

Simplified Plan Sheets for Concrete Overlays

Wisconsin Concrete Pavement Conference
February 9th, 2023
Brent Burwell, OK/AR ACPA



Concrete Pavement Technology Center

cptechcenter.org

GUIDE TO CONCRETE OVERLAYS

FOURTH EDITION



IOWA STATE UNIVERSITY
Institute for Transportation

NOVEMBER 2021

National Concrete Pavement
Technology Center



Overlay Guide

Step by Step Guide

Evaluation

Selection

Design

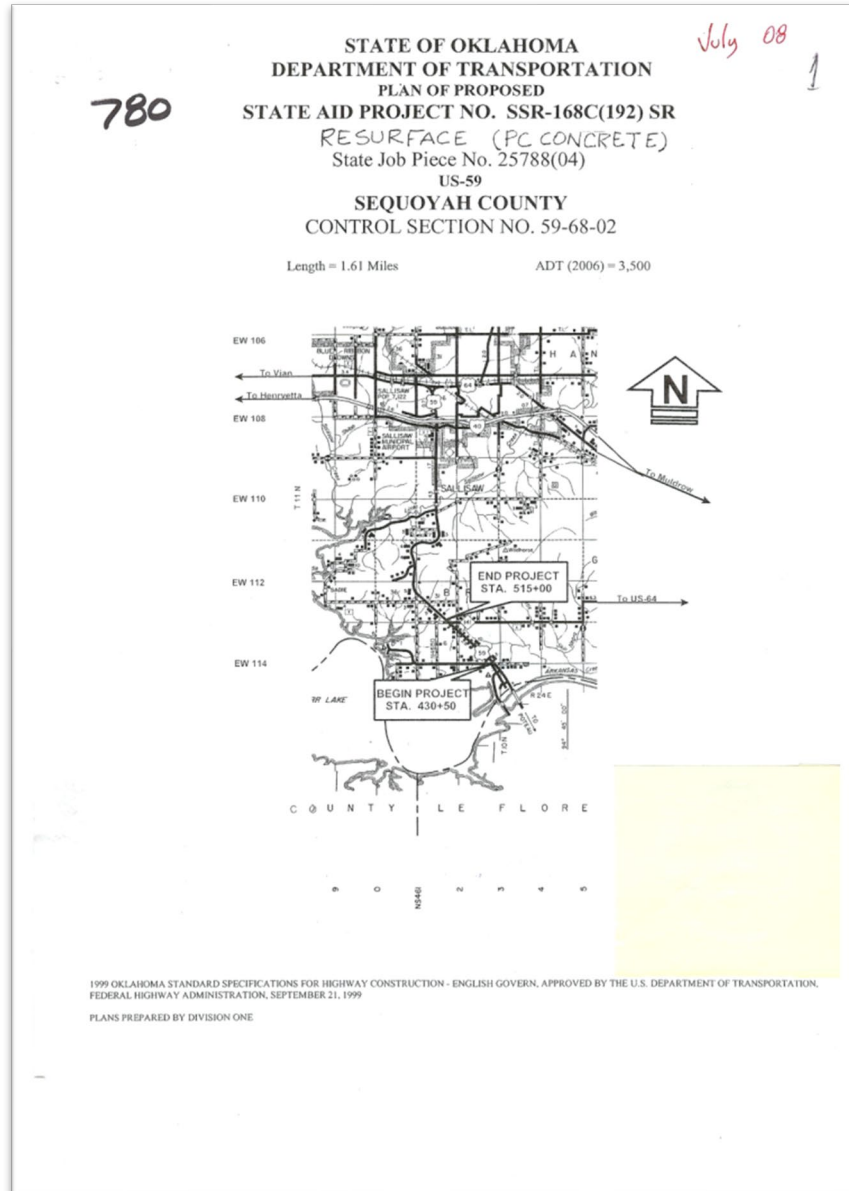
Pre-overlay Repairs

Construction

How hard does it have to be?



