

# MWC Cheese Processing and Whey Drying Facility

ST. JOHNS, MI

## VALUE DELIVERED

Shambaugh provided general contracting services, building information modeling, and numerous self-performed services for MWC's new state-of-the-art cheese processing and whey drying facility.

The completed facility is one of the most technically advanced, efficient, and sustainable dairy processing plants in the world. Dedicated energy recovery systems were incorporated into the design, saving 16,000 PPH of steam and 1,000 tons of refrigeration. Variable frequency drives were utilized to promote HVAC efficiency, and excess heat from the processing lines is recycled in other parts of the plant.

The plant also conserves an incredible amount of water. The whey processing system was designed to recover 95-percent, or about 800,000 gallons, of water each day and convert it to Category 1 water for use throughout the plant.

Process waste at the facility is segregated into two separate streams, diverted to separate collection pits, and pumped separately to an on-site wastewater treatment plant. Waste with high biological oxygen demand (BOD) from production spaces is pumped to the front of the treatment plant. "Clean" or low-BOD process waste is collected in the second stream, bypassing the biological and dissolved air flotation treatment systems and pumping directly to an aeration tank.

The segregation of the high-BOD process waste from the "clean" process waste stream drastically increases efficiency of the wastewater treatment process/equipment, conserves energy, and reduces chemical treatment consumption.

# CASE STUDY

## OPERATING COMPANY

Shambaugh & Son

## CLIENT

MWC, LLC (Glanbia Nutritionals)



## CLIENT OBJECTIVES

MWC sought to construct this new processing facility, which receives and processes 8 million pounds of raw milk each day.

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ST. JOHNS, MI

MANUFACTURING/INDUSTRIAL

FOOD PROCESSING

## CASE STUDY



### PROJECT SOLUTIONS

Shambaugh designed and constructed the building shell and support utilities for the 400,000-square-foot facility. They also self-performed mechanical, electrical, fire protection, and select process and automation services.

The scope of work included:

- Building
  - 340,000 cubic yards of imported fill and stone
  - 34,000 square yards of asphalt paving
  - 4.5 miles of site utilities
  - 1,480 50-foot-deep auger cast piles
  - 20,000 cubic yards of cast-in-place concrete
  - 2,100 pieces of precast
  - 3,150 stainless steel embed plates
  - 900 embedded-precast electrical boxes
  - 800 tons of structural steel
  - 145,000 square feet of vitrified tile
  - 60,000 square feet of resinous flooring
  - Over 25 miles of sealants
- Mechanical and refrigeration installation
  - Over 500,000 pounds of stainless-steel hanger frames
  - Four-plus miles of underground process waste
  - 21-plus miles of utility piping
  - A 3,600-boiler-horsepower steam system
  - A 33,000-gallon chilled glycol system with 3,000 ton-refrigeration cooling
  - An over-one-million-gallon-per-day reverse osmosis plant and a 500,000-gallon holding tank
  - A 550-horsepower compressed air plant
  - 53 roof top units and 97 exhaust fans
  - Six 600 ton-refrigeration ammonia compressors
  - A 60,000-pound ammonia charge
- Electrical and controls installation
  - Eleven 3,000-amp service entrances
  - 2,500 light fixtures
  - 34 800-amp motor control centers
  - 900 variable frequency drives
  - 20,000 linear feet of cable tray and 550,000 linear feet of tray-related power cable
  - 250,000 linear feet of category 6 data cable
  - 20,000 linear feet of fiber
  - 2.3 million linear feet of building wire
  - 41 control enclosures
  - Two 16-port fiber, six 48-port, and 12 24-port Ethernet switches

Shambaugh modeled 100 percent of the project, integrating models from five major process vendors and producing a federated model used in planning and during construction for a completely pre-planned installation.

The plant produces approximately 850,000 pounds of cheese in 40 and 640 lb. blocks each day and processes around 11,000 pounds of concentrated whey per hour, drying and packaging powders in 20kg and bulk bags. In total, the plant processes approximately 25 percent of the total milk produced in the state of Michigan.

### CLIENT BACKGROUND

MWC, LLC is a joint venture between Glanbia plc, Select Milk Producers, Inc., and Dairy Farmers of America.