INITIAL REPORT

FOR

EVALUATION OF EXPERIMENTAL

CONSTRUCTION PROJECT

ON

INTERSTATE HIGHWAY 40

CARSON COUNTY

TEXAS

CONTROL: 275-2-40

CONTROL: 275-3-33

FROM: 2 MI. EAST OF POTTER CO. LINE

TO: 1.6 MI. EAST OF CONWAY

PROJECT SUPERVISION

WILLIAM E. BRYAN, JR., RESIDENT ENGINEER

REPORT PREPARED BY

GERALD D. BRITTEN, ENGINEERING TECH. IV

DATES OF CONSTRUCTION

WORK BEGAN: SEPTEMBER 24, 1987

DATE ACCEPTED: SEPTEMBER 29, 1988

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OBJECTIVES

The objective is to evaluate the bond of a Hot Asphalt-Rubber underseal to a concrete pavement surface that has been cleaned and textured by milling.

Experimental Features:

This project is located on IH 40 12 miles east of Amarillo, in Carson County. The ADT is 9100 with 35% of the volume trucks. For evaluation of the bond, the travel lanes of IH 40 will be cleaned and textured by milling, except for a control section five hundred feet in length.

Work plan is page 3 of this report.

WORK PLAN
for
EVALUATION OF EXPERIMENTAL
CONSTRUCTION PROJECT
on

Project: IR 40-1(141)085
Control: 275-2-40
Highway: IH 40
County : Carson

From : 2 miles E. of Potter Co. Line
To : 1.6 miles E. of Conway

Objective:

The objective is to evaluate the bond of a Hot Asphalt-Rubber underseal to a concrete pavement surface that has been cleaned and textured by milling.

Experimental Features:

This project is located on IH-40 12 miles east of Amarillo, and has a high volume of truck traffic. For evaluation of the bond, the travel lanes of IH-40 will be cleaned and textured by milling, except for a control section five hundred feet in length.

Evaluation:

A report documenting construction procedures will be prepared. An annual condition survey will be made noting the physical condition of the milled section compared to the unmilled control section. Evidence supporting a lack of bond (slipping, rutting, shoving, etc.) or an absence of these factors should be included in each annual survey report. Also, for additional control section data, observations of two previous IH-40 projects shall be included. These projects extend from the west end of this project to the Santa Fe Rail Road in Amarillo. The annual surveys will be made until a conclusive determination has been reached or for a maximum of five years, whichever comes first.

PROJECT BACKGROUND AND CONSTRUCTION PHASE

This project is located on IH 40 east of Amarillo from 2 miles east of the Potter County line to 1.6 miles east of Conway. The existing roadway surface is 8 inch continuously reinforced concrete pavement with 6 inch asphalt stabilized base that was originally constructed in the summer of 1966. The concrete pavement was failing in various locations as of 1987. These areas were repaired by full depth removal and replacement of the concrete and reinforcing steel and was completed November 25, 1987. A field change was submitted in March 1988 to clean and texture the existing concrete pavement surface prior to placing an underseal of hot asphalt-rubber. The 0-1/4 inch texturing is to improve bonding of the underseal and also clean the road film from the exiting concrete pavement.

