



**APPLICATION AND
DESIGN GUIDELINES**

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EQUIPMENT HEIGHT OVERVIEW:

Many engineers, contractors and building owners do not typically consider height as a key product characteristic when making a decision to purchase or specify a packaged rooftop unit. This often overlooked product attribute can have a dramatic effect on the new construction cost of a commercial building.

This cost is independent of the HVAC equipment and pertains directly to the construction cost of the actual building. Purchasing lower profile units can potentially save commercial building owners thousands of dollars per new construction job. Multiply the cost savings by the total number of jobs per year and the savings can add up extremely quickly.

PARAPET WALL CONSTRUCTION COST

Many cities and counties have zoning laws that require building owners to hide packaged rooftop equipment from the view of the public. To meet this requirement, many building owners must construct expensive parapet walls around the perimeter edges of their buildings. While this complies with the zoning laws, hides the equipment and results in a great looking storefront, it can significantly increase the cost of constructing the building.

Using a general rule of thumb for construction costs plus some basic store dimensional data we can easily compute the cost of constructing a parapet wall. All we need to know is the cost per sq. ft., length and height of the parapet wall. Once we have obtained this information, a simple formula will provide the total parapet wall cost.

On average, the cost per sq. ft. to construct a parapet wall ranges from \$18.00 - \$24.00 for a basic parapet wall to \$28.00 - \$34.00 for a wall featuring additional design work or aesthetic appeal elements. Many retail establishments will use a lower cost parapet wall while high-end office buildings may choose to use a more expensive parapet wall.

Parapet Wall Construction Cost Formula:

$$\text{Cost} = \text{Parapet Wall Length} \times \text{Parapet Wall Height} \times \text{Parapet Wall Cost Per Sq. Ft.}$$

It is important to note the required height of the parapet wall can change depending on the application, height of the building and placement of the units on the roof. Taller buildings or buildings where the packaged rooftop equipment has been located away from the edge of the building will typically require shorter parapet walls to hide the units. The parapet wall will often be equal to or less than the tallest packaged rooftop unit.

Shorter buildings or buildings where the packaged rooftop equipment has been located near the edge of the building will require taller parapet walls to hide the same sized units. In this situation, the viewer has a shallow angle and will have an easier time viewing the units, especially when they are located near the edge of the building. The parapet wall will often be the same height or slightly taller than the packaged rooftop unit.

LOW PROFILE UNITS AND CONSTRUCTION COST SAVING POTENTIAL

By switching to equipment with a lower overall height, building owners can lower the required parapet wall height to satisfy the zoning laws. This design change can potentially save a large amount of money by reducing the overall construction cost of the parapet wall.

Parapet Wall Construction Cost Savings Formula:

$$\text{Cost Savings} = \text{Construction Cost (High Parapet Wall Design)} - \text{Construction Cost (Low Parapet Wall Design)}$$

SUPERMARKET EXAMPLE:

Supermarkets and other stores located in strip malls typically only have to install a parapet wall in the front portion of their stores. This is because many zoning laws only require the strip mall occupants to hide the units when viewed from the front of the store. The only exception occurs when a store has been located on the side of a building or if the zoning code requires full enclosure of all rooftop units.

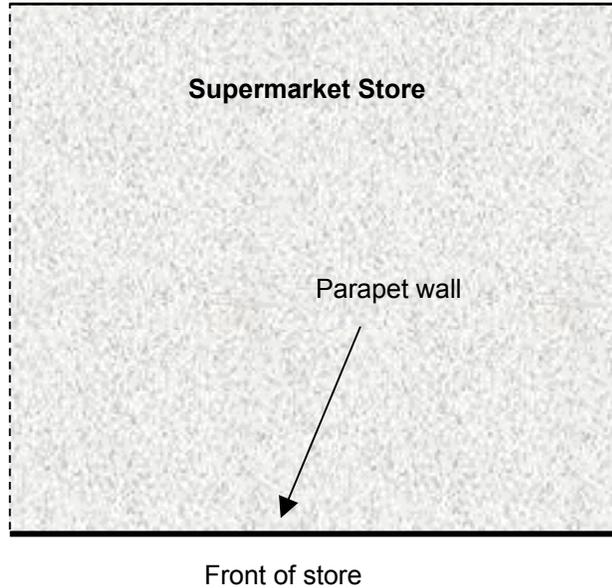
The example below illustrates the cost and savings for a typical supermarket store.

