



Commercial Estimator Program

Worksheet Reference

September 2002



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Overview

This *Worksheet Reference* contains detailed instructions for the entry of information on the Commercial Estimator worksheet. Use the worksheet to collect information about buildings for Marshall & Swift's Commercial Program in the SwiftEstimator Suite.

The worksheet has several major divisions, each for a different type of information. These divisions correspond to the data entry screens in the Commercial Estimator, which are accessed using the following navigation links on the left side of the data entry screens:

General Information

Sections

- Building Data**
- Occupancies**
- Components**
- Additions**
- Remarks /
Notes**

This *Worksheet Reference* includes line by line instructions for entering information in each of the worksheet divisions. This includes guidelines for completing the following divisions of the worksheet:

- ?? General Information (page 3-3)
- ?? Occupancies (page 3-28)
- ?? Building Data (page 3-17)
- ?? Components (page 3-45)
- ?? Additions, Remarks and Notes (page 3-68)
- ?? Basement (page 3-71)

Worksheet Reference

The worksheet has three different types of areas to enter information:

?? **Individual Fields:** These have a field name followed by a line for you to write the information.

Example: The individual field for total floor area is:

Total Floor Area (sq. ft.) _____

?? **Data Entry Grids:** These are tables with several rows and several columns for entering sets of related data.

Example: The occupancy data entry grid is:

| Occ Code | Occupancy Name | % | Class * | Height | Quality ** |
|----------|----------------|---|---------|--------|------------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

You enter the information about one occupancy in each row of this grid, with the column headings indicating the specific data to enter (occupancy code, occupancy name, percentage of total floor area, construction class, story height and quality).

?? **Check Boxes:** These allow you to choose items to include in the estimate.

Example: The check boxes for basement fireproofing are:

Fireproofing Yes No

In the descriptions on the following pages, some of the field names have the word “Required” to indicate that the field is required for calculating your estimate.

General Information

General Information

Estimate ID _____

ZIP/Postal Code _____

Property Owner _____

Property Address _____

City _____

State/Province _____

Comment _____

Use this section of the worksheet to enter information about the owner, location and other identifying items about the building. The fields available in this section are:

- ?? **Estimate ID (Required):** Enter an ID to identify the estimate. This can be any type of data you want, and can have no more than 50 characters, including spaces.
- ?? **Property Owner:** Name of the owner of the property (no more than 50 characters including spaces).
- ?? **Property Address:** Street address of the building being analyzed (no more than 50 characters including spaces).
- ?? **City:** City of the building being analyzed (no more than 50 characters including spaces).
- ?? **State/Province:** State or province of the building being analyzed (no more than 30 characters including spaces).
- ?? **ZIP Code/Postal Code (Required):** 5-digit United States ZIP Code or 6-character Canadian Postal Code for the building being analyzed. This entry is a required field. Commercial Estimator uses the ZIP/Postal Code to determine the default local multiplier, region and climate for the cost report. The local multiplier adjusts the costs for a specific geographical location, and is taken by the Commercial Estimator from Section 99 of the *Marshall Valuation Service*. See page 3-4 for further information about entering Canadian Postal Codes.
- ?? **Comment:** You can use this field to enter any information desired, either to be printed in the reports or to be used when searching for estimates. It can have no more than 50 characters, including spaces. Note that this corresponds to the

Worksheet Reference

comment field in Commercial Estimator 4.0 (which was the only search field available in that earlier program version).

Except for ZIP/Postal Code, entry of information into these fields is optional (you do not have to make entries in them to produce a cost report).

Entering Canadian Postal Codes

In most areas of Canada, Commercial Estimator localizes costs using Local Multipliers based on the Postal Codes (see the Postal Code ranges listed below). However, it does not have Local Multipliers for all Postal Codes in Canada. If a Local Multiplier is not available for a given Postal Code, the message “Invalid ZIP/Postal Code” displays.

In areas outside of the Postal Code ranges listed below, you can enter one of the following standard Province and Territory Symbols to localize the costs using the Province or Territory average Local Multiplier:

AB 3-Alberta
BC 3-British Columbia
MB 3-Manitoba
NB 3-New Brunswick
NF 3-Newfoundland
NS 3-Nova Scotia
NT 3-Northwest Territories
NU 3-Nunavut
ON 3-Ontario
PE 3-Prince Edward Island
QC 3-Quebec
SK 3-Saskatchewan
YT 3-Yukon

The following list contains the Postal Code ranges for which Commercial Estimator has Local Multipliers in Canada. You can enter any Postal Code within a range. For example, in the first range, you can enter A0A0A0, A0B6F2 or A0C9Z9. If the Postal Code of the building is not in one of the ranges below, you can use one of the Province/Territory Symbols listed above.

| Lower Postal Code | Upper Postal Code | Area of Local Multiplier |
|--------------------------|--------------------------|---------------------------------|
| A0A 0A0 | A0C 9Z9 | Newfoundland Average |
| A0E 0A0 | A0E 9Z9 | Newfoundland Average |
| A0G 0A0 | A0H 9Z9 | Newfoundland Average |
| A0J 0A0 | A0N 9Z9 | Newfoundland Average |
| A0P 0A0 | A0P 9Z9 | Newfoundland Average |

| Lower Postal Code | Upper Postal Code | Area of Local Multiplier |
|-------------------|-------------------|--------------------------|
| A0R 0A0 | A0R 9Z9 | Newfoundland Average |
| A1A 0A0 | A1S 9Z9 | St. Johns |
| A1V 0A0 | A1V 9Z9 | Gander |
| A1W 1A1 | A1Y 1C6 | St. Johns |
| A2A 1A1 | A2B 1K5 | Gander |
| A2H 0A0 | A2N 9Z9 | Corner Brook |
| A2V 1A1 | A2V 2Y9 | Sept Iles |
| B0A 0A0 | B0A 9Z9 | Cape Breton |
| B0B 0A0 | B0W 9Z9 | Nova Scotia Average |
| B1A 0A0 | B2A 9Z9 | Sydney |
| B2C 0A0 | B2H 9Z9 | New Glasgow |
| B2J 1A1 | B2N 9Z9 | Truro |
| B2T 0A0 | B3G 9Z9 | Dartmouth |
| B3H 0A0 | B4G 9Z9 | Halifax |
| B4H 1A1 | B4H 4V8 | Moncton |
| B4N 1A1 | B4V 4B8 | Bridgewater |
| B5A 1A1 | B5A 4S7 | Yarmouth |
| C0A 0A0 | C0B 9Z9 | Charlottetown |
| C1A 0A0 | C1N 9Z9 | Charlottetown |
| E1A 0A0 | E1G 9Z9 | Moncton |
| E1N 0A0 | E1N 9Z9 | North Shore Area |
| E1V 4A9 | E1V 4G4 | Moncton |
| E1V 4G6 | E1V 5J1 | Bathurst |
| E1V 5J3 | E1V 5J4 | Moncton |
| E1V 5J5 | E1V 7L8 | Bathurst |
| E1V 7L9 | E1V 7M5 | Moncton |
| E1V 7M6 | E1V 7N1 | Bathurst |
| E1V 7N2 | E1V 7N3 | Moncton |
| E1V 7N4 | E2A 7S2 | Bathurst |
| E2H 0A0 | E2P 9Z9 | St. John |
| E3A 0A0 | E3L 9Z9 | Fredericton |
| E3V 0A0 | E3Z 9Z9 | Edmundston |
| E4A 1A1 | E4E 3H1 | St. John |
| E4E 3H2 | E4E 3H3 | Moncton |
| E4E 3H4 | E4E 3Y2 | St. John |
| E4E 3Y3 | E4E 3Y3 | Moncton |
| E4E 3Y4 | E4E 4C2 | St. John |
| E4E 4C3 | E4E 4C5 | Moncton |
| E4E 4C6 | E4E 4C8 | St. John |
| E4E 4C9 | E4E 4C9 | Moncton |
| E4E 4E1 | E4E 4J3 | St. John |
| E4E 4J4 | E4E 4L8 | Moncton |

Worksheet Reference

| Lower Postal Code | Upper Postal Code | Area of Local Multiplier |
|-------------------|-------------------|--------------------------|
| E4E 4L9 | E4E 4V8 | St. John |
| E4E 4V9 | E4E 4Y3 | Moncton |
| E4E 4Y4 | E4E 4Z3 | St. John |
| E4E 4Z4 | E4E 5C6 | Moncton |
| E4E 5C7 | E4E 5T3 | St. John |
| E4E 5T4 | E4E 5T4 | Moncton |
| E4E 5T5 | E4G 4J2 | St. John |
| E4H 1A2 | E4R 5Z2 | Moncton |
| E4S 1A1 | E4Z 6L6 | St. John |
| E5A 1A1 | E5B 3V3 | Fredericton |
| E5C 1A1 | E5K 4W5 | St. John |
| E5L 1A1 | E5L 2W5 | Fredericton |
| E5M 1A1 | E5N 8J1 | St. John |
| E5P 1A1 | E5P 4L5 | Sydney |
| E5R 1A1 | E5V 1W6 | St. John |
| E7A 1A1 | E7E 2T6 | Edmundston |
| E7G 1A1 | E7P 3M9 | Fredericton |
| E8A 1A1 | E8B 2C1 | Edmundston |
| E8C 1A1 | E9H 2C1 | Bathurst |
| G0A 0A0 | G0C 9Z9 | Quebec Average |
| G0E 0C0 | G0E 9Z9 | Quebec Average |
| G0G 0A0 | G0H 9Z9 | Quebec Average |
| G0J 0A0 | G0N 9Z9 | Quebec Average |
| G0P 0A0 | G0P 9Z9 | Quebec Average |
| G0R 0A0 | G0T 9Z9 | Quebec Average |
| G0V 1A0 | G0V 1B0 | Jonquiere |
| G0V 1C0 | G0V 1C0 | Chicoutimi |
| G0V 1G0 | G0V 1H0 | Quebec |
| G0V 1J0 | G0V 1L0 | Chicoutimi |
| G0V 1M0 | G0V 1M0 | Jonquiere |
| G0V 1N0 | G0V 1T0 | Chicoutimi |
| G0W 0B0 | G0Z 9Z9 | Quebec Average |
| G1A 0A0 | G3Z 9Z9 | Quebec |
| G4A 1A1 | G4A 1L1 | Chicoutimi |
| G4R 0A0 | G4S 9Z9 | Sept Iles |
| G4W 1A1 | G4Z 3B3 | Rimouski |
| G5A 1A2 | G5A 3G1 | Chicoutimi |
| G5B 0A0 | G5R 9Z9 | Rimouski |
| G5T 1A1 | G5T 2K2 | Edmundston |
| G5V 1A1 | G6A 1L6 | Quebec |
| G6B 1A1 | G6B 3J6 | Sherbrooke |
| G6C 1A1 | G6H 2N6 | Quebec |

| Lower Postal Code | Upper Postal Code | Area of Local Multiplier |
|-------------------|-------------------|--------------------------|
| G6J 1A1 | G6L 3T7 | Trois-Rivieres |
| G6L 3T8 | G6L 4K5 | Drummondville |
| G6L 4K6 | G6L 4K6 | Trois-Rivieres |
| G6L 4K7 | G6L 5A2 | Drummondville |
| G6L 5A3 | G6L 5A3 | Trois-Rivieres |
| G6L 5A4 | G6L 5G7 | Drummondville |
| G6L 5G8 | G6L 5G8 | Trois-Rivieres |
| G6L 5G9 | G6T 1W9 | Drummondville |
| G6V 1A1 | G7A 5E4 | Quebec |
| G7B 0A0 | G7K 9Z9 | Chicoutimi |
| G7N 0A0 | G8P 9Z9 | Jonquiere |
| G8T 0A0 | G9X 9Z9 | Trois-Rivieres |
| H1A 0A0 | H5Z 9Z9 | Montreal |
| H7A 0A0 | H7Z 9Z9 | Laval |
| H8N 1A1 | H8T 3P7 | Montreal |
| H8Y 1A1 | H8Z 3C7 | Laval |
| H8Z 3C8 | H8Z 3C8 | Montreal |
| H8Z 3C9 | H8Z 3E8 | Laval |
| H8Z 3E8 | H8Z 3E8 | Montreal |
| H8Z 3G1 | H8Z 3G4 | Laval |
| H8Z 3G5 | H8Z 3G5 | Montreal |
| H8Z 3G6 | H9A 1L9 | Laval |
| H9A 1M1 | H9A 1M1 | Montreal |
| H9A 1M2 | H9B 3J5 | Laval |
| H9B 3J6 | H9B 3K9 | Montreal |
| H9C 1A1 | H9K 1P3 | Laval |
| H9P 0A0 | H9S 9Z9 | Montreal |
| H9T 0A0 | H9X 9Z9 | Laval |
| J0A 0A0 | J0C 9Z9 | Quebec Average |
| J0E 0A0 | J0E 9Z9 | Quebec Average |
| J0G 0A0 | J0H 9Z9 | Quebec Average |
| J0J 0A0 | J0N 9Z9 | Quebec Average |
| J0P 0B0 | J0P 9Z9 | Quebec Average |
| J0R 0A0 | J0T 9Z9 | Quebec Average |
| J0V 0A0 | J0Z 9Z9 | Quebec Average |
| J1A 0A0 | J1X 9Z9 | Sherbrooke |
| J1Z 0A0 | J2E 9Z9 | Drummondville |
| J2G 1A1 | J2N 3E4 | Granby |
| J2S 1A1 | J2T 5C1 | St. Hyacinthe |
| J2W 1A1 | J3E 2M4 | Montreal |
| J3G 1A1 | J3H 4W1 | St. Hyacinthe |
| J3H 4W2 | J3H 4W4 | Montreal |

Worksheet Reference

| Lower Postal Code | Upper Postal Code | Area of Local Multiplier |
|--------------------------|--------------------------|---------------------------------|
| J3H 4W5 | J3H 6E9 | St. Hyacinthe |
| J3L 1A2 | J3L 6T8 | Montreal |
| J3M 1A1 | J3M 1S3 | St. Hyacinthe |
| J3N 1A1 | J3N 1T2 | Montreal |
| J3P 1A1 | J3R 5S3 | Sorel |
| J3T 1A1 | J3T 2A7 | Trois-Rivieres |
| J3V 1A1 | J3V 6L8 | Montreal |
| J3X 1A1 | J3X 7Y6 | Laval |
| J3Y 1A1 | J5R 6H5 | Montreal |
| J5V 1A1 | J5V 3A8 | Sorel |
| J5W 1A1 | J5X 4V3 | Laval |
| J5Y 1A2 | J6E 9B9 | Joilette |
| J6J 1A1 | J6R 2P7 | Montreal |
| J6S 1A1 | J6S 1B1 | Lancaster |
| J6S 1B3 | J6S 1B3 | Laval |
| J6S 1B4 | J6S 1C3 | Lancaster |
| J6S 1C4 | J6S 1C4 | Laval |
| J6S 1C5 | J6S 2H7 | Lancaster |
| J6S 2H8 | J6S 2H8 | Laval |
| J6S 2H9 | J6S 2M6 | Lancaster |
| J6S 2M7 | J6S 2M7 | Laval |
| J6S 2M8 | J6S 3E8 | Lancaster |
| J6S 3E9 | J6S 3G1 | Montreal |
| J6S 3G2 | J6S 4A7 | Lancaster |
| J6S 4A8 | J6S 4A9 | Montreal |
| J6S 4B1 | J6S 4Z2 | Lancaster |
| J6S 4Z3 | J6S 4Z3 | Montreal |
| J6S 4Z4 | J6T 6M9 | Lancaster |
| J6V 1A1 | J7B 1W1 | Laval |
| J7C 1A1 | J7C 5T3 | St. Jerome |
| J7E 1A1 | J7H 1S2 | Laval |
| J7J 1A1 | J7J 2K1 | St. Jerome |
| J7K 1A1 | J7M 2C1 | Laval |
| J7N 1C9 | J7N 5A1 | St. Jerome |
| J7P 1A2 | J7V 8P2 | Laval |
| J7V 8P3 | J7V 8P3 | St. Jerome |
| J7V 8P4 | J7V 9M9 | Laval |
| J7X 1A1 | J7X 1N5 | Lancaster |
| J7Y 1A1 | J8H 4N7 | St. Jerome |
| J8L 1A1 | J8M 2E4 | Ottawa |
| J8N 1A1 | J8N 7X5 | Hull |
| J8N 9A1 | J8N 9H3 | Ottawa |

| Lower Postal Code | Upper Postal Code | Area of Local Multiplier |
|-------------------|-------------------|--------------------------|
| J8N 9H4 | J8N 9H4 | Hull |
| J8N 9H5 | J8R 3S6 | Ottawa |
| J8T 0A0 | J9A 9Z9 | Hull |
| J9P 0A0 | J9T 9Z9 | Val d'Or |
| J9X 0A0 | J9Z 9Z9 | Rouyn-Noranda |
| K0A 0A0 | K0C 9Z9 | Ontario Average |
| K0E 0A0 | K0E 9Z9 | Ontario Average |
| K0G 0A0 | K0H 9Z9 | Ontario Average |
| K0J 0B0 | K0M 9Z9 | Ontario Average |
| K1A 0A0 | K4R 9Z9 | Ottawa |
| K6A 1A1 | K6K 1W5 | Lancaster |
| K6V 0A0 | K7A 9Z9 | Brockville |
| K7C 1A1 | K7C 4T2 | Hull |
| K7G 1A1 | K7G 3G3 | Kingston |
| K7H 1A1 | K7H 3R2 | Brockville |
| K7K 0A0 | K7P 9Z9 | Kingston |
| K7R 1A1 | K7R 4C2 | Belleville |
| K7S 1A1 | K8H 3P9 | Hull |
| K8N 0A0 | K8R 9Z9 | Belleville |
| K8V 0A0 | K8V 9Z9 | Trenton |
| K9A 0A0 | K9L 9Z9 | Peterborough |
| K9V 0A0 | K9V 9Z9 | Lindsay |
| L0A 0A0 | L0C 9Z9 | Ontario Average |
| L0E 0A0 | L0E 9Z9 | Ontario Average |
| L0G 0A0 | L0H 9Z9 | Ontario Average |
| L0J 0A0 | L0N 9Z9 | Ontario Average |
| L0P 0B0 | L0S 9Z9 | Ontario Average |
| L1A 1A1 | L1A 4K2 | Peterborough |
| L1B 0A0 | L1Z 9Z9 | Oshawa |
| L2A 0A0 | L2J 9Z9 | Niagara Falls |
| L2M 0A0 | L3C 9Z9 | St. Catharines |
| L3K 1A2 | L3K 6C9 | Niagara Falls |
| L3M 1A1 | L3M 5N2 | Hamilton |
| L3P 1A1 | L3T 7W9 | Toronto |
| L3V 0A0 | L3V 9Z9 | Orillia |
| L3X 1A4 | L3Y 8T6 | Toronto |
| L3Z 1A1 | L3Z 3C5 | Barrie |
| L4A 1A1 | L4G 7N5 | Toronto |
| L4H 1A1 | L4H 2N3 | Brampton |
| L4J 1A1 | L4K 5P6 | Toronto |
| L4L 1A5 | L4L 9M2 | Brampton |
| L4M 0A0 | L4R 9Z9 | Barrie |

