



Smithfield Foods, the largest hog producer and processor in the world, is a vertically integrated company overseeing every step of the hog and pork production process at its operations. When identifying ways to make their feed manufacturing system more robust, they sought out a tension fabric structure to meet their ingredient storage needs.

“We needed a flat storage solution that was accessible via mechanical means for manipulation,” said Katie Elmer, corporate engineer at Smithfield. Some of the soft stock used to create hog feed – including distillers grain and soybean meal – is compressible and does not flow easily out of traditional vertical silos. The product is delivered by rail, therefore the new flat storage building needed to accommodate a large volume of material and conveyance system to receive product.

BUILDING NAME

Bulk Feed Storage Structure

OWNER

Smithfield Hog Production Division

LOCATION

Rose Hill, NC

MARKET SECTOR

Bulk Storage

APPLICATION

Ingredient Storage

SIZE

125' x 480' / 60,000 SF

SPECIAL FEATURES

79' peak height, fabric liner

INSTALLATION

Legacy in-house crews





After receiving proposals from several different vendors, the team at Smithfield chose Legacy Building Solutions to design, manufacture and install the new building. “We needed a clearspan building,” said Elmer. Clearspan design leaves ample unobstructed space for ingredient piles, as well as equipment and operations inside the building.

Another requirement for the building was a peak height of 60-70 feet. The clearspan design and taller peak create a more economical footprint and more available interior space for stored product and equipment. The building is filled by a conveyance system located at the top of the building. The conveyance system can produce four 53-foot piles using a spouting system that expands and retracts with the growth of the pile. The retractable spouts help with dust control.

At the new Smithfield facility, the conveyor, spouts and catwalk are accessible through two sets of egress stairs. The stairs were included in the design to make it possible for staff to inspect and maintain the equipment on a regular basis – increasing safety and workflow efficiencies within the facility.

The recently completed building is 125 feet wide by 480 feet long and a total of 60,000 square feet – enough to store 20,000 tons of product. Supporting the building are gray primed rigid steel frames. The exterior of the building is white fabric cladding, with a 12 oz. fabric liner added to prevent feed dust from settling on the frame. Protecting the frame in this manner prevents damage to the frame, and further reduces the amount of dust in the building.

Reducing dust also reduces the chances of accidental combustion – a potential safety hazard when working with these materials.

Legacy’s team also added a passive ventilation system to provide airflow throughout the building, which helps prevent spoilage and product damage. Fresh air intake is provided by overhangs with mesh soffit. The gravity system is designed to keep cool air flowing in through the eaves and warm air exhausting out peak vents. This keeps cooler air closer to the occupied level of the structure.

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Cast-in-place concrete walls serve as the foundation of the building and increase the sidewall strength, allowing soft stock to pile right up to the edges of the structure. Smithfield uses concrete jersey walls inside the building to separate products inside the structure while maintaining the clearspan area required for storing material and maneuvering heavy equipment. “Typically there will be two products in the building, but using the jersey wall barriers allows us to store a third product as needed,” said Elmer.

With the new Legacy facility up and running and the capacity to store an additional 20,000 tons of feed ingredients, Smithfield has improved their animal feed manufacturing capabilities.