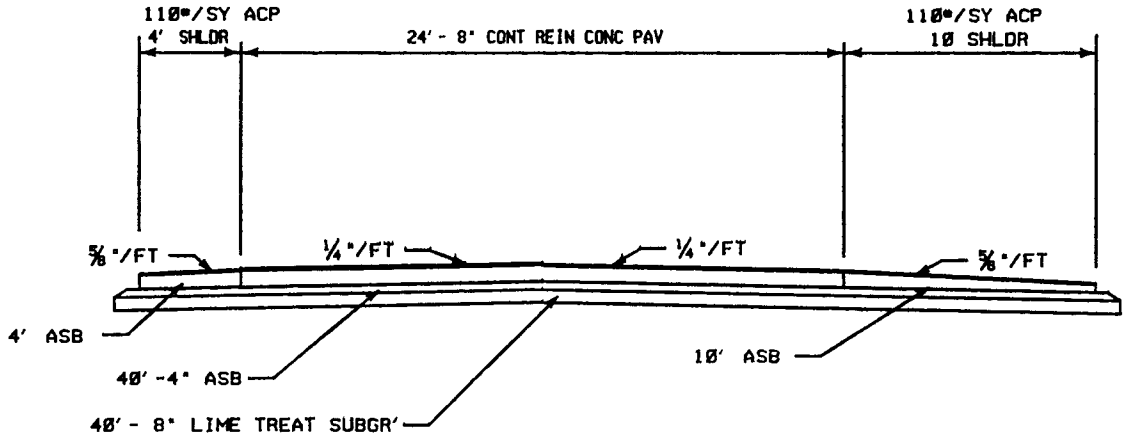
After cleaning and texturing was completed, application of the underseal began on April 21, 1988 and was completed on May 10, 1988. The ACP overlay was begun on May 19, 1988 and completed on July 30, 1988.

In an effort to evaluate the physical condition of the milled sections, one test section was not milled. This five hundred foot section was sealed with hot asphalt-rubber in accordance with specifications on April 29, 1988. The limits of the test section are Sta 600+00 to 605+00 of the eastbound driving lane.

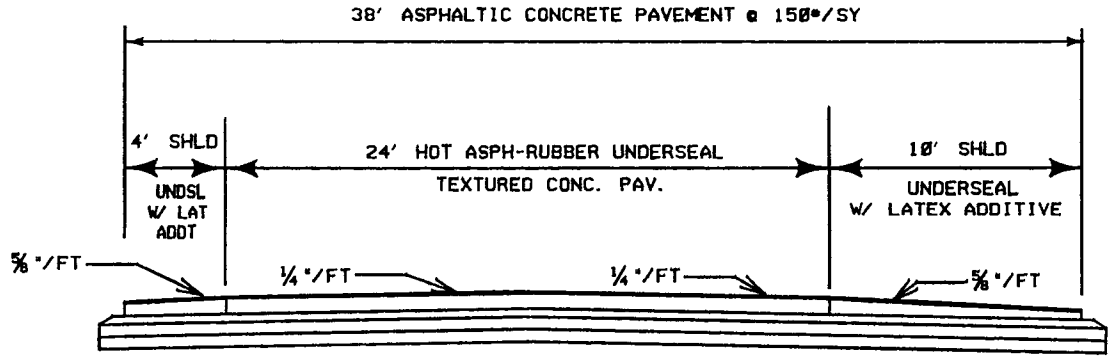
DESIGN

The following pages, 6 and 7, show the existing section, section with improvements, field change and Special Specification Item 3003 that provided for texturing the existing concrete pavement surface.

EXISTING ROADWAY



AS BUILT ROADWAY



EVALUATION OF EXPERIMENTAL CONSTRUCTION PROJECT

IH 40
CARSON CO
PROJ. IR40-1(141)085
CONT. 275-2-40

For 112B (05-86)

APPROVAL OF CHANGE IN PLANS

F.C Request No. 1 Accompanied by Sketches or F.C. Plan-Sheets Numbered _____ Hwy. No. IH 40
Carson County, Federal Proj. No. IR 40-1(141)085 Control 275-2-40
TO THE ENGINEER-DIRECTOR:

Approval of the following changes in plans and/or specifications is requested.
Limits: Sta. 130+00 to Sta. 840+41

Description: Texture surface of existing concrete pavement where hot asphalt-rubber underseal will be applied.

This field change is requested for the following reasons: To clean existing concrete pavement surface to improve bonding of hot-asphalt-rubber underseal. Bonding of the underseal to the concrete pavement will prevent displacement of ACP surface placed on hot asphalt-rubber underseal.
Contractor: J. Lee Milligan, Inc.

Item No.	DESCRIPTION	Unit	Field Change Quantities			Original Plan Quantities		
			Quantity	Contract Price	Amount	Quantity	Contract Price	Amount
300-0006	PLAINING AND TEXTURING PAV. SURF. CL C (1) (0-¼ IN)	SY	379,970.	.50	189,985.			

