

STORAGE DOME

New port facility helps meet demand for cement Page 34

WASILLA LIBRARY

Community rallies for expansion Page 46

CHESTER CREEK

Muldoon redevelopment offers fitness, food under one roof Page 54



A cement ship docked at the Port of Anchorage offloads a shipment to the new storage facility. The facility's ability to take an entire shipload of cement at a time will save shipping costs, said Wes Vander Martin, general manager of Alaska Basic Industries.

ALASKA BASIC INDUSTRIES GETS NEW STORAGE DOME

PORT FACILITY WILL EASE SHIPPING COSTS, PREPARE COMPANY FOR FUTURE GROWTH

The new domed storage facility at the Port of Anchorage can hold 40,000 short tons of Portland cement and will make planning for the busy construction season easier.

PHOTO: JENNIFER SHORT



A laska Basic Industries in May commissioned a huge new domed storage facility at the Port of Anchorage, a structure that ABI officials say will allow them to offload a whole ship full of Portland cement at one time.

Wes Vander Martin, general manager of ABI, said the new dome, which holds 40,000 short tons of Portland cement, will make planning for the busy construction season easier.

The current storage area at the port — two large silos — holds about 20,000 tons, he said, so adding the dome will effectively triple the capacity at the Port of Anchorage. Being able to take a whole shipload at a time will save shipping costs, he said. Having a larger storage space also allows the company to more efficiently handle the volume of cement in storage and to plan for the future.

"We have to plan a year in advance for ships, and you can imagine how much planning it is," he said. The company must somehow divine how much cement it will sell in a year's time and hope it has guessed well. Having more storage gives ABI more flexibility, he said. It also allows the company to better prepare for growth.

"Alaska is going to grow, so as time goes on, there will be more of a cement demand. And if the megaprojects go, like the gas pipeline or a



Specialized equipment is used to draw cement out of the dome. A reclaimer is used to discharge the cement — about 30 percent can be drawn out using gravity alone. A large auger with an incline jib that rotates and moves up and down was installed to reclaim the rest.

dam, we'll be better suited to handle all of this," he said.

The dome may be unique in Alaska, but other companies are using similar domed storage facilities Outside. ABI's sister company, Hawaiian Cement, has two storage domes. California Portland Cement, a company that ABI worked with to help install the dome, also has two storage domes: one in Portland, Oregon, and a second in Stockton, California.

"It's a very common practice in cement storage," he said.

Building in earthquake resistance

The dome project started with a large pile of dirt, or surcharge, in 2014, said Jim Fergusson, ABI's project manager.

In 2015, Roger Hickel Construction, the project contractor, came in to do site work. The company built a circular perimeter footing and

a tunnel roughly 10 feet tall and 10 feet wide that went halfway into the dome underground. Hickel Construction also built a compressor building and a stair tower and transfer bridge leading to the dome.

ABI hired DOMTEC to build the dome itself. Workers from the Idaho Falls, Idaho-based based company erected a neoprene hemisphere on the site, Fergusson said.

"It was flat when they put it together, and it had an airlock. In 24 hours they inflated the hemisphere, and then you had the shape of the dome," Fergusson said.

The crew then sprayed insulating foam on the inside of the neoprene wall, reinforced it with a million pounds of rebar and applied between 16 and 24 inches of shotcrete, or sprayed-in concrete, on the wall, thicker at the base than near the top of the dome.

The shotcrete adds stability, particularly in the case of an earthquake, Fergusson said.

"If we've got 40,000 tons of cement in it and there was an earthquake, it would probably shift to one side like a water balloon," he said. "The shotcrete provides lateral resistance."

Vander Martin said the outer neoprene fabric layer is resistant to sun damage. It should last 25 years or longer, he said.

The facility is huge — 162 feet in diameter and 86 feet high in the middle of the dome. Fergusson pointed out that it holds about 2,000 truckloads of Portland cement.

Massive internal equipment

ABI worked with Salt Lake Citybased Cambelt Industrial, an industrial belt conveyor manufacturer, to make the reclaimer that discharges cement. About 30 percent of the stored concrete can be drawn out of the dome using gravity alone, Vander Martin said. To reclaim the rest, Washington-based mechanical contractor Phoenix Industrial installed a large auger with an incline jib that rotates 360 degrees and also moves up and down as needed.

