

36

THE NEW 32

Moving to taller clear heights for increased capacity



INDUSTRIAL



METHOD
architecture

DESIGNING TO NEW HEIGHTS

With the rise of e-commerce and increased need for logistics centers, the industrial real estate market has seen a movement toward taller clear heights for increased warehouse efficiency. Tenants have moved from a desire for overall square footage to cubic space in their facilities. While 32-foot clear heights have been common, there is a new trend increasing the height to 36-foot clear buildings. So what is the optimal clear eave height for a new development?

clear height

noun. /klɪr/ /hɑrt/

A building's clear height is defined as the usable height to which a tenant can store its product on racking. This figure is measured below any obstructions such as joists, lights or sprinklers.

Efficiency

The vertical expansion to taller clear heights is based on the efficiencies in utilizing more cubic space rather than a larger footprint, maximizing the volume of the "cube". Taller clear heights allow companies to store more palletized product, which translates to lower occupancy costs per square foot.

The height of pallets can vary, however, roughly 50% of the market utilizes 64-inch pallets. Other common sizes include 56-and 72-inch pallets. This measurement is the height of the pallet which indicates which rack size is needed. Structural pallet racks are designed with spacing between racks at 64, 72 and 80 inches. This means the average 32-foot clear height facilities can accommodate between four and six pallets.

Overall, tenants can increase cube capacity by 10 to 25 percent by going to 36-foot clear heights over the same footprint with 32-foot clear heights.

COST TO DEVELOP

The cost of developing a building to the 36-foot height is more than just the cost of additional steel & taller tilt-up panels. A developer must consider many other factors. The increase in construction costs for 36-foot clear varies, but in rough terms, for a building 300,000 SF & larger, the average is approximately \$1.25 per square foot. While this is a generic estimate, it doesn't apply to all markets.

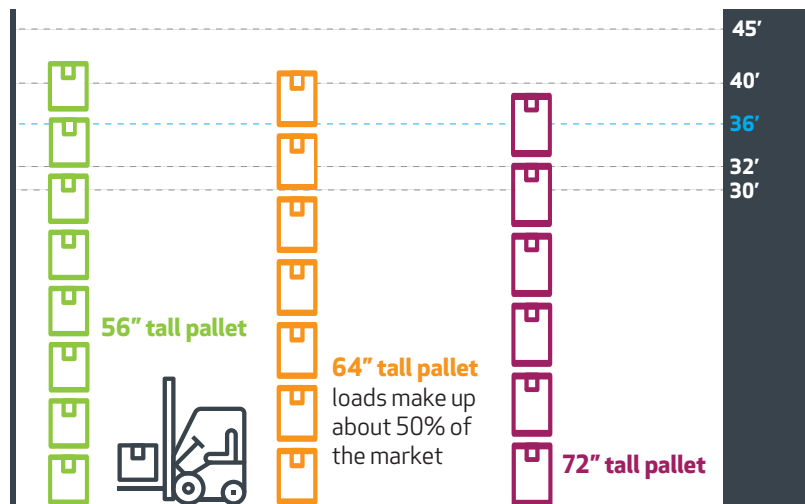
For instance, in areas prone to high winds & storms, the tilt-wall panels must also be increased in size to accommodate the higher wind loads per code. Construction costs overall are rising nationally, so a reasonable estimate considering all these factors is that the added costs may be up to \$1.50 per square foot.

A 2015 study conducted by Colliers International of Class "A" industrial buildings between 300k-600k square feet in the U.S. found that the inventory could be broken down into 3 categories: Existing (63%), Under Construction (24%), and Proposed Developments (13%).

In regards to racking capacity:

- **72%** of existing buildings had 32' clear heights
- **73%** of the projects under construction also had 32' clear heights
- **82%** of proposed industrial developments had 36' clear heights.

This tells us that the industrial market nationally is moving toward a 36' clear height standard.



In a building with a 36-foot clear height, a user will be able to rack one pallet position higher. Fifty-six inch pallets require 37 feet clear before they can gain another pallet position.

Floor Thickness

Typically, in a 28-32-foot clear building, a developer would use a 6-inch floor slab. To accommodate the additional weight of the racking & product associated with the extra clear height, 7-8 inches of slab is recommended for 36-foot clear or above, depending on the product being stored. For build-to-suit warehouses with high-capacity racking systems, the slab thickness may need to be up to 10-inches thick. Flat floors are essential to rack stability and the safe, accurate operation of automated storage/retrieval systems and narrow aisle reach trucks. Incredibly, a fraction-of-an-inch bump or dip in the floor can cause the truck mast to lean to one side, flex the frame or create other problems.



