DITCH AT L.M. 0.25
STR. & APPRS. (S)
CRAIGHEAD COUNTY
ROUTE 163 SECTION 5
JOB 100833
FED. AID PROJ. NHPP-0016 (73)

NOT TO SCALE

DESIGN TRAFFIC DATA:

- DESIGN YEAR: 2038
- 2038 ADT: 2000
- 2038 DHV: 275
- DIRECTIONAL DISTRIBUTION: 60%
- TRUCKS: 92%
- AVERAGE RUNNING SPEED: 35 MPH

BEGIN JOB 100833
LOG MILE 0.24

STA. 108+60.00

END JOB 100833

LATITUDE: N 36°42'29.6" N 36°42'28.4"
LONGITUDE: W 90°39'40.8" W 90°39'41.4"

BEGIN PROJECT MID-POINT OF PROJECT END PROJECT

GROSS LENGTH OF PROJECT 100.00 FEET OR 0.00 MILES
NET: ROADWAY 93.68
NET: BRIDGES 4.12
NET: PROJECT 100.00 0.00

APPROVED
DEPUTY DIRECTOR
AND CHEF ENGINEER
# INDEX OF SHEETS

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JOB 100633 | PLASTIC PIPE
JOB 100633 | PIPE ADJUSTMENT FOR ASPHALT BINDER
JOB 100633 | SETTLEMENT AGREEMENTS
JOB 100633 | SHORING FOR CULVERTS
JOB 100633 | SOIL STABILIZATION
JOB 100633 | STORM WATER POLLUTION PREVENTION PLAN
JOB 100633 | SUBMISSION OF ASPHALT CONCRETE HOT-MIX ACCEPTANCE TEST RESULTS
JOB 100633 | UTILITY ADJUSTMENTS
JOB 100633 | WARM MIX ASPHALT

General Notes
1. GRADE LINE DENOTES FINISHED GRADE WHERE SHOWN ON PLANS.
2. ALL PIPE LINES, POWER, TELEPHONE, AND TELEGRAPH LINES TO BE MOVED OR LOWERED BY THE RESPECTIVE OWNERS AS PER AGREEMENT WITH SUCH OWNERS.
3. ANY EQUIPMENT OR APPURTENANCE THAT INTERFERES WITH THE PROPOSED CONSTRUCTION AND WHICH MAY BE THE PROPERTY OF UTILITY SERVICE ORGANIZATIONS SHALL BE MOVED BY THE OWNERS UNLESS OTHERWISE PROVIDED.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING U.S. MAILBOXES WITHIN THE PROJECT LIMITS IN SUCH A MANNER THAT THE PUBLIC MAY RECEIVE CONTINUED MAIL SERVICE. PAYMENT WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS BID ITEMS.
5. ALL STREET LOCATIONS LOCATED WITHIN THE CONSTRUCTION AREA SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 107.12 OF THE STANDARD SPECIFICATIONS.
6. ALL TREES THAT DO NOT DIRECTLY INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE SPARED AS DIRECTED BY THE ENGINEER. CARE AND DISCRETION SHALL BE USED TO INSURE THAT ALL TREES NOT TO BE REMOVED SHALL BE HAILED AS LITTLE AS POSSIBLE DURING THE CONSTRUCTION OPERATIONS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A FENCE TO CONTROL LIVESTOCK IN AREAS WHERE CATTLE ARE HERDING. THE FENCE MAY BE CONSTRUCTED INPdf-annex.pdf IN-LIEU THEREOF. THE CONTRACTOR TO HIS OWN EXPENSE, MAY ELECT TO PROVIDE TEMPORARY FENCING SUITABLE TO CONTAIN LIVESTOCK.
8. THE SEQUENCE AS SHOWN ON THE MAINTENANCE OF TRAFFIC PLANS IS A GENERAL OUTLINE FOR THE CONSTRUCTION OF THE PROJECT AND IN NO WAY IS INTENDED TO COVER EVERY ITEM IN THE PROJECT. ITEMS NOT CRITICAL TO THE CONSTRUCTION SEQUENCE MAY BE CONSTRUCTED IN ANY STAGE AS APPROVED BY THE RESIDENT ENGINEER.
9. THIS PROJECT IS COVERED UNDER A SECTION 404 NATIONWIDE 14 PERMIT. REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS, EDITION OF 2014, FOR PERMIT REQUIREMENTS.
10. ALL FLEXIBLE BASE AND ASPHALT PAVEMENTS REMOVED SHALL BE PAID FOR UNDER THE ITEM NO. 210 UCLASSIFIED EXCAVATION.
11. THE EXISTING ASPHALT PAVEMENT TO BE REMOVED FROM THE REMAINING PAVEMENT SHALL BE SEPARATED BY SAVING ALONG A HEAT LINE. AFTER SAVING, THE PAVEMENT TO BE REMOVED SHALL BE CAREFULLY REMOVED IN A MANNER THAT WILL NOT DAMAGE THE PAVEMENT THAT IS TO REMAIN. ANY DAMAGE OF THE ASPHALT PAVEMENT THAT IS TO REMAIN IN PLACE SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE.
NOTES:

REFER TO CROSS SECTIONS FOR DEVIATIONS.

FROM THE NORMAL SLOPES NO CHANGES SHALL BE MADE WITHOUT THE APPROVAL OF THE ENGINEER.

THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE PER TOLERANCES OR MINIMUM THICKNESS PROVIDED FOR EACH SECTION TO MEET THE REQUIREMENTS, EXCEPT FOR TOLERANCES INDICATED.

NO CHANGES SHALL BE MADE WITHOUT THE APPROVAL OF THE ENGINEER.

THE FINAL 6" OF SURFACE COURSE IS TO BE PLACED UNLESS OTHERWISE INDICATED ON THE PLAN.

CONSTRUCTION LINES SHALL BE 8'-0" LANE LINES.

TYPICAL SECTIONS OF IMPROVEMENTS
The final 2" of surface course is to be placed after all other courses have dried. Longitudinal joints shall be at lane lines.

TYPICAL SECTIONS OF IMPROVEMENTS
NOTE: Turnouts and Private Drives shall be modified where necessary to meet local conditions as directed by the Engineer.

PROPOSED NO OR TIE TO EXISTING DRIVEWAY, WHICHER IS FURTHER.

DETAIL FOR DRIVEWAY TURNOUTS
OPEN SHOULDER SECTION
(ARTERIALS)

ACWM SURFACE COURSE (1/2")
1200 LBS. PER SQ. YD. AND
AGGREGATE BASE COURSE (CLASS 7)
7" COMP. DEPTH IF ASPHALT OR
GRAVEL DRIVE EXISTING, OR 6"
CONCRETE IF CONCRETE DRIVE
EXISTING.

DETAIL FOR TRANSITIONS

EXISTING ASPHALT
Pavement retain
and Overlay

COLD MILL EXISTING ASPHALT PAVEMENT

100' NORMAL TRANSITION
### GENERAL NOTES


**LIVE LOADING:** HL-93

All concrete shall be Class S with a minimum 28-day compressive strength of 3,500 psi and shall be poured in the dry. All exposed corners to have 1/2" chamfering.

Reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M276 or M282, Type A, with mill test reports.

Reinforcing Steel Tolerances: The tolerances for reinforcing steel shall meet those listed in "Manual of Standard Practice" published by Concrete Reinforcing Steel Institute (CRSI) except that the tolerance for truss bars such as Figure 8 on page 4-4 of the OSH Manual shall be reduced to plus 1/2 inch.

Excavation and backfilling shall be in accordance with the requirements of Section 801.

Membrane Waterproofing shall conform to the requirements of Section 815. Membrane Waterproofing shall be Type E and as directed by the Engineer applied to all construction joints in the top slab and the side of R.C. Box culverts and to the construction joint between wingwalls and R.C. Box culvert walls.

Wing Wall in box culvert walls shall have a maximum horizontal spacing of 10'-0" and shall be spaced to clear reinforcing steel. The pipe opening shall be 4" diameter and shall be placed 12" above the top of the slab bottom.

Wing Walls in wing walls shall have a maximum horizontal spacing of 10'-0" and shall be spaced to clear all reinforcing steel. There shall be a minimum of two (2) wing walls in each wingwall. The slab opening shall be 4" diameter and shall be placed 12" above the top of the wingwall footing.

The barrel components of the culvert may be constructed using continuous pours. For larger culvert construction, the Contractor may use multiple pours with transverse construction joints spaced a minimum of 50 feet apart unless approved by stage construction or site construction as approved by the Engineer. Construction joints between footings and walls shall be made only where shown in the Plans. Joints shall be normal to the centerline of barrel and shall be faced. Longitudinal reinforcing shall be continuous through joints unless shown otherwise. All longitudinal construction joints shall be submitted to the Engineer for approval.

Membrane Waterproofing, Wing Walls, Geotextile Fabric, and Drainage Fill Material shall not be paid for directly but shall be considered subsidiary to Class 5 Concrete.

When the top slab of the box culvert serves as finished roadway surface, curbing and finishing shall be in accordance with subsections 802.17 and 803.36 for concrete roadway surfaces and a fine finish shall be applied in accordance with subsection 802.19 for Class 5 Three Bridge Roadway Surface Finish. Curbing and finishing shall not be paid for directly, but shall be considered incidental to the Item "Class 5 Concrete-Roadway". Class 1 Protective Surface Treatment shall be applied to the roadway surface and this work shall be paid for under the unit price bid for "Class 1 Protective Surface Treatment".

When precast reinforced concrete box culverts are substituted for cast in place box culverts, they shall be manufactured according to ASTM C 1577 and meet the requirements of Section 806. When the top slab of the box culvert serves as the finished roadway surface, a precast reinforced concrete box culvert substitution is not allowed.

#### SHEET 1 OF 4

**GENERAL DETAILS OF R.C. BOX CULVERT**

**GENERAL NOTES & LONGITUDINAL SECTION LENGTH SCHEDULE**

**SPECIAL DETAILS**
Note: when top side of culvert serves as finished roadway surface, see General Notes on Sheet 1 of 4.

**TYPICAL SECTION M-M**

- 2'-0" bars
- 3'-0" bars
- 1'-0"
- 2'-0"
- 3'-0"
- 1'-0"
- 2'-0"
- 3'-0"
- 1'-0"
- 2'-0"
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- 3'-0"
- 1'-0"
END ELEVATION
Flared Wingwalls Shown

TYPICAL KEYWAY DETAIL
All Construction Joints

PART PLAN - FLARED WINGWALLS

WINGWALL ELEVATION
Showing Back Face Reinforcement

PART PLAN - PARALLEL WINGWALLS

PLAN - FLARED WINGWALLS
Showing Footing Reinforcement

PART PLAN - PARALLEL WINGWALLS

PLAN - PARALLEL WINGWALLS
Showing Footing Reinforcement

GENERAL DETAILS OF R.C. BOX CULVERT
DETAILS OF WINGWALLS
SPECIAL DETAILS
SEQUENCE OF CONSTRUCTION

STAGE 1
- MAINTAIN TRAFFIC ON EXISTING LANES
- CONSTRUCT RT. 1 OF R.C. BOX CULVERT AS SHOWN IN PLANS
- CONSTRUCT DETOUR ROAD ON RT. SIDE

STAGE 2
- SHIFT TRAFFIC TO THE DETOUR
- REMOVE EXISTING BRIDGE
- CONSTRUCT REMAINING PORTION OF R.C. BOX CULVERT
- CONSTRUCT MAIN LANES

STAGE 3
- SHIFT TRAFFIC ON TO MAIN LANES
- REMOVE DETOUR ROAD ON RT. SIDE
- END OF JOB

INSTALL FINAL LIFT OF SURFACE
INSTALL FINAL STRIPING

NOTE:
- TURNS AND PRIVATE DRIVES SHALL BE MODIFIED WHERE NECESSARY TO MEET LOCAL CONDITIONS AS DIRECTED BY THE ENGINEER.
SEQUENCE OF CONSTRUCTION

STAGE 1
- Maintain traffic on existing lanes
- Construct RT. of R.C. box culvert as shown in plans
- Construct detour road on Rt. side

STAGE 2
- Shift traffic to the detour
- Remove existing barriers
- Construct remaining portion of R.C. box culvert
- Construct main lanes

STAGE 3
- Shift traffic on to main lanes
- Remove existing bridge
- Construct remaining portion of R.C. box culvert
- Construct lanes

FURNISH AND INSTALL PRECAST CONCRETE BARRIER WALL + 246 LIN. FT. WTH SPECIAL END UNIT

NOTE:
- Turnouts and private drives shall be modified where necessary to meet local conditions as directed by the engineer.

MATERIALS AND LABOR
- 36 TRAFFIC DRUMS
- 30 O.C. DETOUR

CONSTRUCTION PAVEMENT MARKINGS (DETOUR)
- STA. 203+85 to STA. 209+60 = 3600 LIN. FT.

