

INNOVATIVE DESIGN AROUND THE WORLD

A look at the nine 2023 CEBA Built by the Best finalists.

By Keith Loria



Now in its seventh year, the Built by the Best Award, created by the Controlled Environment Building Association (CEBA), honors innovative construction or renovation projects in controlled environment buildings across the world.

This year there are nine finalists selected to compete for the 2023 best-in-class build/design. And, for the first time, the award is truly global with contenders from South Africa and Italy.

There will be one winner for projects under \$35 million and one winner for projects over \$35 million.

Here's a snapshot of this year's finalists and their work.

Under \$35 Million

Core X Complete Facility

Ti Cold



(Photo courtesy of Ti Cold.)

Core X Complete provides frozen and refrigerated warehousing and truckload shipping solutions throughout New England and the Northeast United States.

Looking to expand, it brought on Ti Cold to create a master plan for a high-density, 83,000-square-foot cold storage facility with 18,000 pallet positions in Sturbridge, Massachusetts. And as it had to be built on only 7.05 acres, there were some logistical challenges.

For one, Massachusetts is known for its rocky soil, and blasting was required on the site. Added to that, winter conditions froze the sub-grade, and it required a high level of coordination to progress permitting.

Ti Cold also needed to add complex storm drain construction in lieu of a retention pond.

Plus, COVID-induced supply chain short-

ages demanded proactivity to ensure switchgear delivery, so the project schedule stayed intact. Therefore, spot-on sequencing was necessary for intricate concrete and rail installation for mobile racking and coordination with pre-punched beams for in-rack sprinklers.

The project was also halted by the Massachusetts Department of Transportation, but overcame all challenges, including supply chain disturbances, and the budget was sustained.

The completed facility offers convertible rooms cooled by transcritical CO2 refrigeration, allowing for easy adaptation to Core X's needs. There are also three underground storm basins engineered in order to coordinate the necessary above-ground space (truck parking, employee parking, fire loop, and water tower) while maximizing the facility's square footage.

Vortex Cold Storage Convertible Cold Storage Facility

WDS Construction



(Photo courtesy of WDS Construction.)

To fill a huge need for more cold storage availability in the U.S. Upper Midwest, WDS Construction collaborated with Vortex Cold Storage to develop a new 173,400-square-foot convertible cold storage facility in Albert Lea, Minnesota. It would be utilized by JonnyPops ice cream products.

The ice cream company had been utilizing a leased production facility and needed more room for its continued growth.

WDS Construction designed a new building that allows for that growth. It offers safe, quality food-certified storage space across four cells with temperature ranges from 38 to -20 degrees Fahrenheit. Some of the

building's main features are 34,888 pallet positions, 12 truck docks operating at 15 degrees Fahrenheit, four cells with convertible temperature zones, and 40 feet to top of product with a push-back rack system.

WDS introduced various elements in the Vortex project aimed at promoting environmental sustainability and adherence to environmental, social and governance (ESG) principals. For instance, to help with energy conservation, the company utilized a CO2 refrigerator system.

The project was complicated by COVID-19 and global supply chain delays. However, the team responded with agility and had the facility ready to receive product only 10 months after initial groundbreaking.

The Vortex Cold Storage facility is also home for the company's own corporate offices, and displays high quality employee areas and trucker lounges.

OVER \$35 MILLION

Pick n Pay Eastport Logistic Park Distribution Center

AMC Engineers



(Photo courtesy of AMC Engineers.)

Pick n Pay, a well-known national supermarket chain in South Africa, hired AMC Engineers to build its new distribution center in Eastport Logistics Park in Gauteng, South Africa. This new center would more than double the space of the distribution center it

was replacing, and would serve Pick n Pay's entire inland market.

The result was the largest single-phase warehousing development in South Africa. In fact, the project broke a world record for having the longest roof span covered by a single metal corrugated sheet (called Sky

Forming). The sheet stretches 3,014 square feet across the widest portion of the Pick n Pay roof.

The overall site measures 3.8 million square feet, with 40% (1.6 million square feet) comprising the distribution area, of which nearly 485,000 square feet is the chilled distribution area. That is expected to lower the cost-per-case by 12% over the next five years.

