise #7: "New House" - Residential Models Project

Exercise #8: "Office Repairs" - FM&R Project

Exercise #9: "House Repairs" – Resi R&R Project

Exercise #10: *CostWorks* Estimator – Part 1

Exercise #11: *CostWorks* Estimator – Part 2

Exercise #12: "Fencing" – Assembly Costs Project

Exercise #13: "Tanks, Gravity" – Assembly & Unit Costs Project

Exercise #1: Square Foot Models Project

"Seminar Machine Shop"

1. Create a New Project.
2. Name the Project "Seminar Machine Shop"
3. Set the parameters for the project as follows:
 - Open Title: Square Foot Costs
 - Location Factor: National Average Costs
 - Wage Rate: Union
4. Click on the **Square Foot Models** tab.
5. Create a Preliminary Cost Report (CostList) for the following building:
 - Service Buildings, DOE N13 Machine Shop
 - Metal Siding / Steel Frame
 - 21,000 Square Feet
 - With DOE Information of:
 - ❖ Site Number: 558
 - ❖ Area Number: xxx
 - ❖ Property ID: ModelTest
6. Enter quantity 1 of this Common Additive:
 - Fire Alarm Control Panel, 8 Zone
7. Click the **To List** button and the "Parameters" window will be displayed. Enter an Additional Markup for **Seismic 20%**

Your Preliminary Cost Report (CostList) should resemble the example on the next page.

| Preliminary Cost Report | | | | |
|---|---------------------------------|---------------------------|---------------------|-------------------|
| Project Name: Seminar Machine Shop | | 02/26/2007 | | |
| Site Number: 558 Area Number: xxx Property ID: ModelTest | | | | |
| Model Type: DOE N13 Machine Shop, Metal Siding / Steel Frame | | | | |
| Stories (Ea.): 1 | Location: | US National Average Costs | | |
| Story Height (L.F.): 14 | Data Release: | 2007 DOE | | |
| Floor Area (S.F.): 21000 | Wage Rate: | Union | | |
| Basement: Not Applicable | | | | |
| Costs are derived from a building model with basic components. Scope differences and local market conditions can cause costs to vary significantly. | | | | |
| | | \$Cost/ Per S.F. | \$ Total Cost | % Of Sub-Total |
| A Substructure | | | | 15.4% |
| A1010 | Standard Foundations | 5.83 | 122,500.00 | |
| A1020 | Special Foundations | 4.76 | 100,000.00 | |
| A1030 | Slab on Grade | 12.26 | 257,500.00 | |
| A2010 | Basement Excavation | 0.09 | 1,850.00 | |
| A2020 | Basement Walls | 4.02 | 84,500.00 | |
| B Shell | | | | 3.1% |
| B1010 | Floor Construction | 0.31 | 6,475.00 | |
| B2020 | Exterior Windows | 3.57 | 75,000.00 | |
| B2030 | Exterior Doors | 0.64 | 13,400.00 | |
| B3010 | Roof Coverings | 0.49 | 10,200.00 | |
| B3020 | Roof Openings | 0.43 | 9,075.00 | |
| C Interiors | | | | 5.6% |
| C1010 | Partitions | 2.60 | 54,500.00 | |
| C1020 | Interior Doors | 2.40 | 50,500.00 | |
| C1030 | Fittings | 1.40 | 29,300.00 | |
| C3010 | Wall Finishes | 2.60 | 54,500.00 | |
| C3020 | Floor Finishes | 0.31 | 6,525.00 | |
| C3030 | Ceiling Finishes | 0.47 | 9,900.00 | |
| D Services | | | | 60.1% |
| D2010 | Plumbing Fixtures | 2.45 | 51,500.00 | |
| D2020 | Domestic Water Distribution | 0.76 | 16,000.00 | |
| D2090 | Other Plumbing Systems | 23.60 | 495,500.00 | |
| D3010 | Energy Supply | 3.26 | 68,500.00 | |
| D3020 | Heat Generating Systems | 13.48 | 283,000.00 | |
| D3030 | Cooling Generating Systems | 10.00 | 210,000.00 | |
| D3040 | Distribution Systems | 3.12 | 65,500.00 | |
| D4010 | Sprinklers | 4.14 | 87,000.00 | |
| D5010 | Electrical Service/Distribution | 9.00 | 189,000.00 | |
| D5020 | Lighting and Branch Wiring | 16.79 | 352,500.00 | |
| D5030 | Communications and Security | 0.71 | 15,000.00 | |
| D5090 | Other Electrical Systems | 18.00 | 378,000.00 | |
| E Equipment & Furnishings | | | | 1.1% |
| E1030 | Vehicular Equipment | 0.83 | 17,500.00 | |
| E1090 | Other Equipment | 1.09 | 22,900.00 | |
| F Special Construction | | | | 14.6% |
| F1010 | Special Structures | 18.10 | 380,000.00 | |
| F1030 | Special Construction Systems | 0.86 | 18,000.00 | |
| F1040 | Special Facilities | 6.62 | 139,000.00 | |
| G Building Sitework | | | | 0.2% |
| G1030 | Site Earthwork | 0.32 | 6,625.00 | |
| Sub-Total | | 175.30 | 3,681,250.00 | 100% |
| Seismic 20% | | 20% | 35.07 | 736,500.00 |
| TOTAL BUILDING COST | | 210.37 | 4,417,750.00 | |

Exercise #2: "Garage" Project

1. Create a New Project.
2. Name the Project "**Garage.**"
3. Set the parameters for the project as follows:
 - Open Title: Assemblies Cost Data, Building Construction Cost Data
 - Location Factor: Memphis, TN (380)
 - Wage Rate: Union
4. Click on the **Assembly Costs** tab.
5. Using the "**Search Index**" (binoculars icon), create a CostList consisting of these assemblies:

| Assembly | UOM | Quantity |
|---|------------|-----------------|
| Strip footing, concrete, reinforced, load 5.1 KLF, soil bearing capacity 3 KSF, 12" deep x 24" wide | L.F. | 120.00 |
| Concrete block (CMU) wall, regular weight, hollow, 4 x 8 x 16, 2000 PSI, perlite core fill | S.F. | 1200.00 |
| Slab on grade, 4" thick, light industrial, non reinforced | S.F. | 800.00 |
| Foundation wall, CIP, 4' wall height, direct chute, .099 CY/LF, 4.8 PLF, 8" thick | L.F. | 120.00 |
| Roof, steel joists , 1.5" 22 ga metal deck, on bearing walls, 20' bay, 13.5" deep, 20 PSF superimposed load, 40 PSF total load | S.F. | 800.00 |
| Roofing, single ply membrane , EPDM, 45mils, fully adhered | S.F. | 800.00 |

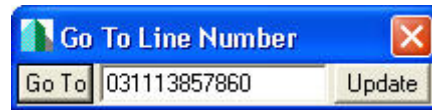
6. Your CostList totals should be:

| | <u>Mat.</u> | <u>Inst.</u> | <u>Total</u> |
|---------------|--------------------|---------------------|---------------------|
| Totals | \$9,860.00 | \$13,094.00 | \$22,954.00 |

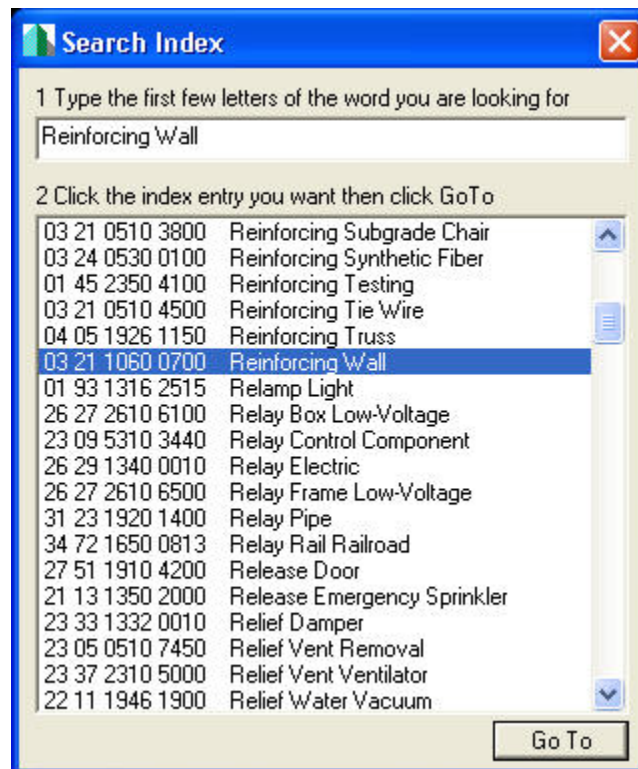
7. Save this CostList as "**Garage.adl.**"
8. Export this CostList to an Excel™ Spreadsheet.
9. Save the spreadsheet as "**Garage.xls.**"

Exercise #3: "Foundation Wall" Project

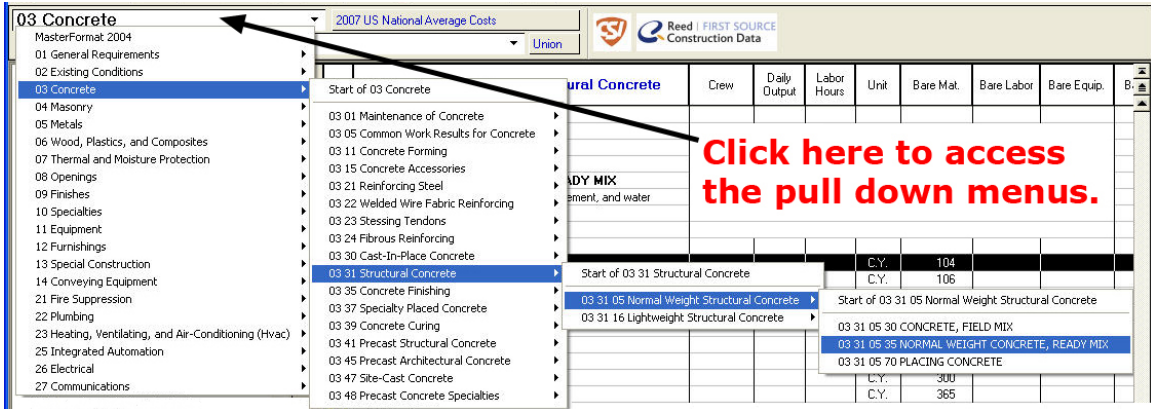
1. Create a New Project.
2. Name the Project "**Foundation Wall.**"
3. Set the parameters for the project as follows:
 - Open Title: Building Construction Cost Data
 - Location Factor: US National Average Costs
 - Wage Rate: Union
 - MasterFormat™: 2004
4. Click on the **Unit Cost** tab located in the lower left corner of the *CostWorks* window.
5. Click the **Go To Line Number** icon (man walking icon), type in "031113857860."



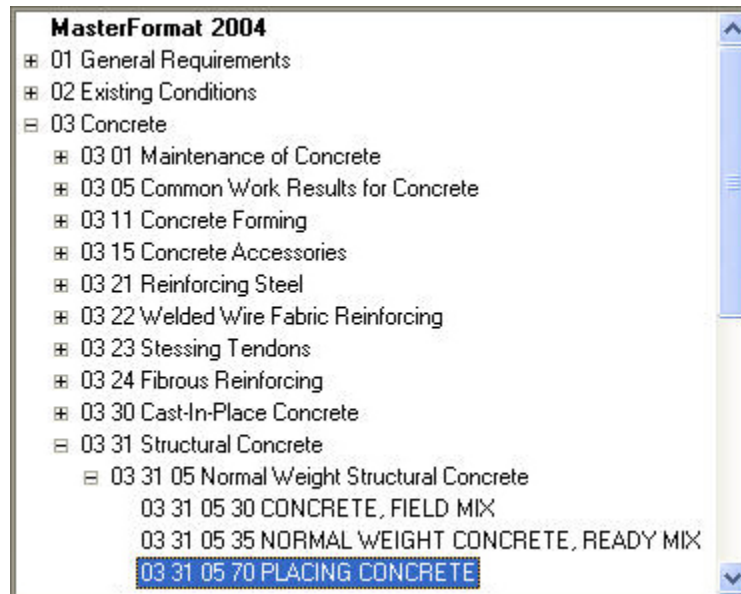
6. Click the **Go To** button and then close the "Go to Line Number" box.
7. In the CostCalc, change the quantity to 1616 SFCA and then click the **To List** button. Confirm the line is in the CostList and then close the CostList.
8. Click the **Search Index** icon (Binoculars) and type in "reinforcing wall."
9. Select the line "03 21 1060 0700 Reinforcing Wall."



10. Click the **Go To** button and then close the "Search Index" window.
11. In the CostCalc, change the quantity to 0.42 Tons and then click the **To List** button. Confirm the line is in the CostList and then close the CostList.
12. Using the dropdown list, navigate to **Division 3 Concrete, 03 31 Structural Concrete, 03 31 05 Normal Weight Structural Concrete, 03 31 05 35 Normal Weight Concrete, Ready Mix.**



13. Scroll down to line item **03 31 05 35 0150** and select this line.
14. In the CostCalc, change the quantity to 31 C.Y. and then click the **To List** button. Confirm the line is in the CostList and then close the CostList.
15. Using the Search Tree, click the plus sign (+) next to **3 Concrete**. Then, click the plus (+) next to **03 31 Structural Concrete**. Next, click the plus (+) next to **03 31 05 Normal Weight Structural Concrete**. Finally double-click **03 31 05 70 Placing Concrete**. The graphic below displays the Search Tree with this navigation completed.



16. Scroll down to line item number **03 31 05 70 5050** and select this line.
17. In the CostCalc, change the quantity to 31 C.Y. and then click the **To List** button. Confirm the line is in the CostList and then close the CostList.