REMOVAL OF PERMANENT PAVEMENT MARKINGS (MAIN LANES)
- STA. 203+85 to STA. 209+60 = 3600 LIN. FT.
SEQUENCE OF CONSTRUCTION

STAGE 1
MANTAIN TRAFFIC ON EXISTING LANES
CONSTRUCT RT. OF R.C. BOX CULVERT AS SHOWN IN PLANS
CONSTRUCT DETOUR ROAD ON RT. SIDE

STAGE 2
SHIFT TRAFFIC TO THE DETOUR
REMOVE EXISTING BRIDGE
CONSTRUCT REMAINING PORTION OF R.C. BOX CULVERT
CONSTRUCT MAIN LANES

STAGE 3
SHIFT TRAFFIC TO MAIN LANES
REMOVE DETOUR ROAD ON RT. SIDE
END OF JOB
INSTALL FINAL LIFT OF SURFACE
INSTALL FINAL STRIPING
SEQUENCE OF CONSTRUCTION

STAGE 1
- MAINTAIN TRAFFIC ON EXISTING LANES
- CONSTRUCT RT. OF R.C. BOX CULVERT AS SHOWN IN PLANS
- CONSTRUCT DETOUR ROAD ON RT. SIDE

STAGE 2
- INSTALL SIGNS TO REDUCE SPEED TO 30 MPH
- SHIFT TRAFFIC TO THE DETOUR
- REMOVE EXISTING BRIDGE
- CONSTRUCT REMAINING PORTION OF R.C. BOX CULVERT
- CONSTRUCT MAIN LANES

STAGE 3
- SHIFT TRAFFIC ON TO MAIN LANES
- REMOVE THE DETOUR SIGNS
- REMOVE DETOUR ROAD ON RT. SIDE

END OF JOB
- INSTALL FINAL LFT. OF SURFACE
- INSTALL FINAL STRIPING

STA. 203+85.00
BEGIN DETOUR

STA. 108+60.00
BEGIN JOB 100833
L.M. 0.24

STA. 212+80.00
END DETOUR

STA. 109+60.00
END JOB 100833

PERMANENT PAVEMENT MARKING DETAILS
### Advance Warning Signs and Devices

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<th>TRAFFIC DRUMS</th>
<th>BARRICADES (TYPE B)</th>
<th>FURNISHING &amp; INSTALLING PRECAST CONCRETE BARRIER</th>
<th>Relocating Precast Concrete Barrier</th>
</tr>
</thead>
<tbody>
<tr>
<td>W0-1</td>
<td>Road Work 1500 FT.</td>
<td>48x48&quot;</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>48x48&quot;</td>
<td>2</td>
<td>20</td>
<td>20</td>
<td>20</td>
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</tr>
<tr>
<td>W0-1</td>
<td>Road Work 1500 FT.</td>
<td>48x48&quot;</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>48x48&quot;</td>
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</tr>
<tr>
<td>W0-1</td>
<td>Road Work 1500 FT.</td>
<td>48x48&quot;</td>
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<td>2</td>
<td>2</td>
<td>2</td>
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<tr>
<td>W0-1</td>
<td>Road Work 1500 FT.</td>
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<td>2</td>
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<tr>
<td>W0-2</td>
<td>End Road Work</td>
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<td>48x24&quot;</td>
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<tr>
<td>R1-2</td>
<td>Road Closed</td>
<td>48x24&quot;</td>
<td>2</td>
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<td>48x24&quot;</td>
<td>2</td>
<td>20</td>
<td>20</td>
<td>20</td>
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<tr>
<td>O-M-5</td>
<td>OBJECT MARKER</td>
<td>12&quot;x36&quot;</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>9.0</td>
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<td>R-M-3</td>
<td>OBJECT MARKER</td>
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<td>4</td>
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<tr>
<td>R-M-4</td>
<td>Double Not Pass</td>
<td>36x48&quot;</td>
<td>2</td>
<td>2</td>
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<td>2</td>
<td>48x24&quot;</td>
<td>2</td>
<td>20</td>
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<td>W0-1M-4</td>
<td>Right Shoulder Closed</td>
<td>48x48&quot;</td>
<td>2</td>
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<td>48x48&quot;</td>
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<tr>
<td>W0-1R-1</td>
<td>Double Reverse Curve RT.</td>
<td>48x48&quot;</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>16.0</td>
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<td>20</td>
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<tr>
<td>W0-1L-1</td>
<td>Double Reverse Curve LT.</td>
<td>48x48&quot;</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>16.0</td>
<td>1</td>
<td>20</td>
<td>20</td>
<td>20</td>
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<td>20</td>
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<tr>
<td>W0-3-1</td>
<td>Advisory Speed Plaques</td>
<td>24x24&quot;</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>8.0</td>
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<td>20</td>
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<tr>
<td>W-I-4</td>
<td>Large Arrow</td>
<td>48x24&quot;</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>16.0</td>
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</table>

**TOTALS:** 297.0

**NOTE:** THIS IS A HIGH TRAFFIC VOLUME ROAD AS DEFINED IN SECTION 604.03, STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

### Construction Pavement Markings and Permanent Pavement Markings

<table>
<thead>
<tr>
<th>Description</th>
<th>Stage 1</th>
<th>Stage 2</th>
<th>Stage 3</th>
<th>Removal of Permanent Pavement Markings</th>
<th>Construction Pavement Markings</th>
<th>Removal of Construction Pavement Markings</th>
<th>Raised Pavement Markers</th>
<th>Thermoplastic Pavement Marking Type</th>
<th>Thermoplastic Pavement Marking Type</th>
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<tr>
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<td>3600</td>
<td>3600</td>
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<td>8100</td>
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<tr>
<td>Construction Pavement Markings</td>
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<tr>
<td>Thermoplastic Pavement Marking White 6&quot;</td>
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<td>1820</td>
<td>1820</td>
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<tr>
<td>Thermoplastic Pavement Marking Yellow 6&quot;</td>
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**TOTALS:** 3600 8100 3600 12 1820 1820

**NOTE:** THIS IS A HIGH TRAFFIC VOLUME ROAD AS DEFINED IN SECTION 604.03, STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

**NOTE:** THE 6" YELLOW STRIPING QUANTITY HAS BEEN ESTIMATED BASED ON A DOUBLE YELLOW CENTERLINE STRIPE FOR THE ENTIRE PROJECT. THE PROJECT MUST BE MARKED FOR PASSING/PASSING ZONES PRIOR TO THE PLACEMENT OF ANY FINAL STRIPING. CONTACT THE MAINTENANCE DIVISION AFTER THE FINAL LIFT OF SURFACE COURSE HAS BEEN PLACED TO SCHEDULE THE ZONING OF THE PROJECT.
### Clearing and Grubbing

<table>
<thead>
<tr>
<th>Station</th>
<th>Location</th>
<th>Clearing</th>
<th>Grubbing</th>
</tr>
</thead>
<tbody>
<tr>
<td>108+65</td>
<td>110+62</td>
<td>2</td>
<td>2</td>
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**Totals:**

- 2
- 2

### Removal and Disposal of Fence

<table>
<thead>
<tr>
<th>Station</th>
<th>Location</th>
<th>Fence</th>
<th>Lin. Ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>107+40</td>
<td>108+66</td>
<td>5</td>
<td>182</td>
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</table>

**Total:** 182

### Removal and Disposal of Items

<table>
<thead>
<tr>
<th>Station</th>
<th>Location</th>
<th>Guardrail</th>
<th>Lin. Ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>108+46</td>
<td>109+56</td>
<td>5</td>
<td></td>
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<tr>
<td>108+44</td>
<td>109+56</td>
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**Total:** 10

**Note:** The quantity shown above for the removal and disposal of guardrail shall include the removal and disposal of all guardrail terminals and terminal anchor posts.