- Start Here
- End There
- Make it this Thick

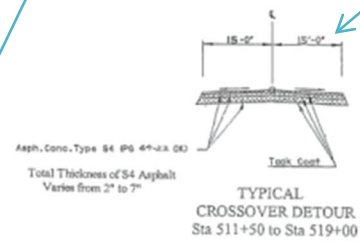
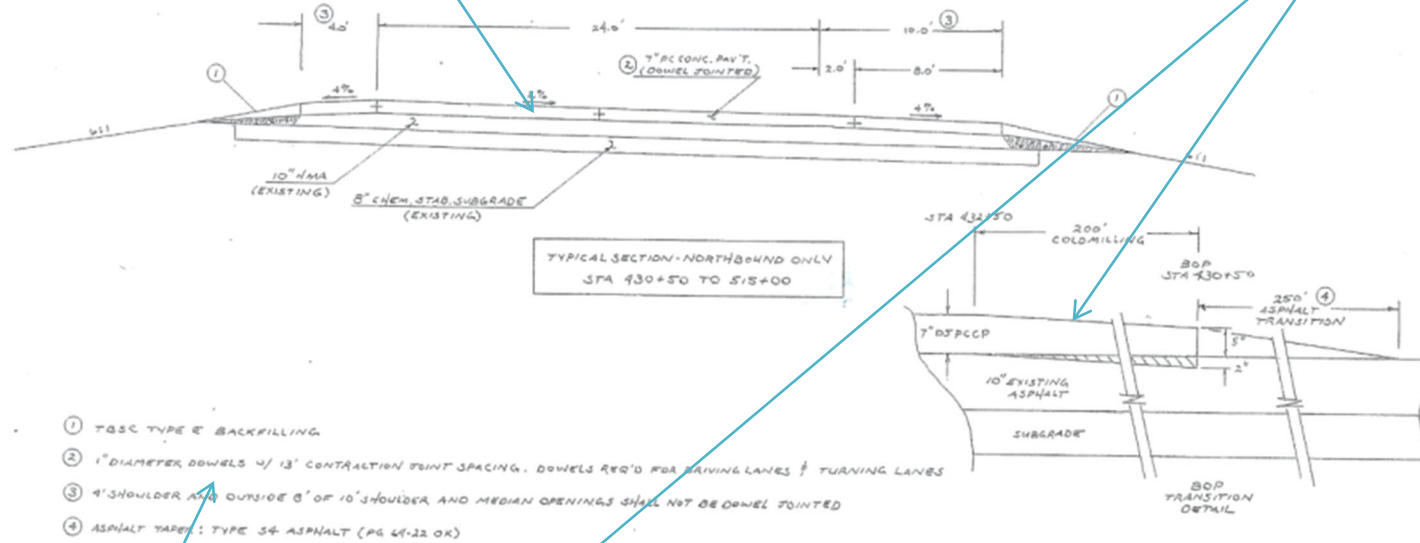