18. Now locate the last line item of this estimate. Click the **Search Index** icon (Binoculars) and type in "concrete wall finish." Select the line **03 35 2960 0020 Concrete Wall Finish** and click the **Go To** button. Close the "Search" window.
19. In the data block, scroll down to line item number **03 35 2960 0050** and select it.
20. In the CostCalc, change the quantity to 1616 S.F. and then click the **To List** button.
21. The totals of your CostList should be:

| | <u>Bare Mat</u> | <u>Bare Labor</u> | <u>Bare Equip</u> | <u>Bare Total</u> | <u>Total Incl. O&P</u> |
|---------------|-----------------|-------------------|-------------------|-------------------|----------------------------|
| Totals | \$4696.04 | \$3,850.14 | \$13.33 | \$8,559.51 | \$11,096.96 |

Exercise #4: "Cornice Repair" Project

1. Create a New Project.
2. Name the Project "**Cornice Repair.**"
3. Set the parameters for the project as follows:
 - Open Title: Repair and Remodeling Cost Data
 - Location Factor: Boston, MA (021)
 - Wage Rate: R & R (this will happen automatically)
 - MasterFormat™: 2004
4. Click on the **Unit Costs** tab.
5. Using "**Search Index**" (binoculars icon), create a CostList consisting of these 6 lines:

| Description: | UOM | Quantity |
|--|--------------|-----------------|
| Brick, cornice, face, on existing building, 12/S.F., includes mortar, excludes scaffolding, minimum Hint: Cornice | S.F. Face | 90.00 |
| Scaffolding, steel tubular, regular, labor only to erect & dismantle, bldg ext, wall face, 6'-4" x 5' frames, 1 to 5 stories, excl. planks Hint: Scaffolding (Tubular) | C.S.F. | 15.00 |
| Minor site demolition, masonry walls, brick, solid, remove, excludes hauling Hint: Site | C.F. | 120.00 |
| Building brick, for walls, 8" wall, 13.5/S.F., 4" x 2-2/3" x 8", includes mortar, 3% brick waste and 25% mortar waste, excludes scaffolding, horizontal reinforcing, vertical reinforcing and grout Hint: Brick Wall (or Wall Brick) | S.F. | 90.00 |
| Temporary Fencing, plywood, painted, 4" x 4" frame, 8" high Hint: Fence (Temporary) | L.F. | 100.00 |
| Flexible Flashing, copper, mastic-backed 2 sides, 3 ounce Hint: Flashing | S.F. | 350.00 |

6. Your CostList totals should be:

| | <u>Bare Material</u> | <u>Bare Labor</u> | <u>Bare Equip.</u> | <u>Bare Total</u> | <u>Total Incl. O&P</u> |
|---------------|---------------------------------|------------------------------|-------------------------------|------------------------------|---------------------------------------|
| Totals | \$2,822.00 | \$7,660.00 | \$145.20 | \$10,627.20 | \$15,884.40 |

7. Save this CostList as "**Cornice Repair.udl.**"
8. Export this CostList to an Excel™ Spreadsheet.
9. Save the spreadsheet as "**Cornice Repair.xls.**"

Totals \$9,860.00 \$13,094.00 \$22,954.00

Exercise #5: "New House" Project

1. Create a New Project.
2. Name the Project "**New House.**"
3. Set the parameters for the project as follows:
 - Open Title: Square Foot Costs
 - Location Factor: National Average Costs
 - Wage Rate: Union
4. Click on the **Residential Models** tab.
5. Create a Preliminary Cost Report (CostList) for the following house model:
 - Model: Average 1-1/2 Story
 - Exterior Wall Type: Stucco on Wood Frame
 - Area: 1400 Square Feet
6. Enter the following Common Additives:
 - 1 Half Bath including plumbing, wall and floor finishes
 - 1 One-Car Detached Garage
 - 1 Fireplace & Chimney
 - Include a finished basement

Your Preliminary Cost Report (CostList) should resemble the example on the next page.

| Preliminary Cost Report | | | |
|---|---------------------|------------------------|-------------------|
| Project Name: New House | | | |
| Model Type: Average 1-1/2 Story, Stucco on Wood Frame | | | |
| Living Area (S.F.): 1400 | Location: | National Average Costs | |
| Perimeter (L.F.): 123 | Data Release: | 2007 | |
| Finished Basement: Included in costs but not living area | Wage Rate: | Resi | |
| Costs are derived from a building model with basic components. Scope differences and local market conditions can cause costs to vary significantly. | | | |
| | \$Cost/ Per S.F. | \$ Total Cost | % Of Sub-Total |
| 1 Site Work | | | 0.8% |
| 1.04 Footing Excavation | 0.93 | 1,300.00 | |
| 2 Foundation | | | 11.2% |
| 2.04 Footing | 1.18 | 1,650.00 | |
| 2.08 Block Wall | 9.57 | 13,400.00 | |
| 2.20 Floor Slab | 2.14 | 3,000.00 | |
| 3 Framing | | | 14.5% |
| 3.02 Floor Framing | 5.32 | 7,450.00 | |
| 3.08 Exterior Wall Framing | 2.68 | 3,750.00 | |
| 3.12 Gable End Roof Framing | 5.61 | 7,850.00 | |
| 3.48 Partition Framing | 2.95 | 4,125.00 | |
| 4 Exterior Walls | | | 12.6% |
| 4.02 Block Masonry | 5.63 | 7,875.00 | |
| 4.20 Insulation | 1.13 | 1,575.00 | |
| 4.28 Double Hung Window | 4.96 | 6,950.00 | |
| 4.52 Entrance Door | 1.11 | 1,550.00 | |
| 4.60 Storm Door & Window | 1.63 | 2,275.00 | |
| 5 Roofing | | | 1.8% |
| 5.04 Gable End Roofing | 2.09 | 2,925.00 | |
| 6 Interiors | | | 30.6% |
| 6.04 Drywall & Thinfoat Wall | 10.50 | 14,700.00 | |
| 6.08 Drywall & Thinfoat Ceiling | 2.09 | 2,925.00 | |
| 6.18 Suspended Ceiling | 2.11 | 2,950.00 | |
| 6.20 Interior Door | 3.66 | 5,125.00 | |
| 6.24 Closet Door | 3.45 | 4,825.00 | |
| 6.60 Carpet | 3.71 | 5,200.00 | |
| 6.64 Flooring | 6.59 | 9,225.00 | |
| 6.90 Stairways | 2.96 | 4,150.00 | |
| 7 Specialties | | | 3.1% |
| 7.08 Kitchen | 2.20 | 3,075.00 | |
| 7.12 Appliances | 1.30 | 1,825.00 | |
| 8 Mechanical | | | 5.5% |
| 8.12 Three Fixture Bathroom | 2.34 | 3,275.00 | |
| 8.60 Gas Heating/Cooling | 3.91 | 5,475.00 | |
| 9 Electrical | | | 5.3% |
| 9.10 Electric Service | 1.27 | 1,775.00 | |
| 9.20 Electric Heating | 1.75 | 2,450.00 | |
| 9.30 Wiring Device | 2.41 | 3,375.00 | |
| 9.40 Light Fixture | 0.61 | 855.00 | |
| 10 Overhead | | | 14.5% |
| 10.0 Contractor's overhead and profit and plans. | 16.64 | 23,300.00 | |
| Total less Mods, Adjs, Alts, & Upgrades | 114.41 | 160,180.00 | |
| Mods, Adjs, Alts, & Upgrades | 15.43 | 21,625.00 | |
| Total | 130.00 | 181,805.00 | |

Exercise #6: "Office Repairs" Project

1. Create a New Project.
2. Name the Project "**Office Repairs.**"
3. Set the parameters for the project as follows:
 - Open Title: Facility Maintenance & Repair Cost Data
 - Location Factor: Eugene, OR (974)
 - Wage Rate: FMR (This will happen automatically)
4. Click on the **Maintenance & Repair** tab.
5. Using the "Go To" and "Search Index" functions, create a CostList consisting of these lines:

| <u>Description</u> | <u>UOM</u> | <u>Quantity</u> |
|---|-------------------|------------------------|
| Minor asphalt shingle repair - (2% of roof area) shingles | S.F. | 6.00 |
| Replace wallpaper | S.Y. | 1.00 |
| Repair 5/8" drywall - (2% of walls) | S.F. | 6.00 |
| Refinish drywall | S.F. | 6.00 |
| Repair internal leaks drinking fountain | Ea. | 1.00 |

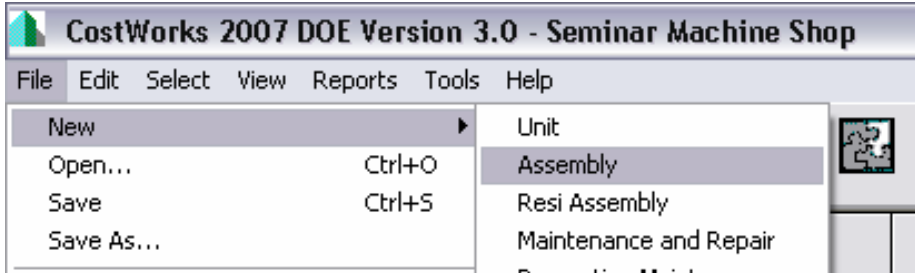
6. Your CostList totals should be:

| | <u>Bare Mat.</u> | <u>Bare Labor</u> | <u>Bare Equip.</u> | <u>Bare Total</u> | <u>Total In-House</u> | <u>Total Incl. O&P</u> |
|---------------|-----------------------------|------------------------------|-------------------------------|------------------------------|----------------------------------|---------------------------------------|
| Totals | \$12.21 | \$69.70 | \$0.00 | \$81.91 | \$105.36 | \$128.66 |

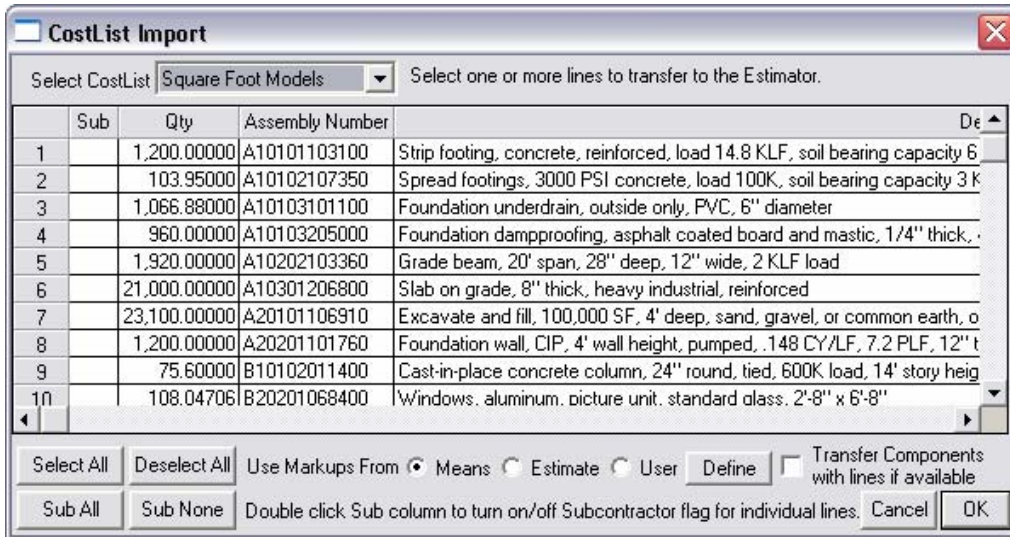
7. Save the CostList as "**Office Repairs.rdl.**"
8. Export the CostList to an Excel™ Spreadsheet.
9. Save the spreadsheet as "**Office Repairs.xls.**"

Exercise #7: CostWorks Estimator – Part 1

1. Open the "Seminar Machine Shop" Project created in Exercise #1.
2. Confirm the CostList matches the result in Exercise #1.
3. Click on the **Estimator** tab.
4. Click on the **File** menu, click **New**, and then click the **Assembly** template.



5. Click on the **CostList Import** Icon (or click **Edit** and then click **CostList**). *CostWorks* will display the "CostList Import" window.
6. Use the Select CostList dropdown list to choose **Square Foot Models** and *CostWorks* will display the individual assemblies from your model.



7. Click the **Select All** button to highlight all of the data lines.
8. Verify that "Means" is selected in the Use Markups From area.
9. Click the **OK** button and *CostWorks* will transfer the data into the Estimator (this may take a few minutes).

< Continued on next page >

Means CostWorks DOE Seminar Workbook

This image shows data after it has been imported to the Estimator:

| | | Source | Line Number | Description | Quantity | Unit | Ext. Material Incl O&P | Ext. Installation Incl O&P | Ext. Sub Incl O&P | Ext. Total Incl O&P | Zip Code Prefix | Type | Release |
|---|--|--------|--------------|---|-----------|------|------------------------|----------------------------|-------------------|---------------------|-----------------|-------|----------|
| 1 | | Model | A10101103100 | Strip footing, concrete, reinforced, load 14.8 KLF, soil bearing capacity 6 KSF, 12" deep x 32" wide | 1,200.00 | L.F. | \$20,451.36 | \$25,809.53 | | \$46,260.89 | | Union | 2007 DOE |
| 2 | | Model | A10102107350 | Spread footings, 3000 PSI concrete, load 100K, soil bearing capacity 3 KSF, 6' - 0" square x 14" deep | 103.95 | Ea. | \$25,475.75 | \$30,362.98 | | \$55,838.73 | | Union | 2007 DOE |
| 3 | | Model | A10103101100 | Foundation underdrain, outside only, PVC, 8" diameter | 1,066.88 | L.F. | \$8,485.16 | \$4,633.01 | | \$13,118.18 | | Union | 2007 DOE |
| 4 | | Model | A10103205000 | Foundation dampproofing, asphalt coated board and mastic, 1/4" thick, 4' high | 960.00 | L.F. | \$2,688.61 | \$4,724.44 | | \$7,413.05 | | Union | 2007 DOE |
| 5 | | Model | A10202103360 | Grade beam, 20' span, 28" deep, 12" wide, 2 KLF load | 1,920.00 | L.F. | \$38,403.84 | \$61,427.37 | | \$99,831.21 | | Union | 2007 DOE |
| 6 | | Model | A10301206800 | Slab on grade, 8" thick, heavy industrial, reinforced | 21,000.00 | S.F. | \$109,195.38 | \$148,210.44 | | \$257,405.82 | | Union | 2007 DOE |
| | | Model | A10101106910 | Excavate and fill 100,000 SF 4' deep | 23,100.00 | S.F. | | \$1,848.00 | | \$1,848.00 | | Union | 2007 DOE |

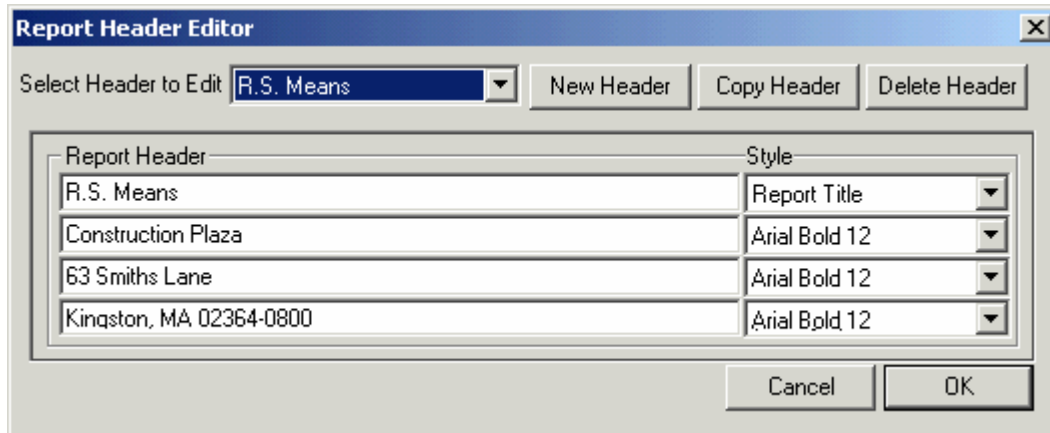
10. Click to highlight the row with Line Number **A10102107350** (Spread ftgs,3000 PSI conc, 1d 100K, soil cap 3 KSF, 6'-0" sq x 14" d).
11. Click the **Edit** menu and then click **Component Swapper**. *CostWorks* will display Assembly Costs screen and highlight line number 7350 (full line number: A10102107350).
12. Click to highlight line number **7450** (full line number: A10102107450). It should appear a just a few lines down from 7350. The description for 7450 should show as: Load 125K, soil capacity 3 KSF,7'-0" sq. x 17" deep
13. Click the **Edit** menu and then click **Component Swapper**. *CostWorks* will display a "Confirm Component Swap" window.
14. On the "Confirm Component Swap" window, click to put a checkmark into the "Remove Swapped Component from Estimate" box.
15. Click the **Yes, Swap these Components** button. *CostWorks* will display the Estimator tab. The 7350 line will be removed and the 7450 line will be added. The 7450 line will also have a note (in the next to last column) that indicates that it was swapped.
16. Next, we will run a report. Click the **Reports** menu and then click **Run Reports**.
17. From the Select Report dropdown list, choose the **SF Model Report** and *CostWorks* will generate the report. Take a moment, review the report, and then close the "SF Model Report."
18. Next, we need to save our work. Estimator Projects must be manually saved to retain the data that has been imported into the Estimator. Click the **File** menu and then click **Save As**.
19. A "Save CostList File" window will open. The default file name for our project is "Seminar Machine Shop Assembly_1.xml". Click the **Save** button to save this project.