### Earthwork

<table>
<thead>
<tr>
<th>Station</th>
<th>Location</th>
<th>Description</th>
<th>Unclassified Excavation</th>
<th>Compact Embankment</th>
<th>Soil Stabilization</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>103+60</td>
<td>112+48</td>
<td>Stage 2 Main Lanes</td>
<td>2222</td>
<td>1211</td>
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<tr>
<td>103+45</td>
<td>112+48</td>
<td>Stage 2 Main Lanes</td>
<td>2056</td>
<td>1024</td>
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<td></td>
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<tr>
<td>103+45</td>
<td>112+48</td>
<td>Stage 2 Main Lanes</td>
<td>1883</td>
<td>1024</td>
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<td></td>
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<tr>
<td>103+45</td>
<td>112+48</td>
<td>Stage 2 Main Lanes</td>
<td>1883</td>
<td>1024</td>
<td></td>
<td></td>
</tr>
<tr>
<td>103+45</td>
<td>112+48</td>
<td>Stage 2 Main Lanes</td>
<td>1883</td>
<td>1024</td>
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<tr>
<td>Entire Project Approaches</td>
<td>45</td>
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<td>Entire Project Temporary Approaches</td>
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<td>Entire Project To Be Used If and Where Directed by the Engineer</td>
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</table>

**Totals:** 9536

**Note:** Earthwork quantities shown above shall be paid as plan quantities.

### Removal of Existing Bridge Structure (Site No. 1)

<table>
<thead>
<tr>
<th>Station</th>
<th>Location</th>
<th>Lump Sum</th>
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</thead>
<tbody>
<tr>
<td>108+69</td>
<td>109+34</td>
<td>48 x 25 EXISTING BRIDGE</td>
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### Soil Log

<table>
<thead>
<tr>
<th>Station</th>
<th>Latitude</th>
<th>Longitude</th>
<th>Location</th>
<th>Depth</th>
<th>Liquid Limit</th>
<th>Plasticity Index</th>
<th>AASHTO Classification</th>
<th>Color</th>
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</thead>
<tbody>
<tr>
<td>103+00</td>
<td>35 42 24.72</td>
<td>60 30 38.00</td>
<td>SW RT</td>
<td>0.5</td>
<td>NO</td>
<td>NP</td>
<td>A-4(0)</td>
<td>GRAY</td>
</tr>
<tr>
<td>103+00</td>
<td>35 42 24.80</td>
<td>60 30 37.70</td>
<td>SW RT</td>
<td>0.5</td>
<td>NO</td>
<td>NP</td>
<td>A-4(0)</td>
<td>GRAY</td>
</tr>
<tr>
<td>112+40</td>
<td>35 42 32.60</td>
<td>60 30 42.00</td>
<td>SW RT</td>
<td>0.5</td>
<td>NO</td>
<td>NP</td>
<td>A-4(0)</td>
<td>GRAY</td>
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<tr>
<td>112+50</td>
<td>35 42 32.50</td>
<td>60 30 42.50</td>
<td>SW LT</td>
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<td>13</td>
<td>A-6(8)</td>
<td>GRAY</td>
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<tr>
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<td>A-6(8)</td>
<td>GRAY</td>
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</tbody>
</table>

**Note:** Soil characteristics tabulated above are representative of the location of the sample and from surface indications are typical of the limits shown. These data are shown for information only. The State will not be responsible for variations in the soil characteristics and/or extent of same differing from the above tabulations.

### Quantities
### EROSION CONTROL

<table>
<thead>
<tr>
<th>STATION</th>
<th>STATION</th>
<th>LOCATION</th>
<th>PERMANENT EROSION CONTROL</th>
<th>TEMPORARY EROSION CONTROL</th>
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</thead>
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<td>SEEDING LIME MULCH COVER WATER</td>
<td>SECOND SEEDING APPLICATION MULCH COVER WATER</td>
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<td>ENTIRE</td>
<td>PROJECT</td>
<td>CLEARING AND GRUBBING</td>
<td>1.50 1.50 30.8</td>
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<td>ENTIRE</td>
<td>PROJECT</td>
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<td>0.31 0.62 0.31 31.8</td>
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<td>STAGE 3</td>
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<td>3.00 6.00 3.00 308.0</td>
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<tr>
<td>TOTALS</td>
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<td>4.05 8.10 4.05 413.1</td>
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</table>

**BASE OF ESTIMATE:**
- LIME: 2 TONS / ACRE OF SEEDING
- WATER: 102.0 M.G. / ACRE OF SEEDING
- WATER: 20.4 M.G. / ACRE OF TEMPORARY SEEDING
- SAND BAG DITCH CHECKS: 22 BAGS / LOCATION

**NOTE:** THE TEMPORARY EROSION CONTROL DEVICES SHOWN ABOVE AND ON THE PLANS SHALL BE INSTALLED IN SUCH A SEQUENCE AS TO DETECT EROSION AND SEDIMENTATION ON U.S. WATERWAYS AS EXPLAINED BY THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT.

*QUANTITIES ESTIMATED.
SEE SECTION 104.03 OF THE STD. SPECS.*

### CONCRETE DITCH PAVING

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<th>STATION</th>
<th>STATION</th>
<th>LOCATION</th>
<th>LENGTH</th>
<th>&quot;W&quot;</th>
<th>CONC. DITCH PAVING</th>
<th>SOIL SODDING</th>
<th>WATER</th>
<th>LIN. FT</th>
<th>FEET</th>
<th>SQ. YD</th>
<th>M.GAL</th>
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<tr>
<td>107-69.50</td>
<td>106-72.00</td>
<td>LT DITCH</td>
<td>112.50</td>
<td>6.00</td>
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**BASE OF ESTIMATE:**
- WATER: 12.6 GAL / SQ. YD. OF SOIL SODDING.

### BENCH MARKS

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<th>EACH</th>
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<tr>
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<td>TOTAL</td>
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**NOTE:** SHOWN FOR INFORMATION ONLY. BENCH MARKS SHALL BE FURNISHED AND PLACED BY STATE FORCES.
4" PIPE UNDERDRAIN

<table>
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<tr>
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<th>LOCATION</th>
<th>LIN. FT.</th>
<th>EACH</th>
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<td>MAIN LANE</td>
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* ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.

TOTALS: 220 4

STATION DESCRIPTION TEMPORARY CULVERTS SPAN HEIGHT LENGTH CLASS & CONCRETE ROADWAY REINF. STEEL-ROADWAY ORANGE MILE UNCLEARED ROAD FOR STR. ROADWAY SOLID SODDING WATER STD. DWG. NO.

