terminal at the terminus

DAKOTA MILL & GRAIN takes advantage of a refurbished short-line railroad and abundant fall crops to build a new rail terminal.

Two changes came together on the agricultural scene to provide Dakota Mill & Grain Inc., a privately-held grain handler in western South Dakota, the opportunity to build a new 4.9-million-bushel rail terminal near Presho, SD.

The first change was the rehabilitation of a rail line owned by the State of South Dakota and now operated by Dakota Southern Railway, a short-line connecting to the Burlington Northern Santa Fe Railway at Mitchell, SD. The work was completed as far west as Presho in 2016.

The other change is the expansion of Corn Belt-style crops westward across the Northern Plains in recent years.

To take advantage of these changes, Dakota Mill & Grain decided in 2017 to build an all-steel elevator near the terminus of the Dakota Southern. The company went with steel due to a lower cost per bushel than concrete, says Jerry Cope, vice president-marketing.

Design Considerations

To serve as design/build contractor and millwright on the new elevator, Dakota Mill selected LandMarc Construction Inc., Hawarden, IA (712-552-1200). "In addition to a favorable bid, we saw some of LandMarc's other projects, and their work was impressive," says Cope.

Also with major roles on the project:

- Dagel Steel Construction Inc.,

DAKOTA MILL & GRAIN INC.

Rapid City, SD
605-342-3834

Founded • 2001

Storage capacity
9.3 million bushels at 10 locations

Annual volume
20 million bushels

Annual revenues • $80-90 million

Number of employees • 60

Crops handled
Hard red winter and hard red spring wheat, corn, sorghum, sunflowers, bird seed, soybeans

Services
Grain handling and merchandising, feed, agronomy, custom application

Key personnel at Presho

- Jerry Cope, VP-marketing
- Bart Banks, general manager
- Dave Cole, location manager
- Julie Clement, office manager
- Cutter Murray, grain origination

DAKOTA MILL & GRAIN INC.
Helping You Grow

SOUTH DAKOTA

Presho ★

Dakota Mill & Grain's new 4.9-million-bushel rail terminal near Presho, SD. Drone photo courtesy of LandMarc Construction Inc.

SUPPLIER LIST

- **Aeration fans** • Rolfes@Boone
- **Aeration systems** • Rolfes@Boone
- **Bin sweeps** • Sioux Steel Inc.
- **Bucket elevators** • Schlagel Inc.
- **Bulk weigh scale** • Warrior Mfg. LLC
- **Bulk weigh scale controls** • InterSytstems
- **Catwalk** • Warrior Mfg. LLC
- **Cleaner** • Warrior Mfg. LLC
- **Contractor/millwright** • LandMarc Construction Inc.
- **Conveyors** • Schlagel - drags; Hi-Roller - belts
- **Conveyors belting** • Fenner Dunlop
- **Distributor** • Schlagel Inc.
- **Electrical contractor** • Muth Electric
- **Elevator buckets** • Tapco Inc.; Maxi-Lift Inc.
- **Engineering** • NOHR Wortmann Engineering
- **Fall protection** • Warrior Mfg. LLC
- **Grain analyzer** • FOSS
- **Grain temperature systems** • Tri-States Grain Conditioning Inc.
- **Leg belting** • Continental
- **Liner** • Ceramic tile with Coors-Tec Epoxy
- **Moisture meter** • Perten Instruments
- **Motors** • Toshiba
- **Sampler** • Gamet Mfg. Inc.
- **Speed reducers** • Dodge
- **Steel storage** • Behlen Mfg. Co.
- **Steel tank erection** • Dagel Steel
- **Temporary storage** • Behlen Mfg. Co./ LandMarc Construction Inc.
- **Tower support systems** • Warrior Mfg. LLC
- **Truck probe** • Gamet Mfg. Inc.
- **Truck scales** • Cardinal Scale Mfg. Co.
- **Truck scale automation** • C&A Scales

Florence, SD (605-886-3796), erected the Behlen steel tanks.

• Muth Electric, Mitchell, SD (605-996-3983), served as electrical contractor.