Exercise #8: CostWorks Estimator – Part 2

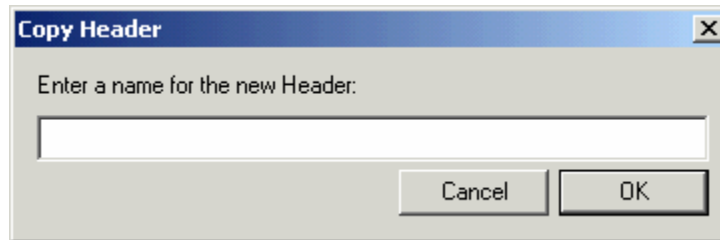
In this exercise, we will make some global changes to the *CostWorks* Estimator Settings.

1. First, we will create a new address Header for the report. Click the **Reports** menu, click **Define**, and then click **Headers**.

This image shows the "Report Header Editor" window that will be displayed:

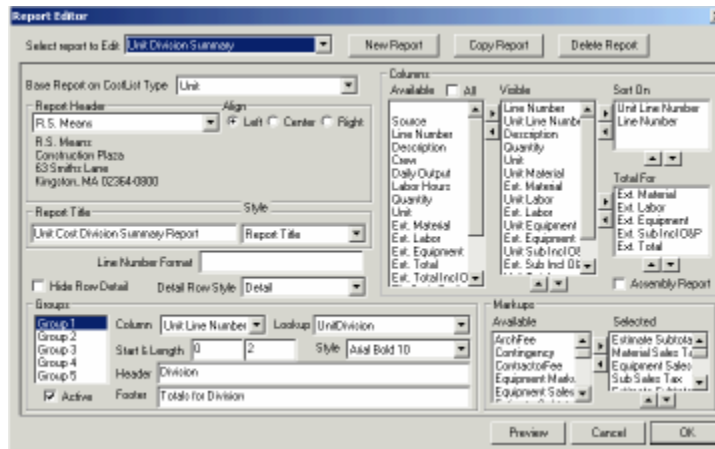


2. In the "Select Header to Edit" drop-down list, choose **R.S. Means**.
3. Click the **Copy Header** button and a "Copy Header" dialog box will open.

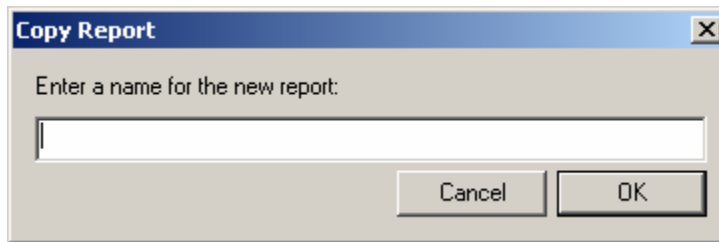


4. Type "Widget" into the blank line on the "Copy Header" dialog box and then click the **OK** button. The "Copy Header" dialog box will close and *CostWorks* will return to the "Report Header Editor" window.
5. On the "Report Header Editor" window, "Widget" will now be selected in the "Select Header to Edit" dropdown list. Locate the default address information on this window and then use this information to replace it:
Widget Company
630 Clark St
Suite 153
Boston, MA 02109
6. Click the **OK** button and the "Report Header Editor" window will close.
7. Click on the **Reports** menu, click **Define**, and then click **Reports**. This will open the "Report Editor" window.

This image shows the "Report Editor" window:



- In the "Select Report to Edit" drop-down list, choose the **SF Model Report** and then click the **Copy Report** button and the "Copy Report" dialog box will open.



- On the blank line in the "Copy Report" dialog box, type **My SF Model Report** as the name for the new report and then click the **OK** button. The "Copy Report" dialog box will close and *CostWorks* will return to the "Report Editor" window.
- Using the "Report Header" drop-down menu, select the header named "Widget."
- Click the **OK** button in the lower right corner.
- Click on the **Reports** menu and then click **Run Reports** and a list of reports to choose from will appear.
- Choose the **My SF Model Report** and the "Widget Company" information will now appear in the right hand corner of the report that is generated.

Exercise #9: Assembly Costs Project "Fencing"

1. Create a New Project/Model.
2. Name the Project "Fencing."
3. Set the parameters for the project as follows:
 - Open Title: Assemblies Cost Data
 - Location Factor: National Average Costs
 - Wage Rate: Union
4. Click on the **Assembly Costs** tab.
5. Using all four navigation methods including the FIMS usage code, 2429 Fencing, create a CostList consisting of these assemblies:

| Assembly | Quantity |
|-----------------|-----------------|
| G2040105 1350 | 15,750 |
| G2040105 1720 | 10 |
| G2040105 1740 | 8 |
| G2040105 1820 | 7,690 |
| G2040105 1732 | 8 |
| G2040105 6080 | 16 |

6. Your CostList totals should be:

| | <u>Mat.</u> | <u>Inst.</u> | <u>Total</u> |
|---------------|--------------------|---------------------|---------------------|
| Totals | \$817,080.00 | \$285,014.00 | \$1,102,094.00 |

7. Now, export this CostList to an Excel™ spreadsheet. Enter the proper Site #, Area #, and Property ID information.
8. Save the spreadsheet as "**Fencing.xls**."
9. Click on the **Estimator** tab. Go to the **File** menu and select **New/ Assembly** to start a new Estimate.
10. Click on the **CostList Import** Icon. *CostWorks* will display the "Transfer from CostList" window.
11. Click the **Select All** button to highlight all of the data lines. Confirm that the "Use Markups From..." setting is set to "Means".
12. Click the **OK** button and *CostWorks* will transfer the data into the Estimator.
13. Next, we will run a report. Click the **Reports** menu and then click **Run Reports**.
14. From the Select Report dropdown list, choose the **SF Model Report** and *CostWorks* will generate the report. Take a moment, review the report, and then close the "SF Model Report".

15. Next save your work. Estimator Projects must be manually saved to retain the data that has been imported into the Estimator. Click the **File** menu and then click **Save As**.
16. A "Save CostList File" window will open. The default file name for our project is "Fencing Assembly _1.xml". Click the **Save** button to save this project.

Exercise #10: Assembly & Unit Costs Project – "Tanks, Gravity"

1. Create a New Project/Model.
2. Name the Project "Tanks, Gravity"
3. Set the parameters for the project as follows:
 - Open Title All of the Following (first category)
 - Location Factor National Average Costs
 - Wage Rate Union
 - MasterFormat 95
4. Click the **Assembly Costs** tab.
5. Using any navigation method including the FIMS usage code, 4121, create a CostList consisting of these assemblies:

| Assembly Number | Quantity |
|------------------------|-----------------|
| G3010130 1010 | 200,000 |
| G3010130 1050 | 2,250,000 |

6. Your CostList totals should be:

| | <u>Mat.</u> | <u>Inst.</u> | <u>Total</u> |
|---------------|--------------------|---------------------|---------------------|
| Totals | \$3,624,000.00 | \$3,303,500.00 | \$6,927,500.00 |

7. Click on the **Estimator** tab. Go to the **File** menu and choose **New/Assembly** to start a new Estimate.
8. Click on the **CostList Import** icon. *CostWorks* will display the "Transfer from CostList" window.
9. Click the **Select All** button to highlight all of the data lines. Confirm that the "Use Markups From..." setting is set to "Means".
10. Click the **OK** button and *CostWorks* will transfer the data into the Estimator.
11. Click on the **Unit Costs** tab.
12. Using "**Go To**" and "**Search Index**", create a CostList consisting of this item, 132013006400, Wood tanks, 3" Redwood, 30,000 gallon, quantity 6.
13. The CostList should like this:

| | Bare Mat. | Bare Labor | Bare Equip. | Bare Total | Total Incl O&P |
|---------------|------------------|-------------------|--------------------|-------------------|---------------------------|
| Totals | \$235,800.00 | \$83,400.00 | \$0.00 | \$319,200.00 | \$390,000.00 |

14. Click on the **Estimator** tab and then repeat steps 8 – 10.
15. This Unit cost item has been added to the estimate. However, the line number is not in an **Assembly** Format. The CAIS percentage will be inaccurate since the cost item percentage is outside the standard volumes. We will change that.
16. On the **Estimator** tab, double click on the Unit cost item.
17. In the lower left area of the Edit Cost item box, click on the **Show Object Details** check box.
18. Look down the list for the field called Assembly Line Number. This controls the location within the report and export features.
19. Change the Assembly Line Number to a valid Unifomat II number, in this case G3010, and click **OK**.
20. The icon changes to a user change designation. Recalc (\$) if necessary and **Save As** or **Export** as appropriate.
21. Estimator Projects must be manually saved to retain the data that has been imported into the Estimator. Click the **File** menu and then click **Save As**.
22. A "Save CostList File" window will open. Save the project as "Tanks, Gravity Assembly_1.xml"
Click the **Save** button to save this project.

Attachment 1 - CostWorks Points of Contact

Department of Energy

Gary Horn, Office of Engineering & Construction Management (MA-50)
Telephone No. – (202) 586-9296
Email – gary.horn@hq.doe.gov

Energy Enterprise Solutions, LLC

Norm Ayers, Project Manager
Telephone No. – (301) 903-8648
Email – norm.ayers@hq.doe.gov

RS Means, Inc

Robert Gair, RS Means Project Manager
Telephone No. – (202) 285-7826
Email – rgair@rsmeans.com

Software Support

Telephone No. 1-800-334-3509
Email – softwaresupport@rsmeans.com

Attachment 2 – CostWorks Installation

Proceed as follows to install CostWorks:

1. **DO NOT** uninstall any previous versions of CostWorks.
Note: If you have purchased a Network License-Enabled version of CostWorks, please follow the Network Installation Instructions in the next section below.
2. Place the CostWorks CD-ROM in your CD-ROM Drive.
3. Select Start, Run then your CD-ROM Drive Letter and the Setup.exe file. (e.g. d:\setup.exe)
4. Follow the instructions as they appear on the screen. If any previous versions exist, install CostWorks in the same directory.
5. If you have a previous version of CostWorks loaded on your computer, you will need to open the 2007 release to access your new data. This is accomplished by starting the program (Start, Programs, CostWorks, then CostWorks again), clicking the **File** menu in CostWorks, clicking on Open Release Update, then clicking "Select Year/release", and clicking to highlight a line that starts with "CostWorks 2007", and then clicking OK.
6. You will be asked to enter the Serial Number and Authorization Code when you start the program for the first time. These numbers can be found on the back of the case supplied by RS Means.
7. If you have purchased CostWorks from a bookstore or retail outlet, it is necessary to complete a telephone activation sequence. For complete instructions, please refer to the Telephone Activation Certificate included with your software.

Note: CostWorks requires the original CostWorks CD-ROM to be in a local (non-networked) CD-ROM drive in order for the program to operate.

If you wish to order additional titles DO NOT return the CD-ROM. Please call RSMeans at 800-334-3509 and ask for the Sales Department.

CAUTION: The CD-ROM is a read-only compact disk. There is no means to back up this disk. Ensure proper handling and care of your CD-ROM disk to avoid inadvertent loss of information.

Windows 2000 & Windows XP users

It may be necessary to have a Local Administrator log in to install the CostWorks program. The first launch of the CostWorks program is also part of the installation procedure. This first launch may require a Local Administrator to log in to help ensure that the Serial Number and Authorization Code register properly.

Attachment 2 (cont.) – CostWorks Network Version Installation

If you have purchased the Network License-Enabled version of CostWorks, follow these steps for CostWorks Advanced Licensing:

Step 1: Copy the **COST2007** folder and all sub-folders from the CD-ROM to a common shared area on the network. The CostWorks users must be given "read/write/modify" permissions to the **COST2007** folder and all of its sub-folders.

Step 2: From a workstation, navigate to the **COST2007** folder on the Network and then into the **CWNW** folder inside of it. Run the program LICENSE.EXE.

LICENSE.EXE Icon:



Step 3: From a workstation, contact RSMMeans (weekdays 8AM-5PM EST) at 1-800-334-3509 and ask to speak to an Advanced License Operator. The Advanced License Operator will walk you through the steps to configure your license file (LICENSE2007.KEY).

Note: Once the file has been authorized, it must remain in this same location.

Step 4: Provide the Advanced License Operator with the Code Entry Number and the Network ID.

Step 5: Enter the Trigger Code from the Advanced License Operator into the License configuration program and then click the **OK** button when the operator asks you to.

Note: The Trigger Code given to you by the Advanced License Operator does not need to be recorded. It is a one-time-use number and cannot be re-used at a later time.

Step 6: Next comes the authorization of the number of concurrent users. Provide the Advanced License Operator with the new Code Entry Number.

Step 7: Enter the Trigger Code and Additional Number from the Advanced License Operator into the License configuration program and then click the **OK** button when the operator asks you to.

Step 8: You must now do a compact/minimal CostWorks installation to each user's workstation. And then copy the configuration file (LICENSE.CFG) into each end users local CostWork folder.