Standard Cost Example

- Store
- Total size (sq. ft.) 55,000
 - Length (feet) 250
 - Width (feet) 220

- Parapet Wall
- Cost (per sq. ft.) \$22.00
 - Length (feet) 250
 - Height (feet) 7

- Construction Cost
- = Length x Height x Cost Per Sq. Ft.
 - = 250 feet x 7 feet x \$22.00
 - = \$38,500.00



Cost Saving Example

By using a piece of equipment with a lower unit height we can decrease the overall height of the parapet wall. The chart below illustrates the total construction cost difference between two 40 ton packaged rooftop units with different heights.

Unit		Parapet Wall			
Description	Height (feet / inches)	Length (feet)	Height (feet)	Cost (per sq. ft.)	Construction Cost
Tall Unit	6' 8"	250'	7'	\$22.00	\$38,500.00
Low Profile Unit	5' 8"	250'	6'	\$22.00	\$33,000.00
Cost savings from low profile unit					\$5,500.00

Office Building Example:

Unlike supermarkets and other stores located in strip malls, office buildings typically have to install a parapet wall around all sides of the building. This is because many office buildings are located in stand alone buildings and the zoning laws require the building owners to hide the units when viewed from all sides.

In addition, many office buildings use more expensive parapet walls featuring additional design or aesthetic appeal elements. The combined factors of additional square footage and more expensive construction can result in large total construction costs and potential savings for these applications.

Store

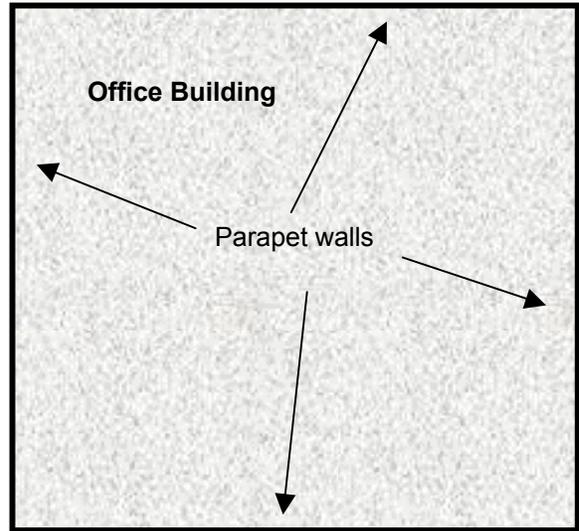
- Total size (sq. ft.) 40,000
- Length (feet) 200
- Width (feet) 200

Parapet Wall

- Cost (per sq. ft.) \$30.00
- Length (feet) 800
- Height (feet) 7

Construction Cost

- = Length x Height x Cost per sq. ft.
- = 800 feet x 7 feet x \$30.00
- = \$168,000.00



Front of building

Cost Saving Example

By using a piece of equipment with a lower unit height we can decrease the overall height of the parapet wall. The chart below illustrates the total construction cost difference between two 40 ton packaged rooftop units with different heights.

Unit		Parapet Wall			
Description	Height (feet / inches)	Length (feet)	Height (feet)	Cost (per sq. ft.)	Construction Cost
Tall Unit	6' 8"	800'	7'	\$30.00	\$168,000.00
Low Profile Unit	5' 8"	800'	6'	\$30.00	\$144,000.00
Cost savings from low profile unit					\$24,000.00