Construction broke ground in October 2017. The facility was completed to the extent that it could take in wheat by July 2018. The terminal was completed and operational by October 2018.

Several design considerations had to be addressed. For one, the plot of land upon which the elevator was situated could not accommodate a loop track for rail loading. Instead, says Cope, Northern Plains Rail Company constructed a 3-mile-long siding, enough to accommodate 120 railcars plus locomotives for loading from beginning to end.

Another consideration was the presence of an airport serving the Presho area. The Federal Aviation Administration limited the facility height to 158 feet. That limited the height of the legs and required the use of fill conveyors inclined at 5 to 9 degrees.

Grain Storage

The bulk of the upright storage consists of four 750,000-bushel Behlen corrugated steel tanks standing 105 feet in diameter, 92 feet tall at the eaves, and 121 feet tall at the peaks. ▶

A pair of 120-foot Cardinal pitless scales under a oneWeigh scale automation system and a Gamet Apollo truck probe serve truckers entering and leaving the facility. Ground-level photos by Ed Zdrojewski.

Warrior center tower with switchback stairs houses two Schlagel receiving and one shipping leg plus a Warrior screener and Schlagel distributor at the top. Twin enclosed receiving pits below left.

stiffeners, 12,000-bph Daay paddle sweeps, and 24-cable TSGC grain temperature monitoring systems. Future plans call for the addition of Bindicator level indicators.

A set of six Rolfes@Boone 50-hp centrifugal fans per tank provide aeration – 1/9.5 cfm per bushel for corn and 1/16 for wheat – through in-floor ducting with help from 10 roof exhausters per tank.

Upright storage also includes a pair of Behlen 80,000-bushel steel tanks intended for blending and wet storage. These stand 36 feet in diameter and 88 feet tall at the eaves filled via Schlagel 20,000-bph drag chain conveyors.

In addition, LandMarc installed two Behlen 500,000-bushel oval-shaped temporary storage bunkers and one 700,000 bushel ground pile area. Both bunkers are equipped with 4-foot perforated steel sidewalls and five 7.5-hp Rolfes@Boone axial fans. Plans call for the addition of ag lime floors. The bunkers and pile are filled via a 20,000-bph Straight Line of Sanborn stacking conveyor and emptied with a DCM speed bucket mounted on an excavator.

Grain Movement

Grain movement through the facility is designed to process trucks quickly. Most are probed, weighed, dumped, and have exited with ticket in hand within 7 minutes. The cycle begins at the Gamet Apollo probe and is followed by a pair of Cardinal 120-foot inbound and outbound scales that utilize oneWeigh automation supplied by C&A Scales. Grain samples are weighed and tested in the office building by the probe using a Perten 5200-A moisture meter, FOSS Infratec 1241 whole grain analyzer, and MCi Kicker dockage tester.

After probing and weighing, digital signage directs drivers to one of two 1,500-bushel mechanical receiving pits. These feed a pair of Schlagel 20,000-bph receiving legs. The legs are equipped with a single row of Tapco 20x8 X-treme buckets mounted on Continental 22-inch belts.

The legs deposit grain into a Schlagel six-duct rotary double distributor. That distributor, in turn, sends grain to upright storage via double Hi Roller inclined 40,000-bph enclosed belt conveyors.

Tanks empty onto Hi Roller Hi Life 60,000-bph above-ground enclosed belt conveyors. These run to a Schlagel 60,000-bph shipping leg equipped with two rows of Maxi-Lift 24x10 Tiger-CC orange buckets mounted on a 53-inch Continental belt.

The shipping leg can deposit grain into a 40,000-bph Warrior gravity screener or bypass that directly feeds a Gamet 6800L sampler and into a 60,000-bph Warrior bulk weigh loadout scale with InterSystems controls. Workers atop railcars are protected by a Warrior trolley-type fall protection system running the length of three railcars.

Cope says that so far, the Presho facility has loaded four unit trains.

Ed Zdrojewski, editor

Hi Roller 60,000-bph reclaim enclosed belt conveyor at left and one of six Rolfes@Boone 50-hp centrifugal fans serving this 750,000-bushel Behlen tank.