

CASE STUDY

Advanced Technology Provides Cost and Schedule Savings for Large Food Producer's Expansion

A confidential client needed to expand its existing food production facility by 50,000 square feet to satisfy increased market demand. Laser-scanning technology and 3D modeling aided the process engineering effort and significantly reduced the project schedule.



Challenge

There is an increased demand for prepared foods affecting major sectors like meats and beverages, as well as smaller sectors including organics and protein-based foods. In the United States, pepperoni is one of the most preferred pizza toppings. To accommodate demand, production facilities across the U.S. and around the world will require additional process lines with a focus on automation and infrastructure.

Our confidential client recognized the need to expand its production footprint and develop a more effective layout designed to increase its pepperoni output. The main challenge proved to be achieving our client's aggressive output goals within the constrained space available for the process, product and people.

Project Stats

Client

Confidential

Location

Midwest

35%

INCREASE IN
ANNUAL PRODUCTION

50K

SQUARE FEET ADDED
TO PROCESS FLOOR

16

WEEKS FOR DESIGN

Solution

Playing its part in the growing industry of ready-to-eat pepperoni products, Burns & McDonnell performed engineering services to expand the client's existing pepperoni production facility. The 50,000-square-foot expansion was built to accommodate the need for new warehouse and shipping space as well as a new process line that increased the company's capacity to produce ready-to-eat pepperoni products for distribution to retail grocers.

The project team redesigned the existing layout and maximized functionality of the new space through the removal and relocation of existing equipment, and installation of new equipment used for grinding, blending, stuffing, slicing and packaging pepperoni. Significant changes were also made to utilities, and to areas used for truck traffic and employee parking.

From reviewing production schedules and analyzing design specifications to carefully analyzing workflows, our team partnered with the client's process engineering team throughout the expansion's development.

An internal process flow diagram was created for the new-build section of the space. The next task was designing a structure — one encompassing the new internal plan — that would connect to the existing structure.

The major process areas and equipment additions included a raw material cooler and final blender, a final grinder, two stuffers, three fermentation ovens, six dry rooms, a whip cooler, a finished product cooler, a freezer, and a shipping dock.

After the equipment and process changes were completed, the design team created the mechanical arrangements, which included mechanical and piping drawings, a motor control center (MCC), a one-line model for power, and panelboard schedules.

To meet the client's need of boosting capacity within a quick time frame, the team turned to laser-scanning technology. The team conducted an on-site 3D scan of the entire existing facility, accurate within 2 millimeters. Working with the client's architectural team, the group developed scans that allowed the 2D drawings of the new addition to be translated into 3D images. This helped establish a high-level overlay of essential walls and structural details.

Employing Revit building information modeling (BIM) software to read scanned data, a model was created for analysis and manipulation. The design team was then able to explore the project site, virtually. From moving walls and cables into different positions to identifying spatial scenarios that would meet both processing and financial parameters, the team had the benefit of comprehensive insight.

"This project was great for our plant, community and customers. We've been able to add more jobs while meeting the growing demand for pepperoni."

PLANT MANAGER
Confidential client

Wastewater Treatment System Upgrade

During the design process, it quickly became clear that increased demand on wastewater treatment processes for both the new and existing equipment would be an issue. Food processing equipment interacts with meats, grains, sugars, fats and oils, and it must be regularly cleaned. Wastewater is generated in this process and requires biological and physical chemical treatment before discharge. It was imperative that this process be properly designed and managed in order to avoid permit violations that could negatively impact production.

The client expanded the project scope to include design of upgrades to the wastewater treatment system. The upgrades consisted of a new rotary drum screen, a new equalization tank, a new aeration/mixing system, and a new equalization tank pH adjustment system. The upgrades enabled the wastewater treatment system to accommodate the increased flow/loads caused by the production facility's expansion. The upgrades resulted in a more efficient treatment process and will provide additional capacity for years to come.

Results

This project validates an approach that emphasizes technology while leading food manufacturers through the often-complex process of expanding production. Our design team, in conjunction with the client's project team, executed a carefully designed expansion that caused minimal disruption to existing operations. The ideal layout was determined thanks to laser-scanning technology that reduced the project schedule by hundreds of hours.

As a result of the successful footprint expansion, the team that worked on this collaborative and innovative project met its goal. Pepperoni output increased by 35%, adding another 27 million pounds of pepperoni annually.

About Burns & McDonnell



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