Title Page

Project No
Description
Highway No
County
Location Map

Typical Section

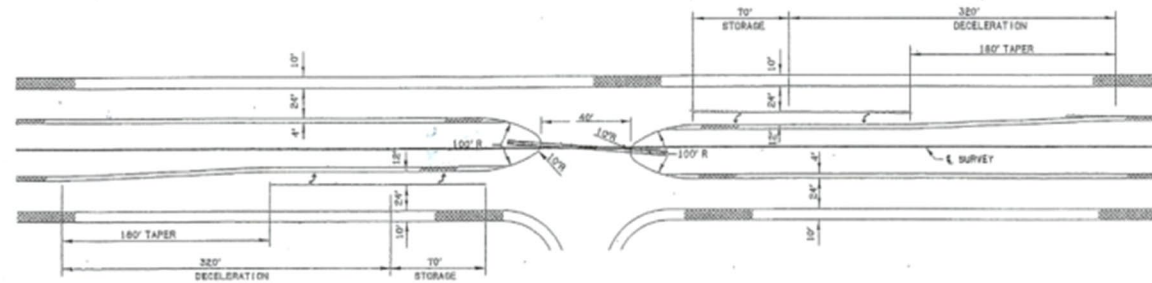
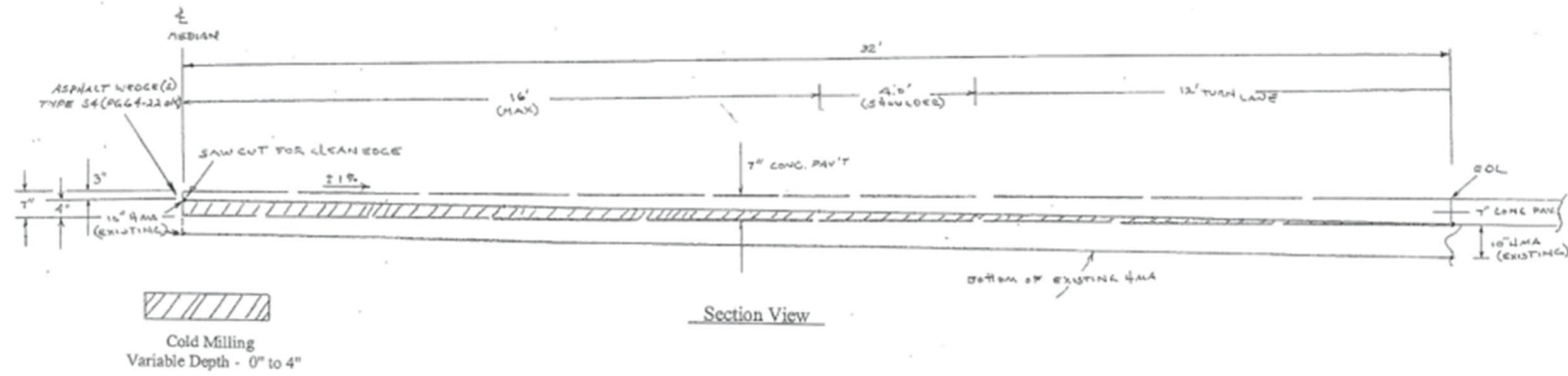
Details



Plan Notes

More Details

MEDIAN OPENING DETAIL
US-59, SEQUOYAH CO.



MEDIAN OPENING DETAIL

STA. 445+50
STA. 451+90
STA. 508+20
STA. 460+60

ENGINEER'S ESTIMATE

NAME OF ROAD: US-59
 SURFACE CODE:
 SURFACE CODE:
 COUNTY: Sequoyah
 TYPE OF IMPROVEMENT: P.C. Concrete Pavement Overlay

PROJECT NO: SSR-168N(192) SR
 JOB PIECE NO: 25788(04)
 CONT. SEC. NO: 59-68-02
 Control Subsection No.

ADT: LESS THAN 1000:
 1000 TO 4999: XXX
 5000 OR MORE:

NEW SURFACE WIDTH: 38' (28' Rdwy with a 4' & 10' Shoulder)

TOTAL ROADWAY LENGTH: 1.61

LOCATION: Begin approximately 0.9 miles N. of the Arkansas River and extend N. approximately 1.61 miles.

ROADWAY SECTION: (7" P.C. Dowel Jointed Concrete Pavement @ 28' Wide) 1.61Miles (See typical for details)

SPEC	ITEM	UNIT	QUANTITY	PRICE	AMOUNT
209	0120 Machine Grading	STA	4.00		
230 (A)	2806 Solid Slab Sodding	SY	3000.00		
403 (E)	0225 Traffic Bound Surface Course - Type E	TON	2,200.00		
407	0250 Tack Coat	GAL	800.00		
411 (S4)	5960 Asph. Conc., Type S4 (PG 64-22 OK)	TON	1,010.00		
413 (D)	4868 (SP) Rumble Strip-Method PCC-CON	LF	17,400.00		
414 (A)	0210 (SP) P.C. Concrete Pavement (Placement)	SY	12,000.00		
414 (A 1)	5725 (SP) Dowel Jointed P.C.C. Pavt. (Placement)	SY	26,900.00		
414 (P)	6000 (SP) P.C. Concrete for Pavement	CY	8,000.00		
417	4267 Cold Milling Bituminous Pavement	SY	5,460.00		
619 (B)	4728 Removal of Asphalt Pavement	SY	2,850.00		
619 (C)	0924 Sawing Pavement	LF	1,000.00		
855 (A)	8812 Traffic Stripe (Plastic) (4" Wide)	LF	22,000.00		
855 (B)	8818 Traffic Stripe (Plastic) (Arrows)	EA	8.00		
859 (A)	8006 Pavement Marking Removal (Traf. Strp.)	LF	1,000.00		
880 (J)	8905 Construction Traffic Control	LSUM	1.00		

TOTAL COST:

Pay Item List

16 Total Pay Items

PAY QUANTITY NOTES

Asphalt Concrete Type S4 (PG 64-22OK) and Tack Coat quantities are estimated for seven (7) driveways/returns, four (4) center of median wedges, one (1) transition at the BOP from new concrete pavement to existing asphalt and the crossover sta. 511+50 to 519+00..