Fergusson said the reclaimer weighs about 400,000 pounds and stands 120 feet tall from the base to the top. Its center mast is about 3 feet in diameter, he said, and it uses a 4-foot, 6-inch auger in its incline jib to drag cement from the pile toward the center, where it falls through a trap door and onto a pneumatic conveyor system.

"It took about 12 truck loads to get (the reclaimer) up here," Fergusson said.



An elevated walkway leads to the top of the storage dome at the Port of Anchorage.

Most of the parts came by barge, he said, including one truck that was roughly 100 feet long, weighed 80,000 pounds and was 12 feet tall and 10 feet wide. That trailer carried the incline jib, he said.

The incline jib is controlled using a fly-by-wire type of system in which the machine is computer-controlled by electrical impulse instead of by cables.

The reclaimer feeds the cement down to a pump that sits in the tunnel in the middle of the dome, Fergusson said. From there, a large electric motor uses compressed air to blow the cement down a 12-inch line through the tunnel, where it can be loaded onto rail cars for transport to Fairbanks, into the storage silos or into trucks to deliver it to ABI customers. Vander Martin said the pump can transfer cement at a rate of about 200 tons per hour.

Fergusson said M&M Wiring Services of Anchorage and Phoenix Industrial out of Portland, Oregon, did the electrical work on the facility.

Integral part of the port

Jim Jager, Port of Anchorage external affairs director, said that adding the dome, with its additional storage, will reduce the number of cement ships visiting the port,

A truck heads to the new storage dome, which can hold 2.000 truckloads of Portland cement. PHOTO: JENNIFER SHORT



Roger Hickel Construction built a circular perimeter footing and a tunnel roughly 10 feet tall and 10 feet wide that went halfway into the dome underground. Hickel Construction also built a compressor building and a stair tower and transfer bridge leading to the dome.

simplifying scheduled visits for fuel ships that use the same berth.

Cement ships take up to two weeks to unload, he said. That will likely change when a new fuel and cement dock is built at the port, a project expected to be complete in two years.

The new fuel and cement dock, to be built south of the existing fuel and cement dock, is part of the \$127 million first phase of the Port modernization and reconstruction project that will build a fuel and cement dock. It will more than cut in half the distance the cement must travel down the large pneumatic line that runs from the ABI dome and storage silos. The new line should be about 800 feet long, Jager said, and coupled with new offloading equipment, should significantly reduce offloading time.

"It takes so long to offload," Jager said, adding that offloading must be done in good weather; rain and cement don't mix well.

"As long as the ship is at the dock, we can't use it for fuel purposes," Jager said. "By cutting the cement ship's offloading time, it's also going to give us more time for (offloading) other vessels."

That's not to say ships are stacked in Cook Inlet, awaiting a berth at the Anchorage dock.



Cement ships can take up to two weeks to unload a shipment. The cement is drawn out of the ship's hold through a large meumatic line.

dak

HARBOUR

"We're at about 40 percent of dock capacity," he said. Summer gets a little more crowded, but it's relatively unusual that all of the port's berths are in use at once.

The fuel and cement dock replacement is the first step of an estimated \$547 million port modernization plan that will ultimately replace the port's aging docks, severely corroded pilings and outdated cargo-handling infrastructure to improve operational safety and efficiency and accommodate modern shipping operations.

"The docks were designed more than 50 years ago when cargo ships were smaller. Our ships are generally smaller than cargo vessels used up and down the West Coast," Jager said.

Smaller ships and smaller cranes mean less efficient cargo handling, he said. "The longer it takes to unload a ship, the higher the shipping cost that gets passed onto consumers."

The municipality has asked the Legislature to include a \$290 million Port of Anchorage bond proposition within the 2016 state General Obligation (or GO) bond initiative. If voters approve the measure in November, construction of the new dock would begin in 2018. That funding would pay to replace the main dock, Jager said.

Rindi White is a freelance writer who lives in Palmer.

The cement ship Oak Harbour is docked at the Port of Anchorage as its load of cement is offloaded.

PHOTO: JENNIFER SHORT

38