Raise the roof! When to consider higher cubic clear heights for your warehouse operations

Shrinking availability of industrial land and shifting consumer demands are driving average warehouse clear heights to new levels. When does it make sense for industrial tenants to consider moving to higher clear-height buildings for their warehouse operations?

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In the commercial real estate business, we tend to think of space in terms of square footage. But when it comes to warehouse properties, many distribution and logistics managers give equal consideration to the third dimension, height.

Warehouse operations professionals use the measurement of "clear height" to refer to the distance from the lowest point on the roof joists to the floor slab ("clear to any steel") in order to calculate potential racking capabilities, allowing for fire suppression tolerances (based on commodity being stored and municipal fire regulations), mechanical systems and lighting.

Four decades ago, the average warehouse clear height across North America was under 20 feet. But as equipment evolved (racking, forklifts, etc.), and locations near cities and distribution centres grew more expensive, building heights started creeping up to accommodate increased storage capacity within the same footprint.

In recent years, as ecommerce companies like Amazon push the envelope in maximizing warehouse efficiency with new automation and racking systems, developers are responding by raising the clear height in new warehouse developments to new levels. Thirty-six-foot clear heights are becoming the norm. One architect recently wrote a column about a request to design a build-to-suit facility with a 50-foot clear height.

A review of Toronto-area new-build warehouse properties by decade shows that average clear heights have more than doubled since the 1970s [see figure 1].

Figure 1:
Toronto-area clear heights and industrial developments over 100,000 SF.

Decade	Average clear height	# of new properties
1970s	16'	211
1980s	22'	258
1990s	24'	216
2000s	28'	385
2010 - Today	36'	130

Source: CoStar

In addition to the upward trend in new industrial buildings, some property owners are literally raising the roof on older properties in strategic locations to be able to compete with newer warehouses for tenants who want more cubic footage. There are even companies that have built an economically viable business model on the concept.

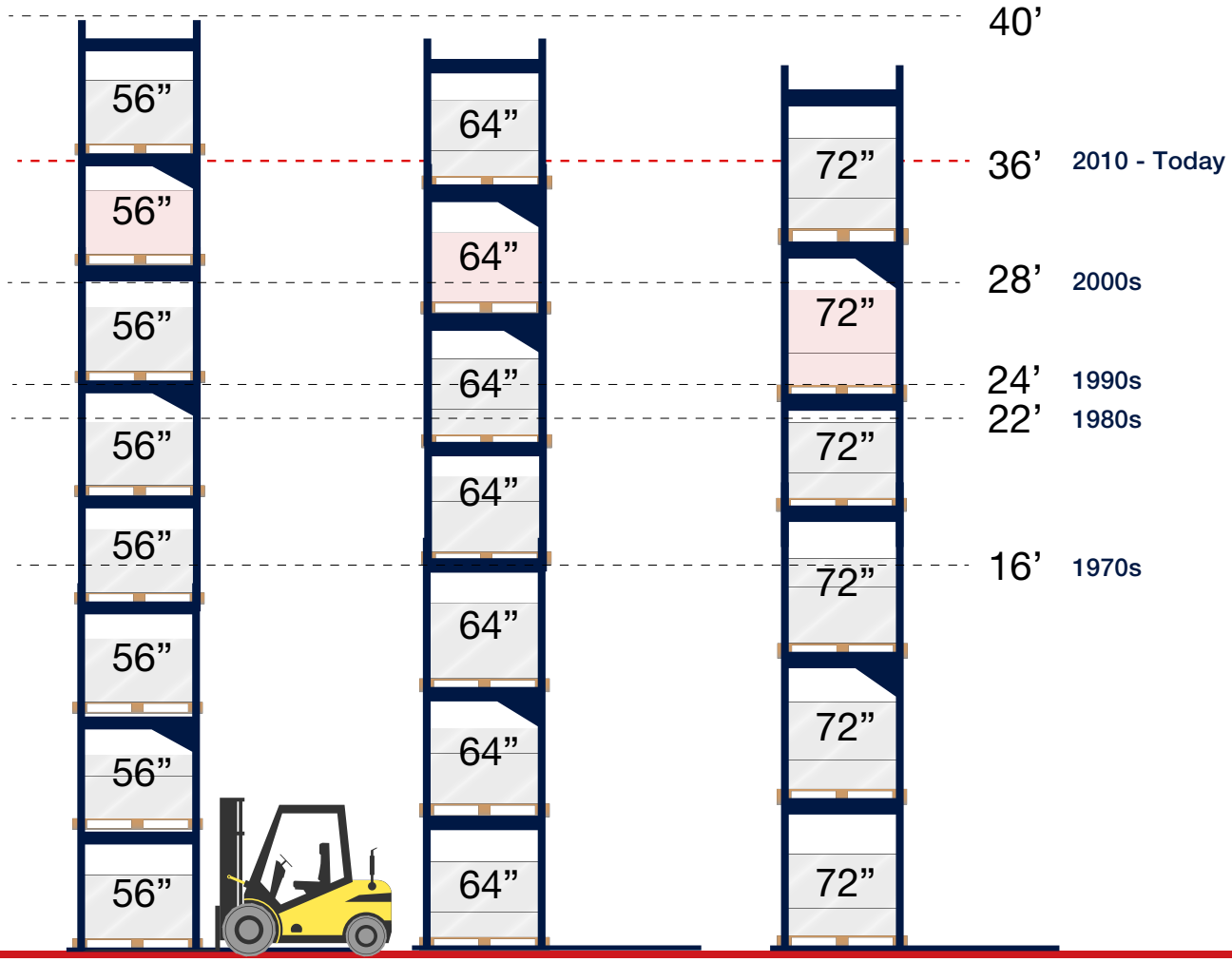
There are higher costs to taller buildings, of course. Heavier floor loads due to taller racking require floors to have increased reinforcement and tighter specifications on slab flatness to accommodate racking and load stability. Walls, support columns and ceilings may need to meet different building codes for

