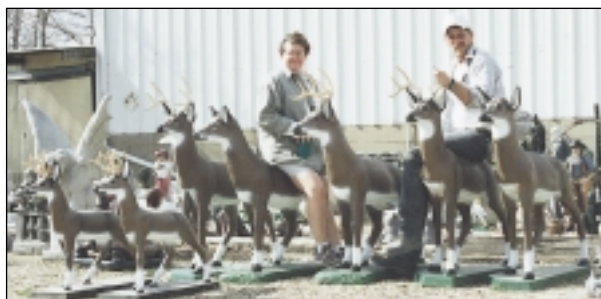


# Overcoming ornamental obstacles with admixtures

*Producers improve concrete durability and workability using several different products*

One profitable segment of the precast concrete market is devoted to producing ornamental and architectural pieces that are wet-cast one at a time in special forms or molds. Many ornamental concrete producers manage quite successful busi-



Becky & Ron Zimmerman, owners of Zimmerman Ornaments in Cedar Rapids, Iowa, display some of their precast concrete friends. They use a special mix design that includes fibers to create durable artistic works.

nesses by marketing each product as a distinct work of art.

Since very few ornamental concrete production facilities have uniformly sized molds and a production-line process, the choice of materials, mix design, and release agents is particularly important for ornamental producers.

Because concrete quality depends on water/cement ratio—weight of water divided by weight of cement per batch or cubic yard—too much free water added to a mix for workability can cause problems rather than solve them. Thus, an admixture should provide measurable water reduction in addition to increased workability of the plastic concrete. Rarely do concrete materials with a 0.40 or lower water/cement ratio (the maximum acceptable level) provide all the workability needed in a mix. Also, about 6% entrained air (microscopic air

bubbles) by volume helps homogenize a mix by reducing entrapped air (visible air bubbles) and keeping larger particles suspended and well distributed. Entrained air also imparts freeze-thaw capability to pieces kept outside.

Several admixtures provide water reduction, mix lubrication, and smooth finishes. Some admixture companies have formulated products specifically for ornamental producers, while others offer products that are easily adaptable to this market niche. Thus, the brand used may not be as important as using what works; not all aggregates and cements exhibit the same results with the same admixtures. The products discussed below—one called Auger Aid (which provides all the above benefits), a new Type F superplasticizer, an unknown local formulation, air entrainment, and fibers—are products ornamental producers have used. Here's what some ornamental concrete producers have said about these products.

■ Morris Hubbart of Roadrunner Lawn Ornaments Inc., Pana, Ill., says he likes to use a new Type F superplasticizer from Grace Construction Products that has a recommended dosage rate significantly lower than that of other Type F products. The product provides the necessary plastic-concrete

workability without too much free water, and it “just vibrates better,” says Hubbart, whose facility is arranged around a continuous mixer that dispenses fresh concrete into large wheelbarrows or buggies. The stone stays in suspension even in the large wheelbarrows they use for transporting fresh mix to the molds, he adds.

■ Double D Statuary is located just north of Corpus Christi, Texas, and sells 95% of its products in the warm Gulf Coast climate. Owner David Reyckert says when Double D uses an admixture, it uses Specco Industries' Auger Aid because it keeps the concrete workable longer in hot weather. This admixture exhibits the properties of a midrange water reducer and appears to hold water within the matrix of the concrete, promoting complete hydration of the cement.

Sufficient dosage rates provide 5% to 6% entrained air, and the product doesn't interfere with the natural effect obtained with white cement and light-colored local aggregates. Reyckert warns that concrete formulated primarily for use in warm climates without air entrainment probably wouldn't be durable in northern freeze-thaw cycles.



Producers can create artistic concrete ornaments when using admixtures that increase workability and durability.

■ Reyckert's brother, Chet, owns Skiatook Statuary in northern Oklahoma, which also has a continuous mixer and forklifts that bring large molds to the mixing area and deliver hoppers of fresh mix to the casting areas. The company has gained notoriety with 10,000-pound concrete gorillas, hippos, and rhinos durable enough to have been placed in a park near Moscow. According to Chet Reyckert, Skiatook Statuary has used both the Specco product and an admixture formulation made locally by a friend. Both admixtures are highly effective, even in a harsh summer environment, says Reyckert.

■ Yard Ornaments Inc., near Ada, Okla., is a large producer of ornamental concrete and uses a continuous mixer that is situated in a central location where it can be charged with a front-end loader. The casting crew can pick up concrete in 5-gallon buckets as needed. Owner Curtis Hogue strives to make high-quality concrete. By using a

different Specco product in all mixes, the company reaps the benefits of water reduction and workability as well as 5% to 6% entrained air. Not only does this help increase the quality of the product surface, Hogue maintains, but the items themselves require less hand finishing and are durable and less likely to be damaged by shipping or winter weather. Furthermore, according to Curtis, because of the reduced water, the concrete sets faster without the use of harsh accelerators. As added insurance against reflective and refractive cracking, Yard Ornaments also uses 1/2-inch fibers.

■ Much farther north, near Cedar Rapids, Iowa, Ron Zimmerman of Zimmerman Lawn Ornaments uses one or two small drum mixers. The company also uses a low-range water-reducing Specco admixture religiously. Zimmerman says this product provides time to work with the fresh concrete and facilitates uniform distribution of fibers throughout the mix. This admix-

ture also eliminates unsightly watermarks and stains from form stripping. For product durability in the northern climate, the company attains 6% air entrainment with a separate admixture. This enables the company to adjust the entrained air volume to compensate for extreme weather differentials.

—*Simon Stanfield is a consultant specializing in the operation of continuous mixers and designing high-performance concrete mixes.*

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