Note: If you accepted the defaults during installation, the local CostWork folder will be located at C:\Program Files\CostWork

Attachment 3 – RPV Bldg. & OSF Plant Models

| Model # | Model Name | Model # | Model Name |
|---------|------------|---------|------------|
|---------|------------|---------|------------|

RS Means Standard Building Models (39)

| | | | |
|-----|----------------------------------|-----|------------------------------------|
| E1 | Housing - Small | E21 | Post Office/Mail Handling |
| E2 | Housing - Large | E22 | Recreation Center/Gym |
| E3 | Auditorium/Meeting | E23 | Retail Store |
| E4 | Cafeteria/Dining | E24 | Security/Badging |
| E5 | Classroom-Small | E25 | Warehouse/Storage (pre-engineered) |
| E6 | Classroom-Medium | E26 | Bank/Credit Union |
| E7 | Fire Station | E27 | Visitor Center |
| E8 | Garage, Repair | E28 | Office 1-story |
| E9 | Hangar | E29 | Warehouse, Mini |
| E10 | Indoor Firing Range | E30 | Assisted - Senior Living |
| E11 | Office/Lab | E31 | College, Dormitory, 2-3 Story |
| E12 | Laundry | E32 | College, Dormitory, 4-8 Story |
| E13 | Library | E33 | Fraternity/Sorority House |
| E14 | Medical Facility/Clinic | E34 | Apartment 1-3 Story |
| E15 | Office-Small | E35 | Apartment 4-7 Story |
| E16 | Office-Medium | E36 | Apartment 8-24 Story |
| E17 | Office-Large | E37 | Hotel 4-7 Story |
| E18 | Parking Structure - Above Ground | E38 | Hotel 8-24 Story |
| E19 | Parking Structure - Below Ground | E39 | Telephone Exchange |
| E20 | Swimming Pool | | |

Dept. of Energy Custom Building Models (30)

| | | | |
|-----|--------------------------------|-----|--------------------------------|
| N1 | Bunkers/Magazines | N16 | Process Bldg w/Pool |
| N2 | Communication Center/Tele | N17 | Process Bldg-Small |
| N3 | Computer Center | N18 | Process Bldg-Large |
| N4 | Day Care Center | N19 | Records Storage/Vault |
| N5 | Explosives Handling | N21 | Labs-Hard Eng (50/50) |
| N6 | Hardened Storage | N22 | Labs-Bio/Environmental (50/50) |
| N7 | High-Bay Facility | N23 | Labs-Chemistry (50/50) |
| N8 | Labs-Hard Eng (80/20) | N24 | Labs-Physics/Comp (50/50) |
| N9 | Labs-Bio/Environmental (80/20) | N25 | Labs-Test/Blast (50/50) |
| N10 | Labs-Chemistry (80/20) | N30 | Office with Atrium |
| N11 | Labs-Physics/Comp (80/20) | N31 | High Radiation Examination Lab |
| N12 | Labs-Test/Blast (80/20) | N32 | Multi-Purpose Facility - large |
| N13 | Machine Shop | N33 | Trailer, Real Property |
| N14 | Maintenance Shops | N34 | Accelerator - Ring |
| N15 | Paint Shop | N35 | Pump Station |

Laboratory Space Key (Lab %/Office %)

Unique Pantex Building Models (4)

| | | | |
|-----|--------------------------------|-----|-------------------------------------|
| N36 | SNM Component Staging Facility | N38 | High Explosive Subassembly Facility |
| N37 | Assembly Cell | N39 | HE Machining Facility |

Attachment 3 – RPV Bldg. & OSF Plant Models

| Model # | Model Name | Model # | Model Name |
|---|---|---------|----------------------------|
| <u>Dept. of Energy Custom Other Structures & Facilities (OSF) Plant Models</u> | | | |
| N40 | Chilled Water Plant- 9,000T Centrifugal | N45 | Steam Plant (Oil) |
| N41 | Chilled Water Plant- 9,960T Absorption | N46 | Base Treatment Plant Bldg. |
| N42 | Base Bldg. Steam Power Plant | | |
| N43 | Steam Plant (Coal) | | |
| N44 | Steam Plant (Gas) | | |

Attachment 4 - RS Means Generic Model Descriptions

| Model No. | Model Name | Model Description |
|-----------|---------------------------|---|
| E1 | Housing, Small | <p>This model should be applied to small residential uses such as a house or small apartment. The model is based on a small 3-story apartment building with 8,000 square feet of floor area. The structure is light wood frame, with vinyl siding exterior, asphalt shingle roof, and packaged HVAC units.</p> <p style="margin-left: 40px;">Perimeter (LF): 213 Location: National Avg. Floor Area (SF): 2,667 Wage Rate: Union No. of Stories: 3 Story Height (LF) 10</p> |
| E2 | Housing, Large | <p>This model should be applied to large residential uses such as a large apartments and dormitories. The model is based on a large 6-story apartment building with 45,000 square feet of floor area. The structure is light steel frame, with brick veneer exterior, built-up membrane roof, and packaged HVAC units.</p> <p style="margin-left: 40px;">Perimeter (LF): 400 Location: National Avg. Floor Area (SF): 7,500 Wage Rate: Union No. of Stories: 6 Story Height (LF) 10</p> |
| E3 | Auditorium | <p>This model should be applied to uses such as meeting facilities and auditoriums. The model is based on a 1-story building with 24,000 square feet of floor area. The structure is light steel frame, with brick veneer and CMU backup exterior, built-up membrane roof, and roof-top HVAC units and central air system.</p> <p style="margin-left: 40px;">Perimeter (LF): 640 Location: National Avg. Floor Area (SF): 24,000 Wage Rate: Union No. of Stories: 1 Story Height (LF) 24</p> |
| E4 | Cafeteria | <p>This model should be applied to uses such as cafeteria and dining facilities. The model is based on a 1-story building with 8,000 square feet of floor area. The structure is light steel frame, with brick veneer and CMU backup exterior, single-ply membrane roof, and roof-top HVAC units and central air system.</p> <p style="margin-left: 40px;">Perimeter (LF): 368 Location: National Avg. Floor Area (SF): 8,000 Wage Rate: Union No. of Stories: 1 Story Height (LF) 12</p> |
| E5 | Classroom - Small | <p>This model should be applied to uses such as small size classroom and training facilities. The model is based on a 1-story building with 45,000 square feet of floor area. The structure is steel frame, with brick veneer and CMU backup exterior, built-up membrane roof, and roof-top HVAC units and central air system.</p> <p style="margin-left: 40px;">Perimeter (LF): 922 Location: National Avg. Floor Area (SF): 45,000 Wage Rate: Union No. of Stories: 1 Story Height (LF) 12</p> |
| E6 | Classroom - Medium | <p>This model should be applied to uses such as medium size classroom and training facilities. The model is based on a 2-story building with 110,000 square feet of floor area. The structure is steel frame, with brick veneer and CMU backup exterior, built-up membrane roof, and roof-top HVAC units and central air system.</p> <p style="margin-left: 40px;">Perimeter (LF): 1,890 Location: National Avg. Floor Area (SF): 55,000 Wage Rate: Union No. of Stories: 2 Story Height (LF) 12</p> |

Attachment 4 (cont.) - RS Means Generic Model Descriptions

| Model No. | Model Name | Model Description | | | | | | | | | | | | |
|-----------------------|----------------------------|---|-----------------|-----|-----------|----------|-----------------------|--------|------------|-------|-----------------|---|-------------------|----|
| E7 | Fire Station | <p>This model should be applied to all fire station facilities. The model is based on a 1-story building with 8,000 square feet of floor area. The structure is steel frame, with decorative block exterior, built-up membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Perimeter (LF):</td> <td style="width: 33%;">386</td> <td style="width: 33%;">Location:</td> <td style="width: 33%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>8,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF)</td> <td>14</td> </tr> </table> | Perimeter (LF): | 386 | Location: | National | Avg. Floor Area (SF): | 8,000 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF) | 14 |
| Perimeter (LF): | 386 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 8,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF) | 14 | | | | | | | | | | | |
| E8 | Garage, Repair | <p>This model should be applied to vehicle repair type uses and facilities. The model is based on a 1-story building with 10,000 square feet of floor area. The structure is masonry bearing wall with steel joist, with painted concrete block exterior, built-up membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Perimeter (LF):</td> <td style="width: 33%;">500</td> <td style="width: 33%;">Location:</td> <td style="width: 33%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>10,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF)</td> <td>14</td> </tr> </table> | Perimeter (LF): | 500 | Location: | National | Avg. Floor Area (SF): | 10,000 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF) | 14 |
| Perimeter (LF): | 500 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 10,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF) | 14 | | | | | | | | | | | |
| E9 | Hangar | <p>This model should be applied to hanger type uses and large clear-span open area facilities. The model is based on a 1-story building with 20,000 square feet of floor area. The structure is steel frame, with galvanized steel siding exterior, single-ply membrane roof, and unit heaters.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Perimeter (LF):</td> <td style="width: 33%;">580</td> <td style="width: 33%;">Location:</td> <td style="width: 33%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>20,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF)</td> <td>24</td> </tr> </table> | Perimeter (LF): | 580 | Location: | National | Avg. Floor Area (SF): | 20,000 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF) | 24 |
| Perimeter (LF): | 580 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 20,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF) | 24 | | | | | | | | | | | |
| E10 | Indoor Firing Range | <p>This model should be applied to indoor firing ranges with 4-6 firing stations. The model is based on a 1-story firing range with 4-6 firing stations 14,000 square feet of floor area. The structure is masonry bearing wall with steel joist, with painted concrete block exterior, built-up membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Perimeter (LF):</td> <td style="width: 33%;">491</td> <td style="width: 33%;">Location:</td> <td style="width: 33%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>14,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF)</td> <td>14</td> </tr> </table> | Perimeter (LF): | 491 | Location: | National | Avg. Floor Area (SF): | 14,000 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF) | 14 |
| Perimeter (LF): | 491 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 14,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF) | 14 | | | | | | | | | | | |
| E11 | Office/Lab | <p>This model should be applied to all simple light use combination laboratory/office uses such as a medical diagnostic lab. The model is based on a 1-story building with 45,000 square feet of floor area. The structure is masonry bearing wall with steel joists, with brick veneer and CMU backup exterior, built-up membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Perimeter (LF):</td> <td style="width: 33%;">900</td> <td style="width: 33%;">Location:</td> <td style="width: 33%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>45,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF)</td> <td>12</td> </tr> </table> | Perimeter (LF): | 900 | Location: | National | Avg. Floor Area (SF): | 45,000 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF) | 12 |
| Perimeter (LF): | 900 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 45,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF) | 12 | | | | | | | | | | | |
| E12 | Laundry | <p>This model should be applied to laundry type uses and facilities. The model is based on a 1-story building with 15,000 square feet of floor area. The structure is steel frame, with brick veneer and CMU backup exterior, built-up membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Perimeter (LF):</td> <td style="width: 33%;">490</td> <td style="width: 33%;">Location:</td> <td style="width: 33%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>15,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF)</td> <td>12</td> </tr> </table> | Perimeter (LF): | 490 | Location: | National | Avg. Floor Area (SF): | 15,000 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF) | 12 |
| Perimeter (LF): | 490 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 15,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF) | 12 | | | | | | | | | | | |

Attachment 4 (cont.) - RS Means Generic Model Descriptions

| Model No. | Model Name | Model Description | | | | | | | | | | | | |
|-----------------------|---------------------------------------|---|-----------------|-----|-----------|----------|-----------------------|--------|------------|-------|-----------------|---|-------------------|----|
| E13 | Library | <p>This model should be applied to all library facilities. The model is based on a 2-story building with 22,000 square feet of floor area. The structure is steel frame, with brick veneer and CMU backup exterior, single-ply membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 35%;">Perimeter (LF):</td> <td style="width: 20%;">435</td> <td style="width: 30%;">Location:</td> <td style="width: 15%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>11,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>2</td> <td>Story Height (LF)</td> <td>14</td> </tr> </table> | Perimeter (LF): | 435 | Location: | National | Avg. Floor Area (SF): | 11,000 | Wage Rate: | Union | No. of Stories: | 2 | Story Height (LF) | 14 |
| Perimeter (LF): | 435 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 11,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 2 | Story Height (LF) | 14 | | | | | | | | | | | |
| E14 | Medical Facility/Clinic | <p>This model should be applied to all medical clinic and diagnostic type facilities and uses. The model is based on a 1-story building with 7,000 square feet of floor area. The structure is masonry bearing wall with steel joists, with brick veneer and CMU backup exterior, single-ply membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 35%;">Perimeter (LF):</td> <td style="width: 20%;">380</td> <td style="width: 30%;">Location:</td> <td style="width: 15%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>7,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF)</td> <td>10</td> </tr> </table> | Perimeter (LF): | 380 | Location: | National | Avg. Floor Area (SF): | 7,000 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF) | 10 |
| Perimeter (LF): | 380 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 7,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF) | 10 | | | | | | | | | | | |
| E15 | Office - Small | <p>This model should be applied to small office facilities less than 80,000SF. The model is based on a 3-story building with 35,000 square feet of floor area. The structure is steel frame, with brick veneer and CMU backup exterior, single-ply membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 35%;">Perimeter (LF):</td> <td style="width: 20%;">440</td> <td style="width: 30%;">Location:</td> <td style="width: 15%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>11,667</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>3</td> <td>Story Height (LF)</td> <td>12</td> </tr> </table> | Perimeter (LF): | 440 | Location: | National | Avg. Floor Area (SF): | 11,667 | Wage Rate: | Union | No. of Stories: | 3 | Story Height (LF) | 12 |
| Perimeter (LF): | 440 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 11,667 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 3 | Story Height (LF) | 12 | | | | | | | | | | | |
| E16 | Office - Medium | <p>This model should be applied to medium size office facilities between 80,000 and 150,000SF. The model is based on a 3-story building with 80,000 square feet of floor area. The structure is concrete frame, with glass curtainwall exterior, single-ply membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 35%;">Perimeter (LF):</td> <td style="width: 20%;">670</td> <td style="width: 30%;">Location:</td> <td style="width: 15%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>26,667</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>3</td> <td>Story Height (LF)</td> <td>12</td> </tr> </table> | Perimeter (LF): | 670 | Location: | National | Avg. Floor Area (SF): | 26,667 | Wage Rate: | Union | No. of Stories: | 3 | Story Height (LF) | 12 |
| Perimeter (LF): | 670 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 26,667 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 3 | Story Height (LF) | 12 | | | | | | | | | | | |
| E17 | Office - Large | <p>This model should be applied to large size office facilities between 150,000 and 250,000SF. The model is based on a 8-story building with 150,000 square feet of floor area. The structure is steel frame, with precast concrete exterior, single-ply membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 35%;">Perimeter (LF):</td> <td style="width: 20%;">520</td> <td style="width: 30%;">Location:</td> <td style="width: 15%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>18,750</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>8</td> <td>Story Height (LF)</td> <td>12</td> </tr> </table> | Perimeter (LF): | 520 | Location: | National | Avg. Floor Area (SF): | 18,750 | Wage Rate: | Union | No. of Stories: | 8 | Story Height (LF) | 12 |
| Perimeter (LF): | 520 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 18,750 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 8 | Story Height (LF) | 12 | | | | | | | | | | | |
| E18 | Parking Structure - Above Grd. | <p>This model should be applied to above ground parking structures and decks. The model is based on a 5-story building with 115,000 square feet of floor area. The structure is concrete frame, with precast concrete exterior, no roof, and no mechanical HVAC systems.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 35%;">Perimeter (LF):</td> <td style="width: 20%;">638</td> <td style="width: 30%;">Location:</td> <td style="width: 15%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>23,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>5</td> <td>Story Height (LF)</td> <td>10</td> </tr> </table> | Perimeter (LF): | 638 | Location: | National | Avg. Floor Area (SF): | 23,000 | Wage Rate: | Union | No. of Stories: | 5 | Story Height (LF) | 10 |
| Perimeter (LF): | 638 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 23,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 5 | Story Height (LF) | 10 | | | | | | | | | | | |