The project qualifies for EDGE Green Building Certification for its commitment to incorporating green and sustainable practices, including incorporating a 3-megawatt peak solar photovoltaic system, a 1-million liter rainwater storage tank and having automation throughout the facility.

By delivering such a large project, AMC Engineers helped make Pick n Pay's supply chain more centralized and aided in fulfilling its customer value project. In addition, the distribution center will enable the company to deliver key logistics and supply chain innovations and grow its market share.

Riverbend Meats Processing Plant

Big-D Construction



(Photo courtesy of Big-D Construction.)

A leading U.S. purebred Angus cattle operation known for its ethical livestock management and protection of the environment, Riverbend Ranch brought in Big-D Construction to build its new meat processing plant in Idaho Falls, Idaho.

It's goal was to have new building reflect its values. After all, Riverbend Ranch focuses on all-natural, hormone-free beef cattle that have never been fed or treated with antibiotics. Its new facility needed to adhere to this sustainable philosophy.

Big-D Construction went to work using primarily precast concrete walls and insulated metal panels with a cast-in-place concrete basement. The facility includes a large fabrication area with state-of-the-art equipment, 28-degree box cooler, -10-degree freezer, multiple Hot Box chillers, a cold dock with eight dock-height doors, order fulfillment space, a two-story office, and various support spaces. In total, the facility offers seven temperature zones.

As a major contributor to the project's success, Big-D utilized 3D modeling and other tools in the early stages of design and construction.

Completed at the end of 2022, the Riverbend Ranch Meats plant is a modern processing facility with the capability to process animals from harvest to finished packaged product.

NewCold Indianapolis Automated Cold Storage Facility

Fisher Construction Group



(Photo courtesy of Fisher Construction Group.)

NewCold, a Netherlands-based company that specializes in temperature-controlled warehousing and distribution, wanted to build the largest automated cold storage facility in Indiana. It brought in Fisher Construction Group for the job.

The 464,646-square-foot Indianapolis, Indiana, cold storage facility was designed for

state-of-the-art technology, including automated storage and retrieval systems (ASRS) to automatically move and store products in the dark highbay warehouse.

The project was divided into three sections: the 250,000-square-foot highbay, dispatch area and layer pick area, and each presented its challenges.

One of the biggest challenges of the project was the thermal principles separating areas by zones.

With multiple elevations connecting separate portions of the building and environments, ranging from -19 degrees to chilled 40 degree environments to an exterior that can have a heat index well over 100 degrees, it took a lot to ensure everything was done perfectly.

Fisher's thermal team designers and onsite team conducted multiple thermal detail reviews prior to construction. They collected insight from various members of both companies to create a working value engineered solution that made sense to both parties.

While traditional cold storage environments are primarily run by forklifts, NewCold decreased the forklift traffic by utilizing a single landing point for products.

At 141 feet high, half the size of the mammoth Lucas Oil Stadium, home of the Indianapolis Colts football team, the completed facility offers more than 100,000 pallet positions, and its advanced cold chain solution ensures that processes are sustainable and traceable.



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Cold Summit Development Multi-tenant Cold Storage Facility

FCL Builders



(Photo courtesy of FCL Builders.)

Cold Summit Development enlisted FCL Builders to create Cold Summit Chicago I, a 212,375 square-foot, capable of -20 to 55 degrees Fahrenheit, multi-tenant cold storage facility on an 11.2-acre site, in Bedford Park, Illinois.

According to FCL Builders, it was one of the most flexible cold storage facilities ever conceived.

The project, which was completed in summer 2022, includes 7,000 square feet of fully convertible temperature-controlled office suites. The facility was designed to accom-

modate two tenants and includes four initial cooler/freezer spaces, with future planning for up to 10 separate cooler/freezer swing rooms, offering maximum flexibility. It also houses a battery charging room with scrubber dump, future battery charging points, electrical gear and three manual tap boxes, ensuring operational continuity during outages.

The development encompasses a multifaceted design tailored for cold storage needs, showcasing efficient space usage, strategic partnerships and advanced systems integration.

For instance, FCL Builders installed an innovative refrigeration system that contributed to 10 dock roof-mounted penthouses to regulate freezer temperatures, and two penthouses for dock cooling.