Tack coat is estimated at 0.05 gallons per square yard of residual asphalt. Type, grade and rate of application of asphalt tack coat shall be in a manner approved by the engineer.

Asphalt concrete type "S4" is estimated at 112 pounds per square yard, one inch thick.

A full width expansion joint (See Standard Drawings) shall be placed at the far north terminus of the new (7") dowel jointed concrete pavement. All cost associated with this expansion joint shall be included in the unit price bid for other items of work.

Cold Milling is intended to provide adequate finish grades at the four (4) median openings and one (1) transition at the BOP while maintaining the concrete pavement thickness of seven (7") inches. See Details.

Sawing Pavement, Removal of Asphalt Pavement, Machine Grading and Solid Slab Sod are for the removal and restoring the median grades of the existing crossover at the south end of the project. Once the area has been graded to the engineer's satisfaction, the Slab Sod will serve as erosion control. NOTE: Existing asphalt crossing is approximately ten (10") inches thick.

Price bid for Solid Slab Sod shall include sufficient water for adequate growth as approved by the engineer, and 430 pounds of 10-20-10 fertilizer.

TBSC Type E for backfilling of new pavement estimated at 160 pcf.

Construction Traffic Control will be installed in a manner approved by the Engineer, in accordance with Chapter VI of the Manual Of Uniform Traffic Control Devices, current edition and applicable ODOT Standard Drawings. The contractor shall provide a proposed traffic control plan for approval by the Engineer prior to beginning work. Price bid for this item shall be payment in full for the installation, maintenance, relocation and subsequent removal of all necessary construction traffic control devices and temporary pavement markings required for completion of the project. All signs, barricades and channelizing devices which are shown with either Type 'A' or Type 'C' lights in the Standard Drawings shall have the corresponding light attached during non-daylight hours.

CONSTRUCTION / TRAFFIC NOTES

All construction and materials shall be in accordance with the 1999 Oklahoma Standard Specifications for Highway Construction, approved by the U.S. Department of Transportation, Federal Highway Administration, September 2, 1999.

This project shall be constructed with the northbound lanes closed to highway traffic. Existing barricades shall remain in place during construction. Access to driveways along the east side shall be maintained during construction. After construction is completed the existing barricades shall be picked up by state forces.

It is the intent of this project to switch the northbound traffic from the southbound lanes onto the completed northbound lanes. The crossover at the north end of the project will then return the northbound traffic back to the existing highway in a two-lane, two-way. There is an adjacent active project at the north end of this project: NHY-033N(012), 17670(05). Refer to Standard Specification 105.07, Cooperation Between Contractors.

Pay Quantity Notes

Construction Notes

CONSTRUCTION / TRAFFIC NOTES CONTINUED

All major patching of the present surface, in preparation for resurfacing operations, shall be performed by State Forces.

The Contractor shall temporarily relocate permanent traffic control devices to accommodate construction operations. Devices shall be maintained and replaced in their original position promptly after operations permit. Any damage to existing signs, guardrail, headwalls, curbs, delineators, or other highway appurtenances shall be repaired or replaced by the contractor at his expense and as approved by the Engineer.

Upon completion of the project all construction signs will be replaced by State Forces. State Forces shall lay the existing construction signs/posts down and the contractor will be responsible for picking them up. The contractor shall provide at least two (2) weeks advanced notification as to when the signs require replacement.

Staking shall not be a pay item. Measurements and grade control necessary to complete project in a successful manner shall be included in other items of work.

Mobilization shall not be a pay item. Cost to be included in other items of work.

Time charges shall begin when work begins or on the work order effective date, whichever occurs first and shall end when substantial completion is achieved.

