



RECONSTRUCTION OF ASPHALT PAVEMENT IN "AMERICAN GOTHIC" COUNTRY JONES COUNTY

Project Report #20
June, 1995

Although widely remembered as the home of Grant Wood and his Prairie School of artists at Stone City, Jones County, Iowa is also envied for its abundance of high-quality limestone aggregate which produces portland cement concrete (PCC) pavements of superior quality.



Beginning in 1964 Jones County constructed its first PCC slab, using the slipform method. With the completion in 1995 of the County Road D-62 project, a total of 116.4 mi. or 81.5% of their paved road inventory has been built with concrete. Residents and travelers enjoy a network of 846 mi. on the secondary road system which also includes 35.4 mi. of unsurfaced local service roads, 667.7 mi. with crushed stone surfacing and 26.5 mi. of asphalt (ACC) paving. Most ACC routes were built with 2 in. mats over 6 in. rolled stone bases but have subsequently required one or two 2 in. overlays. As deterioration becomes evident, they are being replaced with PCC designs.

Such was the case for Jones County Project FM-53(18)--55-53 on Route D-62 between Coggon and Monticello. Traffic counts range from 270 to 550

AADT (1989) but is heaviest on the 3.83 mi. portion from X-31 to an existing PCC pavement about 3 mi. West of Monticello.

From his analysis, County Engineer Dan Waid attributed the random cracks and section failure of the ACC road to poor subgrade soils, lack of base drainage and heavy agricultural vehicle loads in some areas. On the westerly portion, minor geometric improvements in alignment and profile were needed to meet modern engineering standards.

Because of the original use of high-quality base material, project plans were prepared that required salvage by roto milling the existing ACC pavement. This processing method produced a blend of 40% AC and 60% RSB which was recycled as a 7½ in. thick by 34 ft. wide full-width drainable base. In other locations meeting modern design criteria, the existing 8 in. thick 26 ft. wide RSB which by now had a 6 in. total ACC mat was left intact but milled to the specified crown and profile.



On the full-width recycled base sections of the project, a standard 7 in. by 22 ft. Class C slipformed PCC pavement was placed. On the usable ACC segments, PCC "Whitetopping" was constructed 22 ft. wide having a 5½ in. minimum thickness at centerline. A 2% cross-slope was specified throughout the project so an additional 5% in PCC volume was included in the "Whitetopping" estimate to allow for irregularities.

For shoulders adjacent to the full 7 in. slab, backfill using base trim material was added, on which a 3½ in. Type A granular surface was compacted and followed by a single bituminous seal coat. On Whitetopped sections, full-depth shoulder fills were nominally placed 6 in. thick and surface sealed. All shoulders were finished 8 ft. wide.

Where sections changed from full-depth to "Whitetopping" and back, 50 ft. transitions permitted continuous paver operations while adjusting to required pavement thickness. Iowa Department of Transportation standard specifications (Series of 1992), plus current special provisions and supplemental specifications applied.

Following the March 28, 1995 letting, Fred Carlson Co., Inc. of Decorah, Iowa was awarded the \$713,188.04 contract. For their paving operation under Field Superintendent Dennis Kloke, the Carlson firm used:

- Rex/Model S, #1755 batch plant with 10 CY tilting drum mixer
- CMI TS-400 Subgrade planer - "Iowa Special"
- Rex TCR/Town and Country slipform paver
- CMI TC-280/Transverse tine texture-cure machine with Astro-grass drag
- Saws: Clipper, Model C3-75J
Target, Model 3005
- Aggregates: Coarse 1695 lbs. C1-3 Wendling
Fine 1371 lbs., Wendling
- Cement: Holnam Type 1, 457 lbs/CY
- Fly Ash: American/Clinton, 114 lbs/CY
- Air Entraining: 6%, Sika Corporation
- Mix: C3 WR F-20
- Water: 246 lbs./CY

In spite of frequent showers but modest rainfall, work progressed nicely due to the drainable nature and excellent stability of the prepared base. Cleats on the paver tracks supported full-weight of the machine without sinking in.



The concrete mix used exhibited good consistency and low slump. Center point beam breaks showed a modulus of rupture well above the minimum 500 psi break specified after 7 days. At 5 specific locations needed to accommodate local services, high-early strength Class "M" concrete that would achieve 500 psi after two days in place was incorporated.

Iowa's Chart A pavement smoothness specification, Item 2316.01, was required and easily met. Of the 30 contract items, 5 could be considered significant to the total contract.

- Granular Shoulders
8,924 Ton @ \$ 7.25
- PC Conc/Slipform 7" Cl.C
23,054 SY @ \$10.50
- PC Conc/Overlay, Furn.
4,556 CY @ \$36.75
- PC Conc/Overlay, Place
24,736 SY @ \$ 3.50
- Bridge Floor Overlay
392 SY @ \$65.00

Driving over numerous PCC roads in Jones County shows the benefit of good engineering practices and quality construction. Durability of 20-year pavements provides convincing support to conclude that as conditions require and finances allow, the remaining ACC sections will be replaced with PCC pavement.

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