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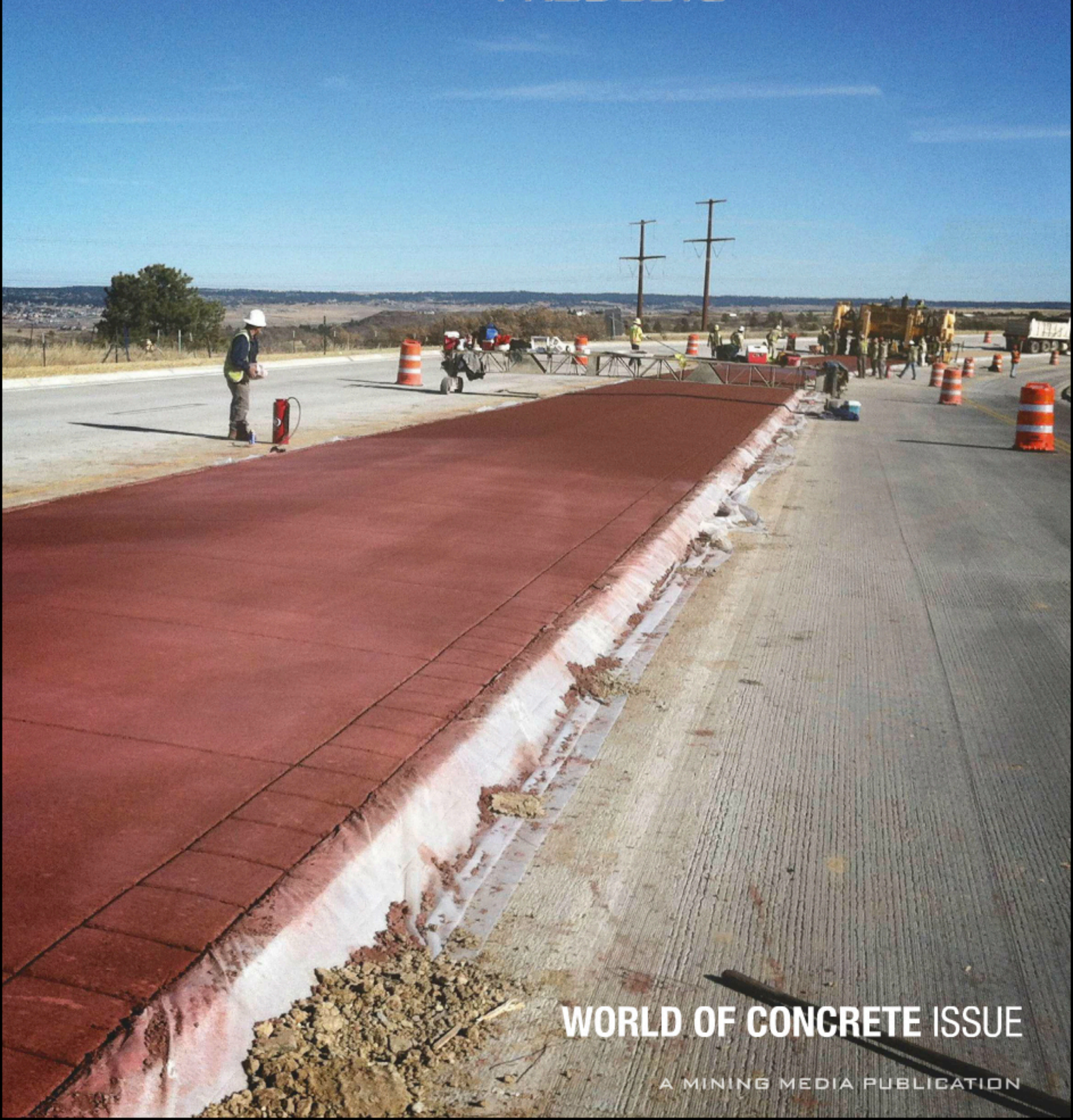
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Concrete