Substantial Completion is defined when all asphalt concrete has been placed, the shouldering operations completed and all permanent plastic striping installed to the satisfaction of the Engineer.

YES	NO	
☐	☒	Project crosses or otherwise involves railroad right-of-way and facilities.
☐	☒	Additional right-of-way and /or utility relocations are necessary.

Applicable Standards

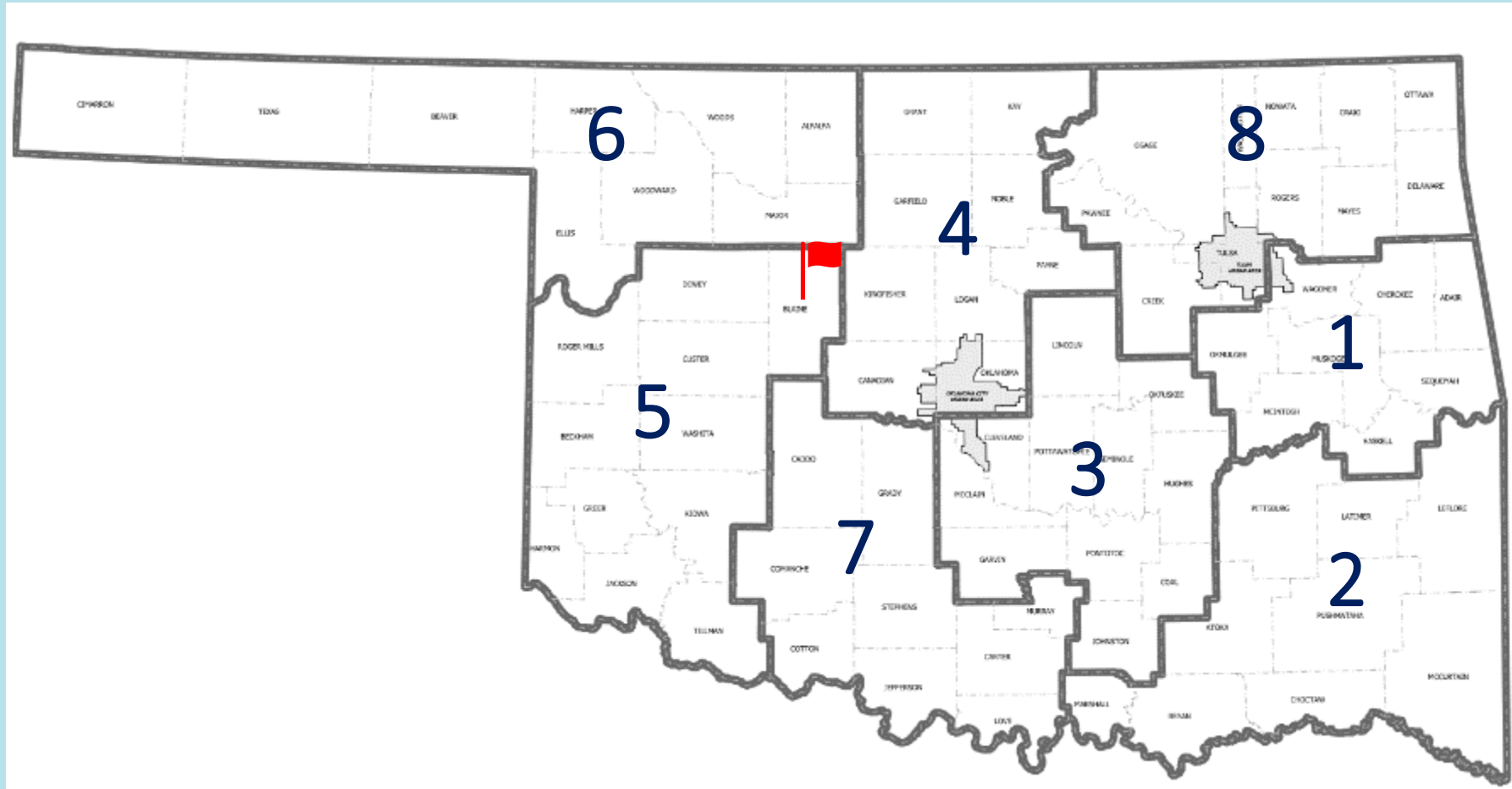
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TCS2-1-00E	TCS33-1-00E
TCS3-1-00E	TCS65-1-00E
TCS4-1-00E	CSCD-4-02E
TCS5-1-00E	LECS-3-01E
TCS6-1-00E	LTU-3-03E
TCS7-1-00E	PM4-1-00E
TCS8-1-00E	PMS5-1-00E
TCS9-1-00E	PMS6-1-00E
TCS10-1-00E	RS1-2-02E
TCS11-1-00E	RS2-2-02E
	ID1-100E