<table>
<thead>
<tr>
<th>STATION</th>
<th>DESCRIPTION</th>
<th>TEMPORARY CULVERTS</th>
<th>SPAN</th>
<th>HEIGHT</th>
<th>LENGTH</th>
<th>CLASS &amp; CONCRETE ROADWAY</th>
<th>REINF. STEEL-ROADWAY</th>
<th>ORANGE MILE</th>
<th>UNCLEARED ROAD FOR STR. ROADWAY</th>
<th>SOLID SODDING</th>
<th>WATER</th>
<th>STD. DWG. NO.</th>
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<tbody>
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TOTALS: 78

BASIS OF ESTIMATE:
WATER: 12.6 GAL./SQ. YD. OF SOLID SODDING
NOTE: FOR R.C. PIPE CULVERT INSTALLATIONS USE TYPE 3 BEDDING UNLESS OTHERWISE SPECIFIED.
NOTE: FOR C.M. PIPE CULVERT INSTALLATIONS USE TYPE 2 BEDDING UNLESS OTHERWISE SPECIFIED.

MAILBOXES

<table>
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<tr>
<th>LOCATION</th>
<th>MAILBOXES</th>
<th>MAILBOX SUPPORTS</th>
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TOTALS: 1 1

STRUCTURES

<table>
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<th>LENGTH</th>
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<th>ORANGE MILE</th>
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<th>WATER</th>
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TOTALS: 148.15 | 16.30 | 130.49 | 60

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2") = 94.9% MIN. AGG. (2") 5.2% ASPHALT BINDER
MAXIMUM NUMBER OF CYLINDERS = 115 FOR PG 64-22

* QUANTITY ESTIMATED
SEE SECTION 104.03 OF THE STD. SPECS.
TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.

NOTE: FOR R.C. PIPE CULVERT INSTALLATIONS USE TYPE 3 BEDDING UNLESS OTHERWISE SPECIFIED.
NOTE: FOR C.M. PIPE CULVERT INSTALLATIONS USE TYPE 2 BEDDING UNLESS OTHERWISE SPECIFIED.

DRIVEWAYS & TURNOUTS

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<tr>
<th>STATION</th>
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<th>AGGREGATE BASE COURSE (CLASS 7)</th>
<th>SIDE DRAINS</th>
<th>STANDARD DRAWINGS</th>
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<td>90.91</td>
<td>10.00</td>
<td>37.12</td>
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TOTALS: 148.15 | 16.30 | 130.49 | 60

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2") = 94.9% MIN. AGG. (2") 5.2% ASPHALT BINDER
MAXIMUM NUMBER OF CYLINDERS = 115 FOR PG 64-22

* QUANTITY ESTIMATED
SEE SECTION 104.03 OF THE STD. SPECS.
TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.

NOTE: FOR R.C. PIPE CULVERT INSTALLATIONS USE TYPE 3 BEDDING UNLESS OTHERWISE SPECIFIED.
NOTE: FOR C.M. PIPE CULVERT INSTALLATIONS USE TYPE 2 BEDDING UNLESS OTHERWISE SPECIFIED.
## COLD MILLING ASPHALT PAVEMENT

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<tr>
<th>STATION</th>
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<th>AVG. WIDTH</th>
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Note: Average milling depth 1".

## ACHM PATCHING OF EXISTING ROADWAY

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<td><strong>TOTAL</strong></td>
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Note: Quantity estimated. See Section 104.03 of the Std. Specs.

## ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC

<table>
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Note: Quantity estimated. See Section 104.03 of the Std. Specs.

## BASE AND SURFACING

### Aggregate Base Course (Class 1)

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### Tack Coat

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Note: Tack coat quantities were calculated using the emulsified asphalt rates. Refer to SS-469-1 for the residual asphalt application rates.
### SUMMARY OF QUANTITIES

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<td>SOL STABILIZATION</td>
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### STRUCTURES OVER 25' SPAN

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<td>LIN FT</td>
</tr>
<tr>
<td>719</td>
<td>THERMOLASTIC PAVEMENT MARKING YELLOW (8')</td>
<td>1800</td>
<td>LIN FT</td>
</tr>
<tr>
<td>721</td>
<td>RAISED PAVEMENT MARKERS (TYPE 6)</td>
<td>12</td>
<td>EACH</td>
</tr>
</tbody>
</table>

### REVISIONS

<table>
<thead>
<tr>
<th>DATE</th>
<th>REVISION</th>
<th>SHEET NUMBER</th>
</tr>
</thead>
</table>

---

**SUMMARY OF QUANTITIES AND REVISIONS**
SURVEY CONTROL COORDINATES

Project Name: s100833
Date: 5/30/2017
Coordinate System: ARKANSAS STATE PLANE - NORTH ZONE BASED ON GPS CONTROL, 160017 - 560002
Projected to GROUND.

UNIT: U.S. SURVEY FOOT

<table>
<thead>
<tr>
<th>Point Name</th>
<th>Northing</th>
<th>Easting</th>
<th>Elev</th>
<th>Feature Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5012399.0254</td>
<td>1710588.6683</td>
<td>230.198</td>
<td>CTL STD AHDT MON. STAMPED Pn 1</td>
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<tr>
<td>2</td>
<td>502061.9021</td>
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<tr>
<td>101</td>
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<tr>
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<td>5131615.8800</td>
<td>1708796.9766</td>
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<td>TBM CHISLED SQUARE N OF COUNTY RD 472</td>
</tr>
<tr>
<td>902</td>
<td>511299.3514</td>
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<tr>
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<td>1709698.2896</td>
<td>246.956</td>
<td>TBM CHISLED SQUARE 300' N OF COUNTY RD 470</td>
</tr>
</tbody>
</table>

**GRID COORDINATES**

**DATE:** 5/30/2017
**PROJECT:** SURVEY CONTROL
**GRID DETERMINED ON:** BASIS OF BEARING
ARKANSAS STATE PLANE GRID BEARINGS - 0301 - NORTH ZONE
DETERMINED FROM GPS CONTROL POINTS: 160017 - 560002
CONVERGENCE ANGLE: 00-46-43 RIGHT AT Pn 4 Lm N 35-44-55 LG W 090-40-08
GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.
SURVEY CONTROL DETAILS
**Type A**

- Refer to tabulation of quantities for "A" dimensions.
- Excavate to near lines to construct ditch paving and solid footing.
- 4" dia. deep hole at 18" centers.

**Type B**

- Refer to tabulation of quantities for "B" dimensions.
- Excavate to near lines to construct ditch paving and solid footing.
- 4" dia. deep hole at 18" centers.

**Toe Wall Detail for Concrete Ditch Paving**

- The steel and additional concrete for the walls shall not be paid for directly but shall be considered to be included in the contract bid for concrete ditch paving.

**General Notes:**

- The full width of each section shall be poured monolithically.
- Toe walls to be constructed full width at each end of ditch paving and poured monolithically.
- Solid sod along ditch paving to be placed within 14 days of ditch paving construction.
- 1" wide transverse expansion joints shall be placed in concrete ditch paving at 40' intervals. The space shall be filled with approved joint filler complying with AASHTO M213.

**Energy Dissipators and Sidewalk**

- Energy dissipators to be used for the entire length of ditch when slope of ditch paving exceeds 5%. The dissipators will not be paid for directly but shall be considered to be included in the price bid for concrete ditch paving.

