

Corn Elevator in Wheat Country

2.2-MILLION-BUSHEL TRUCK FACILITY FEATURES BOTH UPRIGHT AND TEMPORARY STORAGE



CHS Connell Grain
Connell, WA • 509-234-2641

Founded: 1929
Storage capacity: 12.75 million bushels at 13 locations
Annual volume: 14 million bushels
Number of members: 1,000+
Number of employees: 45
Crops handled: Corn; hard red winter, soft white, and dark northern spring wheat
Services: Grain handling and merchandising, seed

Key personnel:
• Scott Althoff, general manager
• Chris Guess, Bruce location mgr.
• Camron Bishop, lead merchandiser

Supplier List

Aeration fans.....Rolfes@Boone, AIRLANCO
Bin sweeps.....The GSI Group
Bucket elevators.....The GSI Group
Catwalks.... LeMar Industries Corp.
Cleaner.... J & D Construction Inc.
Contractor..J & D Construction Inc.
Control system.... Kent Electric Inc.
Conveyors.....The GSI Group
Distributor.....Schlagel Inc.
Dust collection.....Donaldson Torit
Elevator buckets..... Maxi-Lift Inc.
Engineering..... VAA LLC
Grain dryer.....Zimmerman
Grain temp system..... Tri-State Grain Conditioning Inc.
Level indicators..... BinMaster Level Controls
Millwright...J & D Construction Inc.
Moisture meter..... DICKEY-john
Steel storage.....The GSI Group, Meridian Mfg. Inc.
Temporary storage (center tower).... J & D Construction Inc.
Tower support system.....LeMar Industries Corp.
Truck probe..... Gamet Mfg. Inc.
Truck scale.....Rice Lake Weighing Systems



CHS Connell Grain's new 2.2-million-bushel corn elevator in Bruce, WA. It includes a 1.5-million-bushel LeMar temporary storage pile with J & D center fill tower at left. Photos by Bruce Selyem.

Eastern Washington, with its steeply rolling hills, is known primarily as wheat country. However, near the center of the state, the land flattens out, plenty of irrigation water is available from the Columbia River, and the soil becomes suitable for corn production.

CHS Connell Grain, a division of CHS, wanted to capture some of that production. "This is a corn deficit region," says General Manager Scott Althoff, who joined CHS Connell Grain 2-1/2 years ago after running grain operations for Maple River Grain in Casselton, ND. "A lot of it is shipped in from out of state. Most of the corn grown here goes to local dairies and feedlots."

To handle some of the corn, CHS Connell Grain built a 2.2-million-bushel elevator at Bruce, WA, including roughly 700,000 bushels of upright steel storage and a 1.5-million-bushel ground pile. Bruce is mainly an industrial park located about five miles west of Othello, WA. Althoff says one factor in selecting the site was potential rail service from a short-line that connects to the Burlington Northern Santa

Fe, although for now, the elevator at Bruce is strictly a truck house.

After a standard bidding process, CHS Connell Grain selected J & D Construction Inc., Montevideo, MN (320-269-2101) as contractor and millwright. Althoff comments that J & D's bid was competitive, and the coop board liked its proposed design best.

VAA LLC, Plymouth, MN (763-559-9100), performed site, civil, and structural engineering on the project, while Kent Electric Inc., Moses Lake, WA (509-760-6123), served as electrical contractor.

Construction began in September 2013 and was completed 10 months later, for an undisclosed cost.

Two Types of Storage

Upright storage at Bruce includes a large GSI corrugated steel tank for dry grain and a smaller steel tank for wet grain.

The larger 500,000-bushel tank stands 90 feet in diameter, 85 feet 6 inches tall at the eave, and 110 feet 7 inches tall at the peak.



Equipment atop the LeMar support tower includes a J & D 20,000-bph gravity screener and Schlagel double distributor.

It has outside stiffeners, flat floor, 12-inch GSIX-Series sweep auger, 18-cable TSGC grain temperature monitoring system, and BinMaster level indicators. A set of four AIRLANCO 30-hp centrifugal fans provide 1/7 cfm per bushel of aeration on coarse grains through in-floor ducting.

The 120,000-bushel wet tank stands 48 feet in diameter, 69 feet 6 inches tall at the eave, and 82 feet 1 inch tall at the peak. It is equipped similarly to the larger tank, except for a 7-cable grain temperature system. A pair of AIRLANCO 10-hp centrifugal fans provide 1/7 cfm per bushel of aeration.

The 1.5-million-bushel J & D temporary center tower system features a 310-foot-diameter ring with 4-foot perforated steel sidewalls and blacktop floor. The center fill tower is equipped with four Rolfes@Boone 50-hp centrifugal fans providing pull-up aeration through its ductwork. The pile is filled using an inclined 20,000-bph enclosed belt conveyor, which receives grain either from the facility's below-ground tunnel system or through a dedicated receiving pit next to the pile.

Handling Systems

Incoming trucks are weighed on a 110-foot Rice Lake Weighing System pit-less scale adjacent to the facility's control room, where they also are sampled with a Gamet Apollo truck probe. From there, they proceed to one of four mechanical receiving pits, two of which feed a 20,000-bph GSI leg, the third of which feeds a

second 20,000-bph leg, and the fourth going directly to the ground pile. Two of the legs are enclosed in an 18-foot-x-18-foot LeMar-built support tower with switchback staircase.

"A lot of the corn producers in the area also produce crops such as potatoes, onions, and sweet corn," Althoff says. "As a result, they use live-bottom trucks, which take a relatively long time to unload. Dedicating two pits for those trucks can help speed things up."

The two legs, which are outfitted with half an inch of ceramic liner in the boot and head sections and a single row of Maxi-Lift 20x8 low-profile CC-MAX buckets on 7-inch centers mounted on a 22-inch Goodyear belt, lift grain up to a seven-duct Schlagel SwingSet double distributor. That distributor is outfitted with Kryptane-lined spouting with ceramic liner at wear points. The operator has the option of running grain through a 20,000-bph J & D external bypass gravity screener, before it reaches the distributor.

A pair of 20,000-bph GSI overhead drag conveyors carry grain from the distributor out to the upright storage. Those tanks empty onto a 20,000-bph GSI enclosed belt conveyor in a below-ground tunnel that runs back to the receiving legs. For added flexibility, a 10,000-bph GSI drag conveyor was added under the wet tank to feed the dryer, truck loading, or the 500,000-bushel tank.

In addition to storage, the distributor also can send grain via gravity spout to a 6,000-bph, natural-gas-fired Zimmerman tower dryer. Althoff says the dryer was used extensively during the 2013 harvest and performed well.

For truck loading, grain is sent via gravity spout to a Meridian 3,200-bushel welded steel surge tank mounted above the truck scale. Screenings go to a second Meridian tank, rated at 3,400 bushels, adjacent to the first.

Ed Zdrojewski, editor



Dust emissions are kept under control with a Donaldson Torit baghouse system.



Two Meridian welded steel tanks handle corn and screenings, respectively.



Seven-duct Schlagel SwingSet distributor can send grain to storage, dryer, or truck loadout.