structural integrity, and fire suppression systems may need to be upgraded. For instance, a 6-inch slab in a 30-foot-clear building would need to be increased to at least 8 inches in a 36-foot-clear structure.

As clear height rises above 32 feet, specifications for the flatness of the slab surface itself become more important, to ensure stability of the racking and forklift operations. Even the spacing between support columns and width of exterior walls may need to change, to accommodate larger forklifts and sturdier roofs. Lighting a larger-volume space and providing adequate fire safety features also need to be examined.

Despite these higher building standards, the rule of thumb for developers is that a taller building increases the average cost to build per square foot by only about $1.25 to $1.50. So, for a slightly higher cost per square foot, industrial tenants can gain from 20% to 50% more cubic feet. This means that a tenant can store more materials within a smaller footprint, or create room to grow operations. [see figure 2].

Figure 2:
Comparison of cubic footage gain for warehouses with different clear heights.



Given the higher operating costs, moving to higher clear-height space isn't a snap decision for every company.

For example, if a company currently using a warehouse with a 24' clear height moves to a new one at a 36' clear height, it would gain 30% – 50% more space in cubic square feet, depending on its pallet size and racking system. If a company leasing 100,000 square feet can effectively use 30% more cubic height, it can reduce its leased space to 66,000 square feet, lowering its monthly operating costs.

The average height of a pallet of goods varies, but most logistics companies plan for pallet heights of 56, 64 or 72 inches, the most common being 64" high. Allowing for a few inches of space above each stack, a building with a 24-foot clear height can accommodate four racks of pallets. Moving to a warehouse with a 36-foot clear height can add two additional pallets per rack. That's potentially a gain of 50% more space. But to manage higher shelves, of course, the operation needs to have racking systems, forklifts and inventory systems that are designed for taller spaces.

Given the higher operating costs, moving to higher clear-height space isn't a snap decision for every company. For smaller operations, say, under 70,000 square feet, the difference in clear height may not be justified in a cost/benefit analysis.

For larger operations, the decision to look for greater cubic volume is generally business driven. Common scenarios for considering a move to a building with a higher clear height include:

- Lease expiration/renewal dates
- Equipment replacement cycles
- Company growth, merger, contraction
- Application for ISO certification, or other efficiency initiatives, such as six sigma process management

In addition to the individual circumstances informing a company's decision to opt for a warehouse with greater cubic volume, any real estate decision is further complicated by individual markets' options and opportunities. Companies should consult with real estate advisors who have the expertise in the distribution and logistics industry who can help run some calculations and scope out what's available in the area.

It's vitally important to have a specialist on one's side to help objectively analyze the potential market solutions versus current and future business needs. Armed with the best information, companies can potentially save significantly by thinking in three dimensions.

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