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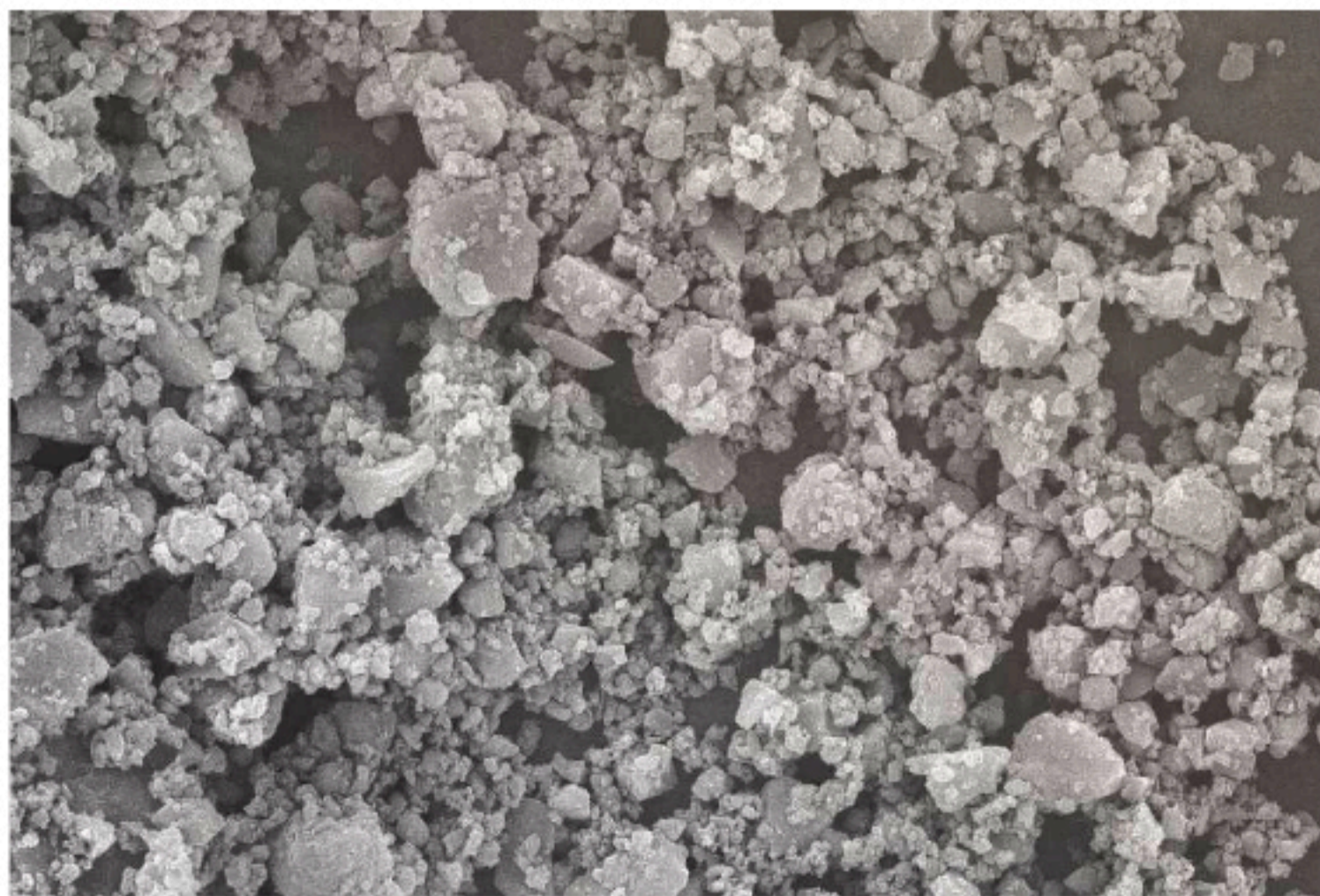
WORLD OF CONCRETE ISSUE

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PUMICE OPERATOR RAMPS UP CONCRETE POZZOLAN PROCESSING, NATIONAL DISTRIBUTION



PHOTOS, MICROGRAPH: Hess Pumice



Hess Pumice draws from its Wrights Creek Area Mine, near its Malad City, Idaho, headquarters, with proven reserves to cover five to six generations. New crushing and screening equipment have increased Hess Pumice's pozzolan processing capacity by 100,000 tons, an investment geared to rollout of the 3-micron Hess UltraPozz and 15-micron HessPozz agents for ready mixed and precast concrete.