Worksheet Reference

| Lower Postal Code | Upper Postal Code | Area of Local Multiplier |
|--------------------------|--------------------------|---------------------------------|
| L4S 1A1 | L4S 2M5 | Toronto |
| L4T 1A1 | L4W 5M8 | Brampton |
| L4X 1A1 | L4X 3A2 | Toronto |
| L4Y 1A1 | L5C 4S9 | Brampton |
| L5E 1A1 | L5G 4T6 | Toronto |
| L5H 1A1 | L5W 1L6 | Brampton |
| L6A 1A1 | L6G 1C7 | Toronto |
| L6H 1A1 | L6H 6Z8 | Hamilton |
| L6J 1A1 | L6J 7W6 | Brampton |
| L6K 1A2 | L6M 4C4 | Hamilton |
| L6P 0A0 | L7A 9Z9 | Brampton |
| L7B 1A1 | L7B 1M1 | Toronto |
| L7C 1A1 | L7G 6E9 | Brampton |
| L7J 1A1 | L7J 2Y4 | Guelph |
| L7L 0A0 | L9K 9Z9 | Hamilton |
| L9L 1A1 | L9L 1T4 | Oshawa |
| L9M 1A3 | L9N 1R9 | Barrie |
| L9P 1A1 | L9P 1X5 | Oshawa |
| L9R 1A1 | L9S 4V9 | Barrie |
| L9T 1A1 | L9T 5J2 | Hamilton |
| L9V 1A1 | L9W 5H3 | Guelph |
| L9Y 1A1 | L9Y 5A4 | Barrie |
| M1A 0A0 | M9Z 9Z9 | Toronto |
| N0A 0C0 | N0C 9Z9 | Ontario Average |
| N0E 0A0 | N0E 9Z9 | Ontario Average |
| N0G 0A0 | N0H 9Z9 | Ontario Average |
| N0J 0A0 | N0M 9Z9 | Ontario Average |
| N0P 0A0 | N0P 9Z9 | Ontario Average |
| N0R 0A0 | N0R 9Z9 | Ontario Average |
| N1A 1A1 | N1A 3G8 | Hamilton |
| N1C 0A0 | N1M 9Z9 | Guelph |
| N1P 0A0 | N1Z 9Z9 | Cambridge |
| N2A 0A0 | N2H 9Z9 | Kitchener |
| N2J 0A0 | N2L 9Z9 | Waterloo |
| N2M 0A0 | N2R 9Z9 | Kitchener |
| N2T 0A0 | N2V 9Z9 | Waterloo |
| N2Z 1A1 | N2Z 3B9 | Owen Sound |
| N3B 1A1 | N3B 3L3 | Waterloo |
| N3C 0A0 | N3H 9Z9 | Cambridge |
| N3L 0A0 | N3V 9Z9 | Brantford |
| N3W 1A1 | N3W 2N4 | Hamilton |
| N3Y 1A1 | N4G 5V7 | Brantford |

| Lower Postal Code | Upper Postal Code | Area of Local Multiplier |
|-------------------|-------------------|--------------------------|
| N4K 0A0 | N4N 9Z9 | Owen Sound |
| N4S 1A1 | N4V 8S3 | Kitchener |
| N4W 1A1 | N4W 3V5 | Waterloo |
| N4Z 1A1 | N5A 7Z8 | Waterloo |
| N5C 0A0 | N7G 9Z9 | London |
| N7L 0A0 | N8A 9Z9 | Sarnia |
| N8H 0A0 | N9Y 9Z9 | Windsor |
| P0A 0A0 | P0C 9Z9 | Ontario Average |
| P0E 0E0 | P0E 9Z9 | Ontario Average |
| P0G 0A0 | P0H 9Z9 | Ontario Average |
| P0J 0A0 | P0M 9Z9 | Ontario Average |
| P0N 1A0 | P0N 1K0 | Timmins |
| P0P 0A0 | P0P 9Z9 | Ontario Average |
| P0R 0A0 | P0T 9Z9 | Ontario Average |
| P0V 0B0 | P0Y 9Z9 | Ontario Average |
| P1A 0A0 | P1C 9Z9 | North Bay |
| P1H 1A1 | P2A 3C2 | Orillia |
| P2N 1A1 | P2N 3S2 | Rouyn-Noranda |
| P3A 0A0 | P3N 9Z9 | Sudbury |
| P3P 1A1 | P3P 1S2 | North Bay |
| P3P 1S3 | P3P 1S8 | Sudbury |
| P3P 1S9 | P3P 1Z2 | North Bay |
| P3Y 1A1 | P3Y 1P9 | Sudbury |
| P4N 0A0 | P4R 9Z9 | Timmins |
| P5A 1A1 | P5A 3T1 | Sault Ste. Marie |
| P5E 1A1 | P5E 1T3 | Sudbury |
| P5N 1A1 | P5N 3J6 | Timmins |
| P6A 0A0 | P6C 9Z9 | Sault Ste. Marie |
| P7A 0A0 | P8T 9Z9 | Thunder Bay |
| R0A 0B0 | R0C 9Z9 | Manitoba Average |
| R0E 0A0 | R0E 9Z9 | Manitoba Average |
| R0G 0A0 | R0H 9Z9 | Manitoba Average |
| R0J 0A0 | R0M 9Z9 | Manitoba Average |
| R1A 0A0 | R6W 9Z9 | Winnipeg |
| R7A 0A0 | R7N 9Z9 | Brandon |
| R8N 0A0 | R9A 9Z9 | Thompson |
| S0A 0A0 | S0C 9Z9 | Saskatchewan Average |
| S0E 0A0 | S0E 9Z9 | Saskatchewan Average |
| S0G 0A0 | S0H 9Z9 | Saskatchewan Average |
| S0J 0A0 | S0N 9Z9 | Saskatchewan Average |
| S0P 0A0 | S0P 9Z9 | Saskatchewan Average |
| S4N 0A0 | S4Z 9Z9 | Regina |

Worksheet Reference

| Lower Postal Code | Upper Postal Code | Area of Local Multiplier |
|-------------------|-------------------|--------------------------|
| S6H 0A0 | S6K 9Z9 | Moose Jaw |
| S6V 0A0 | S6X 9Z9 | Prince Albert |
| S7H 0A0 | S8Z 9Z9 | Saskatoon |
| S9A 0A0 | S9X 9Z9 | North Battleford |
| T0A 0A0 | T0C 9Z9 | Alberta Average |
| T0E 0A0 | T0E 9Z9 | Alberta Average |
| T0G 0A0 | T0H 9Z9 | Alberta Average |
| T0J 0A0 | T0M 9Z9 | Alberta Average |
| T0P 0B0 | T0P 9Z9 | Alberta Average |
| T1A 0A0 | T1C 9Z9 | Medicine Hat |
| T1G 0A0 | T1M 9Z9 | Lethbridge |
| T1P 1A1 | T1P 1T8 | Calgary |
| T1R 0A1 | T1R 1L1 | Lethbridge |
| T1V 0A0 | T4B 9Z9 | Calgary |
| T4C 0A0 | T4S 9Z9 | Red Deer |
| T4V 0A0 | T6Z 9Z9 | Edmonton |
| T7A 1A1 | T7A 2A3 | Red Deer |
| T7E 1A1 | T7E 1Y3 | Grande Prairie |
| T7N 1A1 | T7S 1V7 | Edmonton |
| T7V 1A2 | T7V 2E8 | Grande Prairie |
| T7X 1A1 | T8R 1T3 | Edmonton |
| T8S 0A0 | T8X 9Z9 | Grande Prairie |
| T9A 0A1 | T9K 5A7 | Edmonton |
| T9M 1A1 | T9N 2P1 | North Battleford |
| T9S 1A1 | T9S 3A3 | Edmonton |
| T9V 0A1 | T9X 2C1 | North Battleford |
| V0A 0A0 | V0B 9Z9 | Cranbrook |
| V0C 0A0 | V0C 9Z9 | Prince George |
| V0E 0A0 | V0G 9Z9 | Kamloops |
| V0H 0A0 | V0H 9Z9 | Penticton |
| V0J 1A0 | V0J 1A0 | Prince Rupert |
| V0J 1E0 | V0J 1E0 | Prince George |
| V0J 1G0 | V0J 1J0 | Grande Prairie |
| V0J 1K0 | V0J 1K0 | Prince Rupert |
| V0J 1L0 | V0J 1W0 | Prince George |
| V0J 1X0 | V0J 2A0 | Prince Rupert |
| V0J 2B0 | V0J 2C0 | Prince George |
| V0J 2E0 | V0J 2E0 | Grande Prairie |
| V0J 2G0 | V0J 2G0 | Prince George |
| V0J 2H0 | V0J 2J0 | Prince Rupert |
| V0J 2K0 | V0J 2K0 | Prince George |
| V0J 2N0 | V0J 2N0 | Prince Rupert |

| Lower Postal Code | Upper Postal Code | Area of Local Multiplier |
|-------------------|-------------------|--------------------------|
| V0J 2P0 | V0J 2V0 | Prince George |
| V0J 2W0 | V0J 2X0 | Prince Rupert |
| V0J 2Y0 | V0J 2Y0 | Prince George |
| V0J 2Z0 | V0J 2Z0 | Prince Rupert |
| V0J 3A0 | V0J 3C0 | Prince George |
| V0J 3E0 | V0J 3T0 | Prince Rupert |
| V0K 0A0 | V0K 9Z9 | Kamloops |
| V0L 0A0 | V0L 9Z9 | Prince George |
| V0N 0A0 | V0N 9Z9 | Vancouver |
| V0P 0A0 | V0P 9Z9 | Port Alberni |
| V0R 0A0 | V0R 9Z9 | Prince George |
| V0S 1L0 | V0S 1N0 | Victoria |
| V0T 1B0 | V0T 1B0 | Prince Rupert |
| V0T 1C0 | V0T 1H0 | Port Alberni |
| V0T 1J0 | V0T 1T0 | Prince Rupert |
| V0T 1V0 | V0T 1V0 | Kelowna |
| V0T 1W0 | V0V 1H0 | Prince Rupert |
| V0W 0A0 | V0W 9Z9 | Whitehorse |
| V0X 1C0 | V0X 1K0 | Penticton |
| V0X 1L0 | V0X 1L0 | Kamloops |
| V0X 1N0 | V0X 1R0 | Penticton |
| V0X 1T0 | V0X 1T0 | Vancouver |
| V0X 1W0 | V0X 1W0 | Penticton |
| V0X 1X0 | V0X 1X0 | Vancouver |
| V0X 2L0 | V0X 2L0 | Penticton |
| V1A 1A1 | V1A 3E9 | Cranbrook |
| V1B 1A1 | V1B 3X5 | Kelowna |
| V1C 0A0 | V1C 9Z9 | Cranbrook |
| V1E 1A1 | V1E 4S4 | Kelowna |
| V1G 1A1 | V1G 5A1 | Grande Prairie |
| V1H 1A1 | V1H 1Y1 | Kelowna |
| V1J 1A2 | V1J 7A3 | Grande Prairie |
| V1K 1A1 | V1K 1P9 | Kamloops |
| V1L 0A0 | V1L 9Z9 | Nelson |
| V1M 1A1 | V1M 4B2 | Vancouver |
| V1N 1A1 | V1N 4W2 | Trail |
| V1P 1A1 | V1P 1N1 | Kelowna |
| V1R 0A0 | V1R 9Z9 | Trail |
| V1S 0A0 | V1S 9Z9 | Kamloops |
| V1T 0A0 | V1Z 9Z9 | Kelowna |
| V2A 0A0 | V2A 9Z9 | Penticton |
| V2B 0A0 | V2E 9Z9 | Kamloops |

Worksheet Reference

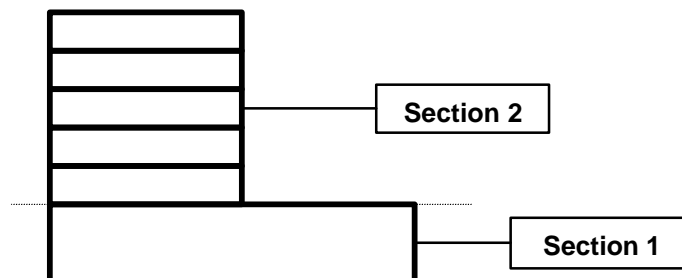
| Lower Postal Code | Upper Postal Code | Area of Local Multiplier |
|--------------------------|--------------------------|---------------------------------|
| V2G 1A1 | V2G 4V3 | Prince George |
| V2H 0A0 | V2H 9Z9 | Kamloops |
| V2J 0A0 | V2N 9Z9 | Prince George |
| V2P 0A0 | V7Z 9Z9 | Vancouver |
| V8A 1A1 | V8A 5V3 | Port Alberni |
| V8C 0A0 | V8J 9Z9 | Prince Rupert |
| V8K 1A1 | V8K 2X4 | Nanaimo |
| V8L 0A0 | V9E 9Z9 | Victoria |
| V9G 1A1 | V9K 2S5 | Port Alberni |
| V9L 1A1 | V9L 6X8 | Nanaimo |
| V9M 1A2 | V9N 9H9 | Port Alberni |
| V9P 0A0 | V9V 9Z9 | Nanaimo |
| V9W 1A1 | V9W 8E9 | Port Alberni |
| V9X 1A1 | V9X 1W9 | Nanaimo |
| V9Y 0A0 | V9Y 9Z9 | Port Alberni |
| X0A 0A0 | X0C 9Z9 | Yellowknife |
| X0D 0A0 | X0G 9Z9 | Yellowknife |
| X1A 0A0 | X1A 9Z9 | Yellowknife |
| Y0A 0A0 | Y0B 9Z9 | Whitehorse |
| Y1A 0A0 | Y1A 9Z9 | Whitehorse |

Sections

You enter the detailed information for the estimate in the “Section” portion of the worksheet. The term “section” is used because the Commercial Estimator allows the building or buildings in the estimate to be optionally divided into two or more sections. Each section can have one or more occupancies. In many estimates, you will have only one section. However, you can divide the building (or buildings) into sections in the following cases:

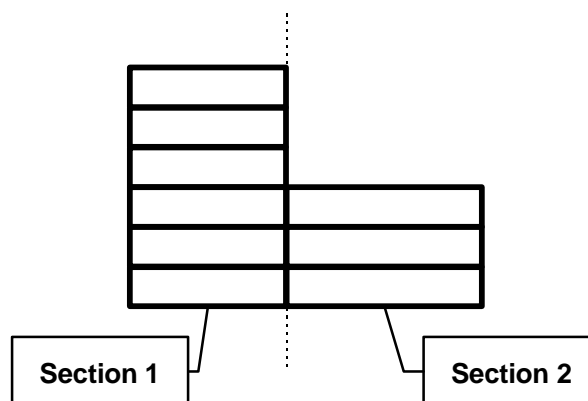
?? **Horizontal Sectioning:** When a building has setbacks (some floors are significantly larger than other floors), you can use one section for the lower floors and another section for the upper floors.

Example:



?? **Vertical Sectioning:** When a building has wings with different number of stories, you can use one section for the main part of the building and other sections for the other portions of the building.

Example:



?? **Multiple Buildings:** When you want a single report for two or more buildings, you can use a section for each building.

Worksheet Reference

You may use combinations of these cases. As a general rule, use a separate section to describe each homogeneous division of the building or each building in the estimate.

The data for each section is divided into three different parts on the worksheet, each corresponding to a different data entry screen:

- ?? **Building Data**, which includes size, height, shape, age and depreciation information.
- ?? **Occupancies**, which includes the occupancy (building use), class of construction, story height and quality.
- ?? **Components**, which includes the construction components for such construction systems as exterior walls, heating and cooling, sprinklers and elevators.
- ?? **Additions and Remarks**

These section items are the front and back of a page in the worksheet. This allows you to use a separate worksheet page for each section in the estimate.

Building Data

Building Data:

| | |
|---|---|
| Section Title _____ | |
| Total Floor Area (sq. ft.) _____ | Effective Age (years) _____ |
| Number of Stories: Section _____ | Combined Physical & Functional Dep % _____ |
| Building _____ | Physical Depreciation % _____ |
| Shape *** _____ | Functional Depreciation % _____ |
| or Perimeter (linear feet) _____ | External Depreciation % _____ |

Building Data consists of the following items:

- ?? Total Floor Area
- ?? Number of Stories
- ?? Shape or Perimeter
- ?? Effective Age
- ?? Depreciation Information

Total Floor Area

Total Floor Area (sq. ft.) _____

The total floor area of a section is the total area on all floors based on the building's exterior dimensions. When calculating total floor area, do not include any of the following: Basements, mezzanines, balconies, unfinished attics, exterior porches, decks, patios or garages.

When entering total floor area on the worksheet and into the program, do not include commas.

Example: The entry for 24,525 square feet is:

Total Floor Area (sq. ft.) 24525

Total floor area is required—you must enter it in each section of the estimate, except if the occupancy in the section is a non-building occupancy.

Number of Stories

Number of Stories: Section _____
 Building _____

Commercial Estimator has two fields for number of stories: the number of stories in the section of the building, and the total number of stories in the building. In many cases, these values will be the same. In such cases, you only need to enter the number of stories in the section—Commercial Estimator will automatically set the number of stories in the building to this value.

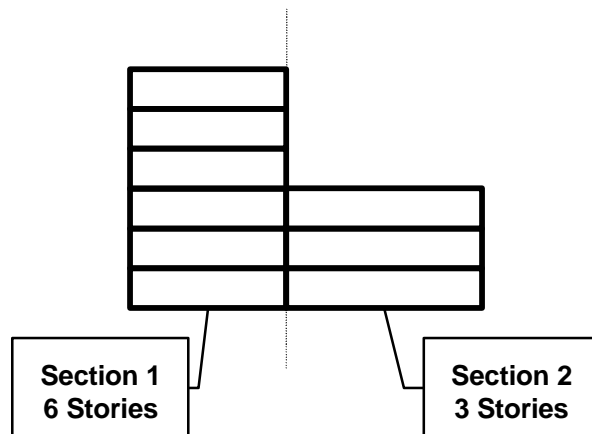
?? **Estimate with One Section:** If your estimate has only one section, enter its number of stories in “Number of Stories: Section” only.