More Construction Notes

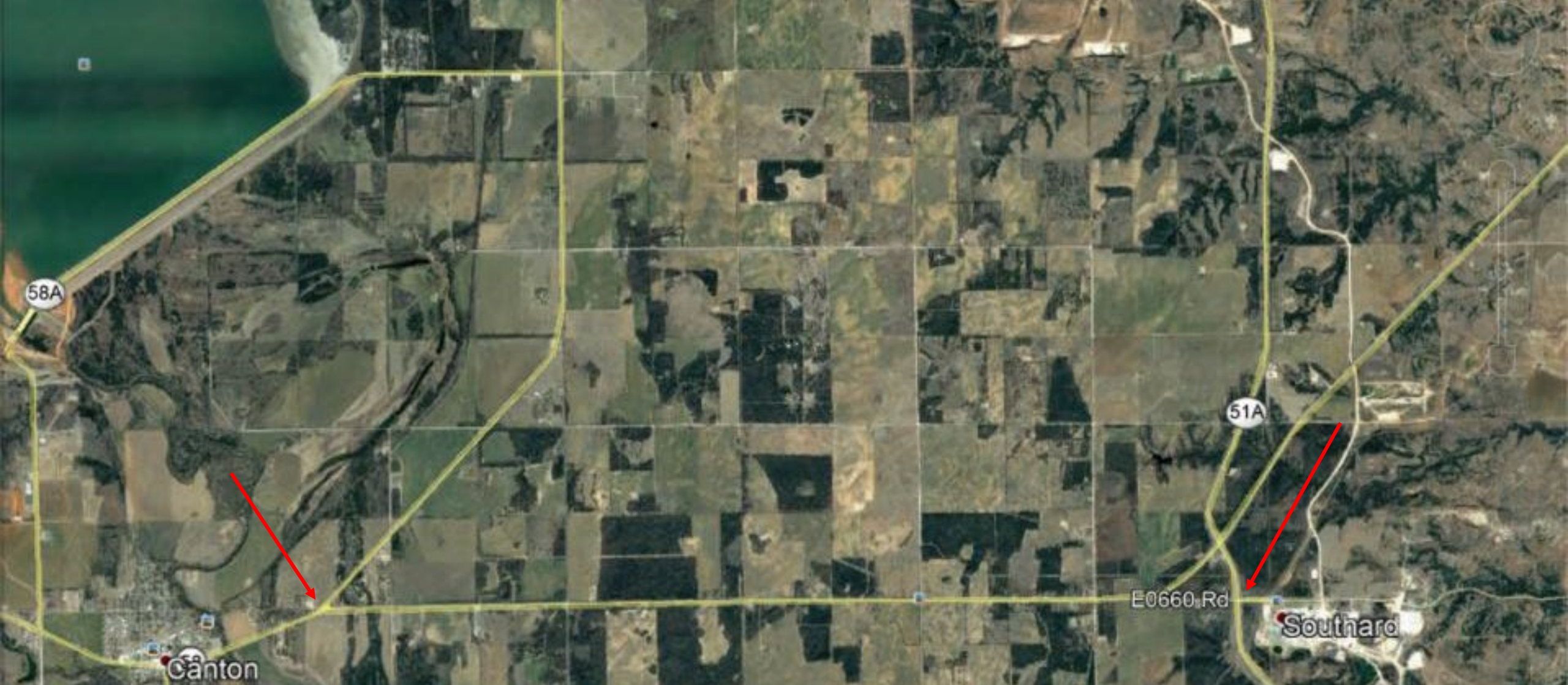
List of Standards

Bonded Concrete
over Asphalt

Blaine County Overlay



Canton, Oklahoma – Blaine County



Google Earth View



Home of the
Walleye Rodeo

- Rural Two-Lane State Highway
- Existing Asphalt Section
- Original Design – Asphalt Overlay

Project Details

- Planned 2" HMA
- S4 PG 76-28
- Let to Bid in 2015
- Single Bidder
- Bid Rejected – Too High!