Total.....$ 189,985.00 Total.....$

Net Underrun $ Net Overrun $ 189,985.00

Respectfully requested by:

Resident Engineer — Date

District Construction Engineer — Date

District Engineer — Date

RECOMMENDED FOR APPROVAL BY:

Chief Engineer, Highway Design — Date

Chief Engineer, Safety & Maintenance Operations — Date

Bridge Engineer — Date

APPROVED
Construction Engineer — Date

APPROVED
Engineer-Director — Date

SPECIAL SPECIFICATION

ITEM 3003

PLANING AND TEXTURING PAVEMENT

DESCRIPTION.

This item shall consist of scarifying and planing the existing asphaltic and/or portland cement concrete pavement and bridge deck surfaces to the depths indicated on the plans, and the removal and disposal or stockpiling of the scarified materials at the locations designated on the plans. The planned surface shall provide a smooth riding surface free from gouges, continuous grooves, ridges, oil film,and other imperfections of workmanship and shall have a uniform textured appearance.

EQUIPMENT.

The equipment for removing the pavement surface shall be a power operated planing machine or grinder capable of removing, in one pass, a combined thickness of two inches of asphaltic concrete pavement and one-half inch of portland cement concrete pavement or a single thickness of four inches of asphaltic concrete pavement or one inch of portland cement concrete pavement in a minimum six foot width. The equipment shall be self propelled with sufficient power, traction, and stability to maintain accurate depth of cut and slope. The equipment shall be capable of accurately and automatically establishing profile grades along each edge of the machine by referencing from the existing pavement by means of a ski or matching shoe or from an independent grade control and shall have an automatic system for controlling cross slope at a given rate.

The machine shall be equipped with an integral loading and reclaiming means to immediately remove material being cut from the surface of the roadway and discharge the cuttings into a truck, all in one operation; and adequate backup equipment (mechanical street sweepers, loaders, water truck, etc.) And adequate personnel will be provided to insure that all cuttings are removed from pavement surface daily. Stockpiling of planed material will not be permitted on the project site unless designated on the plans. The machine shall be equipped with means to control dust created by the cutting action and shall have a manual system providing for uniformly varying the depth of cut while the machine is in motion thereby making it possible to cut flush to all inlets, manholes, or other obstructions within the paved area. The speed of the machine shall be variable in order to leave the desired grid pattern specified under Surface Texture.

3. CONSTRUCTION METHODS.

The pavement surface shall be removed to the depth, width, grade, and cross section as shown on the plans, or as directed by the Engineer.

When in the removal of asphaltic concrete surfacing and an underlying surface of portland cement concrete pavement all of the asphaltic concrete pavement is not removed from the surface of the portland cement concrete pavement, the Engineer may require the surface to be re-planed.

In the event the entire pavement width along a section of highway has not been planed to a flush surface by the end of a work period resulting in a vertical or near vertical longitudinal face exceeding 1 1/4 inches in height, this longitudinal face shall be sloped in a manner acceptable to the Engineer so as not to create a hazard to traffic using the facility during periods when construction is not in progress. Transverse faces that are present at the end of a working period will be tapered in a manner approved by the Engineer to avoid creating a hazard for traffic.

The loose material resulting from the operation shall be disposed of at stockpile sites designated on the plans or at sites obtained by the Contractor and approved by the Engineer in writing. Unless otherwise specified on the plans, the material shall remain the property of the State. Placement of salvaged material in stockpiles shall conform to the dimensions and requirements shown in the plans.

When located within four inches of steep curbs, asphaltic concrete that cannot be removed by the planing machine shall be removed by other methods acceptable to the Engineer and the pavement and curb surfaces shall be cleaned of all debris and left in a neat and presentable condition.

4. SURFACE TEXTURE AND TESTS.

The texture produced for finished pavement shall be a grid surface with uniform discontinuous longitudinal striations or any other pattern that will provide, in the opinion of the Engineer, a satisfactory riding surface with adequate skid resistance.