Attachment 4 (cont.) - RS Means Generic Model Descriptions

| Model No. | Model Name | Model Description | | | | | | | | | | | | |
|-----------------------|---------------------------------------|---|-----------------|-----|-----------|----------|-----------------------|--------|------------|-------|-----------------|---|-------------------|----|
| E19 | Parking Structure - Below Grd. | <p>This model should be applied to below ground parking structures and decks. The model is based on a 2-story building with 100,000 square feet of floor area. The structure is concrete frame, with concrete foundation walls, no roof, and no mechanical HVAC systems.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">900</td> <td style="width: 20%;">Location:</td> <td style="width: 30%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>50,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>2</td> <td>Story Height (LF)</td> <td>10</td> </tr> </table> | Perimeter (LF): | 900 | Location: | National | Avg. Floor Area (SF): | 50,000 | Wage Rate: | Union | No. of Stories: | 2 | Story Height (LF) | 10 |
| Perimeter (LF): | 900 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 50,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 2 | Story Height (LF) | 10 | | | | | | | | | | | |
| E20 | Swimming Pool | <p>This model should be applied to enclosed swimming pool facilities. The model is based on a 1-story building with 20,000 square feet of floor area. The structure is masonry bearing wall with steel joists, with brick veneer and CMU backup exterior, single-ply membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">600</td> <td style="width: 20%;">Location:</td> <td style="width: 30%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>20,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF)</td> <td>24</td> </tr> </table> | Perimeter (LF): | 600 | Location: | National | Avg. Floor Area (SF): | 20,000 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF) | 24 |
| Perimeter (LF): | 600 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 20,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF) | 24 | | | | | | | | | | | |
| E21 | Post Office/Mail Handling | <p>This model should be applied to all post office and mail facilities. The model is based on a 1-story building with 13,000 square feet of floor area. The structure is steel frame, with brick veneer and CMU backup exterior, single-ply membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">468</td> <td style="width: 20%;">Location:</td> <td style="width: 30%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>13,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF)</td> <td>14</td> </tr> </table> | Perimeter (LF): | 468 | Location: | National | Avg. Floor Area (SF): | 13,000 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF) | 14 |
| Perimeter (LF): | 468 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 13,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF) | 14 | | | | | | | | | | | |
| E22 | Recreation Center/Gym | <p>This model should be applied to all recreational and gymnasium facilities. The model is based on a 1-story building with 20,000 square feet of floor area. The structure is steel frame, with painted concrete block exterior, single-ply membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">600</td> <td style="width: 20%;">Location:</td> <td style="width: 30%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>20,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF)</td> <td>25</td> </tr> </table> | Perimeter (LF): | 600 | Location: | National | Avg. Floor Area (SF): | 20,000 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF) | 25 |
| Perimeter (LF): | 600 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 20,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF) | 25 | | | | | | | | | | | |
| E23 | Retail Store | <p>This model should be applied to all retail stores and product sales related facilities. The model is based on a 1-story building with 8,000 square feet of floor area. The structure is masonry bearing wall with steel joist, with decorative concrete block exterior, single-ply membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">360</td> <td style="width: 20%;">Location:</td> <td style="width: 30%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>8,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF)</td> <td>14</td> </tr> </table> | Perimeter (LF): | 360 | Location: | National | Avg. Floor Area (SF): | 8,000 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF) | 14 |
| Perimeter (LF): | 360 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 8,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF) | 14 | | | | | | | | | | | |
| E24 | Security/Badging | <p>This model should be applied to all security, badging, and site entry processing centers and facilities. The model is based on a 2-story building with 15,000 square feet of floor area. The structure is masonry bearing wall with steel joists, with brick veneer and CMU backup exterior, single-ply membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">354</td> <td style="width: 20%;">Location:</td> <td style="width: 30%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>7,500</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>2</td> <td>Story Height (LF)</td> <td>12</td> </tr> </table> | Perimeter (LF): | 354 | Location: | National | Avg. Floor Area (SF): | 7,500 | Wage Rate: | Union | No. of Stories: | 2 | Story Height (LF) | 12 |
| Perimeter (LF): | 354 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 7,500 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 2 | Story Height (LF) | 12 | | | | | | | | | | | |

Attachment 4 (cont.) - RS Means Generic Model Descriptions

| Model No. | Model Name | Model Description | | | | | | | | | | | | |
|-----------------------|---|---|-----------------|-----|-----------|----------|-----------------------|--------|------------|-------|-----------------|---|--------------------|----|
| E25 | Warehouse/Storage (pre-engineered) | <p>This model should be applied to all pre-engineered type structures used for storage and support facilities. The model is based on a 1-story building with 40,000 square feet of floor area. The structure is steel frame, with galvanized steel siding exterior, metal roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">833</td> <td style="width: 30%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>40,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF)</td> <td>24</td> </tr> </table> | Perimeter (LF): | 833 | Location: | National | Avg. Floor Area (SF): | 40,000 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF) | 24 |
| Perimeter (LF): | 833 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 40,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF) | 24 | | | | | | | | | | | |
| E26 | Bank/Credit Union | <p>This model should be applied to all banking and credit union type facilities. The model is based on a 1-story building with 6,200 square feet of floor area. The structure is a steel frame building with steel joists, with brick veneer and CMU backup exterior, single-ply membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">317</td> <td style="width: 30%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>6,200</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF)</td> <td>14</td> </tr> </table> | Perimeter (LF): | 317 | Location: | National | Avg. Floor Area (SF): | 6,200 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF) | 14 |
| Perimeter (LF): | 317 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 6,200 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF) | 14 | | | | | | | | | | | |
| E27 | Visitor Center | <p>This model should be applied to all visitor centers and small museum type facilities. The model is based on a 1-story building with 24,000 square feet of floor area. The structure is masonry bearing wall with steel joists, with brick veneer and CMU backup exterior, single-ply membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">680</td> <td style="width: 30%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>24,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF)</td> <td>12</td> </tr> </table> | Perimeter (LF): | 680 | Location: | National | Avg. Floor Area (SF): | 24,000 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF) | 12 |
| Perimeter (LF): | 680 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 24,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF) | 12 | | | | | | | | | | | |
| E28 | Office 1 - Story | <p>This model should be applied to 1 story office facilities. The model is based on a 1-story building with 7,000 square feet of floor area. The structure is brick on block with a steel roof deck and single-ply membrane roof.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">360</td> <td style="width: 30%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>7,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF)</td> <td>12</td> </tr> </table> | Perimeter (LF): | 360 | Location: | National | Avg. Floor Area (SF): | 7,000 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF) | 12 |
| Perimeter (LF): | 360 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 7,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF) | 12 | | | | | | | | | | | |
| E29 | Warehouse, Mini | <p>This model is a one-story storage and support building with a 12' story height. The model is based on a 20,000 square feet of floor area. The model is concrete block steel frame. Four exterior wall types and structural system options are available for customization. The model square foot matrix runs from 2,000 - 100,000 square feet.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">900</td> <td style="width: 30%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>20,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF):</td> <td>12</td> </tr> </table> | Perimeter (LF): | 900 | Location: | National | Avg. Floor Area (SF): | 20,000 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF): | 12 |
| Perimeter (LF): | 900 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 20,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF): | 12 | | | | | | | | | | | |

Attachment 4 (cont.) - RS Means Generic Model Descriptions

| Model No. | Model Name | Model Description | | | | | | | | | | | | |
|-----------------------|--------------------------------------|---|-----------------|-----|-----------|----------|-----------------------|--------|------------|-------|-----------------|---|--------------------|----|
| E30 | Assisted - Senior Living | <p>This model should be applied to Assisted - Senior Living facilities and uses. The model is based on a 1-story building with 10,000 square feet of floor area and 10' story height. The structure is brick veneer with wood frame and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">400</td> <td style="width: 30%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>10,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF)</td> <td>10</td> </tr> </table> | Perimeter (LF): | 400 | Location: | National | Avg. Floor Area (SF): | 10,000 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF) | 10 |
| Perimeter (LF): | 400 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 10,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF) | 10 | | | | | | | | | | | |
| E31 | College, Dormitory, 2-3 Story | <p>This model should be applied to residential use as dormitories. The model is based on a 3-story building with 25,000 square feet of floor area and 12' story height. The structure is face brick with concrete block backup with a rigid concrete frame and roof-top HVAC units and central air system..</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">400</td> <td style="width: 30%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>8,333</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>3</td> <td>Story Height (LF)</td> <td>12</td> </tr> </table> | Perimeter (LF): | 400 | Location: | National | Avg. Floor Area (SF): | 8,333 | Wage Rate: | Union | No. of Stories: | 3 | Story Height (LF) | 12 |
| Perimeter (LF): | 400 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 8,333 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 3 | Story Height (LF) | 12 | | | | | | | | | | | |
| E32 | College, Dormitory, 4-8 Story | <p>This model should be applied to residential use as dormitories. The model is based on a 6-story building with 85,000 square feet of floor area and 12' story height. The structure is decorative concrete block with a steel frame and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">500</td> <td style="width: 30%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>14,167</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>6</td> <td>Story Height (LF)</td> <td>12</td> </tr> </table> | Perimeter (LF): | 500 | Location: | National | Avg. Floor Area (SF): | 14,167 | Wage Rate: | Union | No. of Stories: | 6 | Story Height (LF) | 12 |
| Perimeter (LF): | 500 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 14,167 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 6 | Story Height (LF) | 12 | | | | | | | | | | | |
| E33 | Fraternity/Sorority House | <p>This model should be applied to residential use as fraternity or sorority houses. The model is based on a 2-story building with 10,000 square feet of floor area and 10' story height. The structure is a wood frame with cedar beveled siding.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">300</td> <td style="width: 30%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>5,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>2</td> <td>Story Height (LF)</td> <td>10</td> </tr> </table> | Perimeter (LF): | 300 | Location: | National | Avg. Floor Area (SF): | 5,000 | Wage Rate: | Union | No. of Stories: | 2 | Story Height (LF) | 10 |
| Perimeter (LF): | 300 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 5,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 2 | Story Height (LF) | 10 | | | | | | | | | | | |
| E34 | Apartment 1-3 Story | <p>This model should be applied to residential use as small apartment building. The model is based on a 3-story building with 22,500 square feet of floor area and 10' story height. The structure is face brick with concrete block back-up with steel joists and chilled water, air cooled condenser system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">400</td> <td style="width: 30%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>7,500</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>3</td> <td>Story Height (LF):</td> <td>10</td> </tr> </table> | Perimeter (LF): | 400 | Location: | National | Avg. Floor Area (SF): | 7,500 | Wage Rate: | Union | No. of Stories: | 3 | Story Height (LF): | 10 |
| Perimeter (LF): | 400 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 7,500 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 3 | Story Height (LF): | 10 | | | | | | | | | | | |

Attachment 4 (cont.) - RS Means Generic Model Descriptions

| Model No. | Model Name | Model Description |
|-----------|-----------------------------|--|
| E35 | Apartment 4-7 Story | <p>This model should be applied to residential use as a medium apartment building. The model is based on a 6-story building with 60,000 square feet of floor area and 10'-4" story height. The structure is face brick with concrete block back-up with steel joists and chilled water, air cooled condenser system.</p> <p style="margin-left: 40px;">Perimeter (LF): 500 Location: National Avg. Floor Area (SF): 10,000 Wage Rate: Union No. of Stories: 6 Story Height (LF) 10 1/3</p> |
| E36 | Apartment 8-24 Story | <p>This model should be applied to residential use as a large apartment building. The model is based on a 15-story building with 145,000 square feet of floor area and 10'-6" story height. The structure is ribbed precast concrete panel with a steel frame and chilled water, air cooled condenser system..</p> <p style="margin-left: 40px;">Perimeter (LF): 442 Location: National Avg. Floor Area (SF): 9,667 Wage Rate: Union No. of Stories: 15 Story Height (LF) 10 1/2</p> |
| E37 | Hotel 4-7 Story | <p>This model should be applied for use as a small hotel or similar facility. The model is based on a 6-story building with 135,000 square feet of floor area and 10' story height. The structure is face brick with concrete block back-up and a steel frame and oil fired hot water boiler, wall fin radiation and chilled water fan coiled units</p> <p style="margin-left: 40px;">Perimeter (LF): 722 Location: National Avg. Floor Area (SF): 22,500 Wage Rate: Union No. of Stories: 6 Story Height (LF) 10</p> |
| E38 | Hotel 8-24 Story | <p>This model should be applied for use as a hotel or similar facility. The model is based on a 15-story building with 450,000 square feet of floor area and 10' story height. The structure is glass and metal curtain walls with a steel frame and oil fired hot water boiler, wall fin radiation and chilled water fan coiled units.</p> <p style="margin-left: 40px;">Perimeter (LF): 800 Location: National Avg. Floor Area (SF): 30,000 Wage Rate: Union No. of Stories: 15 Story Height (LF) 10</p> |
| E39 | Telephone Exchange | <p>This model should be applied to all telephone exchange facilities and related uses. The model is based on a 1-story building with 5,000 square feet of floor area and a 12' story height. The structure is a face brick with concrete block back-up wall with steel joists and a single zone unit for gas heating and electric cooling.</p> <p style="margin-left: 40px;">Perimeter (LF): 286 Location: National Avg. Floor Area (SF): 5,000 Wage Rate: Union No. of Stories: 1 Story Height (LF): 12</p> |

Attachment 5 – DOE Custom Model Summaries

| Model No. | Model Name | Model Description | | | | | | | | | | | | |
|-----------------------|--|--|-----------------|------|-----------|----------|-----------------------|--------|------------|-------|-----------------|---|--------------------|------|
| N1 | Bunkers Magazines | <p>This model should be applied to all bunkers and magazine storage facilities. The model is based on a 1-story building with 1,000 square feet of floor area. The structure is cast-in-place concrete, with cast-in-place concrete exterior, special dirt berm roof system, and no mechanical system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">140</td> <td style="width: 30%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>1000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF):</td> <td>14</td> </tr> </table> | Perimeter (LF): | 140 | Location: | National | Avg. Floor Area (SF): | 1000 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF): | 14 |
| Perimeter (LF): | 140 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 1000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF): | 14 | | | | | | | | | | | |
| N2 | Communications Center/Telephone | <p>This model should be applied to all communication centers, telephone centers and switchgear facilities and related uses. The model is based on a 3-story building with 25,000 square feet of floor area. The structure is masonry bearing wall with steel joists, with brick veneer and CMU backup exterior, single-ply membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">440</td> <td style="width: 30%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>8,333</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>3</td> <td>Story Height (LF):</td> <td>12</td> </tr> </table> | Perimeter (LF): | 440 | Location: | National | Avg. Floor Area (SF): | 8,333 | Wage Rate: | Union | No. of Stories: | 3 | Story Height (LF): | 12 |
| Perimeter (LF): | 440 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 8,333 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 3 | Story Height (LF): | 12 | | | | | | | | | | | |
| N3 | Computer Center | <p>This model should be applied to all computer processing centers and related facilities. The model is based on a 1-story building with 100,000 square feet of floor area. The structure is precast concrete panels, with tilt-up concrete exterior, single-ply membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">1400</td> <td style="width: 30%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>100000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF):</td> <td>14</td> </tr> </table> | Perimeter (LF): | 1400 | Location: | National | Avg. Floor Area (SF): | 100000 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF): | 14 |
| Perimeter (LF): | 1400 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 100000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF): | 14 | | | | | | | | | | | |
| N4 | Day Care Center | <p>This model should be applied to all day care centers and related facilities. The model is based on a 1-story building with 10,000 square feet of floor area. The structure is wood stud with brick veneer, wood trusses, asphalt shingle roof, forced hot air/fin tube radiation heat.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">440</td> <td style="width: 30%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>10,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF):</td> <td>12</td> </tr> </table> | Perimeter (LF): | 440 | Location: | National | Avg. Floor Area (SF): | 10,000 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF): | 12 |
| Perimeter (LF): | 440 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 10,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF): | 12 | | | | | | | | | | | |
| N5 | Explosives Handlings | <p>This model should be applied to all explosive handling type facilities with blowout design features. The model is based on a 1-story building with 5,000 square feet of floor area. The structure is cast-in-place concrete, with cast-in-place concrete exterior, metal blowout roof, and unit heaters and packaged AC units.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">300</td> <td style="width: 30%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>5,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF):</td> <td>14</td> </tr> </table> | Perimeter (LF): | 300 | Location: | National | Avg. Floor Area (SF): | 5,000 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF): | 14 |
| Perimeter (LF): | 300 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 5,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF): | 14 | | | | | | | | | | | |
| N6 | Hardened Storage | <p>This model should be applied to all reinforced and hardened storage facilities. This should be used for all storage facilities that are not pre-engineered. The model is based on a 1-story building with 25,000 square feet of floor area. The structure is cast-in-place concrete, with precast concrete exterior, built-up membrane roof, and unit heaters and packaged AC units.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">650</td> <td style="width: 30%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>25000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF):</td> <td>19.7</td> </tr> </table> | Perimeter (LF): | 650 | Location: | National | Avg. Floor Area (SF): | 25000 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF): | 19.7 |
| Perimeter (LF): | 650 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 25000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF): | 19.7 | | | | | | | | | | | |