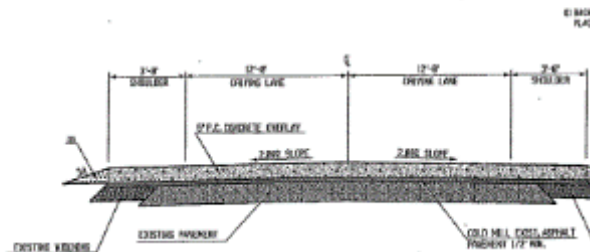
Proposed Asphalt Overlay

Proposed Concrete Overlay

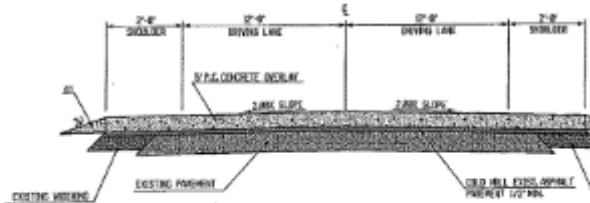
- Project No SSR-106C(122)SR
- 4.95 Miles
- 1.83 Design ESALS
- 5" Bonded Concrete Overlay
- Bid Opened June 2016

Plan Development

- Originated in Field District Office
- Simple Plan Sheets
- Eight letter sized pages total
- 12 Bid Items (almost half traffic control)
- Pavement bid as:
 - *SY Placement*
 - *CY Concrete Materials*