Example: The entry for a building with 3 stories, entered as a single section, is:

Number of Stories: Section 3
 Building _____

?? **Vertically Sectioned Building:** If you vertically section a building, enter the number of stories in each section under “Number of Stories: Section.”

Example: A building that is part 6 stories and part 3 stories can be vertically sectioned as follows:



The entries for this building are:

Section 1:

Number of Stories: Section 6
 Building _____

Worksheet Reference

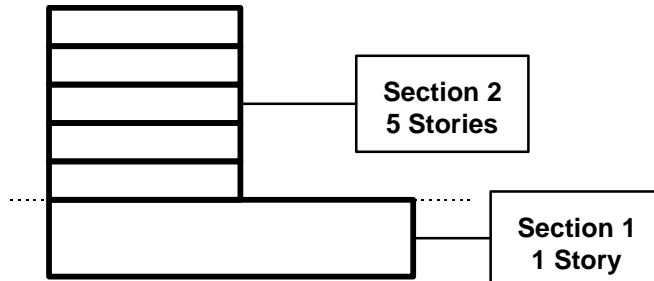
Section 2:

Number of Stories: Section 3

Building

?? **Horizontally Sectioned Building:** If you horizontally section a building, enter the number of stories in each section under “Number of Stories: Section,” and the total number of stories in the building under “Number of Stories: Building.”

Example: A building that has a one-story bank on the first floor (20' story height), and five stories of offices on the second through sixth stories (10' story height), is sectioned horizontally as follows:



The entries for this building are:

Section 1:

Number of Stories: Section 1

Building 6

Section 2:

Number of Stories: Section 5

Building 6

For a multistory building, the number of stories is used to adjust the costs for high-rise construction (by taking into consideration the additional framing required in multi-level buildings as well as the cost of raising material and labor to the upper floors).

Commercial Estimator requires a number of stories for the calculations.

Shape or Perimeter

Shape*** _____
 or Perimeter (linear feet) _____

Use these fields to enter one (but not both) of the following:

?? **Perimeter:** The total linear feet of wall that encloses the floor area (based on exterior dimensions).

If the perimeter varies in a multistory building, enter the average perimeter on this line when using one section.

Example: If a 10-story building has a perimeter of 660 feet on the first floor and 500 feet on the other 9 floors, the average perimeter is

$$\text{Average Perimeter} = \frac{660 \text{ feet} \times 1 \text{ story} + 500 \text{ feet} \times 9 \text{ stories}}{10 \text{ Stories}} = \frac{5,160 \text{ feet}}{10 \text{ Stories}} = 516 \text{ feet}$$

The entry for this perimeter is:

Shape*** _____
 or Perimeter (linear feet) 516

If you horizontally section this building with the first floor in section 1 and the other nine floors in section 2, the entries are:

Section 1:

Number of Stories: Section 1
 Building 10
 Shape*** _____
 or Perimeter (linear feet) 660

Section 2:

Number of Stories: Section 9
 Building 10
 Shape*** _____
 or Perimeter (linear feet) 500

Worksheet Reference

?? **Shape:** If you do not know the perimeter, you can enter one of the following shapes:



1=Square



2=Rectangular or Slightly Irregular



3=Irregular



4=Very Irregular

Whenever possible, it is best to enter the perimeter.

Commercial Estimator requires either the perimeter or the shape for the calculations.

Note: For shed buildings that typically have one open side (i.e., no wall on one side), you should enter the perimeter as the number of linear feet of the sides of the shed with walls (i.e., do not include the side with no wall). If you enter a shape for shed buildings, Commercial Estimator calculates the perimeter assuming only three walls. Given this, when entering wall components for such buildings, the wall percentages should total 100%, as explained on page 3-50.

Effective Age

Effective Age (years) _____

The effective age of a building is its age in years as compared with other buildings performing like functions. It is the actual age less any years that have been taken off by face-lifting, structural reconstruction, removal of functional inadequacies, etc.

Use the following steps to determine the effective age of a building:

- ?? Find the typical building life for the occupancy and quality of the building being valued using the “Typical Building Lives” table in the *Occupancy Reference* section of this *User Guide*.
- ?? Based on an evaluation of the building, its condition, construction quality, actual age and any renovations or repairs that have been made, estimate the number of years of “useful” life that remain.
- ?? Subtract the “remaining life” from the “typical building life” to obtain the effective age.

Example: The building being valued is an above average quality, Class C office building built 30 years ago. The following renovations and repairs have been completed:

- ?? The electrical system was replaced 10 years ago.
- ?? The heating plant was replaced 4 years ago.
- ?? The roof was repaired 8 years ago.
- ?? The interior was completely renovated 10 years ago, with new floor covering, wall finish and plumbing fixtures.

Based on the building's current condition and a subjective evaluation of the effect of these changes, you estimate that the remaining useful life of the office building is now 45 years. The typical building life (based on the table in the *Occupancy Reference*) is 55 years. Therefore, the effective age is:

| | | |
|-----------------------|-----|-----------------|
| Typical Building Life | 3- | 55 years |
| Remaining Useful Life | 3-- | <u>45</u> years |
| Effective Age | 3- | 10 years |

The entry of effective age is optional, except if you want Commercial Estimator to automatically calculate the Combined Physical and Functional Depreciation

Worksheet Reference

percentage. This calculation uses the Occupancy, Class and Quality to Set the Typical Life, then uses this in conjunction with the Effective Age to calculate the depreciation percentage using the depreciation table in Section 97 of the *Marshall Valuation Service* (see page 3-25 for further details):

Depreciation

Combined Physical & Functional Dep % _____
Physical Depreciation % _____
Functional Depreciation % _____
External Depreciation % _____

The Depreciation section of the worksheet allows you to set the Physical and/or Functional Depreciation Percentage for the section, together with the External Depreciation Percentage.

Physical & Functional Depreciation

Commercial Estimator has the following methods for setting Physical and Functional Depreciation for the section. The percentage set here is automatically applied to all components that you do not individually depreciate. Physical depreciation is the loss in value due to physical deterioration. Functional depreciation (or technical obsolescence) is the loss in value due to lack of utility or desirability of part or all of the property, inherent to the improvement or equipment. Thus, a new structure may suffer obsolescence when built.

The methods for setting Physical and Functional Depreciation are:

?? **Marshall & Swift Tables:** Use the section's Occupancy, Class and Quality to set the Typical Life, and use this with the Effective Age to set the combined Physical and Functional Depreciation Percentage using the depreciation table in Section 97 of the *Marshall Valuation Service*. To use this method, enter an Effective Age and do not enter either a Combined Physical and Functional Percentage or a separate Physical Percentage and Functional Percentage.

Example:

Effective Age (years) 10
Combined Physical & Functional Dep % _____
Physical Depreciation % _____
Functional Depreciation % _____
External Depreciation % _____

?? **Combined Physical and Functional Percentage:** Enter your own combined Physical and Functional Depreciation Percentages. To use this method, enter a percentage in the Combined Physical & Functional Dep % field.

Worksheet Reference

Example: The following sets the Combined Physical and Functional Depreciation Percentage to 25%:

Effective Age (years) 10
Combined Physical & Functional Dep % 25
Physical Depreciation % _____
Functional Depreciation % _____
External Depreciation % _____

?? **Separate Physical and Functional Percentages:** Enter your own separate Percentages for Physical and Functional Depreciation.

Example: The following sets the Physical Depreciation Percentage to 18% and the Functional Depreciation Percentage to 7%:

Effective Age (years) 10
Combined Physical & Functional Dep % _____
Physical Depreciation % 18
Functional Depreciation % 7
External Depreciation % _____

?? **None:** Do not set an overall depreciation percentage for the section (i.e., do not automatically depreciate any components). With this method you can, however, depreciate individual building components by entering a depreciation percentage or an age and life for them. To use this method, enter 0 for Combined Physical and Functional Depreciation.

Example:

Effective Age (years) 10
Combined Physical & Functional Dep % 0
Physical Depreciation % _____
Functional Depreciation % _____
External Depreciation % _____

For the methods that set a combined Physical and Functional Depreciation Percentage, the report contains a single line, "Physical & Functional."

Example:

| Units | Cost | Total |
|-------|------|-------|
|-------|------|-------|

| | | | |
|-----------------------|--------|-------|-----------|
| Replacement Cost New | 20,000 | 68.53 | 1,370,600 |
| Less Depreciation | | | |
| Physical & Functional | 12.5% | | 171,325 |
| Depreciated Cost | 20,000 | 59.96 | 1,199,275 |

For the method for which you set separate Physical and Functional Depreciation Percentages, the report contains a line for each depreciation type.

Example:

| | Units | Cost | Total |
|----------------------|--------|-------|-----------|
| Replacement Cost New | 20,000 | 68.53 | 1,370,600 |
| Less Depreciation | | | |
| Physical | 12.0% | | 164,472 |
| Functional | 7.5% | | 102,795 |
| Depreciated Cost | 20,000 | 55.17 | 1,103,333 |

External Depreciation

Use this field to enter a percentage for External depreciation (also called locational or economic obsolescence) , the loss in value due to causes outside the property and independent of it.

Occupancies

| Occ Code | Occupancy Name | % | Class * | Height | Quality ** |
|----------|----------------|---|---------|--------|------------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Occupancies consists of the following items:

- ?? Building's occupancy (building use), as an occupancy code, name and percentage
- ?? Construction class
- ?? Average Story height
- ?? Quality

Occupancy Code, Name and Percentage

| Occ Code | Occupancy Name | % | Class * | Height | Quality ** |
|----------|----------------|---|---------|--------|------------|
| | | | | | |

Occupancy, or building use, identifies the use or uses of the building as it was originally designed. See the *Occupancy Reference* for complete descriptions of all occupancies available in Commercial Estimator. These descriptions are also available in the program's help system.

Note: If the designed use and the actual use differ, the design generally determines the cost used in calculating the basic replacement cost. Therefore, use the occupancy of the designed use to determine costs, and change the occupancy name to match the current use.

You must enter at least one occupancy in each section of the building. You must also enter the percentage of the total floor area for each occupancy in the % column. The total percentage for all occupancies in the section must be 100%. You can enter as many occupancies in each section as you need. Use multiple occupancies as follows:

?? When a building or section has more than one occupancy.

Example: If a four story building has a bank on the first floor and offices on the other three, enter the two occupancies as follows:

| Occ Code | Occupancy Name | % | Class * | Height | Quality ** |
|------------|----------------|-----------|----------|-----------|------------|
| 304 | Bank | 25 | B | 12 | 2 |
| 344 | Office | 75 | B | 12 | 2 |

?? When any of the other information for the occupancy differs within a building or section.

Example: If a three story bank building is 20' high on the first floor and 10' high on the second and third floors, make the following occupancy entries:

| Occ Code | Occupancy Name | % | Class * | Height | Quality ** |
|------------|----------------|-----------|----------|-----------|------------|
| 304 | Bank | 33 | B | 20 | 2 |
| 304 | Bank | 67 | B | 10 | 2 |

When entering occupancies on the worksheet, you can enter either of the following:

Worksheet Reference

?? **Occupancy Code:** When you know the occupancy code, you can directly enter it into the occupancy code field in the program. Commercial Estimator will automatically display the occupancy name.

?? **Occupancy Name:** When you do not know the occupancy code, you can use the occupancy search function in Commercial Estimator to locate the desired occupancy. Commercial Estimator will automatically display the occupancy code.

In most cases, you only need to enter either the occupancy code or the occupancy name on the worksheet. You only need to enter both when you want to change the occupancy name.

Class of Construction

| Occ Code | Occupancy Name | % | Class * | Height | Quality ** |
|-----------------|-----------------------|----------|----------------|---------------|-------------------|
| | | | | | |

Class of construction divides all buildings into basic cost groups by type of framing (supporting columns and beams), walls, floor and roof structures, and fireproofing. Commercial Estimator has the following Marshall & Swift construction classes (each of which is defined beginning on the following page):

- A** - Fireproof Structural Steel Frame
- B** - Reinforced Concrete Frame
- C** - Masonry Bearing Walls
- D** - Wood or Steel Stud Framed Exterior Walls
- H** - Hoop Frame
- M** - Mill Type Construction
- P** - Wood Frame and Metal Walls (Pole Frame)
- S** - Metal Frame and Walls
- W** - Metal Slant Frame and Walls

Construction class is required.

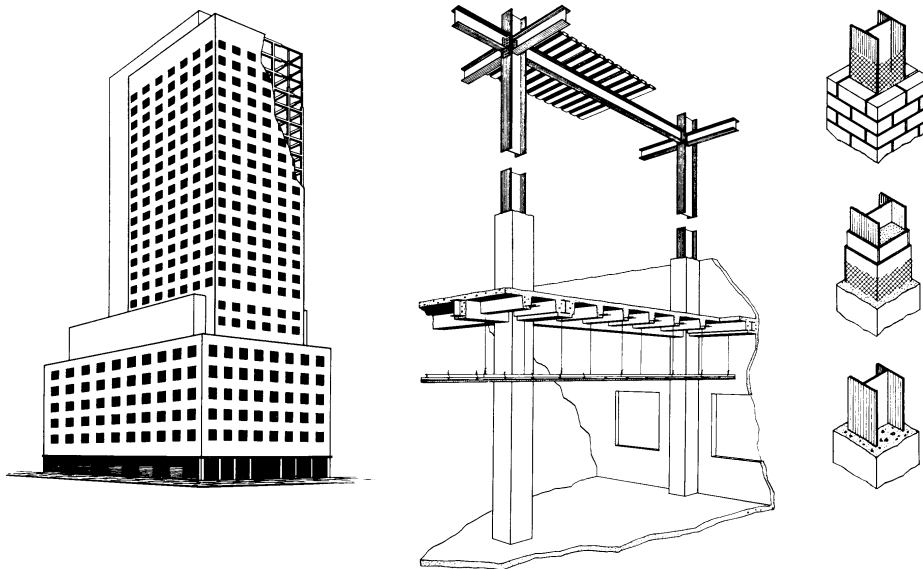
Class A: Fireproof Structural Steel Frame

The primary feature of class A buildings is the fireproofed structural steel frame, which may be welded, bolted or riveted together. The fireproofing may be masonry, poured concrete, plaster, sprayed fiber or any other method, which gives a high fire-resistance rating.

Floor and roof in class A structures are normally reinforced concrete on steel decking or formed slabs resting on the frame or poured to become integral with it. They may also be composed of prefabricated panels and may be mechanically stressed.

Exterior walls are curtain walls of masonry, concrete, steel studs and stucco, or one of the many types of panels of metal, glass, masonry or concrete. Interior partitions frequently are of masonry or gypsum block, although many movable and lightweight steel partitions are used.

Included in this class are Uniform, Basic and Standard Building Code construction, Types I and II (noncombustible) and ISO classes 5 and 6, if the framing is protected steel. ISO class 5 and 6 buildings with load-bearing walls and no interior framing, and most low-rise buildings, should be classified as class C for pricing purposes. This class is also referred to as Modified Fire Resistive or Two to Four-hour construction.

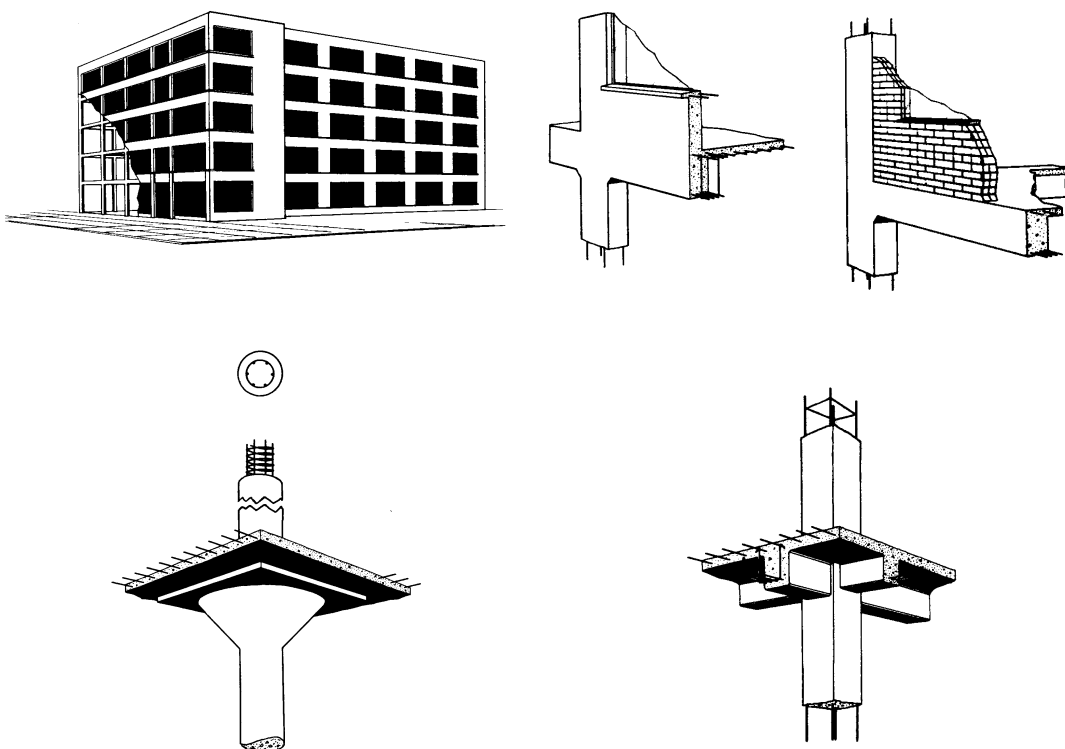


Class B: Reinforced Concrete Frame

The primary characteristic of class B buildings is the reinforced concrete frame in which the columns and beams can be either formed or precast concrete. They may be mechanically stressed. Class B buildings are fire-resistant structures.

Floors and roofs in class B structures are formed or precast concrete slabs. The exterior walls, generally, are masonry or reinforced concrete curtain walls or any of the many types of wall panels of concrete, metal, glass or stone. In some class B buildings the walls may be partially load bearing. Interior partitions are often masonry, reinforced concrete or gypsum block. Many lightweight and movable partitions are used where structural walls are not needed.