Attachment 5 (cont.) – DOE Custom Model Summaries

| Model No. | Model Name | Model Description | | | | | | | | | | | | |
|-----------------------|---|--|-----------------|------|-----------|----------|-----------------------|--------|------------|-------|-----------------|---|--------------------|-------|
| N7 | High-Bay Facility | <p>This model should be applied to all facilities with clear span high ceiling work space with crane. The model is based on a 1-story building with 75,000 square feet of floor area. The structure is steel frame, with metal siding exterior, metal roof, and unit heaters and packaged AC units.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 35%;">Perimeter (LF):</td> <td style="width: 30%;">1150</td> <td style="width: 30%;">Location:</td> <td style="width: 5%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>75000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF):</td> <td>14</td> </tr> </table> | Perimeter (LF): | 1150 | Location: | National | Avg. Floor Area (SF): | 75000 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF): | 14 |
| Perimeter (LF): | 1150 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 75000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF): | 14 | | | | | | | | | | | |
| N8 | Laboratory-Hard Engineered (80/20) | <p>This model should be applied to laboratories used for construction and testing of equipment and is based on 80% lab space and 20% office. The model is based on a 2-story building with 100,000 square feet of floor area. The structure is steel frame, with precast concrete exterior, built-up membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 35%;">Perimeter (LF):</td> <td style="width: 30%;">900</td> <td style="width: 30%;">Location:</td> <td style="width: 5%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>50,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>2</td> <td>Story Height (LF):</td> <td>15</td> </tr> </table> | Perimeter (LF): | 900 | Location: | National | Avg. Floor Area (SF): | 50,000 | Wage Rate: | Union | No. of Stories: | 2 | Story Height (LF): | 15 |
| Perimeter (LF): | 900 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 50,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 2 | Story Height (LF): | 15 | | | | | | | | | | | |
| N9 | Laboratory-Biology/Environmental (80/20) | <p>This model should be applied to laboratories used for biology and environmental research and is based on 80% lab space and 20% office. The model is based on a 3-story building with 60,000 square feet of floor area. The structure is steel frame, with precast concrete exterior, built-up membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 35%;">Perimeter (LF):</td> <td style="width: 30%;">600</td> <td style="width: 30%;">Location:</td> <td style="width: 5%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>20000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>3</td> <td>Story Height (LF):</td> <td>14</td> </tr> </table> | Perimeter (LF): | 600 | Location: | National | Avg. Floor Area (SF): | 20000 | Wage Rate: | Union | No. of Stories: | 3 | Story Height (LF): | 14 |
| Perimeter (LF): | 600 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 20000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 3 | Story Height (LF): | 14 | | | | | | | | | | | |
| N10 | Laboratory-Chemistry (80/20) | <p>This model should be applied to laboratories used for chemistry research and is based on 80% lab space and 20% office. The model is based on a 3-story building with 60,000 square feet of floor area. The structure is steel frame, with precast concrete exterior, built-up membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 35%;">Perimeter (LF):</td> <td style="width: 30%;">600</td> <td style="width: 30%;">Location:</td> <td style="width: 5%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>20,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>3</td> <td>Story Height (LF):</td> <td>14</td> </tr> </table> | Perimeter (LF): | 600 | Location: | National | Avg. Floor Area (SF): | 20,000 | Wage Rate: | Union | No. of Stories: | 3 | Story Height (LF): | 14 |
| Perimeter (LF): | 600 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 20,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 3 | Story Height (LF): | 14 | | | | | | | | | | | |
| N11 | Laboratory-Physics/Computer (80/20) | <p>This model should be applied to laboratories used for physics and computer research and is based on 80% lab space and 20% office. The model is based on a 4-story building with 80,000 square feet of floor area. The structure is steel frame, with precast concrete exterior, built-up membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 35%;">Perimeter (LF):</td> <td style="width: 30%;">600</td> <td style="width: 30%;">Location:</td> <td style="width: 5%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>20,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>4</td> <td>Story Height (LF):</td> <td>14</td> </tr> </table> | Perimeter (LF): | 600 | Location: | National | Avg. Floor Area (SF): | 20,000 | Wage Rate: | Union | No. of Stories: | 4 | Story Height (LF): | 14 |
| Perimeter (LF): | 600 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 20,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 4 | Story Height (LF): | 14 | | | | | | | | | | | |
| N12 | Laboratory-Test/Blast (80/20) | <p>This model should be applied to laboratories used for heavy testing and explosive blast testing research and is based on 80% lab space and 20% office. The model is based on a 3-story building with 60,000 square feet of floor area. The structure is steel frame, with precast concrete exterior, built-up membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 35%;">Perimeter (LF):</td> <td style="width: 30%;">600</td> <td style="width: 30%;">Location:</td> <td style="width: 5%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>20000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>3</td> <td>Story Height (LF):</td> <td>17.33</td> </tr> </table> | Perimeter (LF): | 600 | Location: | National | Avg. Floor Area (SF): | 20000 | Wage Rate: | Union | No. of Stories: | 3 | Story Height (LF): | 17.33 |
| Perimeter (LF): | 600 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 20000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 3 | Story Height (LF): | 17.33 | | | | | | | | | | | |

Attachment 5 (cont.) – DOE Custom Model Summaries

| Model No. | Model Name | Model Description |
|-----------|--------------------------------|--|
| N13 | Machine Shop | <p>This model should be applied to all machine shop and support type facilities with overhead crane. The model is based on a 1-story building with 20,000 square feet of floor area. The structure is steel frame, with metal siding exterior, metal roof, and unit heaters and packaged AC units.</p> <p>Perimeter (LF): 600 Location: National Avg. Floor Area (SF): 20000 Wage Rate: Union No. of Stories: 1 Story Height (LF): 14</p> |
| N14 | Maintenance Shops | <p>This model should be applied to all maintenance, trade, and support type facilities. The model is based on a 1-story building with 20,000 square feet of floor area. The structure is steel frame, with metal siding exterior, metal roof, and unit heaters and packaged AC units.</p> <p>Perimeter (LF): 600 Location: National Avg. Floor Area (SF): 20000 Wage Rate: Union No. of Stories: 1 Story Height (LF): 14</p> |
| N15 | Paint Shop | <p>This model should be applied to all paint shop and support type facilities with paint booths. The model is based on a 1-story building with 20,000 square feet of floor area. The structure is steel frame, with metal siding exterior, metal roof, and unit heaters and packaged AC units.</p> <p>Perimeter (LF): 600 Location: National Avg. Floor Area (SF): 20000 Wage Rate: Union No. of Stories: 1 Story Height (LF): 14</p> |
| N16 | Process Bldg. with Pool | <p>This model should be applied to all process facilities with cooling ponds for roof storage. The model is based on a 1-story building with 125,000 square feet of floor area. The structure is cast-in-place concrete, with brick veneer with CMU backup exterior, built-up membrane roof, and a boiler/chiller mechanical system.</p> <p>Perimeter (LF): 1650 Location: National Avg. Floor Area (SF): 125000 Wage Rate: Union No. of Stories: 1 Story Height (LF): 14</p> |
| N17 | Process Bldg. - Small | <p>This model should be applied to all manufacturing and factory type facilities in the size range less than 250,000SF. The model is based on a 1-story building with 250,000 square feet of floor area. The structure is tilt-up concrete, with tilt-up concrete exterior, built-up membrane roof, and a boiler/chiller mechanical system.</p> <p>Perimeter (LF): 2900 Location: National Avg. Floor Area (SF): 250000 Wage Rate: Union No. of Stories: 1 Story Height (LF): 14</p> |
| N18 | Process Bldg. - Large | <p>This model should be applied to all manufacturing and factory type facilities in the size range of 250,000-750,000SF. The model is based on a 1-story building with 750,000 square feet of floor area. The structure is tilt-up concrete, with tilt-up concrete exterior, built-up membrane roof, and a boiler/chiller mechanical system.</p> <p>Perimeter (LF): 4550 Location: National Avg. Floor Area (SF): 750000 Wage Rate: Union No. of Stories: 1 Story Height (LF): 14</p> |

Attachment 5 (cont.) – DOE Custom Model Summaries

| Model No. | Model Name | Model Description | | | | | | | | | | | | |
|-----------------------|---|---|-----------------|-------|-----------|----------|-----------------------|--------|------------|-------|-----------------|---|--------------------|-------|
| N19 | Records Storage/Vault | <p>This model should be applied to all records storage type facilities with climate controlled space. The model is based on a 2-story building with 150,000 square feet of floor area. The structure is cast-in-place concrete, with brick veneer with CMU backup exterior, single-ply membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">1,150</td> <td style="width: 30%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>75,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>2</td> <td>Story Height (LF):</td> <td>20</td> </tr> </table> | Perimeter (LF): | 1,150 | Location: | National | Avg. Floor Area (SF): | 75,000 | Wage Rate: | Union | No. of Stories: | 2 | Story Height (LF): | 20 |
| Perimeter (LF): | 1,150 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 75,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 2 | Story Height (LF): | 20 | | | | | | | | | | | |
| N21 | Laboratory-Hard Engineered. (50/50) | <p>This model should be applied to laboratories used for construction and testing of equipment and is based on 50% lab space and 50% office. The model is based on a 3-story building with 100,000 square feet of floor area. The structure is steel frame, with precast concrete exterior, built-up membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">900</td> <td style="width: 30%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>33,333</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>3</td> <td>Story Height (LF):</td> <td>12</td> </tr> </table> | Perimeter (LF): | 900 | Location: | National | Avg. Floor Area (SF): | 33,333 | Wage Rate: | Union | No. of Stories: | 3 | Story Height (LF): | 12 |
| Perimeter (LF): | 900 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 33,333 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 3 | Story Height (LF): | 12 | | | | | | | | | | | |
| N22 | Laboratory-Biology/Environmental (50/50) | <p>This model should be applied to laboratories used for biology and environmental research and is based on 50% lab space and 50% office. The model is based on a 3-story building with 60,000 square feet of floor area. The structure is steel frame, with precast concrete exterior, built-up membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">600</td> <td style="width: 30%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>20000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>3</td> <td>Story Height (LF):</td> <td>14</td> </tr> </table> | Perimeter (LF): | 600 | Location: | National | Avg. Floor Area (SF): | 20000 | Wage Rate: | Union | No. of Stories: | 3 | Story Height (LF): | 14 |
| Perimeter (LF): | 600 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 20000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 3 | Story Height (LF): | 14 | | | | | | | | | | | |
| N23 | Laboratory-Chemistry (50/50) | <p>This model should be applied to laboratories used for chemistry research and is based on 50% lab space and 50% office. The model is based on a 3-story building with 60,000 square feet of floor area. The structure is steel frame, with precast concrete exterior, built-up membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">600</td> <td style="width: 30%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>20000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>3</td> <td>Story Height (LF):</td> <td>14</td> </tr> </table> | Perimeter (LF): | 600 | Location: | National | Avg. Floor Area (SF): | 20000 | Wage Rate: | Union | No. of Stories: | 3 | Story Height (LF): | 14 |
| Perimeter (LF): | 600 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 20000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 3 | Story Height (LF): | 14 | | | | | | | | | | | |
| N24 | Laboratory-Physics/Computer (50/50) | <p>This model should be applied to laboratories used for physics and computer research and is based on 50% lab space and 50% office. The model is based on a 4-story building with 80,000 square feet of floor area. The structure is steel frame, with precast concrete exterior, built-up membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">600</td> <td style="width: 30%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>20,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>4</td> <td>Story Height (LF):</td> <td>14</td> </tr> </table> | Perimeter (LF): | 600 | Location: | National | Avg. Floor Area (SF): | 20,000 | Wage Rate: | Union | No. of Stories: | 4 | Story Height (LF): | 14 |
| Perimeter (LF): | 600 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 20,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 4 | Story Height (LF): | 14 | | | | | | | | | | | |
| N25 | Laboratory-Test/Blast (50/50) | <p>This model should be applied to laboratories used for heavy testing and explosive blast testing research and is based on 50% lab space and 50% office. The model is based on a 3-story building with 60,000 square feet of floor area. The structure is steel frame, with precast concrete exterior, built-up membrane roof, and roof-top HVAC units and central air system.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 20%;">600</td> <td style="width: 30%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>20000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>3</td> <td>Story Height (LF):</td> <td>17.33</td> </tr> </table> | Perimeter (LF): | 600 | Location: | National | Avg. Floor Area (SF): | 20000 | Wage Rate: | Union | No. of Stories: | 3 | Story Height (LF): | 17.33 |
| Perimeter (LF): | 600 | Location: | National | | | | | | | | | | | |
| Avg. Floor Area (SF): | 20000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 3 | Story Height (LF): | 17.33 | | | | | | | | | | | |