**Arkansas State Highway Commission**

**Concrete Ditch Paving**

**Standard Drawing CDP-1**
**INSTALLATION TYPE 2**

**SELECTED MATERIALS** (CLASS SM-I, STRUCTURAL BEDDING)

- **Aggregate base course** (Class 5, 6, or 7) or Type 8 HDPE pipe are used in lieu of selected materials.
- **Structural bedding** material shall be a maximum particle size of 100 mm (4 in). Backfill material shall be a minimum of 150 mm (6 in).

**MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT “H”**

<table>
<thead>
<tr>
<th>Fill Height “H” (ft)</th>
<th>Trench Width (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>0.75</td>
</tr>
<tr>
<td>0.6</td>
<td>0.8</td>
</tr>
<tr>
<td>0.7</td>
<td>0.9</td>
</tr>
<tr>
<td>0.8</td>
<td>1.0</td>
</tr>
<tr>
<td>0.9</td>
<td>1.2</td>
</tr>
</tbody>
</table>

**MINIMUM COVER FOR CONSTRUCTION LOADS**

<table>
<thead>
<tr>
<th>Pipe Diameter (in)</th>
<th>Required cover (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>3.0</td>
</tr>
<tr>
<td>18</td>
<td>4.0</td>
</tr>
<tr>
<td>48</td>
<td>6.0</td>
</tr>
</tbody>
</table>

**GENERAL NOTES**

1. **Pipe shall conform to AASHTO M94**. Type 5 Installation shall conform to AASHTO Type 5 Installation Specifications.
2. **Plastic pipe culvert design shall comply with AASHTO LFD Bridge Design Specifications**.
3. **The minimum allowable trench width shall be the minimum width plus a sufficient width to ensure working room to properly and safely place and compact a backfill material.**
4. **Pipe material shall be placed as directed by the engineer**. At the ends of the culvert to prevent loss of structural bedding in case of slippage or loss of material due to erosion.
5. **When the existing material excavation for the pipe trench is determined by the engineer to be unstable for installation, the maximum diameter of the pipe shall be reduced to the next lower size available.**
6. **The pipe shall be compacted to the selected pipe bedding pay limit designated above**.
7. **For pipe types that are not smooth on the outside diameter (e.g., HDPE, PCCP), the bedding compliance shall be selected that will permit the rolling of the corrugations of the pipe.**
8. **High density polyethylene pipes of diameters other than those shown shall not be allowed.**
9. **Joints for HDPE pipe shall meet the requirements for soil tightness as specified in AASHTO T82A and manufacturer’s recommendations.**

**CONSTRUCTION SEQUENCE**

1. **Place structural bedding material to grade, do not compact.**
2. **Install pipe to grade.**
3. **Compact structural bedding outside the middle third of the pipe.**
4. **The structural backfill shall be placed and compacted in layers not exceeding 12 inches (300 mm) in height per AASHTO LGF.**
5. **The structural backfill shall be compacted to the maximum density according to the type or class of material used.**

**LEGEND**

- **H** = Fill Height (ft)
- **D** = Outside diameter of pipe
- **B** = Bottom of excavation
- **L** = Maximum

**MULTIPLE INSTALLATION OF HDPE PIPE**

<table>
<thead>
<tr>
<th>Pipe Diameter (in)</th>
<th>Between Piping</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>6.0</td>
</tr>
<tr>
<td>30</td>
<td>5.0</td>
</tr>
<tr>
<td>24</td>
<td>4.0</td>
</tr>
<tr>
<td>12</td>
<td>3.0</td>
</tr>
</tbody>
</table>

**MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT “H”**

<table>
<thead>
<tr>
<th>Trench Width (ft)</th>
<th>“H” x 0.75</th>
<th>“H” x 0.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.7</td>
<td>0.54</td>
<td>0.60</td>
</tr>
<tr>
<td>0.8</td>
<td>0.60</td>
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<tr>
<td>0.9</td>
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<td>0.72</td>
</tr>
<tr>
<td>1.0</td>
<td>0.72</td>
<td>0.78</td>
</tr>
</tbody>
</table>

**MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT “H”**

<table>
<thead>
<tr>
<th>Fill Height “H” (ft)</th>
<th>Trench Width (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>0.75</td>
</tr>
<tr>
<td>0.6</td>
<td>0.8</td>
</tr>
<tr>
<td>0.7</td>
<td>0.9</td>
</tr>
<tr>
<td>0.8</td>
<td>1.0</td>
</tr>
<tr>
<td>0.9</td>
<td>1.2</td>
</tr>
</tbody>
</table>

**MINIMUM COVER FOR CONSTRUCTION LOADS**

<table>
<thead>
<tr>
<th>Pipe Diameter (in)</th>
<th>Required cover (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>3.0</td>
</tr>
<tr>
<td>18</td>
<td>4.0</td>
</tr>
<tr>
<td>48</td>
<td>6.0</td>
</tr>
</tbody>
</table>
MAXIMUM FILL HEIGHT BASED ON STRUCTURAL BACKFILL

<table>
<thead>
<tr>
<th>PIPE DIAMETER</th>
<th>&quot;H&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>12&quot;</td>
<td>8&quot;</td>
</tr>
<tr>
<td>16&quot;</td>
<td>10&quot;</td>
</tr>
</tbody>
</table>

**NOTES:**
- "H" = MAX. 8" - MIN. DIAMETER
- "H" SHALL MEET MAXIMUM "H" PER AASHTO LRFD (BETWEEN THE AREA OF PIPE AND PIPE BORNE FOR EXISTING PIPE DIAMETER)

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

<table>
<thead>
<tr>
<th>PIPE DIAMETER</th>
<th>TRENCH WIDTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot;</td>
<td>10&quot;</td>
</tr>
<tr>
<td>12&quot;</td>
<td>12&quot;</td>
</tr>
<tr>
<td>16&quot;</td>
<td>14&quot;</td>
</tr>
</tbody>
</table>

MINIMUM COVER FOR CONSTRUCTION LOADS

<table>
<thead>
<tr>
<th>PIPE DIAMETER</th>
<th>COVER &quot;H&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>12&quot;</td>
<td>8&quot;</td>
</tr>
<tr>
<td>16&quot;</td>
<td>10&quot;</td>
</tr>
</tbody>
</table>