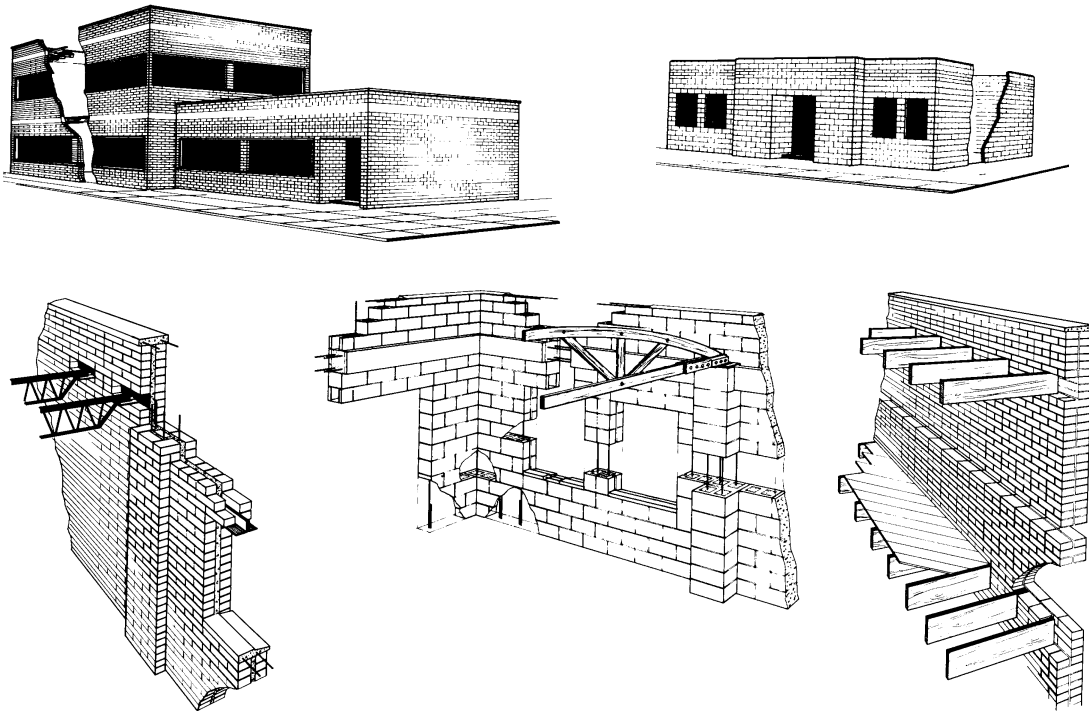
Included in this class are Uniform, Basic and Standard Building Code construction, Types I and II (noncombustible) and ISO classes 5 and 6, if the framing is concrete. ISO class 5 and 6 buildings with load-bearing walls and no interior framing and most low-rise buildings should be classified as class C for pricing purposes. This class is also referred to as Fire Resistive or Two to Four-hour construction.



Class C: Masonry Bearing Walls

Masonry or reinforced concrete (including tilt-up) construction characterizes class C buildings. The walls may be load-bearing, i.e., supporting roof and upper floor loads, or nonbearing with concrete, steel or wood columns, bents or arches supporting the load. Wood or steel joists or trusses support upper floors and roofs. Ground floors may be concrete slabs. Upper floors may be of concrete plank, steel deck or wood. Bearing walls are frequently strengthened by concrete bond beams and pilasters. Class C buildings are not fire-resistant structures.

Included in this class are Uniform and Basic Building Code, Type III (noncombustible wall), Standard Code Type V and ISO classes 2 and 4, and those ISO class 5 and 6 buildings that have load-bearing walls without interior framing and of low-rise design (3 stories or less). This class is also referred to as Masonry or Unprotected Noncombustible, Joisted or Unprotected Masonry, or Ordinary or Unprotected One-hour, and includes certain Two-hour or heavy timber construction.

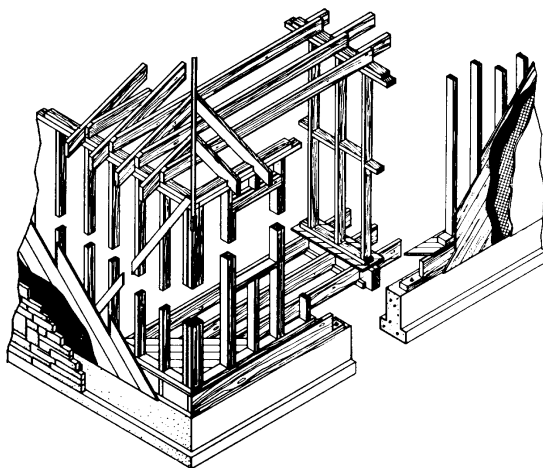


Class D: Wood- or Steel-Framed Exterior Walls

Class D buildings are characterized by combustible construction. The exterior walls may be made up of closely spaced wood or steel studs, as in the case of a typical frame house. Exterior covers may be wood siding, shingles, stucco, brick or stone veneer or some other type of material.

Floors and roofs are supported on wood or steel joists or trusses. The floor may be a concrete slab on the ground.

Construction Type V (wood-frame) of the Uniform, Type IV Basic and Type VI Standard Building Code are included in this class, as are ISO class 1 buildings. This class is also referred to as Unprotected-protected One-hour Construction.



Class H: Hoop Frame

Class H (a subset of Class D) buildings are characterized by combustible prefabricated wood post and tubular steel semicircular (hoop – quonset shape) framed roofs that curve to a short wooden pony wall or to the ground. The roof and walls are generally covered with canvas or a woven vinyl tarp. Ground floors are typically dirt or can be a concrete slab.

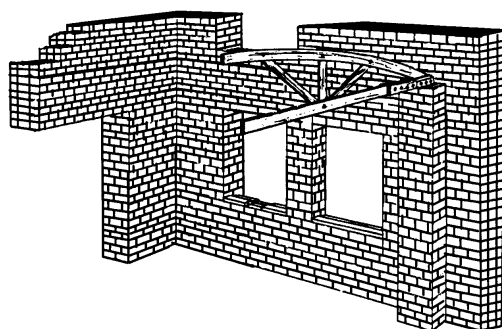
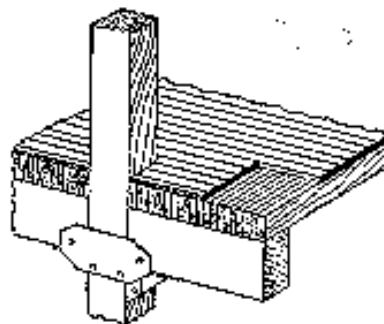
Construction Type V (wood-frame) of the Uniform, Type IV Basic and Type VI Standard Building Code are included in this class, as are ISO Class 1 buildings. This class is also referred to as Unprotected-protected One-hour Construction.



Class M: Mill Type Construction

Class M buildings are characterized by heavy masonry and timber construction. The walls are generally thick load-bearing brick or non-bearing with open wood columns, trusses or arches supporting the load. Floors are heavy laminated wood or a concrete slab on the ground.

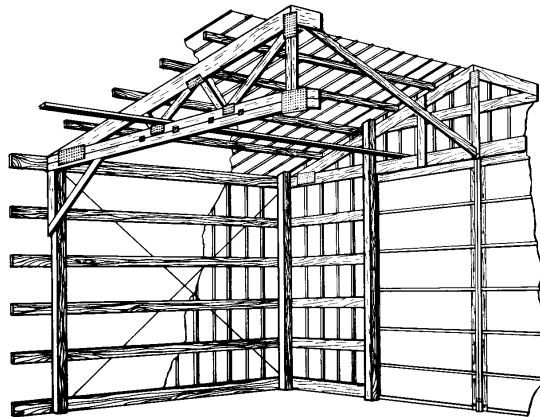
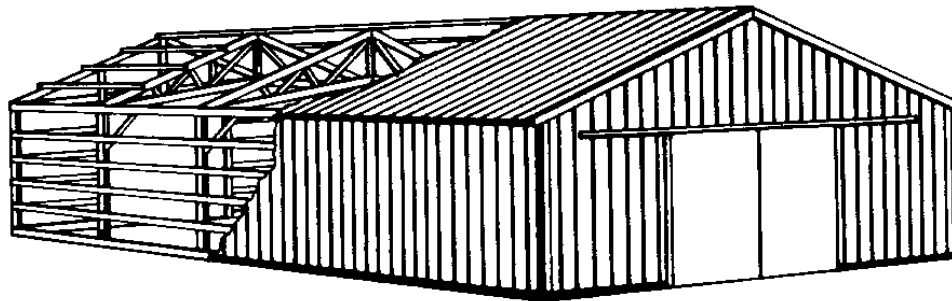
Included in this class are Uniform and Basic Building Code, Type III (noncombustible wall), Standard Code Type V and ISO classes 2 and 4, and those ISO class 5 and 6 buildings that have load-bearing walls without interior framing and of low-rise design (3 stories or less). This class is also referred to as Masonry or Unprotected Noncombustible, Joisted or Unprotected Masonry, or Ordinary or Unprotected One-hour, and includes certain Two-hour or heavy timber construction.



Class P: Wood Frame and Metal Walls (Pole Frame)

Class P buildings (a subset of Class D) are characterized by combustible prefabricated wood structural members. The exterior walls are comprised of an open-wood-skeleton post frame and trusses, with exterior coverings of prefabricated metal panels or sheet siding. Wall girts span between posts and there can be an in-fill of wood studs. Upper floors are supported on wood joists or trusses. The roof is supported by prefabricated trussed-rafters with wood purlins or nailers. Ground floors are typically concrete slabs or can be dirt.

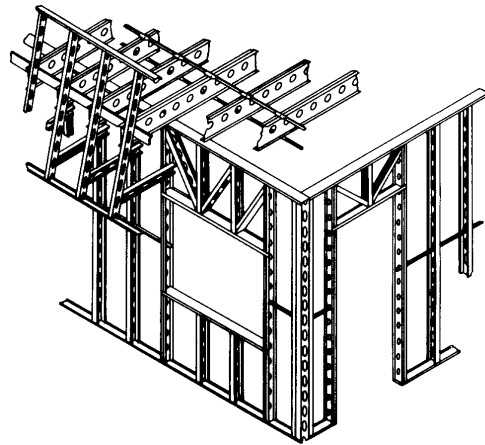
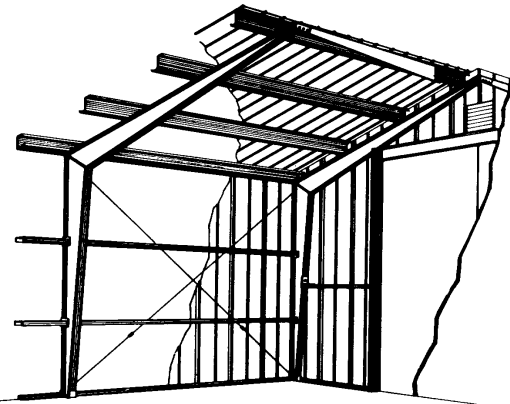
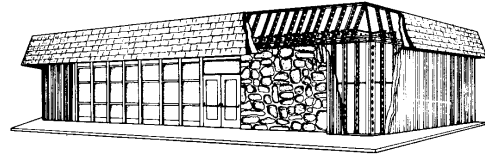
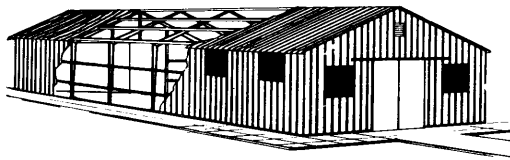
Construction Type V (wood-frame) of the Uniform, Type IV Basic and Type VI Standard Building Code are included in this class, as are ISO Class 1 buildings. This class is also referred to as Unprotected-protected One-hour Construction.



Class S: Metal Frame and Walls

Class S buildings are characterized by incombustible construction and prefabricated structural members. They are not fire-resistant buildings. The exterior walls may be steel studs or an open-steel-skeleton frame with exterior coverings of prefabricated panels or sheet siding. Upper floors and roof are supported on steel joists or beams. Ground floors are typically concrete slabs.

Included in this class are Uniform and Standard Building Code construction, Type IV (noncombustible), Basic code Type V and ISO class 3 buildings. This class is also referred to as Noncombustible and can be One-hour Type II construction.



Class W: Metal Slant Frame and Walls

Class W buildings (a subset of Class S) are characterized by incombustible construction and light prefabricated structural members. They are not fire-resistant buildings. The exterior walls and roof coverings are prefabricated metal panels or sheet siding supported by an open-steel-skeleton slant (modified A) frame. Ground floors are typically concrete slabs.

Included in this class are Uniform and Standard Building Code construction, Type IV (noncombustible), Basic Code Type V and ISO Class 3 buildings. This class is also referred to as Noncombustible.



Story Height

| Occ Code | Occupancy Name | % | Class * | Height | Quality ** |
|----------|----------------|---|---------|--------|------------|
| | | | | | |

Story height is the vertical distance from the top of one floor to the top of the next floor. In a one-story building, measure story height from the floor surface to the roof eave. Do not include parapets (extensions of the wall above the roofline) in story height.

When using a single section, if the story heights vary in a multistory building, you can do either of the following:

- ?? Compute the average story height by dividing the total building height by the number of stories.

Example: If the first floor of a three-story building is 18 feet high and each of the other two floors are 10 feet high, compute the average story height by adding up the heights for each floor and dividing by the number of stories:

$$\text{Average Story Height} = \frac{18 \text{ feet} + 2 \times 10 \text{ feet}}{3 \text{ Stories}} = \frac{38 \text{ feet}}{3 \text{ Stories}} = 12.67 \text{ feet}$$

Enter this in the height column for the occupancy:

| Occ Code | Occupancy Name | % | Class * | Height | Quality ** |
|------------|----------------|------------|----------|--------------|------------|
| 304 | Bank | 100 | B | 12.67 | 2 |

- ?? Enter the two story heights on separate rows in the occupancy grid:

Example: The entries for the previous example are:

| Occ Code | Occupancy Name | % | Class * | Height | Quality ** |
|------------|----------------|-----------|----------|-----------|------------|
| 304 | Bank | 33 | B | 18 | 2 |
| 304 | Bank | 67 | B | 10 | 2 |

Worksheet Reference

For a building with a very high pitched roof, (e.g., A-frame):

- ?? Compute the cubic area (length x width x height) of the lower building portion, excluding A-frame roof section.
- ?? Compute the cubic area of the A-frame roof section by multiplying the length x width x height and divide by 2.
- ?? Add both sections of the building together and divide total by square foot area (excluding mezzanines) to determine building height.

For unfinished attics, include half of the increased height of the attic area when computing average story height.

Example: A two-story building with a height of 10 feet on each of the two floors and an unfinished 8-foot-high attic has an effective height of 24 feet, computed as follows:

$$10 \text{ feet} + 10 \text{ feet} + \frac{8 \text{ Feet}}{2} = 24 \text{ feet}$$

The average story height entered on the worksheet for this building is 12 feet (the 24-foot effective height divided by the 2 floors).

Commercial Estimator requires a story height for the calculations.

Quality

| Occ Code | Occupancy Name | % | Class * | Height | Quality ** |
|----------|----------------|---|---------|--------|------------|
| | | | | | |

The quality determines the overall cost level in the report. You can override this quality for any individual construction component.

The four basic qualities are:

- ?? **Low (Quality 1)** - These tend to be very plain buildings that conform to minimum building code requirements. Interiors are plain with little attention given to detail or finish. Typically, there are minimum mechanical and low-cost finishes throughout.
- ?? **Average (Quality 2)** - These buildings are the most commonly found and meet building code requirements. There is some ornamentation on the exterior with interiors having some trim items. Lighting and plumbing are adequate to service the occupants of the building.
- ?? **Good (Quality 3)** - These are generally well designed buildings. Exterior walls usually have a mix of ornamental finishes. Interior walls are nicely finished and there are good quality floor covers. Lighting and plumbing include better quality fixtures.
- ?? **Excellent (Quality 4)** - Usually, these buildings are specially designed, have high-cost materials and exhibit excellent workmanship. Both exteriors and interiors have custom and ornamental features. Lighting and plumbing include high-cost fixtures.

In addition to the four qualities listed on the worksheet, you can enter qualities down to 0.5 and up to 5.

Also, you can enter a quality between two quality numbers.

Example: If a building is between average (Quality 2) and above average (Quality 3) in cost, you can enter 2.5 for the quality:

| Occ Code | Occupancy Name | % | Class * | Height | Quality ** |
|------------|----------------|------------|----------|-----------|------------|
| <i>304</i> | <i>Bank</i> | <i>100</i> | <i>C</i> | <i>14</i> | <i>2.5</i> |

Commercial Estimator requires a quality for the calculations.

Worksheet Reference

You should exercise extreme care in choosing the quality. The descriptions above are only a brief guide to the basic characteristics found at each quality level. The steps you should follow in selecting a quality for a building are:

- ?? Locate the appropriate section in the *Marshall Valuation Service* for the occupancy selected (Sections 11-18).
- ?? Review the photographs and notes as a preliminary screening step in selecting the quality. Identify the photograph or photographs that appear similar to the building being valued, and note the quality level given.
- ?? Review the descriptions in the quality Selection Guide in the *Occupancy Reference* or the Help system for each quality level for the construction class of the building. From the characteristics described under exterior wall, interior, lighting, plumbing, mechanical and heat, select the quality that best describes the building. This is the building's quality.

Components

Components (see back for list):

| Code | System | Description | Units | % | Other | Quality | Depr |
|------|--------|-------------|-------|---|-------|---------|------|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

The Section Detail of the worksheet is for the entry of building components for the following construction systems in Commercial Estimator:

- Exterior Walls
- Heating, Cooling and Ventilation (HVAC)
- Elevators
- Sprinklers
- Mezzanines
- Balconies
- Malls
- Miscellaneous Items (Fire Alarm Systems and Balconies)
- Land Value and Site Improvements

Commercial Estimator automatically includes exterior walls and HVAC (where appropriate) in the calculated costs. If you enter an exterior wall or HVAC component in a section, it overrides the system “default.” For all other construction systems, you must enter one or more components to have Commercial Estimator include a cost in the report.

The component grid on the worksheet, which is identical to the component data entry grid in the program, has the following columns:

?? Code, System and Description

| Code | System | Description | Units | % | Other | Quality | Depr |
|------|--------|-------------|-------|---|-------|---------|------|
| | | | | | | | |

Use these columns to identify the construction component in either of the following ways:

Worksheet Reference

?? Enter the code, either from the back of page 1 of the worksheet or from the following pages. When you enter this code in the data entry grid, Commercial Estimator automatically displays the component's construction system and description.