PARK 249

This project consisted of designing a 36-foot clear height tilt wall distribution center in Houston, Texas. Bay spacing was adjusted to 56-feet to allow enough room for reach trucks to lift pallets at increased heights.



443,520 SF
SIZE



36'
CLEAR HEIGHT

A Pulse on Tenant Demand

Warehouse users less than 300,000 SF often find clear heights 30' or less to be sufficient. However, with a heavy push from large logistics companies and e-commerce giants such as Amazon, we are seeing the needs shift from 32 to 36. In a report published by SIOR, a calculation of increased base rent was formulated based on the following to gauge whether an increase would affect tenant desire for additional capacity:

Assuming that a 300,000 square foot 32' clear height building has a proforma rent of \$4.85 NNN for the developer to achieve the required return on investment to take the risk of constructing a new building.

Development Specs	
Building Size	300,000
Lot Size Gross w/ Retention	35
Land cost per gross acre	\$100,000
Total Land Cost	\$3,500,000
Cost per bldg SF	11.67

The rental rate must increase by \$0.13 per square foot for the developer. This is a 3% increase in rent to the tenant. Considering the additional 10-25% increase in cube capacity that can be obtained from a tenant's operations, the additional lease cost is proportionally small.

Lastly, there is the value from a developer's standpoint. If an industrial developer is building today, they likely plan to sell the property once it is leased up within 2-4 years. Even institutional investors and

32' Clear Building	
Budget Item	Cost PSF (\$)
Grand total land cost under bldg	11.67
Impact Fees / Permitting	3.00
Site & Shell	32.00
T.I.	7.00
A&E	2.00
Brokerage	2.00
Dev Fee	1.00
Total Costs	58.67
Lease Rate	4.85
Yield	8.27%

REIT's don't hold property as long and often turn portfolios in the 5 to 7-year range. As an added incentive for the developer, the types of tenants attracted to these buildings tend to be larger, more sophisticated tenants that can offer better financial strength and increased certainty of performance during the lease. Looking ahead, higher clear buildings may make sense in markets where users distribute over a larger geographic area.

36' Clear Building	
Budget Item	Cost PSF (\$)
Grand total land cost under bldg	11.67
Impact Fees / Permitting	3.00
Site & Shell	32.00
T.I.	7.00
A&E	2.00
Brokerage	2.00
Dev Fee	1.00
Additional bldg costs 36'	1.50
Total Costs	60.17
Lease Rate	4.98
Yield	8.27%

Upgraded Fire Protection

Most high-bay buildings with ceiling heights greater than 40-feet are designed & utilized as warehouse facilities. The primary fire protection concern with these facilities involves the provision of adequate sprinkler protection.

NFPA 13 requires ceiling heights from 40-45-feet have an increased water demand of approximately 15-20% be provided for Early Suppression, Fast Response (ESFR) sprinkler systems. The installation of these systems in buildings greater than 40-feet in height will generally require larger fire pumps & pipe sizes & will increase the probability that the available water supply is insufficient & must be supplemented with a firewater tank.

Another area to consider for 40-foot ceiling heights is that you lose the ability to store some commodity types.

It is important to understand the planned or potential uses for a warehouse facility with a ceiling height in excess of 40-feet.

Aisle Spacing

As clear heights reach 36 feet and racking gets taller, your reach truck must have the capacity and aisle space to lift pallets nearly 34 feet off the floor. Mast extensions and battery compartment dimensions on narrow aisle reach trucks can measure up to 10 feet, so the optimal configuration for a distribution center with 36-foot clear height is 56-foot structural bays and 10-foot aisles.

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FIRM SNAPSHOT

INDUSTRIAL | OFFICE | RETAIL | PUBLIC | BREWERIES + DISTILLERIES

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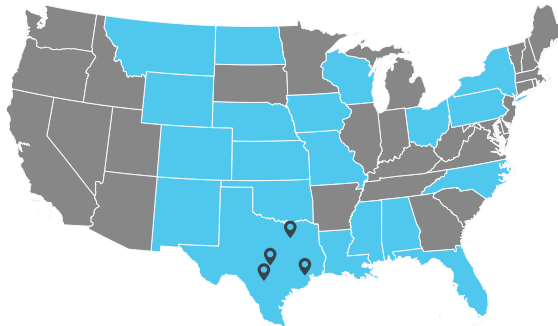
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