**GENERAL NOTES:**
1. PVC PIPE SHALL COMFORM TO ASTM F949 (CLASS 101). INSTALLATION SHALL COMPLY TO THE SPECIFICATIONS FOR HIGHWAY CONSTRUCTION. SPECIAL EDITION.
2. PVC PIPE CULVERT DESIGN SHALL COMPLY TO AASHTO LRFD PIPE DESIGN SPECIFICATIONS, 5TH EDITION (2010 EDITION).
3. THE MINIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WITH PLUS A DIFFERENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT METERING AND STRUCTURAL BACKFILL MATERIAL.
4. IMPERIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER. AT THE END OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, IMPERVIOUS MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH UNTIL THE AREA DESIGNATED AS "STRUCTURAL BEDDING 99%" WILL BE ELEVATED AND REPLACED WITH SELECTED PIPE FOR SELECTED BID. THE QUANTITY OF MATERIAL ACCORDING TO BID AND THE UNDISTURBED AREA OF SELECTED PIPE BID DESIGN BASED ABOVE WILL BE MEASURED AND EXPENSED FOR AS SELECTED PIPE BEDDING.
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNIMPESSIVE, THE AREA IDENTIFIED AS "STRUCTURAL BACKFILL MATERIAL" SHALL BE BROUGHT TO THE PROPER DESIGN "MINIMUM COVER MATERIAL" AND "UNDISTURBED SOIL" AS DIRECTED BY THE ENGINEER.
7. PVC PIPE OF DIAMETERS OTHER THAN 9" WILL NOT BE ALLOWED.
8. JOINTS FOR PVC PIPE SHALL MEET THE REQUIREMENTS FOR SOLID TIGHTNESS AS SPECIFIED IN AASHTO LRFD AND PVC "AASHTO LRFD PIPE DESIGN SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
NOTES:
1. Refer to the striping details for pavement marking line widths.
2. This drawing shall be used in conjunction with the latest revised addition of the "Manual on Uniform Traffic Control Devices."
3. Raised pavement markers shall be placed on an 80-foot spacing unless otherwise shown in the plans.

2" for asphalt or concrete pavement
6" for bituminous surface treatment

SOLID LINE STRIPING ON ASPHALT PAVEMENT

SOLID LINE STRIPING ON CONCRETE PAVEMENT

CONCRETE PAVEMENT

ASPHALT PAVEMENT

YIELD LINE DETAIL

CROSSWALK AND STOPBAR DETAILS

DETAIL OF STANDARD RAISED PAVEMENT MARKERS

ARKANSAS STATE HIGHWAY COMMISSION

PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-1

DATE

REVISION

EDMEO
### Reinforced Concrete Box Culvert General Notes

Concrete shall be class S with a minimum 28-day compressive strength of 3500 psi. Reinforcing steel shall be A706 M 30 or M 53, grade 60. Construction and materials for wingwall & culvert drainage, including weep holes and granular material, shall be subsidiary to the bid item "class 5 concrete". Membrane waterproofing shall conform to the requirements of section B5 of the standard specifications.

Membrane waterproofing shall be applied to all construction joints in the top slab and the sideswalls of R.C. box culverts as directed by the engineer. No payment shall be made for this item but payment will be considered to be included in the various items bid for the R.C. box culvert.

Reinforcing steel tolerances. The tolerances for reinforcing steel shall meet those listed in "manual of standard practice" published by concrete reinforcing steel institute (crsii) except that the tolerance for cross bars such as figure 3 on page 1-4 of the crsii manual shall be minus zero to plus 0.75 inch.

### Wingwall & Culvert Drainage Detail

![Diagram of Wingwall & Culvert Drainage Detail]

**NOTE:** Dimensions of bars are measured out to out of bars.

**Overall Height of Hooked Bar Diagram**

The hooked bars shall be placed in the bottom of the top slab and the top of the bottom slab. The straight bars shall be placed in the top of the top slab and the bottom of the bottom slab. See Table below for lengths of replacement hooked and straight bars.

For skewed culverts, the replacement straight bar may have to be cut in field to fit.

### Replacement Bar Lengths Table

<table>
<thead>
<tr>
<th>Bar Size</th>
<th>Length of Hooked Bar</th>
<th>Length of Straight Bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;b2&quot;</td>
<td>L + 1'-0&quot;</td>
<td>See &quot;o&quot; Bar Length</td>
</tr>
<tr>
<td>&quot;b3&quot;</td>
<td>L + 2'-0&quot;</td>
<td>See &quot;o&quot; Bar Length</td>
</tr>
<tr>
<td>&quot;b4&quot;</td>
<td>L + 3'-0&quot;</td>
<td>See &quot;o&quot; Bar Length</td>
</tr>
<tr>
<td>&quot;b5&quot;</td>
<td>L + 4'-0&quot;</td>
<td>See &quot;o&quot; Bar Length</td>
</tr>
<tr>
<td>&quot;b6&quot;</td>
<td>L + 5'-0&quot;</td>
<td>See &quot;o&quot; Bar Length</td>
</tr>
<tr>
<td>&quot;b7&quot;</td>
<td>L + 6'-0&quot;</td>
<td>See &quot;o&quot; Bar Length</td>
</tr>
<tr>
<td>&quot;b8&quot;</td>
<td>L + 7'-0&quot;</td>
<td>See &quot;o&quot; Bar Length</td>
</tr>
<tr>
<td>&quot;b9&quot;</td>
<td>L + 8'-0&quot;</td>
<td>See &quot;o&quot; Bar Length</td>
</tr>
</tbody>
</table>

L = "o" - 3 inches

### R.C. Box Culvert Headwall Modifications

- **Bent Bars," - Cut as required
  - 10" or +3" (whichever is greater)

**NOTE:** For all skewed R.C. box culverts the length "k" of the modified headwall shall be equal to the roadway length "l". The ends of the headwall shall be constructed parallel to the skew angle of the box culvert.
PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

NOTE: LENGTH MEASURED ALONG THE CENTER OF 2' STRIP OF SOLID SODDING.

GENERAL NOTES:
ROADWAY EXCAVATION (CHANNEL CHANGE) WILL BE PAID FOR AT R.C. BOX CULVERT LOCATIONS. IT WILL BE PAID TO THE LIMITS ACTUALLY CUT AND WILL BE CONFIRMED TO THAT PORTION OF THE INDICATED AREA THAT IS ABOVE THE FLOW LINE. ROADWAY EXCAVATION (CHANNEL CHANGE) SHALL BE MEASURED BY CROSS SECTIONS AND VOLUMES COMPUTED BY AVERAGE END AREA METHOD. ALL CHANNEL CHANGES SHALL BE BROUGHT TO GRADE PRIOR TO MAKING ANY EXCAVATION FOR STRUCTURES. EXCAVATION FOR STRUCTURES WILL BE PAID FOR AT ALL R.C. BOX CULVERT LOCATIONS. IT WILL BE PAID TO THE LIMITS SHOWN AND SHALL BE CONFIRMED TO THAT PORTION OF THE INDICATED AREA THAT IS BELOW THE CHANNEL FLOW LINE. ROADWAY EXCAVATION SHOWN IN SECTION C-C ABOVE AS SUBSIDARY WILL NOT BE MEASURED OR PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS OF EXCAVATION.

