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FORWARD THINKING

AVR INC. PLANT UPGRADES ANTICIPATE NEW ENVIRONMENTAL REGULATIONS, MARKET REBOUND

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RCC PAVEMENT

Builder's Concrete spearheads Indiana market development

"Future of Pavement: RCC" hosts Scott Noel (below, left) and Scott Hall gauge the light-duty RCC pavement's density with a Clegg hammer, a QC tool more often associated with asphalt than concrete. Builder's Technical Service Reps Randy Robertson (left) and Roger Stern prepare RCC test specimens in a four-layer, fill and compact sequence as described in ASTM C 1435. The Hilti TE 805 hammer helps replicate the compaction and finishing mechanisms RCC mixes undergo in field construction. Builder's RCC pavement mix averages 7,500 psi compressive and 900 psi flexural strength.

Builder's Concrete & Supply Co. capped a late-2009 seminar, "The Future of Pavement: Roller Compacted Concrete," by placing both light- and heavy-duty sections of RCC for truck routing and auto parking areas at its Fishers, Ind., headquarters plant, northeast of Indianapolis. The demonstration saw a tilting drum mixer load zero-slump RCC into dump trucks feeding the machines of seminar cosponsors, Calumet Civil Contractors, Whitestown, Ind., and Delello & Sons Asphalt Paving, Westfield, Ind.

Calumet placed the 8-in.-thick, heavy-duty portions with a mainline tracked high-density paver. It spreads dry RCC mixes and finishes the slab in a process similar to a concrete slipforming machine, substituting vibration with compaction. A finish roller was then applied to increase surface smoothness. Delello & Sons crews tackled the light-duty paving in two steps: placing mixes with a conventional asphalt paver, then finishing with two vibratory and two static drum roller passes. The exercise yielded 13,200 sq. ft. of service-ready RCC pavement on a gloomy day, whose freezing temperatures sustained limited evidence of the season's first snowfall—and idled central Indiana's asphalt plants.

BEST PRACTICES

The headquarters plant placement added 150 yd. to the 5,800-plus yd. of RCC pavement mixes Builder's Concrete delivered in 2009. Estimates from Fishers-based Chris Tull, P.E., principal of CRT Concrete Consulting LLC, suggest the company accounted for more than half of the 10,000 yd. of RCC pavement deliveries Indiana ready mixed producers logged last year. Underscoring its intent to lead the market, Builder's Concrete recently took delivery of the first mobile mix production unit of its kind (note box, page 10), engineered to meet the 150- to 200-yd./hour output required for most public and private jobs where RCC pavement is specified, or is an asphalt replacement candidate.

The RCC demonstration followed a four-hour seminar and panel discussion, hosted by Builder's Sales Manager Scott Noel and Quality Control Manager Scott Hall at a nearby conference venue. The event drew about 150 transportation agency, design and construction professionals from across Indiana; in the face of escalating petroleum-based binder

The light-duty pavement serves a parking area for the Concrete Store, stocking decorative flatwork tools and finishing products.

The heavy-duty RCC slab links a perimeter and central truck path at Builder's Concrete's Fishers, Ind., headquarters operation.

PHOTOS: *Concrete Products*

prices, many have observed or helped advance development of RCC pavement as an alternative to asphalt base layers or full depth sections.

Opening the seminar, Portland Cement Association Director of Pavements Wayne Adaska traced RCC pavement's emergence over the past three decades, from specialized, heavy-duty applications for truck staging and material handling to the present, where petroleum-based bitumen binder price volatility has positioned RCC and conventional concrete competitively against asphalt. As RCC pavement usage has moved from milder climates to markets like Indiana, where freeze-thaw cycles are a greater factor in pavement specification decisions, Adaska noted that some RCC practitioners have raised the prospect of using ASTM C67 - 09 Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile as an alternative to ASTM C666/C666M - 03(2008) Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing. RCC mix designs and compaction methods are similar to those for ASTM C 67-tested concrete paving stones. Asphalt paver placement and roller drum finishing typically yield finished RCC specimens exceeding 4,000 psi compressive strength.

Buzzi Unicem USA Manager of Technical Services Frank Lennox reviewed RCC mix production capabilities of ready mixed plant equipment versus continuous pugmill units common on large-scale pavement or dam placements. Based at the Signal Mountain Plant in Chattanooga, Tenn., he noted customers who had achieved 100–150 yd./hour with central mixed plants feeding dump trucks, or 75–100 yd./hour for dry plants, where mixer trucks prepare 5- to 7-yd. loads, dispensing into dumps after five-minute cycles. RCC mixes' low water content (typically representing a 0.15 w/c ratio) necessitates the limited load sizes in mixer drums, Lennox said, adding that the use of polycarboxylate-type superplasticizers dosed at 3 oz. per 100 lbs./cementitious material is highly effective for eliminating material build up on drum fins.

As asphalt contractors become accustomed to RCC pavement construction and load sequencing, Lennox has observed a role reversal between the plant and site: "Instead of being questioned about mixer location and arrival, the producer on an RCC job is calling the contractor and asking 'Where's my dump truck?'"

One of Buzzi's best promotion allies, Chattanooga City Engineer Ariel Soriano, showed "Future of Pavement" attendees how RCC has proved consistently more competitive against asphalt in the face of bitumen binder price spikes. He cited ball field parking area, recycling center, and water terminal access road jobs where city paving crews placed RCC pavements at savings of 10–50 percent compared to asphalt alternatives. Soriano added that RCC pavement has been specified for the 19-acre parking lot of a new Volkswagen of America assembly plant site outside Chattanooga, and a service road linking the facility to Interstate 75. — *Don Marsh*

Report continues on page 10 ...

Panel members wrapped up the seminar reviewing RCC market opportunities and fielding questions on plant and site conditions. Joining the discussion (from left) are Calumet Civil Supervisor Steve Sweet; Chattanooga City Engineer Ariel Soriano; Buzzi Unicem's Frank Lennox; PCA's Wayne Adaska; and Builder's Concrete's Scott Hall.

SICOMA, STEPHENS MOBILIZE RCC MIX PRODUCTION

Builder's Concrete is taking a lead role in promoting roller compacted concrete as an alternative to asphalt for base layers or full depth pavements in heavy-duty parking or truck service applications and municipal streets. After delivering orders for street projects in Indianapolis, Fishers and other central Indiana towns—and observing agencies' concerns over asphalt pricing volatility—it is ramping up RCC mix production capabilities.

The company is the premier user of a portable RCC mixer designed by Sicoma Strength and Stephens Mfg. Built around a horizontal twin shaft mixer, widely used in RCC dam construction, the 35-ft.-long unit affords the flexibility of producing the material at Builder's Concrete's main central mixed or three satellite transit mixed plants.

Bearing on a tandem axle and 17.75-in. frame rail, the mixer has a charge height just over 13 ft. It feeds a bend-up conveyor with 42-in.-wide x 50-ft.-long belt. At a 20-deg. angle, the conveyor provides a 12-ft. charge height for dump trucks, transferring mixes through a 0.75-yd. hopper and 48-in., double-clam-shell gate. The pilot unit (shown here during the producer's early December Fishers pavement placement demonstration) has a 3.5-yd. Sicoma twin shaft mixer, to be replaced by a 5-yd. model. The latter mixer will equate to two-batch cycles per dump load versus the smaller model's three-batch cycle. — *www.sicoma.biz*