The entire facility is fortified with a Quell (k-17 head) fire protection system designed by Shambaugh & Sons, which includes a 200,000-gallon bolted tank and a 2,500 GMP diesel fire pump in an on-site pump house for enhanced safety measures.

NewCold Fiorenzuola d'Arda Automated Facility

NewCold



(Photo courtesy of NewCold.)

As a global leader in temperature-controlled warehousing and advanced food logistics, NewCold set out to build its own \$70 million automated facility in Fiorenzuola d'Arda, near Piacenza, Italy.

The company partnered with Isopan to supply 409,000 square feet of insulated sandwich panels for the casing of the facility to ensure superior thermal efficiency. These panels increased the energy efficiency of the facility, exceeding 60% compared to corporate competitors.

The completed automated warehouse has a capacity of more than 72,000 pallets and a state-of-the-art automated logistics system designed for frozen goods. The facility consists of a 130-foot highbay, a dispatch center for receiving and deploying items and an area for picking.

The building boasts jointless concrete slabs with 1-mm differential deflection tolerance; multiple evaporators located on service platforms at high levels of the highbay facility; and a concrete structure with a suspended concrete pick-floor level.

The entirety of cold storage included in the dispatch area is kept at -25 degrees Celsius to guarantee the integrity of the cold chain. In addition, products are all stored in areas that are only accessible by automation, ensuring the top food safety standards.

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Maersk Cold Storage Distribution Site

Primus Builders Inc.



(Photo courtesy of Primus Builders.)

RL Cold is a real estate development company focused exclusively on cold storage distribution projects. When Maersk, one of its clients, was looking to expand in North America, RL Cold was brought in to help identify a site

that would best maximize its earning potential with easy access to rail, port and highway.

RL Cold had already started earthwork on a spec project in Baytown, Texas, and recommended the site for what would become Maersk's first cold storage distribution project

in the United States.

To make it happen, Primus Builders met with the two companies and set the plan in motion. Using Revit, Primus' building information modeling (BIM) software, the team got to work creating a design that met Maersk's goals for budget, quality, sustainability and safety while also serving the building's function – cold storage.

The 283,000-square-foot facility includes 30,000 pallet positions, 45 dock doors, 90-foot, temperature-controlled loading dock – the biggest in the industry – 58 drop trailer positions, state-of-the-art blast freezing technology and on-site USDA import/export inspection services.

The facility also has convenient access to both BNSF and Union Pacific rail lines, the Port of Houston and major highways.

Sierra Supply Chain Operating Facility Expansion

Ti Cold



(Photo courtesy of Ti Cold)

Sierra Supply Chain Services was looking to expand its operating facility in Mississauga, Ontario, Canada. The company turned to Ti Cold to add 36,000 pallet positions and transform the warehouse from 86,000 square feet to 250,000 square feet, with 30,000 square feet designated for food processing.

The state-of-the-art addition completely transposed the 65-foot-tall temperature-controlled warehouse, despite a host of challenges Ti Cold faced along the way. Some of the hurdles included COVID distancing protocols, material shortages, union strikes and closed national borders. Yet, the project finished on time and without going over budget.

Among Ti Cold's innovative design ideas was combining very narrow aisles, extended ceiling heights and 2-deep, push-back RBI racking to maximize density, decrease footprint, and increase storage capacity to more than three times the pallets per square foot. That means that a standard 100,000-square-foot footprint can go from 10,000 to 36,000 pallet positions.

In sustainability, the builders implemented energy-saving features such as modular QFM with dashboard optimization, an Evapco low charge ammonia system and ensured high-yield heat recovery throughout the facility.

These efforts helped Sierra merit the largest seven-figure government rebate to date, a special operational permission resulting in lessened operational cost and the facility to conserve an approximate 13,000,000 kilowatt-hours per year, resulting in steep monetary savings. ☞

2023 Judges

The CEBA leadership would like to recognize the 2023 Built by the Best Award judges and thank them for their time and their excellent work.

- Bobby DeGregorio, VP Business Development – ESI Group USA
- Burnie Taylor, Chief Development & Solutions Officer – Arcadia Cold Storage & Logistics
- Jim Romine, VP, Engineering Design & Development – Lineage Logistics
- Steve Hansen, President – Hansen Cold Storage Construction
- Zach Norris, Vice President of Food & Beverage – Evans General Contracting

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