

Construction NEWS

Edition

Serving Arkansas, Louisiana, Mississippi, Oklahoma and Western Tennessee

TREATMENTS TAILORED FOR US84 FACELIFT

Louisiana matches preventive maintenance and rehabilitation work to pavement conditions using chip seal, micro surfacing and HMA mill and fill.

By Paul Fournier

Extensive pavement wheel path rutting and shoving on US Route 84 in Louisiana were addressed aggressively recently by the state's Department of Transportation and Development (LDOTD) using a battery of pavement preservation and rehabilitation techniques.

LDOTD awarded a \$2.25-million contract for US84 improvements to Vance Brothers, a Kansas City, Missouri-based firm that manufactures, distributes and installs asphalt pavement products. The contract, which covered 17.5-miles of road, began on US84 at the city limits of Jonesville, Catahoula Parish, and continued westerly to near the limits of Jena, LaSalle Parish. Included in this total mileage was a three-mile section of Louisiana Route 28 running southerly from its intersection with US84. Construction inspection was the responsibility of LDOTD's District 58, which maintains more than 1,400 miles of non-Interstate highways and over 400 bridges throughout six parishes.

Road With A History

US84 was first built in the mid-1920s as a short road between Georgia and Alabama but today is an east-west two-to-four-lane U.S. highway running hundreds of miles from I-95 in Midway, Georgia, through Alabama, Mississippi, Louisiana, Texas, and New Mexico to US160 in Pagosa Springs,



Vance Brothers uses a rut box attached to a Bergkamp Mobile Mix Paver to fill wheel ruts with micro surfacing.

Colorado. The portion that recently underwent improvements under the Vance Brothers contract was originally an 18-foot-wide concrete road.

"Most of the road was concrete, but over the years it was overlaid a number of times with asphalt, and in the fifties they widened it to two, 12-foot lanes," said Ken Mason, P.E., design engineer for LDOTD. Mason said although the road was generally in good shape with not many instances of pavement failure, there was significant wheel rutting.

The Micro Surface Solution

After conducting a thorough field survey of pavement conditions along the US84 project, the agency specified micro surfacing as the wearing course for most of the route, and other preventive maintenance and rehabilitation techniques to correct

TREATMENTS TAILORED FOR US84 FACELIFT

Owner: Louisiana Department of Transportation and Development

General Contractor: Vance Brothers





A CAT 926E loads sandstone into a Rawson mobile plant that screens, weighs and deposits aggregate into a nurse truck.



Contractor's Volvo distributor truck sprays SBR latex-modified CRS2-P emulsion for the chip sealing treatment.



Bergkamp mix paver applies micro surfacing over entire 12-foot lane width in a single pass.

pavement problems in specific areas.

A preventive maintenance treatment, micro surfacing meets criteria for pavement preservation as defined by the Federal Highway Administration. According to FHWA, pavement preservation addresses pavements whose structural sections are still in good condition and whose surfaces can be restored almost to their original condition. Other preventive maintenance treatments meeting these criteria are asphalt crack sealing, chip sealing, and thin and ultra-thin hot mix asphalt overlays.

Micro surfacing is a cold-mix material, created on the job site by blending mineral aggregate, mineral filler such as portland cement, water, and a polymer-modified asphalt emulsion. It can be used on high-traffic volume roadways, doesn't require rolling and is usually ready to accept traffic within an hour. Since it can be spread to variable thicknesses, micro surfacing is ideal for not only applying wearing courses but for leveling surfaces and filling wheel ruts as well.

Vance Brothers' crew, headed by job superintendent Dorman Tompkins, employed a self-propelled Bergkamp Mobile Mix Paver to blend raw materials and apply micro surfacing. The mix paver, capable of laying a pass 9 to 14 feet wide, applied micro surfacing to each 12-foot lane in a single pass. As it operated, the Bergkamp machine was continuously fed all necessary raw materials by "nurse trucks."