?? Enter the construction system and description of the component. When entering data into the program, you can select the construction system and component description from lists, and Commercial Estimator automatically adds the component code, system and description to the grid.

?? Units or %

| Code | System | Description | Units | % | Other | Quality | Depr |
|------|--------|-------------|-------|---|-------|---------|------|
| | | | | | | | |

Use these columns to enter the amount of the component in one (but not both) of the following ways:

?? **Units:** Quantity or amount of the component, either square feet, number of, or dollar amount (depending on the component).

?? **%:** The percentage of total floor area for the component.

Not all components have both of these methods available, as indicated by “N/A” in the following table:

| Component Type | Units | % |
|--------------------------------|----------------------------------|---------------------------------------|
| HVAC | Square feet of floor area served | Percentage of total floor area served |
| Exterior Walls | N/A | Percentage of total wall area |
| Elevators (Square Foot Method) | Square feet of floor area served | Percentage of total floor area served |
| Elevators (Count Method) | Number of elevators | N/A |
| Sprinklers | Square feet of floor area served | Percentage of total floor area served |
| Mezzanines | Square feet of mezzanine area | N/A |
| Balconies | Square feet of balcony area | N/A |
| Malls | Square feet of mall area | N/A |
| Fire Alarm Systems | Square feet of floor area served | Percentage of total floor area served |
| Land Value (Site Value) | Dollar amount | N/A |
| Site Improvements | Dollar amount | N/A |

You cannot enter a percentage for any of the components in the special Agricultural Estimator construction systems. The type of units varies from component to component in these construction systems.

?? Other

| Code | System | Description | Units | % | Other | Quality | Depr |
|------|--------|-------------|-------|---|-------|---------|------|
| | | | | | | | |

This column allows you to enter the following additional information about selected components:

?? Climate for HVAC: Commercial Estimator automatically sets the climate code based on the building's ZIP Code. If you want to specify the climate yourself, enter one of the following codes in this column:

1. Mild (Low Cost)
2. Moderate (Average Cost)
3. Extreme (High Cost)

?? Number of Stops for Elevators (by Count): Commercial Estimator automatically sets the number of stops for elevators to the number of stories in the section. Use this column to enter a different number of stops.

?? Quality

| Code | System | Description | Units | % | Other | Quality | Depr |
|------|--------|-------------|-------|---|-------|---------|------|
| | | | | | | | |

The Quality column allows you to enter the quality for a component. If you do not enter a component quality, Commercial Estimator automatically uses the quality entered for the occupancy. The minimum quality is 0.5 and the maximum is 5.0, with the four standard qualities:

- Quality 1: Low
- Quality 2: Average
- Quality 3: Good
- Quality 4: Excellent

?? Depreciation

| Code | System | Description | Units | % | Other | Quality | Depr |
|------|--------|-------------|-------|---|-------|---------|------|
| | | | | | | | |

This column allows you to enter the depreciation percentage for a component. If you do not enter a component depreciation percentage, Commercial

Estimator automatically calculates its cost using the depreciation percentage(s) for the section (either the overall percentage, or the physical and functional percentages).

Exterior Walls

You do not need to select wall components. If you do not enter any wall components, the Commercial Estimator automatically includes a wall cost in the report. This cost is based on the default wall types for your occupancy, quality and class in the *Marshall Valuation Service*. In many cases, this cost is an average of two or more wall types.

?? **Wall Codes and Descriptions**

See page 3-78 for a complete list of wall types and their detailed descriptions.

?? **Units or %**

Use the % column to specify the percentage of each wall type in the building. The percentages should total 100% for all wall types entered.

For shed buildings that only have three walls, the total wall percentages should be 100% even though the shed does not have four walls. This does not result in too high a wall cost, since the perimeter you enter for these sheds is only the length of the sides with walls (as indicated on page 3-22). If you enter a shape for one of these sheds, Commercial Estimator calculates the perimeter assuming three walls.

You cannot make an entry in the units column for wall components—you must use the % column to enter the percentage of each wall type.

?? **Other**

You cannot make an entry in the other column for wall components.

?? **Quality**

Enter an individual quality for a wall only if it differs from the section quality(s).

Quality choice depends mainly on the type and quality of the interior and exterior facing and finish, and on the amount and quality of the openings. Use the following range in selecting a wall quality:

Low (Quality 1): A low cost wall may be quite thin, such as a non-bearing curtain wall, or have few openings and inexpensive finish.

Excellent (Quality 4): A high quality might be a very heavy wall with many openings and extensive interior or exterior finish or ornament depending on the class and type of building.

?? Depreciation

Only enter a depreciation percentage for a wall component if you want to depreciate it at a different rate than the overall section depreciation.

Note: Wall selections are not available for the following occupancies:

- 558 Farm Implement Arch-Rib, Quonset
- 566 Farm Sun Shade Shelter
- 557 Farm Utility Arch-Rib, Quonset
- 565 Farm Utility Shelter
- 135 Greenhouse, Hoop, Arch-Rib, Small (under 4,500 square feet)
- 521 Greenhouse, Hoop, Arch-Rib, Medium (4,500 – 9,000 square feet)
- 138 Greenhouse, Hoop, Arch-Rib, Large (over 9,000 square feet)
- 518 Greenhouse, Lath Shade House
- 134 Greenhouse, Modified Hoop, Small (under 4,500 square feet)
- 520 Greenhouse, Modified Hoop, Medium (4,500 – 9,000 square feet)
- 137 Greenhouse, Modified Hoop, Large (over 9,000 square feet)
- 519 Greenhouse, Shade Shelter (4,500 – 9,000 square feet)
- 136 Greenhouse, Straight Wall, Small (under 4,500 square feet)
- 522 Greenhouse, Straight Wall, Medium
- 139 Greenhouse, Straight Wall, Large (over 9,000 square feet)
- 155 Hunting Shelter
- 555 Light Commercial Arch-Rib, Quonset
- 473 Material Shelter
- 585 Mechanical Penthouse
- 174 Pavilion
- 598 Relocatable Classroom
- 599 Relocatable Office

Heating, Cooling and Ventilation (HVAC)

The HVAC cost includes the basic heating unit for the system and any boilers, pumps, oil or gas burners, cooling towers, piping and ducts, registers, operating motors and fans.

You do not need to select any HVAC components. If you do not enter any HVAC, the Commercial Estimator automatically uses the default HVAC type for your occupancy based on the *Marshall Valuation Service*. If the building has no HVAC system, enter 100% "No HVAC" (code 649).

?? HVAC Codes and Descriptions:

| | |
|-----|---|
| 601 | Electric |
| 602 | Electric Wall |
| 603 | Forced Air Unit |
| 604 | Hot Water |
| 605 | Hot Water, Radiant |
| 606 | Space Heaters |
| 607 | Steam |
| 608 | Steam Without Boiler |
| 609 | Ventilation |
| 610 | Wall Furnace |
| 611 | Package Unit |
| 612 | Warmed and Cooled Air |
| 613 | Hot and Chilled Water |
| 614 | Heat Pump |
| 615 | Floor Furnace |
| 616 | Individual Thru-Wall Heat Pump |
| 617 | Complete HVAC |
| 618 | Evaporative Cooling |
| 619 | Refrigerated Cooling, Zoned |
| 620 | Electric Panels |
| 621 | Space Heaters, Radiant |
| 622 | Space Heaters, Steam Coil w/ Boiler |
| 623 | Space Heaters, Steam Coil w/o Boiler |
| 624 | Heat Pump, Ground Loop |
| 625 | Refrigerated Cooling, Packaged |
| 626 | Controlled Atmosphere, Conditioned Air |
| 627 | Controlled Atmosphere, Livestock |
| 628 | Controlled Atmosphere, High to Precise Humidity |
| 629 | Controlled Atmosphere, Warmed and Cooled Air |
| 649 | No HVAC |

See page 3-97 for complete definitions of each of these heating types.

?? Units or %

For HVAC, enter one of the following, but not both:

?? Units: Enter the floor area served by the HVAC system.

?? %: Enter the percentage of total floor area in the section served by the HVAC system.

?? Other

Make an entry in the Other column if you want to override the default climate (which is based on the ZIP/Postal Code of the building). The available codes are:

- 1 Mild (Low Cost)
- 2 Moderate (Average Cost)
- 3 Extreme (High Cost)

The cost qualities (low “Mild”, average “Moderate” and high cost “Extreme”) for the heating and cooling systems found in each occupancy, are primarily dependent on the capacity of the central unit that is affected by the climate. This, in turn, affects wall and insulation types and also by the occupancy load (personnel density and amount of traffic in and out of the building), which determines the complexity and amount of zoned areas. The lowest priced installations would normally be in a mild climate (down to 30?), while the highest priced systems would be found in the best buildings in a cold climate (down to -30?) or a hot humid climate with respect to air conditioning. Air conditioning costs, in addition, are dependent somewhat on prevailing humidity for atmospheric coolers and the building's residual heat load. But the major cost in heating and cooling is the number of controlled areas.

When supplemental perimeter heat is found, the primary system might be priced as “Average” or moderate with the perimeter at “Low” or mild, or the primary system may be priced only at a “High Cost” or extreme range to account for the supplemental costs involved.

In selecting a proper cost for basement heating, it is important to remember that a minimal amount of outlets would be incidental to the overall cost of the system.

?? **Quality**

Entering a quality for HVAC has no effect on the cost, except for heating type 617 (complete HVAC) for selected occupancies. See the discussion of climate codes on the previous page for details on changing the quality for heating.

?? **Depreciation**

Only enter a depreciation percentage for an HVAC component if you want to depreciate it at a different rate than the overall section depreciation.

Sprinklers

The sprinkler cost includes the cost of the system and supply lines, but not tanks, towers or high-pressure pumps. Types of systems vary depending on their design characteristics. They are either concealed or exposed systems, and wet or dry. The wet system has water in the lines, while the dry system is filled with air under pressure. The heat from a fire opens a sprinkler head, allowing water to flow into the piping.

?? Sprinkler Codes and Descriptions:

681 Sprinklers

Use this generic sprinkler system when you do not know whether the building's sprinkler system is a dry or wet system. Its costs range from low quality exposed wet systems to high quality concealed dry systems. Most wet types fall within qualities 1 through 3, while most dry systems fall within qualities 2 through 4.

When possible, you should use sprinkler codes 682 (dry sprinklers) or 683 (wet sprinklers).

682 Dry Sprinklers

A dry sprinkler system that is filled with air under pressure until the heat from a fire opens a sprinkler head, allowing water to flow into the piping. These systems are typically found in areas where there is a chance that the water filling a wet system could freeze and damage the system.

683 Wet Sprinklers

A wet sprinkler system that constantly has water in its lines.

?? Units or %

For sprinklers, enter one of the following, but not both:

?? Units: Enter the floor area served by the sprinkler system.

?? %: Enter the percentage of total floor area in the section served by the sprinkler system.

?? Other

You cannot make an entry in the Other column for sprinkler components.

?? **Quality**

Enter an individual quality for a sprinkler system only if it differs from the section quality(s).

For the wet and dry sprinkler systems, use the following when selecting quality:

Low (Quality 1): Exposed systems with wide spacing of lower cost heads, smaller size pipes and shorter pipe runs.

Excellent (Quality 4): The high end of the range is for concealed systems with close spacing of higher cost heads, larger size pipes and longer pipe runs.

For the generic sprinkler system, the cost qualities represent all types from exposed wet to concealed dry sprinkler systems. Most wet types will fit in qualities 1 (Low) through 3 (Good) and dry systems in qualities 2 (Average) through 4 (Excellent). There is an overlap in the costs of the various systems.

?? **Depreciation**

Only enter a depreciation percentage for a sprinkler system if you want to depreciate it at a different rate than the overall section depreciation.

Elevators

Commercial Estimator has two methods for entering elevators:

- ?? **Elevators by Count**, for which you enter the number of elevators.
- ?? **Elevators by Area**, for which you enter the area served by the elevators in square feet. This method is only available for selected occupancies, as listed on the following page.

It is always better to price elevators by the **Count Method** when the type and number of elevators are known.

?? **Code and Description**

- 650** Elevators (By Area)
- 651** Passenger
- 652** Freight Power Doors
- 653** Freight Manual Doors
- 654** Man Lift
- 655** Escalator
- 656** Wheelchair Lift

?? **Units or %**

For elevators by area (650), enter one of the following, but not both:

- ?? **Units:** Enter the floor area served by the elevator system
- ?? **%:** Enter the percentage of total floor area served by the elevator system

For elevators by count (651-656), you must enter the number of elevators in the units column. You cannot make an entry in the % column.

?? **Other**

For elevators 651, 652 and 653, use the Other column to enter the number of stops made by each elevator. If you do not enter the number of stops, Commercial Estimator automatically uses the number of stories in the section as the number of stops. When you enter the number of stops, be sure to enter the number of stops per elevator, not the total number of stops in the building.

?? **Quality**

Worksheet Reference

Enter an individual quality for an elevator component only if it differs from the section quality(s).

Base your selection of the quality on the quality of the elevators (not necessarily the quality of the building) using the following:

651, 652, 653 Elevators

Low (Quality 1): Small capacity, slow speed, simple systems, such as those typically found in low-rise multiple residences.

Excellent (Quality 4): Better quality elevators with a large weight capacity and higher speed, such as those typically found in high-rise office buildings.

654 Man Lift

When elevator costs are included in the base cost on a per square foot basis, the cost includes consideration of the type of controls, speed, capacity, power door operation, number of stops, series of banks, etc. typical for the occupancy, class and quality of the building being evaluated.

Changing the quality will adjust or allow for more or less dollars, based on a square foot of total floor area, that accounts for variations from the typical or average costs, based primarily on density.

?? Depreciation

Only enter a depreciation percentage for an elevator if you want to depreciate it at a different rate than the overall section depreciation.

Note: Elevators by area are only available for the following occupancies:

- 300 Apartment (High Rise)
- 304 Bank
- 310 City Club
- 313 Convalescent Hospital
- 318 Department Store
- 321 Dormitory
- 326 Storage Garage
- 327 Governmental Building
- 330 Home for the Elderly
- 331 Hospital
- 337 Library, Public
- 338 Loft
- 341 Medical Office

344 Office Building
345 Parking Structure
372 Library (College)
381 Veterinary Hospital
392 Industrial Engineering Building
406 Storage Warehouse
407 Distribution Warehouse
414 Regional Shopping Center
443 Central Bank
462 Shell, Regional Shopping Center
484 High School (Entire)
492 Shell, Office Building
494 Industrial Light Manufacturing
495 Industrial Heavy Manufacturing
496 Laboratory
571 Passenger Terminal
577 Parking Levels
581 Post Office, Main
583 Mail Processing Facility
589 Multiple Residence, Assisted Living (Low Rise)
594 Hotel, Full Service
595 Hotel, Limited Service
596 Shell, Apartment (High Rise)
700 Mall Anchor Department Store
710 Multiple Residence, Retirement Community Complex
984 Luxury Apartment (High Rise)

Mezzanines

When entering the total floor area of a building, do not include the area of any mezzanines. Use the special mezzanine components to account for mezzanines.

?? Mezzanine Codes and Descriptions:

The following mezzanines are available in Commercial Estimator:

759 Mezzanine

A mezzanine with finishes and detail typical of the section's occupancy or occupancies (e.g., office in an office building, display in a retail store, etc.).

760 Mezzanines-Display

A mezzanine with finishes and detail typical of retail stores.

761 Mezzanines-Office

A mezzanine with finishes and detail typical of offices.

762 Mezzanines-Open

An open mezzanine area.

763 Mezzanines-Storage

An unfinished mezzanine used for storage.

765 Mezzanines-Classroom

A mezzanine with finishes and detail typical of classrooms.

?? Units or %

Use the units column to enter the mezzanine size in square feet. You cannot make an entry in the % column for mezzanines.

?? Other

You cannot make an entry in the Other column for mezzanine components.

?? Quality

Enter an individual quality for a mezzanine only if it differs from the section quality(s).

?? Depreciation

Only enter a depreciation percentage for a mezzanine if you want to depreciate it at a different rate than the overall section depreciation.

Malls

Mall components are used for the following shopping center occupancies:

- 412 Neighborhood Center
- 413 Community Center
- 414 Regional Center

Mall costs are for the public pedestrian concourse areas only, exclusive of open well areas. They include stairs and ramps as necessary. This can consist of a single access way, or it can include a number of subsidiary approach routes connecting to the main shopping corridor. Costs include typical paving, lighting and permanent focal elements such as built-in searing, planters, center court wells, stages and fountains commensurate with the quality of the shopping center buildings. Costs do not include kiosks, landscaping, skating rinks, monumental sculptures or other individual works.

?? Mall Codes and Descriptions:

The following malls are available in Commercial Estimator:

755 Malls-Open

An open-air pedestrian concourse, generally called an arcade or courtyard.

756 Malls-Covered

A covered but open-to-the-air pedestrian concourse. Costs include floor and roof finishes, and supports commensurate with the quality of the center buildings. The area entered includes covered areas only.

757 Malls-Enclosed

A completely enclosed, climatized pedestrian concourse in which the enclosing walls are part of the shopping center buildings. Costs include floor, ceiling, roof and entryway finishes and heating and cooling systems commensurate with the quality of the anchor buildings. If the mall has elevators/escalators, enter the area served separately using the component Malls-Elevators.

758 Malls-Elevator

Used to enter the square feet of area served by elevators and escalators in enclosed malls.

?? Units or %

Use the units column to enter the mall size in square feet. You cannot make an entry in the % column for malls.

?? Other

You cannot make an entry in the Size column for mall components.

?? Quality

Enter an individual quality for a mall component only if it differs from the section quality(s).

?? Depreciation

Only enter a depreciation percentage for a mall component if you want to depreciate it at a different rate than the overall section depreciation.

Balconies

When entering the total floor area of a building, do not include the area of any exterior balconies. Use the balcony component (under the miscellaneous category) to account for balconies.

?? Balcony Code and Description:

The balcony component is:

751 Balcony

Costs include the floor structure (either wood frame or concrete) and the railings (wood and/or ornamental iron). Depending on the quality, the floor or roof soffit may or may not be finished.

?? Units or %

Use the units column to enter the balcony size in square feet. You cannot make an entry in the % column for balconies.

?? Other

You cannot make an entry in the Other column for the balcony component.

?? Quality

Enter an individual quality for a balcony only if it differs from the section quality(s).

?? Depreciation

Only enter a depreciation percentage for a balcony if you want to depreciate it at a different rate than the overall section depreciation.

Fire Alarm Systems

Commercial Estimator includes a component (under the miscellaneous category) for automatic fire alarm systems.

