

# From Crib to Concrete

COOP BUILDS TALL ANNEX TO MAXIMIZE STORAGE IN LIMITED IN-TOWN LOCATION

NORTH DAKOTA

★ Garrison

## CHS Garrison

Garrison, ND • 701-463-2251

**Founded:** 1939

**Storage capacity:** 1.3 million bushels at two locations

**Annual volume:** 12 million bushels

**Annual revenues:** \$97 million

**Number of members:** 450

**Number of employees:** 22

**Crops handled:** Hard red spring and winter wheat, durum wheat, barley, flax, sunflowers, canola, peas

**Services:** Grain handling and merchandising, feed, seed, agronomy, custom application

### Key personnel:

- Chris Gratton, general manager
- Cody Schultz, assistant manager
- Dean Franklin, safety officer
- Lawrence Talbott, scale operator
- Kristina Steele, scale operator
- Chris Jerome, driveway
- Chris Rhoades, driveway
- Randy Hiatt, operations/safety
- Jim Alexander, operations
- Steve Dimitch, operations

### Supplier List

**Actuators** ..Andco Actuators/Meier Sales & Engineering Inc.

**Aeration fans**.....AIRLANCO

**Aeration system** .... North American Equipment Co. Inc.

**Bucket elevators**.....Schlagel Inc.

**Bulk weigh scale** .....Meier Sales & Engineering Inc.

**Bulk weigh scale controls**..... C&A Scales

**Catwalk**..... Warrior Mfg. LLC

**Construction manager** .....CHS Construction Dept.

**Contractor/millwright** .....Vigen Construction Inc.

**Control system**... Hope Electric Inc.

**Conveyors (belt)**.....Hi Roller Conveyors

**Conveyors (drag)** .....Schlagel Inc.

**Distributor**.....Schlagel Inc.



CHS Garrison flagship facility in Garrison, ND, with new slipform concrete annex at right. Aerial photo courtesy of Vigen Construction, Inc.

Garrison Farmers Union Elevator, now a division of CHS, has a history dating back to 1939. Part of its legacy at the cooperative's flagship elevator in Garrison, ND was an old wood crib elevator with two annexes holding a total of 166,000 bushels of storage.

The natural impulse in 2012 was to replace the outdated facilities with something faster with more bushel storage capacity, says General Manager Chris Gratton who has been at Garrison since 2006. "We needed to boost speed and efficiency for our customers, and



Assistant Manager Cody Schultz (left) and General Manager Chris Gratton. Ground-level photos by Ed Zdrojewski.

<b>Elevator buckets</b> .....	Maxi-Lift, Inc.
<b>Engineering (civil/structural)</b> .....	VAA, LLC
<b>Excavation</b> .....	Nygaard Construction
<b>Fall protection</b> .....	Warrior Mfg. LLC
<b>Manlift</b> .....	Schumacher Elevator Co.
<b>Motion sensors</b> .....	4B Components Ltd.
<b>Roof system</b> .....	Kooiker Roofing
<b>Samplers</b> .....	InterSystems
<b>Screeners</b> .....	InterSystems
<b>Tower support system</b> .....	Warrior Mfg. LLC
<b>Truck probe</b> .....	Gamet Mfg. Inc.
<b>Truck scales</b> .....	Rice Lake Weighing Systems

that old structure was too difficult to keep OSHA-compliant," he says.

That posed a challenge with the elevator's downtown location along Railroad Street with limited space for expansion.

The solution was to maximize space by tearing down the old crib house and replacing it with a tall structure, in this case a 140-foot-tall slipform concrete annex, 220 feet if you



Ground-level view of four 20,000-bph Schlager legs mounted outside of the slip.

count the steel support tower housing equipment above the roof level.

To construct the new 550,000-bushel, \$11 million-plus annex, CHS Garrison hired Vigen Construction, Inc., East Grand Forks, MN (218-773-1159). “We’ve worked with Vigen a number of times,” says Gratton, “and we’ve always been pleased with their work. They have top-of-the-line foremen and crews, and they have access to the necessary equipment. It required a special crane to build the 220-foot manlift shaft.”

In addition to Vigen: the CHS Construction Department, Inver Grove Heights, MN, performed initial site design and managed construction; VAA, LLC, Plymouth, MN (763-559-9100), performed civil and structural engineering services on the project; and Hope Electric, Hope, ND (701-945-2460), supplied the automation systems.

Work on the project began in October 2012, and it was completed in June 2014.

In addition to the often harsh North Dakota weather, the project faced other challenges that delayed completion. Gratton notes that downtown city streets had to be closed from time to time; the cooperative worked closely with city government to coordinate those times. Also, the site had soil type issues requiring the



Scalehouse and new Gamet Apollo probe station outside the Garrison elevator. Truck is parked on a new Rice Lake inbound scale in distance at left.

sinking of 228 auger cast pilings 67 feet deep to support the concrete structure. During the excavation, crews uncovered an old boot pit dating back to the 1910s.

### Concrete Workhouse

The slipform concrete storage structure includes a six-pack of 80,000-bushel tanks. These stand 30 feet in diameter and 140 feet tall, with side sump-style North American Equipment Co. Kanalsystem floors for aeration and air-assisted unloading installed by Vigen. A pair of 50-hp AIRLANCO centrifugal fans provide power to move air through the floor gratings. At this point, the tanks have no grain temperature monitoring or level indicators.

“We like that you don’t have to have a person inside the tanks to finish unloading, and the process with the Kanal floors is faster than a conventional design,” Gratton says.

In addition to the six-pack, the structure includes two 20,000-bushel and two 9,000-bushel interstices and an 11,000-bushel loadout tank above an 80,000-bph bulkweigher from Meier Sales & Engineering, which is housed inside the slip to shelter it from the weather.

### Grain Handling

Incoming trucks are routed through a Gamet Apollo probe station adjacent to the scalehouse southeast of the elevator along Railroad Street and then onto a 120-foot Rice Lake pitless inbound scale.

From there, trucks proceed to one of two 1,000-bushel enclosed mechanical receiving pits. These feed three of four Schlager 20,000-bph legs. These three legs are used for receiving and are equipped with 20x8 Maxi-Lift Tiger-Tuff buckets mounted on 22-inch Goodyear

Pathfinder belts. (The fourth leg is used exclusively for reclaim and shipping.)

After unloading, drivers proceed to a 120-foot pit-type Rice Lake outbound scale for their tare weight.

The receiving legs feed into a nine-duct Schlager single distributor. The operator has the option of routing grain through one of two InterSystems 25,000-bph gravity screeners ahead of storage. From the distributor, a pair of Schlager 20,000-bph drag conveyors carry grain out to the new storage.

Tanks in the slipform structure empty onto a 60,000-bph Hi Roller enclosed belt conveyor. Sumps are outfitted with General Electric gate actuators supplied by Meier Sales & Engineering for blending on the go. The belt conveyors, in turn, feed a pair of 20,000-bph Schlager shipping legs, which are identical to the receiving legs.

Three of the four new legs can be utilized for rail loadout simultaneously, as needed. Grain can be routed through a 40,000-bph InterSystems gravity screener situated above the bulkweigher, which is equipped with an InterSystems sampler and automated controls from C&A Scales.

During train loading, workers are protected by a Warrior/Micada trolley-type fall protection system running the length of 15 railcars.

Gratton comments that the new annex has performed well, with few flaws, since it opened in 2014. He adds that the facility has space for the addition of a grain dryer, if needed, in the future.

*Ed Zdrojewski, editor*