Bigger Stone And Latex Glue

According to Tim Harrawood, Vance Brothers' southern region manager, some 6,200 tons of 3/8-inch, densely graded sandstone was supplied for micro surfacing by Capital Aggregate of Marble Falls, Texas. The coarsest gradation of stone available for micro surfacing was used for rut filling. "It is actually better than a smaller stone for rut filling," he observed. Stone was applied at the rate of 15 to 30 pounds per square yard for rut filling depending on depth of rut, and 25 pounds per square yard for the wearing course.

About 175,000 gallons of latex polymer-modified CSS-1HP asphalt emulsion specified for micro surfacing treatment was provided by the Vicksburg, Mississippi, plant of Ergon Asphalt & Emulsions. Ergon makes the cationic emulsion using SBR (Styrene Butadiene Rubber), a latex polymer manufactured by BASF Corporation, to help 'glue' the asphalt, mineral aggregate and fines together in the micro surfacing. Emulsion was added to the mixture at the rate of 12 percent by weight of stone.

Rut Filling, Milling And Combos

Ruts were slated for filling where they were more than ½-inch deep. LDOTD's Mason estimated that about 15 percent of the total job mileage had to undergo this procedure first before the scratch, or leveling, course was placed. The contractor used a specially designed five-foot wide "rut-box" attached to the Bergkamp mix paver to fill in one wheel path at a time.

Other problem areas of the highway required different solutions. Conditions in one road segment, for example, called for a combination of pavement preservation treatments.

"There was a section a couple of miles long that had too much cracking for the micro surfacing alone to correct," Mason said. "So we cold planed it first to get rid of surface cracks, and put down a chip seal. We allowed traffic on this for a couple of days and then applied micro surfacing over the chip seal." (Ed.: the combination of a chip seal bottom course topped with micro surfacing is sometimes referred to as cape seal.)

For the area that was chip sealed, Vance Brothers applied approximately 10,000 gallons of CRS2-P asphalt emulsion. This, too, was supplied by Ergon's Vicksburg plant. Vance distributed the emulsion, a cationic, rapid setting product modified with BASF's SBR latex, at the rate of .4 gallons per square yard. An Etnyre ChipSpreader broadcast the ½-inch limestone chips at the rate of 25 pounds per square yard. Terrell River Services of Alexandria, Louisiana, supplied the 300 tons of aggregate.

Thicker Is Sometimes Needed

Another area of pavement distress, the busy intersection of US84 and LA28 in Archie, Catahoula Parish, warranted a departure from the thin surface treatment approach.

"There's a lot of heavy truck traffic at that intersection, and constant braking caused the pavement to shove," said Mason. "More pavement structure was needed to resist shoving, so we called for cold planning off 1-1/2 inches of existing pavement and replacing it with hot mix asphalt." He said the mix is a Superpave Asphaltic Concrete Wearing Course – Level Two, with Level Two indicating relatively high traffic volume at the intersection.

Subcontractor D&J Construction of Alexandria, Louisiana, performed the cold planing using a ROADTEC RX60C milling machine. Next, the company's paving crew utilized a CAT 1055D paver to place the 1-1/2 inches of hot mix asphalt on both highways for about 2000 feet on each side of the intersection. A ROADTEC SB-2500B Shuttle Buggy supported the paver with a continuous supply of asphalt mix.

A Complex Job With A Happy Ending

While procedures utilized on the US84 project were diverse, crews had no difficulties performing the work according to Vance Brothers' project superintendent.

"It was a big enough job so crews could do different work in different areas," said Tompkins. "We'd be in one area micro surfacing while another crew was milling and another overlaying someplace else."

LDOTD's Mason feels that using micro surfacing as the wearing course for most of the job was an ideal solution.

"It gives us a smoother surface, improves skid resistance, and makes our road maintenance dollars go further," he said. He pointed out the District has gotten up to ten years of service life from some parish roads that have been treated with micro surfacing.

"We're very happy with it," he concluded.



A White GMC nurse truck feeds raw materials into Bergkamp mix paver during micro surfacing treatment.



D&J Construction Company's ROADTEC RX60C mills off ½-inch of existing pavement prior to chip seal placement.



Supported by a ROADTEC Shuttle Buggy, a CAT 1055D paver places a 1-1/2-inch Superpave asphalt wearing course.