

Mobile Batching of Shotcrete

By Mason Guarino and Tom Norman

Site foreman to the local ready mix plant dispatcher: “Hi, we ordered concrete 30 minutes ago and were wondering where the truck is?” Local ready mix plant dispatcher to the site foreman: “Oh, sorry about that, we are running behind. He is batching now and will be on site soon,” or maybe, “Oh, sorry, due to tomorrow’s rain, one of our large customers moved up a big job and we will get to you in about 3 hours.” The variations are endless, but it usually means we’ll be waiting for concrete. At least for our company, these comments have been relatively common in all of our experiences with ready mix concrete suppliers, not just with shotcrete. We wanted to gain more control over our concrete deliveries and the simplest answer was to buy a batch plant and a truck. So we did, only it was a mobile batch plant mounted on a truck—a volumetric batch plant. Once we started running our own batch trucks, we were then able to get rid of the ready mix delivery headaches and have more control over our concrete needs. At South Shore Gunite Pools & Spas, Inc. (SSG), we have been able to successfully batch both wet- and dry-mix shotcrete and use the trucks in a few different ways.

The driving factor behind using mobile batching trucks was to be more profitable. If our concrete costs less, our bids can be less and we can win more jobs. However, once we started working with the batch plants, we realized that we could also be more efficient and, in turn, become more profitable. Because we control the trucks, we always know where they are and do not have to wait for a promised ready mix concrete

truck to show up late or not at all. The truck driver is our employee, so he will work with our crews as part of the team rather than someone who just wants to empty his truck as fast as possible and move on. On large projects of 150 yd³ (115 m³) or more, we are also able to park a portable cement silo and an excavator next to the mobile batch trucks and create an on-site batch plant to be even more efficient. We do not need to shut down for 15 minutes every 8 to 10 yd³ (6 to 8 m³) to swap the concrete trucks. We can shut down and restart when needed—not at the whim of a concrete supplier.

SSG is a pool company that uses both the wet- and dry-mix processes. We prefer the dry-mix process on the smaller projects under 50 to 60 yd³ (38 to 46 m³). We use Airplaco mobile batch plants on our smaller projects (refer to Fig. 1). The Airplaco mobile batch body is mounted to, in our case, a triaxle heavy-duty truck that can legally drive around with a 77,000 lb (35,000 kg) total weight. These dry-batch trucks produce material quickly and efficiently to supply the Gunite Supply C-10 gun we use on all of our dry-mix projects. These trucks are easy to calibrate with the manufacturer-provided calibration bin. One of the benefits to the dry process is that when the truck is empty, they can be cleaned up more quickly and thoroughly than a wet-batch truck or a conventional concrete truck. When the job is done, it is also very easy to clean the area around the gun that has dry sand and cement, as opposed to a pile of wet material. When working in residential backyards, being quick and clean is helpful. We have been running three dry Airplaco mobile batch trucks for close to 15 years now. The trucks fill up on a regular basis at one of our two cement silos. The sand is kept dry under a sand barn and when not in use the trucks are parked under a roof to keep the sand from getting too-wet, because too-wet sand will really clog up a gun.

SSG uses the wet-mix process to do the work on the larger projects, as it is roughly twice as fast as the dry process. When walls start to get thick, it’s nice to have the higher productivity. SSG uses a Cementech mobile batch plant for all of the wet-mix batch work we do. Ninety-five percent of our wet-mix mobile batch work is on large jobs, where we set up a Cementech portable silo and an excavator next to the truck (refer to Fig. 2). If



Fig. 1: On-site dry-mix batching truck



Fig. 2: On-site wet-mix batching setup

the shotcrete receiving surface is ready to start shooting on the day we pull in with the equipment, we can typically set up the truck, silo, and excavator, then have the silo filled and aggregate deliveries made, then calibrate and start shooting by 1 pm at the latest. Using this setup on larger projects really relieves stress for the crew leader and allows him to concentrate on the job rather than worry about concrete deliveries. In this scenario, the excavator operator is able to monitor the raw material quantities and let the crew leader know when more of anything is needed or make the orders themselves. Just be sure to swap back and forth between nozzlemen if shooting for an extended period of time.

Our mixtures for the dry-mix trucks are a simple concrete sand to cement ratio. The wet-mix trucks are very customizable and can add all the ingredients that your mixture would need. The manufacturers are very eager to provide a product that will suit your specifications. Our wet-mix truck has separate fine- and coarse-aggregate bins and a cement bin along with three admixture tanks. We use air-entraining and water-reducing admixtures, as well as an Acti-Gel slurry. We like the Acti-Gel because it provides many of the benefits of fly ash. Also, when using a batch truck, using fly ash would require an extra powder hopper and a separate silo, while the liquid slurry Acti-Gel is just added using one of the liquid admixture tanks.

Having about 7 years of experience operating the wet-mix batch trucks, we can't stress enough the importance of calibrating and checking the settings regularly. There are a significant number of moving parts and calibration items on these trucks that can move off setting on their own—sometimes when a cobble works its way through the system or even when someone just bumps up against something. Calibrating confirms the accuracy of the materials in the mixture to achieve the desired results but it also makes you go through all of the moving parts to check that everything is working the way it is supposed to. The site-batching process makes you put your hands on everything to ensure proper operation and accuracy.

Some of the other benefits include saving on raw materials. A concrete truck will often turn around with hundreds of dollars of material that you paid for because you either over-ordered to ensure completion or misjudged the quantities and over-ordered by accident. When the portable batch trucks are done with the job, you just clean the mixing auger and go top off the material bins on the truck for the next job. There is never the worry of getting a load of concrete that has been hydrated too long or is getting too hot, as none of the materials are mixed until you are ready to use them. Don't worry about the quality of concrete on hot days or when you have long hauls before it gets to you. These trucks are commonly used by the military and night-time highway work crews for placing high-performance concrete, and by SSG for all of its shotcrete work. We are very happy with how they work, the flexibility and profitability they bring to our jobs, and look forward to using them for years to come.



Mason Guarino, Vice President of South Shore Gunite Pools & Spas, Inc. (SSG), started in the pool industry when he was 14, learning how to install reinforcing bar. Since then, he has worked on all phases of swimming pool construction. Guarino has worked full time with SSG since receiving his BS in construction management from the Wentworth Institute of Technology, Boston, MA, in 2009. Guarino currently serves on ASA's Board of Direction and is an ACI Certified Nozzleman.



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