Family-owned Hess Pumice Products has developed 3-micron and 15-micron gradations of its amorphous aluminum silicate product, each with pozzolanic properties well suited to concrete mixes. A sister business to Hess Ready Mix, it recently doubled capacity at its pozzolan production facility in southeast Idaho, arranging distribution of packaged Hess UltraPozz and HessPozz to precast producers through Nippon Electric Glass, a Dallas-based supplier of (GFRC-grade) concrete fibers; and, direct bulk sales to ready mixed producers.

HessPozz was formally introduced at the 2012 Precast/Prestressed Concrete Institute Convention in Nashville, following release of a white paper reflecting University of Utah testing on concrete designed with the 3-micron and 15-micron agent. "How Pumice Pozzolans Super-Charge Concrete Performance" details the agents' potential to a) lower heat of hydration 10-40 percent in a mix's first 100 hours; b) resist sulfate attack and alkali-silica reactivity development; and, c) to replace up to 40 percent of portland cement as a supplementary cementitious material. The latter finding is indicated in four 0.48 water-cement ratio specimens exhibiting 3,300- to 4,600-psi and 4,800- to 7,000-psi compressive strength characteristics, respectively, in 7-day and 28-day tests.

Hess UltraPozz and HessPozz are lightly colored, thus suited to architectural or decorative slabs and structures; chemically inert outside of a calcium hydroxide environment, the raw material differing only in gradation from powder the company supplies for dental toothpastes; and, measure up well against fly ash, silica fume and metakaolin in reacting with free lime to form a denser calcium silicate hydrate concrete matrix. The non-crystalline silica agents comprise about 80 percent SiO_2 and 14 percent Al_2O_3 . The pozzolans' reactivity characteristics enable the high rate of portland cement replacement.

"HessPozz has been used around the world in a variety of applications, ranging from down-hole well (oil/gas) cementing and precast concrete structures, to ultra-fine cementitious grout used to seal leaking dams, tunnels, sewers, and mine shafts," says Hess Pumice Vice President of Research & Development Joseph Thomas. "The last frontier for HessPozz and Hess UltraPozz is the North American ready mixed concrete market—a mature and cautious industry sometimes hesitant to adapt to new technologies."

Hess Ready Mix, along with Idaho peer operators Valley Ready Mix, Idaho Falls, and Walters Ready Mix, Rexburg, are incorporat-

ing pozzolans in demonstration and commercial concrete orders. The producers enlighten customers and prospects on the very old (i.e. ancient Rome) but proven, technology underpinning Hess UltraPozz and HessPozz. The natural pozzolan protects concrete from the ravages of chemical attack such as sulfates and chlorides, yet is non-hazardous and non-toxic, they note. Its white color allows for greater innovation in decorative and architectural concrete, while providing—as the Colosseum in Rome attests—an unmatched level of durability in finished concrete.

Romans lacked the type of quick-setting cement available today, Thomas explains in “How Pumice Pozzolans Super-Charge Concrete Performance,” adding, “They used hydrated lime, a cementitious product made from limestone which has been heated to drive off the carbon dioxide and transform calcium carbonate into calcium oxide (lime) + H₂O. Lime does not act like hydraulic cement on its own, and will only form the concrete binder, calcium silicate hydrate, in the presence of water and pozzolan. Whether using ordinary portland cement or lime, the end result is the very same cementitious binder in concrete: calcium silicate hydrate.”

“The Romans demonstrated that concrete, based on natural pumice pozzolan, could withstand the ravages of time like no construction medium in history,” Thomas concludes. “What other product has 2,000-year-old structures to prove its case? What was old is new again, and better than ever.”

Hess Pumice Products, Malad City, Idaho, 800/767-4701; www.hesspozz.com; www.hesspumice.com. The white paper, “How Pumice Pozzolans Super-Charge Concrete Performance,” and report on product testing conducted under University of Utah’s Dr. Paul Tikalsky, can be obtained at the HessPozz website.



Hess Pumice is shipping its concrete-grade pozzolans in 50-, 1,200- and 2,000-lb. bags, or bulk. Hess Ready Mix, whose mixers are shown at the company’s pumice processing operation (left), has enlisted fellow Idaho producers in commercializing the pozzolans. Joining in the process, from left, are Valley Ready Mix Plant Manager Shane Holden and Walters Ready Mix’s Michael Walter, Driggs plant assistant manager; James Walters, Driggs plant manager, and John Walters, Rexburg plant dispatcher.