Attachment 5 (cont.) – DOE Custom Model Summaries

| Model No. | Model Name | Model Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------|--|--|-----------------|-------|-----------|----------|------------------------|-----------|------------|-------|-----------------|---------|--------------------|----|-------------|-----------|--|--|-----------|---------|--|--|-----------------|-----------|-------------------|-----|-----------------|---|-------------------|----|
| N30 | Office with Atrium | <p>The model should be applied to a large office building. The model is based on a 2 story office building with approximately 33,000 SF per floor totaling 66,000 SF. The structure included structural steel framing supported by concrete foundations. Exterior enclosure is metal wall panels and glazed curtain walls. Roofing is EPDM Membrane trimmed with aluminum flashing. The building is fire protected. The HVAC system is a combination of hot water boilers and roof top units. A 2000 amp service with power, lighting, fire alarm, public address and tel/data cables are provided. This model includes a cafeteria, computer center, auditorium support functions and an atrium. This model is based on a building at Thomas Jefferson National Accelerator Facility.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 30%;">1,530</td> <td style="width: 20%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>33,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>2</td> <td>Story Height (LF):</td> <td>12</td> </tr> </table> | Perimeter (LF): | 1,530 | Location: | National | Avg. Floor Area (SF): | 33,000 | Wage Rate: | Union | No. of Stories: | 2 | Story Height (LF): | 12 | | | | | | | | | | | | | | | | |
| Perimeter (LF): | 1,530 | Location: | National | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Avg. Floor Area (SF): | 33,000 | Wage Rate: | Union | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No. of Stories: | 2 | Story Height (LF): | 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| N31 | High Radiation Examination Laboratory | <p>The estimate is for a 46,416 SF (excluding basement) High Radiation Examination Laboratory. The foundation is structural concrete. In addition there is a barium concrete core/cell areas for observing radioactive reactions. The exterior structure is a combination of steel framing and reinforced concrete block. Exterior veneer is a combination of brick, metal siding and painted finishes. Floor construction consist of a basement slab on grade and structural concrete floors. The roof is built up bituminous. Toilet and locker rooms for employees are included. Fire protection system for the facility is included. Heating for the building is provided through a central heating plant with backup systems in the facility. Electrical power, control systems and backup systems have been provided. Interior construction is a combination of CMU and gypsum partitions. Reactor equipment has not been included.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 30%;">530</td> <td style="width: 20%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Total Floor Area (SF):</td> <td>46,416</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td> Basement</td> <td>15,472</td> <td></td> <td></td> </tr> <tr> <td> 1st Floor</td> <td>15,472</td> <td></td> <td></td> </tr> <tr> <td> 2nd Floor</td> <td>15,472</td> <td></td> <td></td> </tr> <tr> <td> 3rd Floor</td> <td>15,472</td> <td></td> <td></td> </tr> <tr> <td>No. of Stories:</td> <td>3</td> <td>Story Height (LF)</td> <td>12</td> </tr> </table> | Perimeter (LF): | 530 | Location: | National | Total Floor Area (SF): | 46,416 | Wage Rate: | Union | Basement | 15,472 | | | 1st Floor | 15,472 | | | 2nd Floor | 15,472 | | | 3rd Floor | 15,472 | | | No. of Stories: | 3 | Story Height (LF) | 12 |
| Perimeter (LF): | 530 | Location: | National | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Floor Area (SF): | 46,416 | Wage Rate: | Union | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Basement | 15,472 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1st Floor | 15,472 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2nd Floor | 15,472 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3rd Floor | 15,472 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No. of Stories: | 3 | Story Height (LF) | 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| N32 | Multi-Purpose Facility - Large | <p>This model applies to a large manufacturing facility including clean rooms, storage, manufacturing and office areas. The facility encloses approximately 1,700,000 SF; this includes a basement, a first level and a mezzanine level. The structure contains concrete foundations, concrete walls and concrete roof framing and deck. The exterior enclosure is a brick façade with service doors. The roof covering and flashings are bituminous. The HVAC system is a combination of hot water boilers and roof top units. A 2000 amp service with power, lighting, fire alarm, public address and Tel/data cables are provided.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 30%;">4,960</td> <td style="width: 20%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Total Floor Area (SF):</td> <td>1,700,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td> Basement</td> <td>300,000</td> <td></td> <td></td> </tr> <tr> <td> First Floor</td> <td>1,145,000</td> <td></td> <td></td> </tr> <tr> <td> Mezzanine</td> <td>255,000</td> <td></td> <td></td> </tr> <tr> <td>No. of Stories:</td> <td>3 partial</td> <td>Story Height (LF)</td> <td>152</td> </tr> </table> | Perimeter (LF): | 4,960 | Location: | National | Total Floor Area (SF): | 1,700,000 | Wage Rate: | Union | Basement | 300,000 | | | First Floor | 1,145,000 | | | Mezzanine | 255,000 | | | No. of Stories: | 3 partial | Story Height (LF) | 152 | | | | |
| Perimeter (LF): | 4,960 | Location: | National | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Floor Area (SF): | 1,700,000 | Wage Rate: | Union | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Basement | 300,000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| First Floor | 1,145,000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mezzanine | 255,000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No. of Stories: | 3 partial | Story Height (LF) | 152 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| N33 | Trailer- Real Property | <p>The Trailer estimate includes the purchase and installation of a 10' x 50' construction office trailer. Attached to the trailer are two 10' x 10' entry platforms and stairs. The trailer installation includes a perimeter skirt , power, grounding, fire alarm and sprinklers.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 30%;">120</td> <td style="width: 20%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>500</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF):</td> <td>10</td> </tr> </table> | Perimeter (LF): | 120 | Location: | National | Avg. Floor Area (SF): | 500 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF): | 10 | | | | | | | | | | | | | | | | |
| Perimeter (LF): | 120 | Location: | National | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Avg. Floor Area (SF): | 500 | Wage Rate: | Union | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF): | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Attachment 5 (cont.) – DOE Custom Model Summaries

| Model No. | Model Name | Model Description | | | | | | | | | | | | | | | | |
|------------------------|--|---|-----------------|-------|-----------|----------|------------------------|--------|------------|-------|-----------------|--|--------------------|----|--|--|---------|----------|
| N34 | Accelerator - Ring (TJ Lab) | <p>The estimate includes General Contractor work for providing site, concrete, waterproofing, mechanical & electrical work for a continuous electron beam accelerator tunnel and supporting stairways. The tunnel is essentially a continuous concrete box approximately 4300 LF long with interior dimensions of 14' wide by 10' high. Dimension vary at access building and stairways. Elevated and slab on grades vary from 2'-0" to 4'-0" thick. Six access stair locations are also included.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 30%;">4,300</td> <td style="width: 20%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Avg. Floor Area (SF):</td> <td>92,400</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1 with exception for 6 access stairs @ 2 stories</td> <td>Story Height (Ft):</td> <td>10</td> </tr> </table> | Perimeter (LF): | 4,300 | Location: | National | Avg. Floor Area (SF): | 92,400 | Wage Rate: | Union | No. of Stories: | 1 with exception for 6 access stairs @ 2 stories | Story Height (Ft): | 10 | | | | |
| Perimeter (LF): | 4,300 | Location: | National | | | | | | | | | | | | | | | |
| Avg. Floor Area (SF): | 92,400 | Wage Rate: | Union | | | | | | | | | | | | | | | |
| No. of Stories: | 1 with exception for 6 access stairs @ 2 stories | Story Height (Ft): | 10 | | | | | | | | | | | | | | | |
| N35 | Pumping Station | <p>This model should be applied to an 8.1 MGD pump station. The pump station's intakes water from a reservoir and transfers to a municipal system. The model is based on a 2-story building with 3024 square feet of floor area. The first story is constructed of thickened concrete walls and slabs that support the intake and pump room. The second floor is enclosed in a prefabricated steel building. The second floor supports mechanical & electrical equipment along with an office and support areas.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Perimeter (LF):</td> <td style="width: 30%;">220</td> <td style="width: 20%;">Location:</td> <td style="width: 20%;">National</td> </tr> <tr> <td>Total Floor Area (SF):</td> <td>3,024</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>2</td> <td>Story Height (LF)</td> <td>20</td> </tr> <tr> <td></td> <td></td> <td>Rating:</td> <td>5625 GPM</td> </tr> </table> | Perimeter (LF): | 220 | Location: | National | Total Floor Area (SF): | 3,024 | Wage Rate: | Union | No. of Stories: | 2 | Story Height (LF) | 20 | | | Rating: | 5625 GPM |
| Perimeter (LF): | 220 | Location: | National | | | | | | | | | | | | | | | |
| Total Floor Area (SF): | 3,024 | Wage Rate: | Union | | | | | | | | | | | | | | | |
| No. of Stories: | 2 | Story Height (LF) | 20 | | | | | | | | | | | | | | | |
| | | Rating: | 5625 GPM | | | | | | | | | | | | | | | |

Attachment 6 – OSF Plant Model Descriptions

| Model No. | Model Name | Model Description |
|-----------|---|--|
| N40 | Chilled Water Plant - 9,000T Centrifugal Chiller | <p>Plants used to produce centralized chilled water for installation-wide industrial processes or personal comfort cooling. The design of this model is based on a 9,000 Ton Centrifugal chiller plant made up of 6-1500 Ton centrifugal chillers. The model is a 10,000 square foot 1 story building. The structure is steel frame, metal sandwiched exterior, with a metal roof.</p> <p style="margin-left: 40px;">Perimeter (LF): 450 Location: National Total Floor Area (SF): 10,000 Wage Rate: Union No. of Stories: 1 Story Height (Ft): 14</p> |
| N41 | Chilled Water Plant - 9,960T Absorption Chiller | <p>Plants used to produce centralized chilled water for installation-wide industrial processes or personal comfort cooling. The design of this model is based on a 9,960 Ton steam absorption chiller plant made up of 6-1660 Ton steam absorption chillers. The model is a 10,000 square foot 1 story building. The structure is steel frame, metal sandwiched exterior, with a metal roof.</p> <p style="margin-left: 40px;">Perimeter (LF): 450 Location: National Total Floor Area (SF): 10,000 Wage Rate: Union No. of Stories: 1 Story Height (Ft): 14</p> |
| N42 | Base Bldg. Steam Plant | <p>This model is a base design/shell structure for either a gas or oil fired steam plant. The model is a 4 story, 75,000 steel frame structure with metal siding. The basis of the shell is the N7 Height Bay facility. The user must add the appropriate number and size of the boilers to complete the design of the steam generating facility</p> <p style="margin-left: 40px;">Perimeter (LF): 700 Location: National Total Floor Area (SF): 74,050 Wage Rate: Union No. of Stories: 4 Story Height (Ft): 17.5</p> |
| N43 | Steam Plant (Coal) | <p>Coal-fired boilers used to produce steam or high temperature water for installation-wide distribution for industrial or personal comfort purposes. The model is a 4 story, 75,000 steel frame structure with metal siding. The basis of the shell is the N7 Height Bay facility. The model includes 250,000 Lb/Hr boilers, coal handling systems, chemical treatment systems and all necessary controls and instrumentation.</p> <p style="margin-left: 40px;">Perimeter (LF): 700 Location: National Total Floor Area (SF): 74,050 Wage Rate: Union No. of Stories: 4 Story Height (Ft): 17.5</p> |
| N44 | Steam Plant (Gas) | <p>Gas-fired boilers used to produce steam or high temperature water for installation-wide distribution for industrial or personal comfort purposes. The model is a 4 story, 75,000 steel frame structure with metal siding. The basis of the shell is the N7 Height Bay facility. The model includes 250,000 Lb/Hr boilers, gas piping systems, chemical treatment systems and all necessary controls and instrumentation.</p> <p style="margin-left: 40px;">Perimeter (LF): 700 Location: National Total Floor Area (SF): 74,050 Wage Rate: Union No. of Stories: 4 Story Height (Ft): 17.5</p> |

Attachment 6 (cont.) – OSF Plant Model Descriptions

| Model No. | Model Name | Model Description | | | | | | | | | | | | |
|------------------------|-----------------------------------|---|-----------------|-------|-----------|----------|------------------------|--------|------------|-------|-----------------|---|--------------------|--------|
| N45 | Steam Plant (Oil) | <p>Oil-fired boilers used to produce steam or high temperature water for installation-wide distribution for industrial or personal comfort purposes. The model is a 4 story, 75,000 steel frame structure with metal siding. The basis of the shell is the N7 Height Bay facility. The model includes 250,000 Lb/Hr boilers, oil storage tanks, chemical treatment systems and all necessary controls and instrumentation.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Perimeter (LF):</td> <td style="width: 33%;">700</td> <td style="width: 33%;">Location:</td> <td>National</td> </tr> <tr> <td>Total Floor Area (SF):</td> <td>74,050</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>4</td> <td>Story Height (Ft):</td> <td>17.5</td> </tr> </table> | Perimeter (LF): | 700 | Location: | National | Total Floor Area (SF): | 74,050 | Wage Rate: | Union | No. of Stories: | 4 | Story Height (Ft): | 17.5 |
| Perimeter (LF): | 700 | Location: | National | | | | | | | | | | | |
| Total Floor Area (SF): | 74,050 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 4 | Story Height (Ft): | 17.5 | | | | | | | | | | | |
| N46 | Base Treatment Plant Bldg. | <p>This model is a generic design plant shell that can be used for primary, secondary and tertiary sewage treatment and for water treatment. The model must be modified to include the appropriate treatment equipment and building square footage, perimeter and story height. The model is a 1 story structure with metal siding.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Perimeter (LF):</td> <td style="width: 33%;">1,150</td> <td style="width: 33%;">Location:</td> <td>National</td> </tr> <tr> <td>Total Floor Area (SF):</td> <td>75,000</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (Ft):</td> <td>14 ft.</td> </tr> </table> | Perimeter (LF): | 1,150 | Location: | National | Total Floor Area (SF): | 75,000 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (Ft): | 14 ft. |
| Perimeter (LF): | 1,150 | Location: | National | | | | | | | | | | | |
| Total Floor Area (SF): | 75,000 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (Ft): | 14 ft. | | | | | | | | | | | |

Attachment 7

Other Structures and Facilities (OSF) System Models

These OSF systems cover the distribution, storage and transmission of water, sewage, storm water, gas, electricity, steam and chilled cooling services. In addition fencing, industrial gases and roads and pavements are included in this list. These models are based on RS Means Assembly and Unit Cost books and require the model users to have accurate information on the number, size and length of these distribution and support systems. The CostWorks Workbook provides guidance on how to create these models including an exercise for you to follow. The estimator should rely on the RS Means Assembly, Mechanical, Plumbing, Site Work and Landscape cost books and the Unit Cost Tab in CostWorks to develop these non-building OSF models. Some of these costs are referenced to the FIMS Usage Code in the RS Means descriptions.

| System | FIMS Usage Code: Title | Description (Unit of Measure) |
|---|----------------------------------|--|
| Chilled Water | | |
| | 5769 Towers | Cooling towers used in the production, processing or treatment of chilled water. (Tons) |
| | 5789 Cooling Ponds or Reservoirs | Cooling ponds or reservoirs used in the production, processing, or treatment of chilled water. (Sq. Ft) |
| | 8719 Other Chill Water Systems | Anything not in 8721 & 8731. |
| | 8721 Supply Piping | Piping used to move chill water from points of supply to consumption. (Linear Feet). The RSM assembly and unit cost books have many size pipes to choose from. |
| | 8731 Return Piping | Piping used to move chill water from points of supply to consumption. (Linear Feet). The RSM assembly and unit cost books have many size pipes to choose from. |
| Electric Transmission/Distribution | | |
| | 8929 Electric Cables, Primary | Primary cable (115 kV or above) distribution networks used to transmit electrical power. (Linear Miles) |
| | 8939 Electric Cables, Secondary | Secondary cable (2.4 to 114kV) distribution networks used to transmit electrical power. (Linear miles) |
| | 8949 Electric Cables, Tertiary | Tertiary cable (less than 2.4 kV) distribution networks used to transmit electrical power. (Linear Miles) |
| | 8961 Poles, Towers | Poles and towers used to support above ground electrical distribution cables. (Each) |
| | 8979 Substations | Substations used to set the voltage or other characteristics in the cable system and ensure electrical power will flow points of supply to demand in an efficient manner. (1000-Volt-Ampere) |
| | 8988 Power Transformers | Power transformers used to change the voltage or other characteristics in the cable system and ensure electrical power will flow from points of supply to demand in an efficient manner. (1000-Volt- Ampere) |
| | 8989 Distribution Transformers | Distribution transformers used to change primary distribution voltage to secondary voltage and ensure electrical power can flow between the points of supply to demand in an efficient manner. (1000-Volt-Ampere) |
| Fencing | | |
| | 2429 Fencing (Security) | Barriers used to provide physical security for an installation. This category includes fencing used in perimeter security external to buildings or other structures. (Linear Feet). Barriers also include security gates that control entry and exit of the site. (Each) |
| | 2439 Towers (Security) | Elevated guard towers used in providing physical security to an installation or a specific area at an installation. (Height) |

Attachment 7 (cont.)

