

# WHITE PAPERS

**THE SKY'S THE LIMIT**



More and more companies are turning to high-rise storage solutions and the automated storage and retrieval systems (AS/RS) utilized within them, to increase distribution efficiency and control, decrease energy use, reduce labor costs and maximize use of available land. With numerous advantages, high-rise warehousing can provide a valuable alternative to conventional warehousing.

“Across the food and beverage industries, the need for speed and accuracy in distribution is continually increasing,” said Mike Netting, divisional vice president of Distribution and Logistics Services at Stellar, a leading construction, design, engineering and mechanical services firm. “This evolution is causing companies around the country and the globe to take a closer look at high-rise warehousing as a way to reduce costs and gain a competitive edge in the marketplace.”

## CONVENTIONAL VS. HIGH-RISE WAREHOUSING

When compared to conventional steel-frame warehousing, high-rise warehousing differs in many ways. A conventional warehouse has a steel frame as its structure and is composed of insulated metal wall panels, prefabricated metal walls or tilt-up walls. High-rise warehouses typically are rack-supported buildings. In rack-supported structures, the racking system comprises the primary structural support for the facility, including its roof and walls, which are often called its “skin.” Conventional warehouses have product storage heights of 40 to 60 feet, must be expanded horizontally and rely on workers and forklifts to move products. High-rise warehouses can be constructed as high as 140 feet, resulting in an increased product storage density and requiring much less real estate. High-rise warehouses also are outfitted with automated storage and retrieval systems (AS/RS), which are composed of automated cranes, elevators, carts, product racking and robust software controls.

High-rise warehousing is similar to conventional warehousing in one way—it can be implemented for a variety of applications, including use for refrigerated storage. The structures can accommodate all temperature ranges—from -40°F to ambient.

## SMALLER FOOTPRINT, LARGER CAPACITY

One of the primary benefits of high-rise warehousing is its utilization of space. Companies seeking to construct a storage facility in a highly-populated area will likely encounter challenges in accommodating space needs. High-rise warehouses have a smaller base footprint, requiring less land for construction. Less land use reduces real-estate investment, allows for warehousing in a more populated area and reduces the amount of “set-aside” land required by many open-space laws. High-rise storage facilities also can store more per square foot of building. They can incorporate multiple rack configurations, including single-unit load racks and multi-deep pallet racks. This allows for accommodation of an increased number of pallets and pallet positions. These high-rise warehouses also have more room for storage because they do not require structural support columns and have narrower aisles, which need only to accommodate automated equipment. Additionally, automated equipment can reach to the highest levels of the structure, allowing pallets to be stacked the entire height of the facility.

## EFFICIENCY AND LABOR REDUCTIONS

Automated storage and retrieval systems, essential in high-rise warehousing and incorporating everything from cranes to carts, are designed for efficiency. By working with enterprise software solutions, AS/RS track the location of all stored items and the ongoing status of the order fulfillment process, allowing complete control of inventory and an ability to react quickly to customer needs. AS/RS are often integrated with automated guided vehicles for cross docking, loading, offloading of trucks and use of centralized picking systems. Products can be received, stored and transported rapidly within the warehouse, significantly increasing throughput rates.

“In a three-shift environment inherent to warehousing and distribution, use of automated systems represents significant labor reductions,” said John Hinchey, vice president of sales for Westfalia Technologies, Inc. “AS/RS can run 24 hours a day with minimal human oversight. By taking the human element out of the equation, you eliminate product damage, and there is no need to conduct a physical inventory because you have 100 percent, real-time inventory accuracy.”

Reduced manual labor significantly increases overall efficiency of the facility. Automated systems move faster, are easily programmable and greatly reduce human error. High-rise warehousing virtually eliminates the need for workers in roles such as forklift operation. Although highly trained and educated—and typically higher-salaried—workers are needed, long-range labor cost analyses demonstrate a savings compared to the number of workers needed to work a conventional warehouse.

## ENERGY EFFICIENCY

The efficiency of high-rise warehousing extends to energy as well. Because automated systems do not require light to work, facilities need less energy for operation. For refrigerated facilities, the load requirement of cooling per cube is less in a high-rise warehouse, due to minimal door penetrations—a conventional warehouse would require more points of entry to accommodate the traffic of standard forklifts. The reduced number of entry points makes it easier for refrigerated facilities to maintain lower temperatures and reduces refrigeration equipment needs. The smaller roof size also reduces heat absorption and cooling needs.

## CONSTRUCTION COST SAVINGS

Many companies that choose high-rise warehousing will incur substantial tax benefits, depending on the tax laws and codes that apply to a particular company. In rack-supported enclosures, the racking that serves as the frame for the building is considered equipment, and therefore the roof and walls are considered components of an equipment enclosure. This categorization can allow these components to be depreciated at an accelerated rate.

## DETERMINING IF HIGH-RISE IS RIGHT FOR YOU

Expectations of supply chain accuracy and speed to market are rapidly growing in the distribution of food, pharmaceuticals and consumer products. In addition, land availability is increasingly limited, and there is an increased emphasis on energy efficiency among company stakeholders, the government and the general public. These factors can make high-rise warehousing a value-added alternative to conventional warehousing. Prior to implementing a high-rise facility, companies should evaluate various factors, including building functionality needs, land availability and customer needs. Companies that are ideal candidates for implementation of high-rise warehousing solutions typically possess the following characteristics:

- o High throughput rates
- o Fixed customer and product
- o Land in desired location is expensive or limited in availability

## ABOUT STELLAR'S DISTRIBUTION AND LOGISTICS SERVICES

Stellar, a fully-integrated firm focused on construction, design, engineering and mechanical services worldwide, has partnered with automation supply companies to create high-rise facilities for some of the nation's leading food companies. Stellar provides architecture, engineering and construction to retail, wholesale and foodservice distribution facilities and public refrigerated warehouses. By understanding the operational issues inherent to today's supply chain and by planning for the future of the facility, Stellar's team helps clients maximize return on investment. For companies considering high-rise warehousing and AS/RS, Stellar can provide a cost and value analysis to determine the best warehousing solution.

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