It is the intent that the minimum texture depth resulting from the number of tests directed by the Engineer be not less than 0.05 inches for portland cement concrete pavement and for asphaltic concrete pavement, unless otherwise shown in the plans, when tested in accordance with Texas Test Method 436A. Should the texture depth fall below that intended, the finishing procedures shall be revised to produce a surface texture acceptable to the Engineer.

Unless otherwise shown on the plans or directed by the Engineer, the grade reference used by the Contractor may be of any type approved by the Engineer. The Engineer may require that the pavement planing operation be referenced from an independent grade control in those areas where he deems this type of control to be apropriate. Control points, if required by the plans or Engineer, will be established for the finished grade by the Engineer. These points will be set at intervals not to exceed 50 feet. The Contractor shall set the grade reference for the sensor of the automatic control to follow from the control points established by the Engineer, and this grade reference shall have sufficient support so that the maximum deflection shall not exceed 1/16 inch per 25 feet.

The surface of the pavement, after planing, shall be smooth and true to the established line, grade and cross section; and when tested with a 10-foot straightedge placed parallel to the centerline of the roadway or tested by other equivalent or acceptable means, except as provided herein, the maximum deviation shall not exceed 1/8 inch in 10 feet, and any point in the surface not meeting this requirement shall be corrected as directed by the Engineer.

5. MEASUREMENT.

Work prescribed by this item will be measured by the square yard of surface area for the various depths and types of material removal specified under the various classes listed below.

Class A (1) - Measurement under this bid item shall include removal of asphaltic concrete pavement by the square yard of variable depth up to a maximum of two inches in thickness.

Class A (2) - Measurement under this bid item shall include the removal of asphaltic concrete pavement by the square yard of variable depth that is greater than two inches and equal to or less than four inches in thickness.

Class C (1) - Measurement under this bid item shall include removal of portland cement concrete pavement by the square yard of variable depth up to a maximum of one inch in thickness.

Square yard calculations will be based on the neat dimensions shown on the plans.

Depth of removal for the purpose of determining the category of payment will be measured at the remaining vertical face created by each pass of the planing machine except that the depth to be used for the last pass of the machine in an area will be based on the vertical face that existed immediately prior to that pass.

Tapering or sloping of longitudinal or transverse joints as describe. under "Construction Methods" will not be measured for payment.

6. PAYMENT.

The work performed as prescribed by this item, measured as provided under "Measurement" will be paid for at the unit price bid per square yard for "Planing and Texturing Pavement Surface" of the various classes listed under measurement, which price shall be full compensation for removing all material to the depth shown, texturing the pavement surface, loading, hauling, unloading, and satisfactorily storing or disposing of the material, and for all labor, tools, equipment, manipulation and incidentals necessary to complete the work.

Measurement and payment will be based on the maximum thickness indicated for each bid item without regard to the nominal thickness shown on the plans or the number of passes required with the following exception: Where specifically indicated in the "General Notes" of the plans, payment will be based on the class of measurement specified within established limits.

When Class A(1) measurement has been specified on the plans for limits including an area that requires removal of asphaltic concrete pavement to a depth exceeding two inches, the Contractor will be entitled to additional measurement and payment under Class A(1) for each pass required to plane the area exceeding two inches in depth. Measurement and Payment will be limited to the longitudal length for which the depth of asphaltic concrete pavement exceeds two inches.

EVALUATION

As of this report, there have been no visible failures or construction problems. The ACP overlay appears to be in the same condition on both textured and untextured areas. However, it was noted that the entire 13.5 mile project had no slipping or rutting in either lanes.

SUMMARY

This is the initial evaluation of the performance of the cleaning and texturing of the concrete pavement by milling. The improvement for better bonding of underseals to be placed on the pavement were definitely noticed during the construction phase of this project. The roadway was freed from the slick or filmy residue left by traffic, plus, the texture greatly increased the bond of the underseal to reduce slipping and rutting of the ACP overlay.