?? Fire Alarm System Code and Description:

The fire alarm system component is:

764 Fire Alarm System

?? Units: Enter the floor area served by the fire alarm system. You cannot make an entry for % for this component.

?? Other

You cannot make an entry in the Other column for the fire alarm system component.

?? Quality

Enter an individual quality for a fire alarm system only if it differs from the section quality(s).

?? Depreciation

Only enter a depreciation percentage for a fire alarm system if you want to depreciate it at a different rate than the overall section depreciation.

Land Value and Site Improvements

Commercial Estimator has special components for both land value and site improvements.

?? Land and Site Codes and Descriptions:

The land value and site improvements components are:

61 Land Value

The land value in dollars. If you enter the land value, do not also enter a site value for component 64 (since these two components are simply different names for the value of the land).

62 Site Improvements (Depreciated)

The cost of all items generally associated with the site, including landscaping, fencing, walks, paving, etc. This site improvement component prints in the report under the extras heading, which is included in the replacement cost new and is depreciated with the other parts of the building. If you do not want to depreciate the site improvements, use component 63 (site improvements, undepreciated).

63 Site Improvements (Undepreciated)

The cost of all items generally associated with the site, including landscaping, fencing, walks, paving, etc. This site improvement component prints in the report under the miscellaneous heading, which follows the depreciated cost. If you want to depreciate the site improvements, use component 62 (site improvements, depreciated).

64 Site Value

The site (land) value in dollars. If you enter the site value, do not also enter a land value for component 61 (since these two components are simply different names for the value of the land).

?? Units or %

Use the units column to enter the dollar amount for the land value or site improvements. You cannot make an entry in the % column for any of these items.

?? **Other**

You cannot make an entry in the Other column for these components.

?? **Quality**

Since you enter a dollar amount for these items, quality has no meaning for these components.

?? **Depreciation**

You can only enter a depreciation percentage for item 63, depreciated site improvements. You only need to enter a depreciation percentage to depreciate the site improvements at a different rate than the overall section depreciation.

Additions, Remarks and Notes

Additions:

| Code | Description | Units | Cost | Depr | LM | Base Date |
|------|-------------|-------|------|------|----|-----------|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Additions allow you to add additional items to the report for items that are not available in Commercial Estimator. The fields in the additions grid are:

?? Code

Indicates where to print the addition in the report, using one of the following codes:

| | |
|-------|-----------------------------------|
| Basic | Basic Structure Cost |
| Super | Superstructure Cost |
| Bsmnt | Basement Cost |
| Extra | Extras |
| Depr | Depreciation (prints as negative) |
| Misc | Miscellaneous |

?? Description

The description of the addition that prints in the report. You can use up to 30 characters including spaces.

You can also use this field to enter comments if you do not enter a cost in the cost column or units in the units column.

?? Units

Enter a number of units if you want the addition to include the number of units, unit cost and total cost (number of units times unit cost).

?? Cost

You can enter the addition's cost in one of two ways:

?? Total Cost: Enter the total cost of the addition if you did not enter a number in the units column. Do not include commas in the entry (e.g., enter 5000 for \$5,000).

?? Unit Cost: Enter the cost per unit if you entered the number of units. Commercial Estimator will multiply this cost times the number of units and print the result as the total cost.

?? Depr.

Use this field to depreciate the items separately. Note that addition codes "Depr" and "Misc" cannot be depreciated.

?? LM

Use this field to indicate whether or not you want the local multiplier applied to this item. The applicable codes are:

Y = Yes, apply the local multiplier to this item.

N = No, do not apply the local multiplier to this item.

?? Base

This field allows you to bring the cost to a specific date. Enter the date in the format mm/yyyy. The earliest date available is January, 1977.

Remarks and Notes

Commercial Estimator gives you an unlimited number of free-format text lines to use as follows:

- ?? **Remarks:** Any text you want to print in the reports.
- ?? **Notes:** Any text you want to record about an estimate but do not want to print in the report (such as internal notes about the estimate). Notes only print in the input data listings.

Basements

Number of Levels: _____
 Shape _____
 or Perimeter (linear feet) _____
 Section _____
 Fireproofing Yes No

| Occ Num | Occupancy Name | Type# | Area | Class | Depth | Quality |
|---------|----------------|-------|------|-------|-------|---------|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Components (HVAC and Sprinklers only)

| Code | System | Description | Area | % | Quality | Depr | Other |
|------|--------|-------------|------|---|---------|------|-------|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

The basement page of the worksheet contains the following items:

- ?? **Occupancies:** Includes the basement's occupancy (building use), type, area, class of construction, depth per level and quality.
- ?? **Building Data:** Includes the number of levels, whether or not the basement is fireproofed, perimeter or shape, and the section with which the basement is associated.
- ?? **Components:** Identical to the main building component grids, to enter components for basement heating and sprinklers.

Basement Occupancies

| Occ Num | Occupancy Name | Type# | Area | Class | Depth | Quality |
|---------|----------------|-------|------|-------|-------|---------|
| | | | | | | |
| | | | | | | |
| | | | | | | |

The fields in the basement grid are:

?? Occupancy Code, Occupancy Name and Type (Required)

| Occ Code | Occupancy Name | Type# | Area | Class | Depth | Quality |
|----------|----------------|-------|------|-------|-------|---------|
| | | | | | | |

To identify the basement's occupancy and usage, enter both of the following:

?? Occupancy Code or Name, which identifies the use of the basement as originally designed. This is typically the occupancy of the section the basement is associated with. The back of the worksheet's basement page has a complete list of occupancies. See the *Occupancy Reference* for complete descriptions of all occupancies available in Commercial Estimator. These descriptions are also available in the program's help system.

As in the section data grid, you do not need to enter both the occupancy code and the occupancy name in the basement data grid:

Occupancy code: When you know the occupancy code, you can directly enter into the basement data grid in the program. Commercial Estimator will automatically display the occupancy name.

Occupancy Name: When you do not know the occupancy code, you can use the occupancy search function in Commercial Estimator to locate the desired occupancy. Commercial Estimator will automatically display the occupancy code.

?? **Basement Type** from the following available types:

Finished 3- 3-Resident Units 3- 3-Parking
 Semifinished 3- 3-Display 3- 3-Laboratory
 Unfinished 3- 3-Storage 3- 3-Classroom

Example: The entries for an apartment building with a 5,000 square foot basement, 1,000 square feet of which are used for storage and 4,000 square feet of which are used for parking, are:

| Occ Num | Occupancy Name | Type# | Area | Class | Depth | Quality |
|---------|----------------|---------|------|-------|-------|---------|
| 300 | Apartment | Storage | 1000 | B | | |
| 300 | Apartment | Parking | 4000 | B | | |

?? **Area (Required)**

| Occ Num | Occupancy Name | Type# | Area | Class | Depth | Quality |
|---------|----------------|-------|------|-------|-------|---------|
| | | | | | | |

Enter the size of each basement occupancy/type combination (in square feet).

?? **Class of Construction (Required)**

| Occ Num | Occupancy Name | Type# | Area | Class | Depth | Quality |
|---------|----------------|-------|------|-------|-------|---------|
| | | | | | | |

Enter one of the following Marshall & Swift construction classes (each of which is defined beginning on page 3-32):

- A - Fireproof Structural Steel Frame
- B - Reinforced Concrete Frame
- C - Masonry Bearing Walls
- D - Wood or Steel Stud Framed Exterior Walls
- M - Mill Type Construction
- P - Wood Frame and Metal Walls (Pole Frame)
- S - Metal Frame Walls
- W - Slant Wall

Construction class is required and is typically equal to the class entered in the section.

Worksheet Reference

?? Depth per Level

| Occ Num | Occupancy Name | Type# | Area | Class | Depth | Quality |
|---------|----------------|-------|------|-------|-------|---------|
| | | | | | | |

Enter the basement depth per level in this column. Depth is measurement made from top of one level to top of next level. For multilevel basements with varying depths, calculate average depth per level by dividing total basement depth by the number of levels.

Commercial Estimator automatically sets the basement depth to a typical depth for the basement occupancy and type. If you do not enter a basement depth on the worksheet, you can accept the default value supplied by the program.

?? Quality

| Occ Num | Occupancy Name | Type# | Area | Class | Depth | Quality |
|---------|----------------|-------|------|-------|-------|---------|
| | | | | | | |

Only enter a quality for a basement if you want its quality to be different than the section quality. Enter a value between 0.5 and 5.0, with the standard qualities:

- Quality 1: Low
- Quality 2: Average
- Quality 3: Good
- Quality 4: Excellent

Basement Building Data

Number of Levels _____

Shape _____

or Perimeter (linear feet) _____

Section _____

Fireproofing Yes No

The additional basement fields are:

?? Number of Levels

Number of Levels _____

Use this field to indicate the number of levels for the basement. If you leave this field blank, Commercial Estimator assumes one level.

?? Perimeter or Shape

Shape _____

or Perimeter (linear feet) _____

Use these fields to enter one (but not both) of the following:

?? **Perimeter:** The total linear feet of wall that encloses the total basement area of all basement occupancy/types entered.

If the perimeter varies in a multilevel basement, enter the average perimeter on this line.

?? **Shape:** If you do not know the perimeter, you can enter one of the following shapes:



1=Square

2=Rectangular or Slightly Irregular

3=Irregular

4=Very Irregular

Whenever possible, it is best to enter the perimeter.

Commercial Estimator requires either the perimeter or the shape for the calculations.

?? Section

Section _____

For multi-section buildings, the basement costs are printed in the report in one of the building sections. Use this field to indicate in which section you want to print the basement costs. If you do not make an entry, Commercial Estimator automatically prints the basement costs in section 1.

?? Fireproofing

Fireproofing Yes No

Use this field to indicate if a class C, D, S, M or P building's basement has been made fire resistive. If you do not select "Yes" or "No," Commercial Estimator assumes that the basement under these classes is **NOT** fireproofed.

The extra costs associated with a type 1 fire resistive basement include a concrete slab separation and installation of fire doors.

Note: For class A and B buildings, the Commercial Estimator assumes that the basement is type 1 fire resistive and no entry is required.

Basement Components

Components (HVAC and Sprinklers only)

| Code | System | Description | Units | % | Other | Quality | Depr |
|------|--------|-------------|-------|---|-------|---------|------|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

The basement component grid allows you to specify the basement's HVAC and Sprinkler systems, if any. Data entry for these components is identical to that in the section, except for the following fields:

- ?? **Quality:** If you do not enter a quality for the component, Commercial Estimator automatically uses the quality or qualities entered for in the basement grid. If you did not enter qualities for the basements, it uses the quality or qualities entered for the section.
- ?? **Depreciation:** If you do not enter a depreciation percentage for the component, Commercial Estimator automatically uses the section depreciation percentages.

See page 3-97 for details on the types of heating, cooling and ventilation available, and how to enter HVAC components. If you do not enter any HVAC for the basement, Commercial Estimator automatically sets the HVAC type based on occupancy and basement type.

See page 3-55 for details on the types of sprinklers available, and how to enter sprinkler components. If you do not enter any sprinklers, Commercial Estimator assumes that the basement does not have sprinklers.

Wall Definitions

The following pages contain complete definitions of the wall components available in Commercial Estimator. The definitions are preceded by two lists of available walls, one in numerical order by wall code and the other grouped by major categories of wall types.

Numerical Listing of Walls

| | |
|-----|--|
| 801 | 3-Masonry-Adobe Block |
| 802 | 3- -Ashlar Stone Veneer, Block Back-up |
| 803 | 3- -Block with EIFS |
| 804 | 3- -Block with Stucco |
| 805 | 3- -Brick with Block Back-up |
| 806 | 3- -Brick with Clay Tile Back-up |
| 807 | 3- -Brick, Solid |
| 808 | 3- -Brick, SCR Modular (6"-8") |
| 809 | 3- -Cavity Concrete Block |
| 810 | 3- -Cavity Brick |
| 811 | 3- -Cavity Brick with Block Back-up |
| 812 | 3- -Concrete Block |
| 813 | 3- -Concrete Block, Glazed |
| 814 | 3- -Concrete Block, Slumpstone |
| 815 | 3- -Concrete Block, Textured Face |
| 816 | 3- -Concrete, Formed |
| 817 | 3- -Concrete, Precast Panels |
| 818 | 3- -Concrete, Tilt-up |
| 819 | 3- -Concrete w/ Stay-in-Place Forming |
| 820 | 3- -Glass Block |
| 821 | 3- -Hollow Clay Block |
| 822 | 3- -Rubble Stone Veneer, Block Back-up |
| 823 | 3- -Solid Granite Stone |
| 824 | 3- -Solid Limestone |
| 825 | 3- -Solid Local Stone |
| 826 | 3- -Structural Clay Tile |
| 840 | 3-Curtain Walls-Aggregate Siding Panels |
| 841 | 3- -Bronze and Glass Panels |
| 842 | 3- -Composite Stone Panels |
| 843 | 3- -Concrete and Glass Panels |
| 844 | 3- -EIFS Panels |
| 845 | 3- -Glass Fiber Reinforced Concrete Panels |
| 846 | 3- -Glazed Atrium |
| 847 | 3- -Marble Panels |
| 848 | 3- -Masonry Panels |

- 849 3- -Metal and Glass Panels
- 850 3- -Stainless Steel Panels
- 851 3- -Steel Studs and Stucco
- 852 3- -Stone Panels, Granite
- 853 3- -Stone Panels, Local Stone
- 854 3- -Stone Panels, Limestone
- 855 3- -Wood Siding Panels
- 860 3-Pre-Engineered Cement Fiber Sandwich Panels
- 861 3- -Cold Storage Metal Sandwich Panels
- 862 3- -Cold Storage Stainless Steel Sandwich Panels
- 863 3- -Fiberglass Sandwich Panels
- 864 3- -Glass Exterior w/Metal Sandwich Panels
- 865 3- -Metal Sandwich Panels
- 866 3- -Texture Covered Metal Sandwich Panels
- 867 3- -Pre-Fabricated Panels, Masonry Veneer
- 868 3- -Pre-Fabricated Panels, Metal and Glass
- 869 3- -Pre-Fabricated Panels, Metal with Block Back-up
- 870 3- -Stone Veneer on Metal Panels
- 871 3- -Stucco on Metal Panels
- 872 3- -Porcelain Enamel Finish Additive
- 880 3-Stud Walls-Asphalt Siding
- 881 3- -Ashlar Stone Veneer
- 882 3- -Brick Veneer
- 883 3- -Block Veneer
- 884 3- -Cement Fiber Siding
- 885 3- -EIFS
- 886 3- -Hardboard Sheet
- 887 3- -Hardboard Siding
- 888 3- -Metal Siding
- 889 3- -Rubble Stone Veneer
- 890 3- -Shingles
- 891 3- -Stresskin Sandwich Panel Additive
- 892 3- -Stucco
- 893 3- -Synthetic Masonry Veneer
- 894 3- -Textured Plywood
- 895 3- -Vinyl Siding
- 896 3- -Wood Siding
- 910 3-Single Wall-Boards on Wood Frame
- 911 3- -Boards on Steel Frame
- 912 3- -Cement Fiber on Wood Frame
- 913 3- -Cement Fiber on Steel Frame
- 914 3- -Fiberglass Panels on Wood Frame
- 915 3- -Fiberglass Panels on Steel Frame
- 916 3- -Metal on Steel Frame

Worksheet Reference

- 917 3- -Metal, Texture Covered on Steel Frame
- 918 3- -Metal on Wood Frame
- 919 3- -Rustic Log
- 920 3- -Spaced Boards on Wood Frame
- 921 3- -Stucco on Wood Frame
- 922 3- -Synthetic Plaster on Steel Frame (EIFS)
- 923 3- -Wire Mesh on Wood Frame
- 924 3- -Interior Finish Liner Additive

Listing of Walls by Category

CONCRETE-MASONRY WALLS/BEARING or CURTAIN

Brick

- 808 3-Brick, SCR Modular (6"-8")
- 807 3-Brick, Solid
- 805 3-Brick with Block Back-up
- 806 3-Brick with Clay Tile Back-up
- 810 3-Cavity Brick
- 811 3-Cavity Brick with Block Back-up

Block

- 801 3-Adobe Block
- 803 3-Block with EIFS
- 804 3-Block with Stucco
- 809 3-Cavity Concrete Block
- 812 3-Concrete Block
- 814 3-Concrete Block, Slumpstone
- 815 3-Concrete Block, Textured Face
- 813 3-Concrete Block, Glazed
- 820 3-Glass Block
- 821 3-Hollow Clay Block
- 826 3-Structural Clay Tile

Concrete

- 816 3-Concrete, Formed
- 817 3-Concrete, Precast Panels
- 818 3-Concrete, Tilt-up
- 819 3-Concrete with Stay-in-Place Forming

Stone

- 802 3-Ashlar Stone Veneer, Block Back-up
- 822 3-Rubble Stone Veneer, Block Back-up
- 823 3-Solid Granite Stone
- 824 3-Solid Limestone
- 825 3-Solid Local Stone

CURTAIN WALLS

Glass

- 841 3-Bronze and Glass Panels
- 846 3-Glazed Atrium
- 849 3-Metal and Glass Panels
- 850 3-Stainless Steel Panels

Masonry

- 843 3-Concrete and Glass Panels
- 845 3-Glass Fiber Reinforced Concrete Panels
- 848 3-Masonry Panels

Studs

- 840 3-Aggregate Siding Panels
- 844 3-EIFS Panels
- 851 3-Steel Studs and Stucco
- 855 3-Wood Siding Panels

Stone

- 842 3-Composite Stone Panels
- 852 3-Stone Panels, Granite
- 854 3-Stone Panels, Limestone
- 853 3-Stone Panels, Local Stone
- 847 3-Stone Panels, Marble

Worksheet Reference

Pre-Engineered - Sandwich

- 860 3-Cement Fiber Sandwich Panels
- 861 3-Cold Storage Metal Sandwich Panels
- 862 3-Cold Storage Stainless Steel Sandwich Panels
- 863 3-Fiberglass Sandwich Panels
- 864 3-Glass Exterior w/Metal Sandwich Panels
- 865 3-Metal Sandwich Panels
- 866 3-Texture Covered Metal Sandwich Panels

Pre-Engineered Buildings - Prefabricated Wall Panels (Service Stations)

- 872 3-Porcelain Enamel Finish Additive
- 867 3-Pre-Fabricated Panels, Masonry Veneer
- 868 3-Pre-Fababricated Panels, Metal and Glass
- 869 3-Pre-Fabricated Panels, Metal with Block Back-up
- 870 3-Stone Veneer on Pre-Fabricated Metal Panels
- 871 3-Stucco on Pre-Fabricated Metal Panels

STUD WALLS

Siding

- 880 3-Asphalt Siding
- 884 3-Cement Fiber Siding
- 886 3-Hardboard Sheet
- 887 3-Hardboard Siding
- 888 3-Metal Siding
- 890 3-Shingles
- 894 3-Textured Plywood
- 895 3-Vinyl Siding
- 896 3-Wood Siding

Stucco

- 885 3-EIFS
- 892 3-Stucco

Masonry Veneer

- 881 3-Ashlar Stone Veneer
- 883 3-Block Veneer
- 882 3-Brick Veneer
- 889 3-Rubble Stone Veneer
- 891 3-Stresskin Sandwich Panel Additive
- 893 3-Synthetic Masonry Veneer

SINGLE WALL

- 911 3-Boards on Steel Frame
- 910 3-Boards on Wood Frame
- 913 3-Cement Fiber on Steel Frame
- 912 3-Cement Fiber on Wood Frame
- 915 3-Fiberglass Panels on Steel Frame
- 914 3-Fiberglass Panels on Wood Frame
- 924 3-Interior Finish Liner Additive
- 916 3-Metal on Steel Frame
- 918 3-Metal on Wood Frame
- 917 3-Metal, Texture Covered on Steel Frame
- 919 3-Rustic Log
- 920 3-Spaced Boards on Wood Frame
- 921 3-Stucco on Wood Frame
- 922 3-Synthetic Plaster on Steel Frame (EIFS)
- 923 3-Wire Mesh on Wood Frame

Wall Definitions

The following descriptions for exterior walls are in numerical order by wall code.

