# PROBLEM SOLVED™ PAPER

**SOLUTION:** Martin® Silo Cleaning and Air Cannons

**INDUSTRY:** Cement

**LOCATION:** Paulden, AZ (USA)

The Martin® Heavy Duty Whip is set up above the access at the top of the silo and controlled remotely.

Contractors installing the pipe nozzles at a 30º angle to promote material flow.

The lower silo cannons were strategically placed around the 60º incline.

## PROBLEM

The Drake Cement facility ten miles north of Paulden, AZ was experiencing clogging issues on a weekly basis, forcing maintenance personnel to spend up to 12 hours to clear the blockage using tools and compressed air. During damp weather, the problem worsened, and at times the large structure would fill in as little as two hours, forcing operators to use CO2 blasting tubes every 15 to 30 minutes. Especially in the months of January through March, rain caused the limestone being extracted from the nearby quarry to have elevated moisture levels. Little of that water is lost in the crushing process, and by the time the material lands in the 536-ton (486 metric ton) limestone silo, it can be nearly saturated.

## SOLUTION

When Martin Engineering National Business Development Manager Doug Brown arrived at the plant, he found a silo so compactly clogged that it had halted the entire production process. “We realized that the limestone was so wet and dense that it could be packed like snowballs,” he said. A 2-man crew set up a Martin® Heavy Duty Whip. Powered by compressed air, the device can be equipped with a variety of flails and cutting edges to knock down accumulated material without damaging the silo’s walls or support structure. Requiring no confined space entry, the unit was set up over the manhole opening at the top of the vessel and maneuvered by remote control.

## RESULT

Once the silo had been completely evacuated, Brown -- a flow aid specialist -- realized that the ongoing problem could be remedied by air cannons. Using an innovative placement strategy, five Martin® cannons were installed around the vessel. Since installation, plant production has returned to normal levels. Material flow is ongoing, and the silo has not been shut down for cleaning. There has been no unscheduled downtime due to clogging, and the use of CO2 tubes has been stopped altogether. “This equipment upgrade has paid for itself many times over,” said Drake Maintenance Manager Jose Venegas. “We are extremely happy with the results.”

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