

Closing the Loop

Rohrer's Quarry adds recycling/reclaiming system to central mix plant

By Ken Stadden

When family-run Rohrer's Quarry built a fully enclosed central mix plant three years ago ("Out of Sight," Concrete Products, August 2008), the owners were making a major commitment not only to future growth, but also to being environmentally responsible to the surrounding community. The thoroughly modern plant, located near Lititz, Pa., assured a strong future in ready-mixed concrete, but some unfinished business remained: updating time-tested but primitive means of disposing of returned material. Methods progressed little beyond waste blocks, ribboning, crushing, and mucking out slurry pits since the first plant became operational in 1962.

With annual production at 90,000-plus yd., on-site slurry disposal sites dwindling, costs rising for third parties to break up concrete for crushing, and hassles with waste block production, it was time for a change.

Travis Rohrer, vice president of sales and son of company President and CEO Wilbur Rohrer, says the main issue driving the operation toward a reclaimer was "just having to deal with all the bring back concrete." About 10 percent of ready-mixed production comes back, with 8 percent dumped and crushed, and about 2 percent going to waste blocks. "Making blocks is physically demanding outdoor work," he says. "It leads to worker's comp claims, and you're doing it just to get rid of the stuff."

Crushing means "paying someone with a hydraulic hammer to come in and break it up, then crush it, and we stockpile it," says Travis Rohrer. A customer preference for crushed stone limits the price for which crushed concrete can be sold. "By the time you handle it enough times, you're not even covering your costs," he says. "And that doesn't even address the water. You muck out the pits, it doesn't dry out, and it gets rehydrated when it rains. We use it in backfill/reclamation, but we're running out of room for that."

Rohrer's also produces decorative blocks, but mainly as a replacement for limestone boulders, which are in short supply since they are only found near the quarry surface. Storage is another problem, since weather makes outdoor block production a seasonal operation and block storage space is limited. And to a small degree, notes Rohrer, decorative block production creates its own waste.

Selecting a Reclaimer

After visiting other producers using a variety of reclaimers, the Rohrer's selected a BIBKO model 4000 zero-waste, zero-discharge system, supplied through local dealer Mid Atlantic Concrete Equipment, which also facilitated Rohrer's purchase of a Con-E-Co central mix plant in 2008. "They've stood behind the plant 100 percent," says Rohrer, "so we were confident in going back to them for a reclaimer."

With the concrete plant situated hard against the east wall of the old quarry, trucks entering from the west, and limited space on either side, the reclaimer and its enclosure building had to be located 400 feet away. This necessitated a 400-ft., 4-in.-diameter water line feeding a 3,500-gallon, in-plant holding tank, which was specified to eliminate batching delays. A piggybacked data line ties into Command Alkon batching software in the batch room.

Main components of the BIBKO installation are the reclaimer unit with three-truck tray for receiving discharged concrete and rinse water, plus a ground-level pit with feeder screw to accommodate concrete pumps and dump trucks; a screener at the discharge end of the output screw to separate aggregate and sand; a steel building with 32,000- and 21,000-gallon gray water pits with agitators, and an Infern-O-Therm water heater with 10,000-gallon tank. The heated water is circulated through false bottom heat exchangers in each pit, water-to-air exchangers to heat the building, and embedded plastic tubing beneath the outdoor slab where trucks discharge, which is intended to improve safety and save labor by eliminating ice formation in winter. If and when Rohrer's decides to add a chiller to the tank for summer use, circulation to the slab would be closed off.

The Infern-O-Therm tank, located outdoors behind the reclaimer building, uses two, 500,000-BTU waste-oil heaters, one on each end, fueled by used fuel from Rohrer's maintenance shop, which services other fleets as well as its own and thus generates a steady supply. "It's full-circle recycling," says Concrete Supervisor Troy Styer. "You're getting a lot of bang for your buck on your hot water down there."

Recycling Gray Water

Water in the 21,000-gallon pit is held at a constant specific gravity of 1.03 (via automated mixing of potable water with process water from the 32,000-gallon pit) and piped to the holding tank in the plant. From there, water is blended with freshwater in the weigh hopper. The operator can call for a percentage of gray water, or for a particular specific gravity.

As the reclaimer was set for mid-summer start up, Travis Rohrer said he planned to use gray water in flowable fill (100 percent), and at volumes up to 50 percent in a variety of finish applications, plus "a high percentage" in poured walls.

Gray water in new production is not currently an option for state contracts, he says. "I would hope that some day PennDOT would consider it. Other states that border us are doing it. I think it's a great use of a byproduct."

Ancillary Benefits

In addition to providing aggregate recovery and water recycling, the reclaimer is expected to reduce yard congestion, truck fuel use and truck wear. "We won't have to run trucks across the street to get wash water," says Rohrer. "It really contains the concrete operations to this side of the road."

Rohrer's Controller Tom Kifolo points to another implication of reclaiming: "Recapturing the stone and sand will help extend the life of the quarry; minimally, but still, every ton reclaimed

counts toward that goal.” Driver productivity levels are expected to rise too, he adds, with the reclaimer eliminating several back-and-forth trips within the yard for dumping and rinsing.

Rohrer says that initially no personnel will be hired to operate and maintain the BIBKO unit. Instead, a worker will be transferred from making blocks. Kifolo preferred not to quote a return-on-investment period but says BIBKO’s ROI calculator at www.concretereclaiming.com was part of decision-making process.

A Holistic Solution

“I’m excited to see it work,” says Rohrer. “Everyone in the family was in favor of moving forward, because it’s a 100 percent closed-loop holistic solution to the problem. So many reclaimers are just screeners. They’ll screen out the solids, but what do you do with the rest of the mess? A retention pond fills up with cement fines and you have the same scenario.”

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