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Landlocked LBM dealer overcomes logistical restraints



NORTH CAROLINA dealer created a drive-through structure to provide additional storage without additional overhead.

WHEN REEVES ACE HARDWARE of Highlands, N.C., sought to improve the efficiency and merchandising of their lumber and building material operations, some serious challenges hindered logistics, quality control, and profitability.

Since their downtown location is landlocked and subject to restrictive building ordinances, this limited the

available space to increase product storage, and left some product uncovered and insufficiently protected from weather.

Cramped, inefficient storage had led to redundant handling of product, causing damage and depleting inventory. Without a fully covered warehouse, Highlands' annual 81 inches of rainfall, along with snowfall,

caused unavoidable product damage.

A lack of continuous rack space for display and storage also hindered merchandising and inventory management. Because of this, customers could not readily see all products available, and shipping products to job sites was impeded.

In response, Reeves Ace corporate president Jeff Reeves, manager Jim Luke, and sales manager John McCall identified several key objectives. This involved creating a drive-through structure to provide additional storage without additional overhead, with wide aisles to ease loading, shopping, accessibility and increased volume.

To prevent product damage in a severe climate, the structure would need to be engineered to survive the "storm of the century." (Their foresight was substantiated two weeks later when a snowstorm destroyed their existing lumber shed). The structure also had to comply with local ordinances, offer aesthetic appeal, and avoid disrupting Reeves' existing operation because business could not be shut down for construction.

Reeves turned to LJS Solutions, known for its expertise in lumber and building material facilities. LJS regional sales manager Bill Lawson teamed up with Steel King Industries to develop a unique solution, a cantilever rack-supported building.

As both design engineer and manufacturer, Steel King was able to offer the sole-source responsibility, resulting in a seamless interface between engineering and manufacturing. Additionally, the company is the only manufacturer of rack-supported buildings with in-house P.E. qualified engineers.

A cantilever rack supported building is more cost effective than a conventional metal building and freestanding racks because the racking supports the structure. This equates to fewer required contractors and faster erection of the structure.

Equally important, with the cantilever rack-supported design, the concrete involved in the construction process can utilize a much simpler, more cost-effective design than traditional options. Footings for support columns do not need to be as deep as those for conventional buildings. Building anchors are installed in finished concrete, not placed prior to concrete pours. This was a major factor in allowing Reeves to continue doing business during construction.

In regard to warehousing and material handling, cantilever rack is often used to maximize the storage density and selectivity of long, odd-shaped items such as lumber, doors, pipe, tubing, sheet metal, and rolls of material without the need to palletize. Unlike standard pallet rack, cantilever rack, with no obstructive front column, offers individual selectivity. This lowers handling time and cost, and saves horizontal space normally lost to rack structure.

To identify the maximum allowable building size on the property, in compliance with building ordinances while optimizing lineal and cubic storage space, LJS Solutions worked closely with Luke, McCall, yard foreman Justin Watson, and professional engineer Anne Russell. The result would be a 100-ft.-long by 92-ft.-wide building with three double-sided runs of cantilever, including two drive aisles. The building would also take advantage of an existing single-sided, 70-ft.-long cantilever structure.

Functionally, a drive-through cantilever building was the best choice to meet Reeves' needs, since the racks are compact, adaptable, and well suited to storing long or odd-shaped building materials. In addition, installing the right system minimizes handling time and employee stress.

To meet the structural requirements to withstand the "storm of the centu-



RACK-SUPPORTED structure designer/builder was able to offer sole-source responsibility, resulting in a seamless interface between engineering and marketing.

ry," Russell's design utilized strategic spacing of roof support columns, along with cost-effective roof girder and roof substructure. The engineering resulted in a snow load of 40 lbs. per sq. ft. that exceeded local code requirements.

The building design includes features that virtually eliminate product damage. To protect product inside the building, the design utilized sheeting on the outside walls of cantilever runs, while engineered 10-ft. eaves shelter product outside that is exposed to weather. Because forklifts are prone to damage gutters that capture rainwater runoff at the side of the building, the design places the gutter in the roof. The gutter's size is increased by widening the space between the roof purlins and the gutter, so the downspouts can run down the side of the end walls, out of harm's way from forklifts.

Additional design features enhanced material handling and logistics, with a layout that has facilitated order picking, increased volume, and allowed customers to see total product assortment. Taking into account the cantilever arm loads based on bundle weights, maximum fork lift reach, and gable end requirements, the design utilizes two 90' runs of double-sided cantilever, with a base, three arms on each side, and one

70' center run of a base and three arms per side. The bottom two levels are for picking orders, and the top two levels are for overstock on the outside runs. The inside run allows picking on three levels and overstock on two levels.

The design also includes a climate-controlled office. However, this required special column engineering since two separate columns were needed to straddle the office. Construction utilized durable cement board siding to meet local codes. The interior was upgraded with pre-galvanized wall girts and purlins to resist corrosion as well as painted girders that match the cantilever components.

Throughout the entire construction process, efforts were coordinated to allow Reeves Ace Hardware to continue to serve their customers.

The use of drive-through cantilever rack supported building has resulted in significantly better material handling, product protection, merchandising, and aesthetics. This has boosted profitability, the bottom line, and civic pride.

Manager Luke stated, "This project was long overdue. We should have really done it 20 years ago. It is a great asset to our company, our inventory, and our community." 