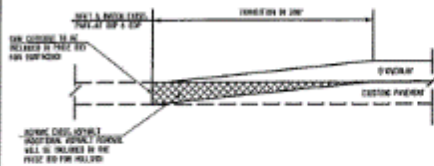


TYPICAL SECTION NO. 1
STA. 10+00 TO 271+35

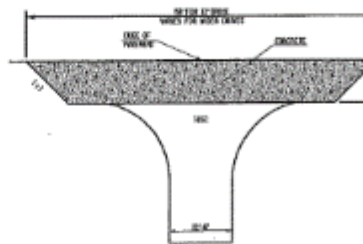


SPUR 51/51A

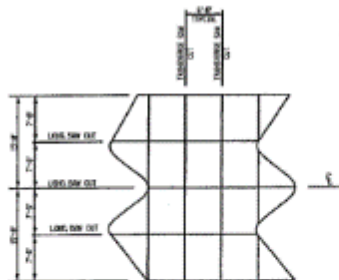
TYPICAL SECTION



TYPICAL TRANSITION AT BOP & BOP

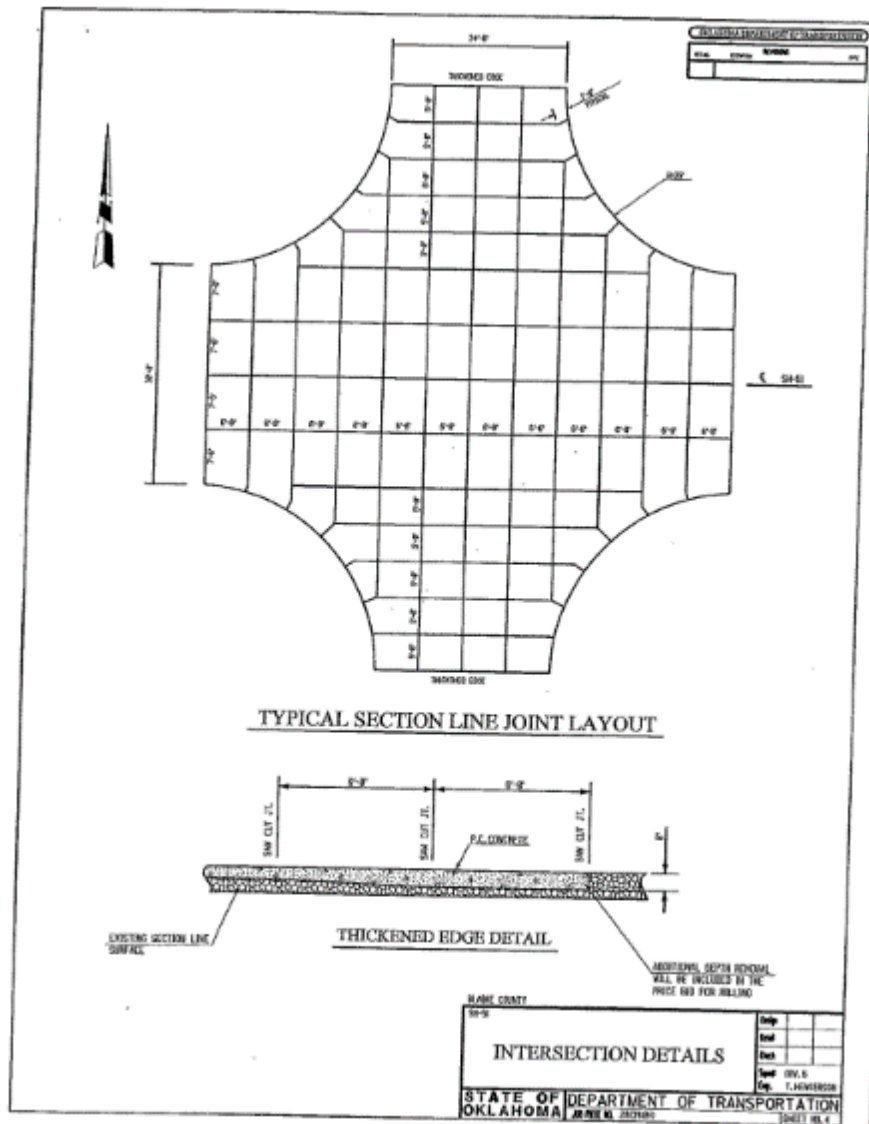


TYPICAL WIDENING FOR DRIVES

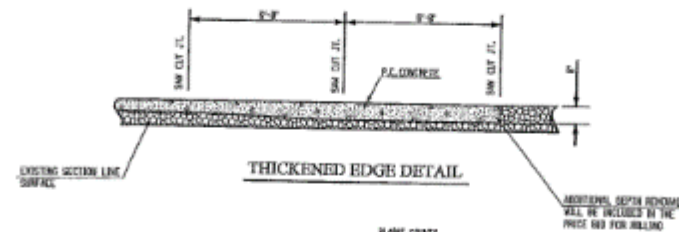


TYPICAL JOINT LAYOUT

DETAIL SHEET



TYPICAL SECTION LINE JOINT LAYOUT



THICKENED EDGE DETAIL

INTERSECTION DETAILS

- Bid Opened June 2016
- Four Bidders
- Engineer's Estimate
\$2,795,777
- Winning Bid \$2,626,298
- Contract Time 45 Days

Bid Details

Construction

- Cold Milled Surface
- Used Millings to Shoulder Up
- Milled During Daytime
- Paved At Night

- 20 Paving Days – 29,139 ft
- Joints Not Sealed
- Opening Strength Required for Local Traffic - 2500psi

Construction

Traffic Control

- Closed to Through Traffic
- Close One Mile at a Time
- Contractor Contacted Landowners
- Utilized Section Line Roads
- Max Time to Opening – 48 Hours
- Planned Runs to End at Logical Points



Original Surface Ahead of Milling Operation



Cold Millings Deposited on Shoulder



Cold Milled Surface Before Paving



Span Saw Cutting Transverse Joints



Closeup of Span Saw



Tining Machine



Finished Days Run



Completed Project



US 69 N of McAlester



Okarche Bypass — Kingfisher County



True Road – Mayes County



SH 51/US 177 in Stillwater



Glen Bailey Drive in West Memphis, AR



US 59 Sequoyah Co



SE 15th St Del City



ACPA National Overlay Explorer



Questions?

Somewhere on a
county road in
Southeastern
Oklahoma, far, far
away...