MASONRY WALLS

These walls are constructed entirely of masonry units (or concrete) which are bonded together with mortar or some other type of cementitious material.

801 3-Adobe Block

Solid masonry made from adobe blocks, which are unburnt, sundried blocks molded from adobe soil found in arid regions, generally rough in shape and texture. The wall may be grouted and reinforced or of a post and girder type of construction.

802 3-Ashlar Stone Veneer, Block Back-up

Some type of veneer stone, usually limestone, attached to a concrete block back-up wall using metal wall ties. The stones have an irregular shape. They may be finished with a split face and backed with sawed surfaces for top and bottom bed joints.

803 3-Block with EIFS (Exterior Insulation and Finish System)

This is a rigid insulation board which has a synthetic plaster coating applied to the exterior exposed surface of the board over concrete block. Thickness of the board insulation varies between 1" and 2" typically. The plaster coating is affixed to the board through the use of a matting material. The thickness of the matting material can vary. With this type of cover over the masonry block wall, it appears that the wall has a plaster (stucco) finish.

804 3-Block with Stucco

Solid masonry wall built typically with one or two rows of concrete block and mortar with stucco finish coat. The amount of reinforcing varies due to the structural requirements of the wall. Reinforcing is laid horizontally with various courses and vertically on the hollow core of the concrete block. Door and window jambs are typically metal.

805 3-Brick with Block Back-up

Brick on the exterior surface applied over a concrete block wall. This is a solid masonry wall. The thickness of the wall varies depending on the thickness of the block used, with 4", 8" and 12" block being the most commonly applied with this type of wall.

806 3-Brick with Clay Tile Back-up

Brick on the exterior surface applied over a clay tile block wall. This is a solid masonry wall. The thickness of the wall varies depending on the thickness of the block used, with 4", 8" and 12" block being the most commonly applied with this type of wall.

807 3-Brick, Solid

Masonry wall structure comprised of common clay bricks only. Typically two or more rows thick, with each row grouted together. The structural requirements of the wall determine the thickness of the mortar joints, (usually between 1/8" and 3/4") and the type of bond used.

808 3-Brick, SCR Modular (6" - 8")

Masonry wall structure built of cored modular common clay bricks only, typically one row thick. The structural requirements of the wall determine the amount of reinforcing bar used.

809 3-Cavity Concrete Block

Constructed typically of two concrete block rows (two single vertical walls) separated by air space and held together by ties placed in the bed joints of the walls at various course intervals. The air space can be grout-filled, insulated, reinforced or left void. It provides a barrier against the penetration of moisture to the inner side of the wall.

810 3-Cavity Brick

Constructed typically of two brick rows (two single vertical walls) separated by air space and held together by ties placed in the bed joints of the walls at various course intervals. The air space can be grout-filled, insulated, reinforced or left void. It provides a barrier against the penetration of moisture to the inner side of the wall.

811 3-Cavity Brick with Block Back-up

Solid masonry wall constructed typically of two wythes or rows of masonry units. The exposed exterior row is a common brick and a concrete block is the second row. The two rows are separated by air space and held together by ties placed in the bed joints of the walls at various course intervals. The air space can be grout-filled, insulated, reinforced or left void. The air space or cavity provides a barrier against the penetration of moisture to the inner side of the wall.

812 3-Concrete Block

Solid masonry wall built typically with one or two rows of concrete block and mortar. The amount of reinforcing varies due to the structural requirements of the wall. Reinforcing is laid horizontally with various courses, and vertically in the hollow core of the concrete block.

813 3-Concrete Block, Glazed

Solid masonry wall built typically with one or two rows of concrete block and mortar, exposed exterior being a glazed tile finish. The amount of reinforcing varies due to the structural requirements of the wall. Reinforcing is laid horizontally with various courses and, vertically in the hollow core of the concrete block.

814 3-Concrete Block, Slumpstone

Solid masonry wall built typically with one or two rows of slumpstone (an adobe-like appearance) concrete block and mortar. The amount of reinforcing varies due to the structural requirements of the wall. Reinforcing is laid horizontally with various courses and, vertically on the hollow core of the concrete block.

815 3-Concrete Block, Textured Face

Solid masonry wall built typically with one or two rows of exposed textured split, fluted or ground face concrete block and mortar. The amount of reinforcing varies due to the structural requirements of the wall. Reinforcing is laid horizontally with various courses and, vertically on the hollow core of the concrete block.

816 3-Concrete, Formed

Generally constructed of poured-in-place concrete. The reinforcing is usually a bar set in a grid pattern within the form for the concrete wall. Forms used for the wall are usually some type of a metal or wood panel. Thickness of these walls varies depending on the structural requirements of the building.

817 3-Concrete, Precast Panels

Surfaces constructed of precast concrete. The reinforced concrete flat panels or tees may be built off-site and transported to the site or they may be built on site. They generally do not carry any structural strength needed to support the floor or roof loads.

818 3-Concrete, Tilt-up

Generally used in large, one-story structures (industrial buildings). The wall section is formed on top of a concrete slab floor structure. A vapor barrier is used between the slab and the to-be-poured wall section, so that when the wall section is poured with concrete, the wall and slab do not bond together. Once the concrete in the section is cured, it is lifted into place on top of the foundation by a crane. These walls are usually reinforced.

819 3-Concrete w/ Stay-in-Place Forming

A wall constructed of poured-in-place concrete, where the forming material remains in place. The reinforcing is usually a bar set in a grid pattern within the form for the concrete wall. Forms used for the wall are usually some type of a rigid insulation board or metal panel and finish system. Thickness of these walls varies depending on the structural requirements of the building.

820 3-Glass Block

Masonry wall structure comprised of hollow glass blocks only. Typically one row thick, having the advantage of admitting light without sacrificing privacy.

821 3-Hollow Clay Block

Solid masonry wall built with typically one row of hollow clay textured block and mortar. The amount of reinforcing varies due to the structural requirements of the wall. Reinforcing is laid horizontally with various courses, and vertically in the hollow core of

the clay block.

822 3-Rubble Stone Veneer, Block Back-up

Some type of local fieldstone set in a wall which is built without coursing or regularity attached to a concrete block back-up wall using metal wall ties. The amount of mortar required varies depending on the size and shape of the stone and the thickness of the wall.

823 3-Solid Granite Stone

A solid cut stone masonry block wall comprised of granite. The thickness of the wall varies depending on the thickness of the block used.

824 3-Solid Limestone

A solid cut stone masonry block wall comprised of limestone. The thickness of the wall varies depending on the thickness of the block used.

825 3-Solid Local Stone

A solid cut stone masonry block wall comprised of local sandstone. The thickness of the wall varies depending on the thickness of the block used.

826 3-Structural Clay Tile

Solid masonry wall built typically with one or two rows of clay tile and mortar. Reinforcing is laid horizontally with various courses, and vertically in the hollow core of the clay tile block. The amount of reinforcing varies due to the structural requirements of the wall.

CURTAIN WALLS

These are non-bearing exterior walls supported by the structural frame of the building. These walls carry no load other than their own weight. The primary function of these walls is to protect the interior of the building from the weather.

840 3-Curtain Walls - Aggregate Siding Panels

This non-bearing wall is a combination of exposed stone aggregate-faced wood panels and glass. The panel system is comprised of various size aggregates embedded in epoxy, bonded to a wood board backing that is attached to studs and to a supporting frame.

841 3-Curtain Walls - Bronze and Glass Panels

Combination of bronzed finished panels and glass found in higher quality, higher cost buildings. The metal and glass panels may be insulated and are mechanically anchored or

welded onto the supporting frame.

842 3-Curtain Walls - Composite Stone Panels

A stone wall and glass panel system comprised of embedded and exposed aggregates or homogeneous crushed stone in a reconstituted stone-like composite panel. Epoxy embedded aggregates, bonded to a cement board backing attached to steel studs, is one of the least expensive stone curtain walls.

843 3-Curtain Walls - Concrete and Glass Panels

A combination of concrete panels (precast or poured-in-place) and glass attached to the concrete panels with the use of a metal frame. Generally these walls carry no load other than their own weight. Some perimeter or shear wall load bearing units can be found in some low to mid-rise structures.

844 3-Curtain Wall - EIFS Panels (Exterior Insulation and Finish System)

This is a rigid insulation board that typically has an acrylic-synthetic stucco plaster coating applied to the exterior exposed surface of the board. Thickness of the board insulation varies between 1/2" and 2" typically. The plaster coating is affixed to the board through the use of a matting material. The thickness of the matting material can vary. The board in turn is attached to non-bearing steel studs, which are attached to a supporting frame. It is one of the least expensive curtain walls in mid to high-rise buildings.

845 3-Curtain Walls - Glass Fiber Reinforced Concrete Panels

A lightweight precast glass fiber reinforced concrete (GFRC) and glass panel wall system that is attached to a supporting frame. GFRC is a Portland cement-based composite reinforced with randomly dispersed glass fibers to form a variety of shaped and textured panels, many of which are integrated with a steel stud support system.

846 3-Curtain Walls - Glazed Atrium

A structural, frameless area where the glass walls are either self-supporting, or supported from behind by glass fin mullions or thin wall trusses.

847 3-Curtain Walls - Marble Panels

Lightweight marble stone panels or thin veneer and substrate backing, attached as an integrated panel and installed on the frame of a building along with glass panels. Older buildings may have stone attached to a block back up for support.

848 3-Curtain Walls - Masonry Panels

This non-bearing wall is a combination of either a thinset or modular masonry veneer or

ceramic tile panels and glass which has been manufactured offsite and transported to the site. The masonry units may be glazed or unglazed, and are generally attached to steel studs and a backing material, which in turn is attached to a supporting frame.

849 3-Curtain Walls - Metal and Glass Panels

These curtain walls are comprised of both vertical and horizontal metal frames. In the metal frame, which is attached to the structural frame of the building, metal and glass panels are installed. These walls are common in high-rise commercial construction.

850 3-Curtain Walls - Stainless Steel Panels

Glass is attached to the structural frame of the building and uses a combination of stainless steel and glass panels. The steel and glass panels may be insulated and are mechanically anchored or welded onto the supporting frame.

851 3-Curtain Walls - Steel Studs and Stucco

Non-bearing steel stud framing usually covered with a backing material to which stucco is applied and attached to a supporting frame.

852 3-Curtain Walls - Stone Panels, Granite

Lightweight granite stone panels or thin veneer and substrate backing, attached as a panel and installed on the frame of a building along with glass panels. Older buildings may have stone attached to a block back-up for support.

853 3-Curtain Walls - Stone Panels, Local Stone

Lightweight local stone comprised of sandstone panels or thin veneer and substrate backing, attached as a panel and installed on the frame of a building along with glass panels. Older buildings may have stone attached to a block back-up for support.

854 3-Curtain Walls - Stone Panels, Limestone

Lightweight limestone panels or thin veneer and substrate backing attached as a panel and installed on the frame of a building along with glass panels. Older buildings may have stone attached to a block back-up for support.

855 3-Curtain Walls - Wood Siding Panels

This non-bearing wall is a combination of wood spandrels and glass. The finish may consist of redwood or cedar siding, or other high cost wood panels attached to studs and to a supporting frame.

PRE-ENGINEERED WALLS

These walls are pre-fabricated panels constructed with two sheets or “skins” (interior and exterior) bonded to a core material. The core material is some type of wood fiber, urethane, polystyrene, perlite, foam insulation or some other type of material that has a low density. The thickness and the panel size vary. The panels can be anchored to brackets or connected to the structural frame of a building.

860 3-Pre-Engineered, Cement Fiber Sandwich Panels

This type of wall is constructed with two sides or “skins” of a cement fiber reinforced material. The cement fiber panels are made of a combination of Portland cement and asbestos-free fibers. Normally, the skins are edge sealed for moisture protection. Finishes may be a natural gray, painted or have an acrylic color finish.

861 3-Pre-Engineered, Cold Storage Metal Sandwich Panels

This type of wall is constructed with two sheets or “skins” of metal (steel or aluminum) bonded to an insulated core used in cold storage applications.

862 3-Pre-Engineered, Cold Storage Stainless Steel Sandwich Panels

This type of wall is constructed with two sheets or “skins” of metal (stainless steel) bonded to an insulated core used in cold storage applications.

863 3-Pre-Engineered, Fiberglass Sandwich Panels

This type of wall is constructed with two sheets or “skins” of reinforced fiberglass bonded to a core material. The weight, profile and type of plastics used for the skin vary.

864 3-Pre-Engineered, Glass Exterior w/Metal Sandwich Panels

This type of wall is constructed with glass as the exterior skin and metal as the interior skin bonded to a core material. The finished exterior appearance of a building with this type of panel is of a glass wall. Typically in multi-level structures, the spandrel beams are covered with the metal skin.

865 3-Pre-Engineered, Metal Sandwich Panels

This type of wall is constructed with two sheets or “skins” of metal bonded to a core material. The gauge and finish of steel or aluminum used for the skin varies.

866 3-Pre-Engineered, Texture Covered Metal Sandwich Panels

This type of wall is constructed with two sheets or “skins” of metal, with the outer sheet being protected-coated steel (Galbestos) bonded to a core material. Galbestos is one trade

name for a protected metal panel consisting of textured waterproof outer coating of a special hot melted layer application of resin, or asphalt giving the appearance of a stucco-like granular finish.

PRE-ENGINEERED, PRE-FABRICATED WALL PANELS

These walls are pre-engineered unitized single wall sections for small pre-fabricated booths and buildings, such as Service Stations. For a porcelainized enamel finish, use additive component Number 872.

867 3-Pre-Engineered, Pre-Fabricated Panels, Masonry Veneer

Masonry face block or brick facing applied over a pre-fabricated solid metal panel structure to give it the appearance of a site-built masonry structure.

868 3-Pre-Engineered, Pre-Fabricated Panels, Metal and Glass

Pre-fabricated solid metal panel with glass window wall inserts typical of service station installations. For porcelain enamel finishes, use in conjunction with wall additive number 872.

869 3-Pre-Engineered, Pre-Fabricated Panels, Metal/Block Back-up

Pre-fabricated metal panels applied over a concrete block back-up wall. Primarily found in service station applications.

870 3-Pre-Engineered, Pre-Fabricated Panels, Stone Veneer on Metal Panels

Masonry stone facing applied over a pre-fabricated solid metal panel structure to give it the appearance of a site-built masonry structure.

871 3-Pre-Engineered, Pre-Fabricated Panels, Stucco on Metal Panels

Stucco facing applied over a pre-fabricated solid metal panel structure to give it the appearance of a site-built frame and stucco structure.

872 3-Pre-Engineered, Porcelain Enamel Finish Additive

This additional cost to an exterior pre-engineered metal wall is the difference between the cost of a porcelain enamel finish and that of standard applied paint surfaces. Porcelain enameling results from heat bonding which produces a highly vitrified glazed protective surface finish.

STUD WALLS

These walls are of wood or steel stud bearing wall construction. Typically, steel stud

framed walls have a slightly higher quality than wood. Where a stressskin sandwich panel replaces the stud framing, use additive component Number 891.

880 3-Stud Walls - Asphalt Siding

Asphalt shingles applied over spaced sheathing and a building paper attached to either wood or steel stud framing.

881 3-Stud Walls - Ashlar Stone Veneer

Stone ashlar veneer laid in either regular or irregular patterns attached to a stud framed wall through the use of metal clips.

882 3-Stud Walls - Brick Veneer

Brick facing (clay) applied to a stud framed structure to give it the appearance of a solid brick structure. The single course of brick veneer is held to the wooden or steel structure by small, corrugated strips of metal fastened to the sheathing at the studs and imbedded in mortar.

883 3-Stud Walls - Block Veneer

Block facing (concrete) applied to a stud framed structure to give it the appearance of a brick structure. The block is held to the wooden or steel structure by small, corrugated strips of metal fastened to the sheathing at the studs and imbedded in mortar.

884 3-Stud Walls - Cement Fiber Siding

Composed of asbestos-free fiber and Portland cement combined under pressure. Typically, the natural siding or shingle is light gray. Board siding may be applied over sheathing or a building paper attached to either wood or steel stud framing.

885 3-Stud Wall - EIFS (Exterior Insulation and Finish System)

This is a rigid insulation board which typically has a stucco plaster coating applied to the exterior exposed surface of the board. Thickness of the board insulation varies between 1/2" and 2" typically. The plaster coating is affixed to the board through the use of a matting mesh or wire material. The board is attached to wood or steel stud bearing walls and is found normally in low-rise structures.

886 3-Stud Wall - Hardboard Sheet

Usually applied in sheets over either wood or steel stud framing. Hardboards are generally composed of a wood fiber that has been pressed into a board form and may be tempered or treated to provide extra strength and durability. The vertical joints can be butted flush or with a slight bevel at the edges.

887 3-Stud Wall - Hardboard Siding

Usually applied in individual lapboards over either wood or steel stud framing. Hardboards are generally composed of a wood fiber, which has been pressed into a board form and may be tempered or treated to provide extra strength and durability.