Other Structures and Facilities (OSF) System Models

These OSF systems cover the distribution, storage and transmission of water, sewage, storm water, gas, electricity, steam and chilled cooling services. In addition fencing, industrial gases and roads and pavements are included in this list. These models are based on RS Means Assembly and Unit Cost books and require the model users to have accurate information on the number, size and length of these distribution and support systems. The CostWorks Workbook provides guidance on how to create these models including an exercise for you to follow. The estimator should rely on the RS Means Assembly, Mechanical, Plumbing, Site Work and Landscape cost books and the Unit Cost Tab in CostWorks to develop these non-building OSF models. Some of these costs are referenced to the FIMS Usage Code in the RS Means descriptions.

| System | FIMS Usage Code: Title | Description (Unit of Measure) |
|-------------------------|------------------------------------|---|
| Industrial Gases | | |
| 4322 | Tanks (Combustible Gases) | Tanks used to store combustible gases, other than natural gas, such as acetylene, butane, hydrogen, or propane. (Cubic Feet) |
| 4331 | Tanks (Process Gases) | Tanks used to store noncombustible process gases, such as carbon dioxide, compressed air, or nitrogen. (Cubic Feet) |
| 8328 | Piping (Combustible Gases) | Structures (normally piping) used to distribute other combustible gases, such as acetylene, butane, hydrogen, or propane. (Linear Feet) |
| 8339 | Piping (Industrial, process Gases) | Structures (normally piping) used to distribute other process gases, such as carbon dioxide, compressed air, or nitrogen. (Linear Feet) |
| Natural Gas | | |
| 8329 | Piping | Structures (normally pipes) used to distribute natural gas. (Linear Feet) There are various sizes and material pipe selections available in the Assembly and Mechanical unit cost books. |
| 8369 | Metering Stations | Structure where the amount of natural gas passing through the station is recorded. (Cubic Feet per Minute) |
| 8379 | Pumping Stations | Pumping or other support structures used to maintain the pressure or other characteristics in the piping system. These pumps ensure the natural gas will flow from points of supply to demand. This OSF is treated as a building in CostWorks. |
| Roads/Pavements | | |
| 1129 | Sidewalks | Paved paths used predominantly for walking or bicycling between two different locations. This category does not include the bridges and tunnels connecting such paths or paved structures used for driving. (Linear Feet) |
| 1729 | Primary Roads | Paved highways or major thoroughways used as the major arteries on large installations. These roads usually have higher speed limits than secondary paved roads. This category does not include bridges, tunnels, or parking areas. (Linear Miles) |
| 1739 | Secondary Roads | Paved secondary roads on which vehicles travel from the primary roads to their point of destination. These paved roads usually have moderate speed limits to accommodate the number of entry and exit points coupled with potential pedestrian traffic. This category does not include bridges, tunnels, or parking areas. (Linear Miles) |
| 1749 | Tertiary Roads (Unpaved) | Unpaved or unimproved roads. This category does not include bridges, tunnels, or parking areas. (Linear Miles) |
| 1289 | Parking (Aircraft) | Paved areas for parking aircraft. This category does not include runways or taxiways. (Square Yards) |
| 1789 | Parking (Vehicular) | Vehicular parking areas. (Square Yards) |
| 1239 | Taxiways | Paved strips of ground used to move aircraft between locations. This category does not include parking structures or runways. (Linear Feet) |
| 1229 | Runways | Paved strips of ground used for liftoff or landing of aircraft. This category does not include parking structures or taxiways. (Linear Feet) |
| 1279 | Helicopter Landing Pad | Paved areas used to land helicopters. (Square Yards) |

Attachment 7 (cont.)

Other Structures and Facilities (OSF) System Models

These OSF systems cover the distribution, storage and transmission of water, sewage, storm water, gas, electricity, steam and chilled cooling services. In addition fencing, industrial gases and roads and pavements are included in this list. These models are based on RS Means Assembly and Unit Cost books and require the model users to have accurate information on the number, size and length of these distribution and support systems. The CostWorks Workbook provides guidance on how to create these models including an exercise for you to follow. The estimator should rely on the RS Means Assembly, Mechanical, Plumbing, Site Work and Landscape cost books and the Unit Cost Tab in CostWorks to develop these non-building OSF models. Some of these costs are referenced to the FIMS Usage Code in the RS Means descriptions.

| System | FIMS Usage Code: Title | Description (Unit of Measure) |
|---|--|---|
| <i>Sewage Treatment</i> | | |
| | 5569 Septic Tanks | Settling tanks in which settled sludge is in immediate contact with sewage flowing through the tanks while solids are decomposed by anaerobic action. (Gallons) |
| | 4521 Tanks | Tanks used to store sewage prior to treatment. (Thousands of gallons) |
| | 8529 Piping, Gravity | Piping networks that use gravity to move sewage from points of generation to treatment, processing or disposal. (Linear Feet) CW has manholes costs that should be included in the piping costs. |
| | 8549 Piping, Pressure | Piping networks that use pressure or pumps to move sewage from points of generation to treatment, processing or disposal. (Linear Feet) CW has manholes costs that should be included in the piping costs. |
| | 8561 Lifting Stations | Pumping or other support structures used to maintain the flow or other characteristics in the network system. These pumps ensure the sewage will be transported between points of origination to processing or disposal. (Gallons per minute) |
| <i>Steam Generation & Distribution</i> | | |
| | 5819 Other Boilers | These boilers (not-gas, not oil, & not coal-fired boilers) are used to produce steam or high temperature water for installation-wide distribution for industrial or personal comfort purposes. (British Thermal Unit Per Hour) |
| | 8839 Piping, Supply Steam | Lines used to distribute steam. (Linear Feet) These lines may be insulated and of various sizes. |
| | 8849 Piping, Return (Steam Condensate) | Lines used to move steam/condensate from points of consumption to reprocessing. (Linear Feet) |
| | 8828 Piping, Supply (High Temperature Water) | Lines used to distribute high-temperature hot water. |
| | 8829 Piping, Return (Low Temperature Water) | Lines used to move high temperature – hot water from points of consumption to reprocessing. (Linear Feet) |
| <i>Storm Water</i> | | |
| | 4621 Tanks | Tanks used to store storm water prior to treatment. (Thousands of Gallons) |
| | 8629 Piping, Gravity | Piping networks that use gravity to move storm water from points of collection to treatment, processing, or disposal. (Linear Feet) |

Attachment 7 (cont.)

Other Structures and Facilities (OSF) System Models

These OSF systems cover the distribution, storage and transmission of water, sewage, storm water, gas, electricity, steam and chilled cooling services. In addition fencing, industrial gases and roads and pavements are included in this list. These models are based on RS Means Assembly and Unit Cost books and require the model users to have accurate information on the number, size and length of these distribution and support systems. The CostWorks Workbook provides guidance on how to create these models including an exercise for you to follow. The estimator should rely on the RS Means Assembly, Mechanical, Plumbing, Site Work and Landscape cost books and the Unit Cost Tab in CostWorks to develop these non-building OSF models. Some of these costs are referenced to the FIMS Usage Code in the RS Means descriptions.

| System | FIMS Usage Code: Title | Description (Unit of Measure) |
|------------------------|-------------------------------|--|
| Water, Potable | | |
| | 4121 Tanks, Gravity | Elevated water tanks that store potable water and depend on gravity to empty their water. These tanks do not require pumps to extract water from them. (Gallons) These components require manually inputting the total cost. |
| | 4161 Tanks, Pressure | Potable water tanks that require pumps or pressure to extract their water. (Gallons) These components may require that the total cost be inputted into CostWorks manually. |
| | 5169 Wells | Wells used to obtain potable water prior to it being distributed through the installation's piping systems or stored in an elevated or pressurized tank. (Gallons per minute) |
| | 8129 Piping | Piping used to move potable water. (Linear Feet) |
| Fire Protection | | |
| | 4141 Tanks, Gravity | Elevated water tanks that store fire protection water and depend on gravity to empty their water. These tanks do not require pumps to extract water from them. (Gallons) |
| | 4181 Tanks, Pressure | Fire protection water tanks that require pumps or pressure to extract their water (Gallons) |
| | 5181 Wells | Wells used to obtain fire protection water prior to it being distributed throughout the installation's piping systems or stored in an elevated or pressurized tank. (Gallons per minute). |
| | 8141 Piping | Piping used to move fire protection water. (Linear Feet) Other components to include are fire hydrants, and manholes. |
| | 8181 Pumping Stations | Pumps used to maintain the pressure or other characteristics in the piping system. These pumps ensure that fire protection water will flow from points of supply to demand. (Gallons per minute) |

Attachment 8 – Pantex Model Descriptions

| Model No. | Model Name | Model Description | | | | | | | | | | | | |
|------------------------|--|--|-----------------|-------|-----------|----------|------------------------|--------|------------|-------|-----------------|-----|-------------------|--------------|
| N36 | SNM Component Staging Facility | <p>The SNM Component Staging Facility is a 47,987 GSF cast-in-place concrete building. The perimeter is 1,041 LF and the height varies from 27ft to 11ft. There is a partial first floor of 10,300 SF. The majority of the exterior wall is 24" thick but there is a small area where it is 40" thick. The interior partitions are a mix of CIP and drywall. The foundation is a 1'-3" concrete mat foundation. There is a low entrance link building comprised of industrial type siding and metal roofing (there is also a PH with the same construction). The finishes are a combination of exposed structure and ACT ceilings with resinous flooring and acoustical wall panels. Heat is brought into the building by existing HP steam service. There are 11AHU's, two packaged dehumidifiers, 11 FCU's and a 130 Ton reciprocating chiller. The building is fully sprinkled.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Perimeter (LF):</td> <td style="width: 33%;">1,041</td> <td style="width: 33%;">Location:</td> <td>National</td> </tr> <tr> <td>Total Floor Area (SF):</td> <td>47,987</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>N/A</td> <td>Story Height (LF)</td> <td>N/A (VARIES)</td> </tr> </table> | Perimeter (LF): | 1,041 | Location: | National | Total Floor Area (SF): | 47,987 | Wage Rate: | Union | No. of Stories: | N/A | Story Height (LF) | N/A (VARIES) |
| Perimeter (LF): | 1,041 | Location: | National | | | | | | | | | | | |
| Total Floor Area (SF): | 47,987 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | N/A | Story Height (LF) | N/A (VARIES) | | | | | | | | | | | |
| N37 | Assembly Cell | <p>This facility comprises of a central single story 27ft wide corridor & storage "spine" constructed with 12" thick reinforced concrete retaining walls with counter forts and a steel roof deck with steel beam supports. Attached to this spine (two from the North and two from the south) are four single story reinforced concrete circular assembly cells each with a cantenary roof beneath approximately 20ft of fill. The cells have blast resistant entry doors. Each assembly cell contains the following reinforced concrete below grade support spaces; Mech. room; tooling staging; SNM staging; corridor; inert parts staging; equipment airlock; personnel corridor. At each end of the spine is a prefabricated building with insulated metal siding approximately 58ft long x 40ft wide containing the main mechanical and electrical rooms and an entrance ramp also constructed from a prefabricated structure approximately 56ft x 17ft.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Perimeter (LF):</td> <td style="width: 33%;">2,575</td> <td style="width: 33%;">Location:</td> <td>National</td> </tr> <tr> <td>Total Floor Area (SF):</td> <td>36,604</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF)</td> <td>N/A</td> </tr> </table> | Perimeter (LF): | 2,575 | Location: | National | Total Floor Area (SF): | 36,604 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF) | N/A |
| Perimeter (LF): | 2,575 | Location: | National | | | | | | | | | | | |
| Total Floor Area (SF): | 36,604 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF) | N/A | | | | | | | | | | | |
| N38 | High Explosive Subassembly Facility | <p>Single story complex comprising a central reinforced blast-proof concrete core containing 15 assembly bays and one vacuum chamber which are separated by a blast proof sand filled containment area. The central core is buried under compacted earth fill with erosion control. This central core is ringed by a 16 ft wide service corridor constructed from structural steel framing with a metal panel exterior closure & roofing system. The steel frame is specially reinforced at the entrance of each assembly bay to form a fragment shield. The entire structure is constructed off an nmat foundation. The facility is entered by a pre-fabricated ramp building.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Perimeter (LF):</td> <td style="width: 33%;">1,521</td> <td style="width: 33%;">Location:</td> <td>National</td> </tr> <tr> <td>Total Floor Area (SF):</td> <td>90,222</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF)</td> <td>16</td> </tr> </table> | Perimeter (LF): | 1,521 | Location: | National | Total Floor Area (SF): | 90,222 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF) | 16 |
| Perimeter (LF): | 1,521 | Location: | National | | | | | | | | | | | |
| Total Floor Area (SF): | 90,222 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF) | 16 | | | | | | | | | | | |
| N39 | High Explosive Machining Facility | <p>The HE Machining facility is a 49,600 GSF single story facility. The building is divided into the HE Machining facility (23,500 GSF) and the adjacent support area (26,100 GSF). The HE machining facility is comprised of eleven 600 SF lathe/milling rooms and one large equipment room. All the HE rooms are constructed of blast resistant concrete walls & slabs. The rooms are separated from a HE corridor by blast resistant CIP concrete vestibules and blast resistant doors. Each lathe/milling room contains an exterior door protected with blast resistant exit mazes. The HE machining facility is constructed on a 48" thick mat slab. Support areas and HE corridor are on a 6" slab. The HE corridor has a precast slab and beams. Support spaces are constructed of a CIP concrete deck with rib joists and concrete columns supported on caissons. The roof is a flat EPDM roof and the exteriors are EIFS finish on reinforced CIP concrete walls. Each lathe/milling room contains a full height removable access panel. Interior partitions are CMU or GWB partitions in the support areas and are blast resistant CIP concrete in the HE facility. There is 6,557 GSF prefab ramp building with metal siding and roofing.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Perimeter (LF):</td> <td style="width: 33%;">1,033</td> <td style="width: 33%;">Location:</td> <td>National</td> </tr> <tr> <td>Total Floor Area (SF):</td> <td>49,600</td> <td>Wage Rate:</td> <td>Union</td> </tr> <tr> <td>No. of Stories:</td> <td>1</td> <td>Story Height (LF)</td> <td>42</td> </tr> </table> | Perimeter (LF): | 1,033 | Location: | National | Total Floor Area (SF): | 49,600 | Wage Rate: | Union | No. of Stories: | 1 | Story Height (LF) | 42 |
| Perimeter (LF): | 1,033 | Location: | National | | | | | | | | | | | |
| Total Floor Area (SF): | 49,600 | Wage Rate: | Union | | | | | | | | | | | |
| No. of Stories: | 1 | Story Height (LF) | 42 | | | | | | | | | | | |

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