888 3-Stud Wall - Metal Siding

Various types of aluminum or steel siding attached to either wood or steel stud framing. The siding may be found in sheets or in conventional individual lap siding.

889 3-Stud Wall - Rubble Stone Veneer

Some type of local fieldstone veneer laid in either regular or irregular patterns attached to a stud framed wall through the use of metal clips.

890 3-Stud Wall - Shingles

Wood shingles that may have regular, irregular or thatched butts. For quality selection, consider how much exposure each shingle has to the weather. The less the exposure, the higher the cost. Most bundles of shingles are furnished in random widths and applied over spaced sheathing and a building paper. The shingles are thin, small units laid in overlapping layers or combined into panels.

891 3-Stud Wall - Stresskin Sandwich Panel Additive

The additional cost for a stresskin sandwich panel wall is the difference between the cost of a solid insulated panel and stud framing as part of a wall. This unfinished bearing panel is composed of two skins of board sheathing bonded to a rigid insulation core. The core thickness can vary.

892 3-Stud Wall - Stucco

Stucco (exterior plaster) applied over an integral wire and paper or an individual paper and wire over a solid sheathing. The stucco is composed of Portland cement base and sand. Stucco is normally applied in three layers. The first layer is called a scratch coat; the second coat is the brown coat; and the final layer is the dash or color coat.

893 3-Stud Wall - Synthetic Masonry Veneer

A synthetic thin masonry veneer composed of light plaster cement or fiberglass panels to give the appearance of real brick or stone, attached to stud framing.

894 3-Stud Wall - Textured Plywood

Plywood siding usually applied in sheets. Exposed surface has been treated or vinyl

coated to give the plywood a solid wood, stucco or lap siding effect. Panels are found in various grades, thicknesses and species of wood with redwood and cedar being the most expensive. Generally, thicker pieces are more expensive. Normal application requires some type of a blocking material to be used for nailing purposes.

895 3-Stud Wall - Vinyl Siding

Solid vinyl lap siding with various types of butt joints that may be squared, grooved or beveled. Siding may be applied directly to the stud framing or it may be applied over some type of sheathing.

896 3-Stud Wall - Wood Siding

Wood siding finish is applied over a paper backing or sheathing on a wood or steel stud framing. The siding may be either individual vertical boards or a dropped or beveled lap siding.

SINGLE WALL CONSTRUCTION (WOOD or STEEL SKELETON FRAMES)

Each of the wall types listed under the single wall construction category refers to a wall enclosure that is typically applied over an open skeleton prefabricated metal or wood pole framed building. That frame characteristically has the same configuration for each cover. The costs include the costs of the wall supporting girts and cover but not the framing.

The skeleton frame is basically designed with a non-bearing, single-skin curtain wall. The vertical framing members are placed with wide spacing, with support for the exterior cover coming from the horizontal framing (girts), or, in some cases, without horizontal framing, from the vertical members. A finished interior sheathing or liner panel can be added using additive component Number 924.

910 3-Single Wall - Boards on Wood Frame

Consists of structural support provided by wood posts, which have wide spacing, and girders. Board siding usually is applied horizontally, sheet siding vertically, with no support other than the girts and/or posts. The types of board or sheet siding vary, but typically are lower cost sidings.

911 3-Single Wall - Boards on Steel Frame

Consists of structural support provided by metal posts, which have wide spacing, and girders. Board siding usually is applied horizontally, sheet siding vertically, with no support other than the girts and/or posts. The types of board or sheet siding vary, but typically are lower cost sidings.

912 3-Single Wall - Cement Fiber on Wood Frame

Consists of a very dense material that is a combination of Portland cement and asbestos-free fibers. The sheets can be found with two basic profiles, either ribbed or corrugated, which are applied over an open wood skeleton frame. Typically, the exterior exposure has some type of a waterproof outer coating.

913 3-Single Wall - Cement Fiber on Steel Frame

Consists of a very dense material that is a combination of Portland cement and asbestos-free fibers. The sheets can generally be found with two basic profiles, either ribbed or corrugated, which are applied over an open steel skeleton frame. Typically, the exterior exposure has some type of a waterproof outer coating.

914 3-Single Wall - Fiberglass Panels on Wood Frame

Wood skeleton frame with the exterior single sheet skin being fiberglass corrugated panels. The weight and structural fiber reinforcement of the plastic panels can vary.

915 3-Single Wall - Fiberglass Panels on Steel Frame

Steel skeleton frame with the exterior single sheet skin being fiberglass corrugated panels. The weight and structural fiber reinforcement of the plastic panels can vary.

916 3-Single Wall - Metal on Steel Frame

Steel skeleton frame with the exterior single sheet skin being aluminum or steel corrugated or ribbed panels. The gauge and finish of the panels can vary.

917 3-Single Wall - Metal, Texture Covered on Steel Frame

Steel skeleton frame with the exterior single sheet skin being a protected-coated steel (Galbestos) corrugated or ribbed panel. Galbestos is one trade name for a protected metal panel consisting of textured waterproof outer coating of a special hot melted layer application of resin or asphalt giving the appearance of a stucco-like granular finish.

918 3-Metal on Wood Frame

Wood skeleton frame with the exterior single sheet skin being aluminum or steel corrugated or ribbed panels. The gauge and finish of the panels can vary.

919 3-Single Wall - Rustic Log

A solid wall using various diameters of logs. The logs are usually tongue and groove, spiked or doweled using weather sealant or caulking. Normally, the logs are pretreated with preservative.

920 3-Single Wall - Spaced Boards on Wood Frame

An open wall composed of spaced wood boards applied to a wood skeleton frame, primarily found in agricultural applications.

921 3-Single Wall - Stucco on Wood Frame

A stucco (exterior plaster) wall finish applied over an open wood skeleton frame.

922 3-Single Wall - Synthetic Plaster on Steel Frame (EIFS)

An exterior insulation and finish system (EIFS) wall comprised of a rigid insulation board and synthetic plaster cover applied over an open steel skeleton frame.

923 3-Single Wall - Wire Mesh on Wood Frame

An open wall composed of wire mesh applied to a wood skeleton frame, primarily found in agricultural applications.

924 3-Single Wall - Interior Finish Liner Additive

The additional cost for site-installed finished interior sheathing or liner applied to single wall construction.

HVAC Descriptions

All heating and air conditioning costs take into consideration all necessary ancillary components (i.e. ductwork, electrical, cooling towers, etc.) to support the system in question. Costs are averages of the cost ranges that might make up a system depending on the demand loads required by the occupancy, building design and/or climate encountered.

601 3-Electric

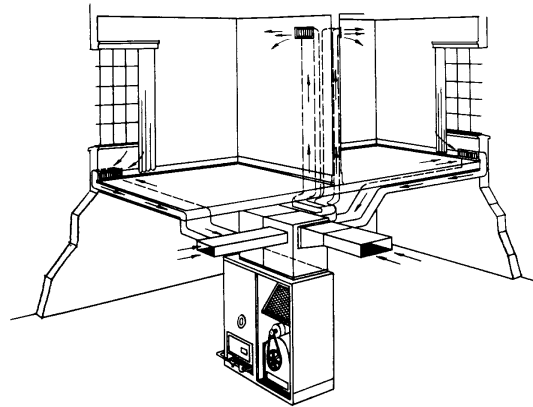
Radiant type heating, either cable, panel or baseboard. Cable is commonly found installed in ceilings beneath a sprayed-on finish.

602 3-Electric Wall

Individual electric unit in the wall capable of heating only small areas with or without a small circulation fan. When used as supplemental heating to the main heating plant, such as in a bathroom, it might be considered as a built-in appliance.

603 3-Forced Air Unit

Gas-fired or electric-powered unit that circulates the warm air with a motor driven fan. Cool air is taken from various points in the building, passed over a combustion chamber and flue, and distributed throughout the duct system.



604 3-Hot Water

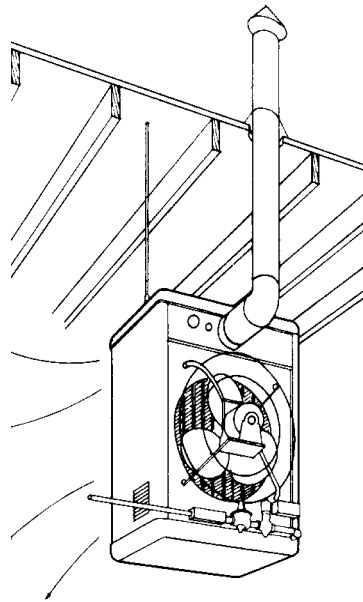
An exposed boiler and radiator or baseboard network, expansion tank and piping. The water is circulated through piping and radiators allowing the heat to radiate into the rooms. The boiler is designed to burn coal, oil or gas.

605 3-Hot Water, Radiant

Water is heated by circulating it over coils or through a boiler that circulates the water through a system of concealed pipes. The piping is most commonly found in floors but may also be found in the ceiling.

606 3-Space Heaters

Comprised of individual unit heaters, generally suspended from the ceiling of roof structure. Within the unit there is generally a fan blower system used to move the warm air. This type of system is typically utilized in structures with large open areas.



607 3-Steam

Steam generated using a boiler and piped to radiators throughout the building by its own pressure.

608 3-Steam without Boiler

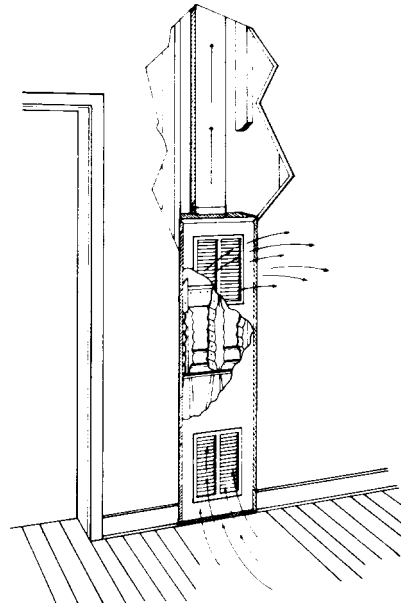
System using a radiator system receiving steam from an external source, such as a central steam plant or adjoining building.

609 3-Ventilation

Air circulation only via fans and ducts.

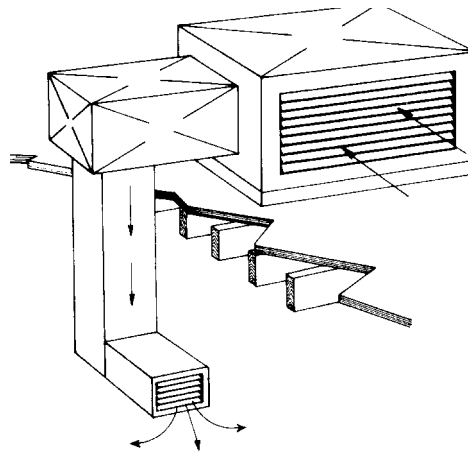
610 3-Wall Furnace

Small furnace either gas-fired or electric-powered and vented to the outside by vertical ductwork. This is a relatively low-cost heating system that can be found in both lower quality and older structures.



611 3-Package Unit

Basically the same as central air (warmed and cooled air) except for the capacity and amount of ductwork involved. Typically, a small package system contains one short duct and thermostat per unit, and it is not uncommon to find a number of individual units servicing one building. A “split system” is a type of package that has a separate gas-fired, forced-air heating unit, with either gas or electric remote refrigerated cooling unit. These are individual roof-mounted units or ground units having their own individual compressors.



612 3-Warmed and Cooled Air

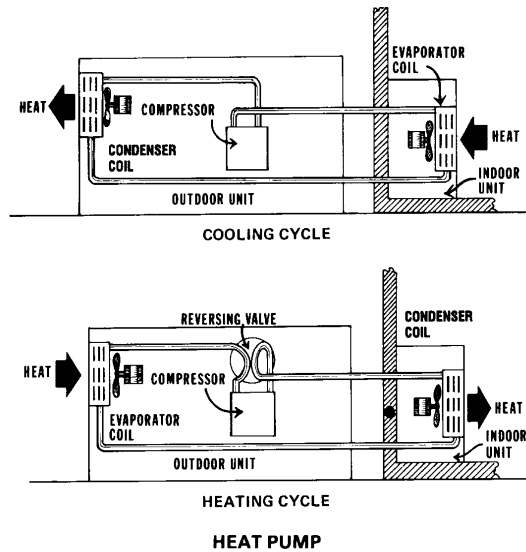
Similar to hot and chilled water, except that the warmed and cooled air is generated at the main plant and distributed throughout the building by a long, complex duct system to numerous zoned areas. This system offers combined heating and cooling.

613 3-Hot and Chilled Water

Hot and chilled water generated in a boiler, chiller and cooling tower (usually a central room), and piped to various sections of a building. From these various points, fin coils or convectors with fans are used to produce warmed or cooled air, which is then circulated throughout that section (referred to as a zone). This system is normally found in class A and B high-rise buildings where system piping must penetrate the fire barriers between floors.

614 3-Heat Pump

Self-contained, reverse cycle, heating and cooling unit. On its heating cycle, heat is collected by the outside coil and pumped inside the building. On its cooling cycle, the heat is collected from inside and pumped to the outside coil where it is dissipated.



615 3-Floor Furnace

Located in the floor and generates heat from the furnace into the rooms.

616 3-Individual Thru-Wall Heat Pump

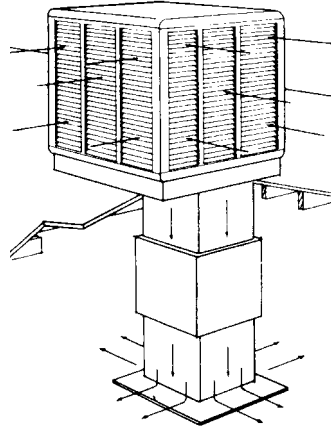
A small, self-contained heat pump designed to be installed in a window opening or wall. Typically there is no ductwork with this unit. Unlike the larger heat pump, it only services one room.

617 3-Complete HVAC

A complete heating, ventilating and air conditioning system typically found in occupancies such as restaurants, general hospitals and surgical centers. For other occupancies, Commercial Estimator uses an appropriate HVAC system (either warmed and cooled air, or hot and chilled water).

618 3-Evaporative Cooling

A cooling unit, usually roof mounted, which cools the air by water evaporation. Outside air is drawn through a moistened filter pad in the plant and cooled air is then circulated throughout the interior. They are usually single-ducted packaged units or relatively short-ducted central systems. This type of system is commonly found in arid climates.



619 3-Refrigerated Cooling, Zoned

This type of system is for cooling only. The cooling unit, a condenser, can be located outside the building or in a mechanical area within the structure. Generally, air is drawn through the system over refrigerated tubes or coils. Once the air is cooled, it is distributed through the building's ductwork. Costs are for a large capacity central cooling system that generates the cooled air at a main plant, and is distributed throughout the building by a long, complex duct system to numerous zoned areas.

620 3-Electric Panels

Radiant type heating, either individual wall or ceiling panels, which may be recessed or surface mounted in an aluminum frame.

621 3-Space Heaters, Radiant

Suspended radiant unit heaters that include the continuous pipe loop system with reflectors, burners and vacuum pumps.

622 3-Space Heaters, Steam Coil with Boiler

A steam coil unit space heater system where the steam is piped in from a boiler.

623 3-Space Heaters, Steam Coil without Boiler

A steam coil unit space heater system receiving steam from an external source as a central steam plant.

624 3-Heat Pump, Ground Loop

A water source heat pump, where the water is circulated through a continuous closed loop inserted into the ground, creating an underground heat exchanger.

625 3-Refrigerated Cooling, Packaged

This type of system is for cooling only. The cooling unit, a condenser, can be located outside the building or in a mechanical area within the structure. Generally, air is drawn through the system over refrigerated tubes or coils. Once the air is cooled, it is distributed to the register outlet through ductwork. Costs are for a simple single zoned self-contained ducted unit with typically one short duct and thermostat per unit. It is not uncommon to find a number of individual units servicing one building.

626 3-Controlled Atmosphere, Conditioned Air

Controlled atmosphere, conditioned air is for environmental storage, usually of fruits, at reduced temperatures, and can include reduced oxygen and elevated carbon dioxide levels to further reduce the metabolic activity of the stored product in a completely sealed environment. The amount of cooling will vary by the type of crop, its maturity, harvest conditions, loading or stacking patterns, length of storage, and the intended use. For example, late crops may have a lower field temperature requiring less refrigeration, while an early crop with higher temperatures will require more refrigeration. Some crops require a rapid cool down or narrower variation in temperature levels, which requires a larger capacity system (extreme cost). Bulk storage may rely more on constant ventilation and precise humidity levels (heating types 628 or 629). Costs include all controllers, sensors, analyzers, and scrubbers appropriate for the storage operation.

627 3-Controlled Atmosphere, Livestock

Controlled atmosphere, livestock, is for environmental confinement, usually swine housing, at a specified temperature range using air-to-air heat exchanges. Costs include all controllers, thermostats, timers and distribution systems. For ventilation fans only use heating type 609 (Ventilation).

628 3-Controlled Atmosphere, High to Precise Humidity

Controlled atmosphere, high to precise humidity, is for environmental storage, usually of vegetables, at a specified humidity and cooled temperature range. The amount of cooling and humidity level will vary by the type of crop, its maturity, harvest conditions, loading or stacking patterns, length of storage, and the intended use. For example, late crops may have a lower field temperature requiring less refrigeration (mild cost), while an early crop with higher temperatures will require more refrigeration. Some crops require a rapid cool down or narrower variation in

temperature and humidity levels, which requires a larger capacity system (extreme cost). Certain pallet or bin storage may require only conditioned air (HVAC type 626), and for cooling and heating (HVAC type 629). Costs include all controllers, sensors and analyzers appropriate for the cooling operation.

629 3-Controlled Atmosphere, Warm and Cooled Air

Controlled atmosphere, warm and cooled air is for environmental storage, usually of vegetables, at specified humidity and temperature range. The amount of cooling and heating will vary by the type of crop, its maturity, harvest conditions, loading or stacking patterns, length of storage, and the intended use. Costs include all controllers, sensors, and analyzers appropriate for the storage operation. For precise humidity and cooling use HVAC type 628, and for conditioned air use HVAC type 626.

649 3-No HVAC

Use this component for areas of a building that do not have any heating, cooling or ventilation. This is mainly used to override the default HVAC in buildings that typically have HVAC. It is not necessary to use it in farm buildings that do not typically have any heating (such as barns and poultry houses), since the default for these buildings is no heat.