SECTION B-B DETAILS FOR NEW CHANNELS

SECTION C-C DETAILS FOR BOX CULVERT

SECTION A-A DETAILS THROUGH EXISTING CHANNELS
### SUPERELEVATION TABLE FOR TWO-WAY TRAFFIC

<table>
<thead>
<tr>
<th>DEGREE OF CURVE</th>
<th>30 MPH</th>
<th>40 MPH</th>
<th>50 MPH</th>
<th>60 MPH</th>
<th>70 MPH</th>
<th>80 MPH</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MIN. DESIRABLE</td>
<td>MIN. DESIRABLE</td>
<td>MIN. DESIRABLE</td>
<td>MIN. DESIRABLE</td>
<td>MIN. DESIRABLE</td>
<td>MIN. DESIRABLE</td>
</tr>
<tr>
<td>15°</td>
<td>40</td>
<td>60</td>
<td>80</td>
<td>100</td>
<td>120</td>
<td>140</td>
</tr>
<tr>
<td>20°</td>
<td>35</td>
<td>55</td>
<td>75</td>
<td>95</td>
<td>115</td>
<td>135</td>
</tr>
<tr>
<td>25°</td>
<td>30</td>
<td>50</td>
<td>70</td>
<td>90</td>
<td>110</td>
<td>130</td>
</tr>
<tr>
<td>30°</td>
<td>25</td>
<td>45</td>
<td>65</td>
<td>85</td>
<td>105</td>
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<td>35°</td>
<td>20</td>
<td>40</td>
<td>60</td>
<td>80</td>
<td>100</td>
<td>120</td>
</tr>
<tr>
<td>40°</td>
<td>15</td>
<td>35</td>
<td>55</td>
<td>75</td>
<td>95</td>
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<td>45°</td>
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<td>50°</td>
<td>5</td>
<td>25</td>
<td>45</td>
<td>65</td>
<td>85</td>
<td>105</td>
</tr>
</tbody>
</table>

**ABBREVIATIONS:**
- NC: Normal Crown
- CC: Reverse Crown
- TP: Transition Point
- FT: Foot
- FT²: Foot²
- M: Miles
- MPH: Miles per Hour

**GENERAL NOTES:**
1. On pavements having two-way traffic, the superelevation shall be reversed on the inside pavement edge unless otherwise noted on the plans.
2. Superelevation values shown on the cross sections are values for individual lanes.
3. Superelevation values shown for bridges on the plans are values at the point of transition.
4. Transition lengths vary with the superelevation and the type of superelevation used. Transition lengths shall be calculated using applicable Lₚ values.
5. Note normal crown on inside edge until superelevation exceeds 2°.

**STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE**

**TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC**

**ARKANSAS STATE HIGHWAY COMMISSION**

**STANDARD DRAWING SE-2**
4 feet or greater preferred, if less than 4 feet Precast Units shall be connected to slab (SEE BARRIER STABILIZATION DETAIL- BRIDGE DECKS STD. DRWG. TC-4).

**Offset Distance for Two Way Traffic Only**

<table>
<thead>
<tr>
<th>Offset Distance (ft)</th>
<th>Offset Distance (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>3.5</td>
</tr>
<tr>
<td>&gt; 4</td>
<td>&gt; 3.5</td>
</tr>
</tbody>
</table>

If offset distance is not attainable, then see “Barrier Placement With Attenuator” Detail shown below.

When shown on the Plans, the ends of the Temporary Precast Concrete Barrier shall be protected with an NCHRP-350 or Manual For Assessing Safety Hardware (MASH) approved Crash Cushion. Payment for Crash Cushions shall be made under the item of “Temporary Impact Attenuation Barrier.”

**General Notes**

### BARRIER PLACEMENT ALONG BRIDGE WITH OFFSET

- **Offset Distance:**
  - No Scale

### BARRIER PLACEMENT ALONG ROADWAY WITH OFFSET

- **Offset Distance:**
  - No Scale
  - **Offset Distance Table:**
    - Offset Distance (ft) | Offset Distance (ft)
    - 4 | 3.5
    - > 4 | > 3.5

If offset distance is not attainable, then see “Barrier Placement With Attenuator” Detail shown below.

### BARRIER PLACEMENT WITH ATTENUATOR

- **Offset Distance:**
  - No Scale
  - **Offset Distance for Two Way Traffic Only**

### SPECIAL END UNIT

When shown on the Plans, the ends of the Temporary Precast Concrete Barrier shall be protected with an NCHRP-350 or Manual For Assessing Safety Hardware (MASH) approved Crash Cushion. Payment for Crash Cushions shall be made under the item of “Temporary Impact Attenuation Barrier.”

**General Notes**

### ARKANSAS STATE HIGHWAY COMMISSION

#### STANDARD TRAFFIC CONTROLS

<table>
<thead>
<tr>
<th>Standard Description</th>
</tr>
</thead>
<tbody>
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<td>FOR HIGHWAY CONSTRUCTION</td>
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<td>TEMPORARY PRECAST BARRIER</td>
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#### STANDARD DRAWING TC-5
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)

SEDIMENT BASIN WITH PIPE OUTLET (E-10)

Arkansas State Highway Commission
Temporary Erosion Control Devices
Standard Drawing TEC-2
CLEARING AND GRUBBING

CONSTRUCTION SEQUENCE
1. Place perimeter controls (i.e. Silt fences, diversion ditches, sediment basins, etc.)
2. Perform clearing and grubbing operation.

EXCAVATION

EXISTING GROUND

INTERCEPT OR
DIVERSION DITCH

EXISTING GROUND

PHASE 1 EXCAVATION

PHASE 2 EXCAVATION

FINAL PHASE EXCAVATION

NOTE: NUMBER OF PHASES WILL VARY. ILLUSTRATION SHOWN FOR ILLUSTRATION.

GENERAL NOTE

ALL CUT SLOPES SHALL BE DRESSED, PREPARED, SEEDED AND MULCHED AS THE WORK PROGRESSES. SLOPES SHALL BE EXCAVATED AND STABILIZED IN EQUAL INCREMENTS NOT TO EXCEED 25 FEET, MEASURED VERTICALLY.

CONSTRUCTION SEQUENCE
1. Excavate and stabilize interceptor and/or diversion ditches.
2. Perform phase 1 excavation. Place permanent or temporary seeding.
3. Perform phase 2 excavation. Place permanent or temporary seeding.
4. Perform final phase of excavation. Place permanent or temporary seeding. Stabilize slopes. Slope Vegan. Place other erosion control devices as required.

EMBANKMENT

EXISTING GROUND

SIDE DITCH (STABILIZE AS REQUIRED)

EXISTING DITCH

VARIOUS EROSION
CONTROL DEVICES

GENERAL NOTE

ALL EMBANKMENT SLOPES SHALL BE DRESSED, PREPARED, SEEDED AND MULCHED AS THE WORK PROGRESSES. SLOPES SHALL BE CONSTRUCTED AND STABILIZED IN EQUAL INCREMENTS NOT TO EXCEED 25 FEET, MEASURED VERTICALLY.

CONSTRUCTION SEQUENCE
1. Construct diversion ditches, ditch checks, sediment basins, silt fences, or other erosion control devices as specified.
2. Place phase 1 embankment with permanent or temporary seeding. Place other erosion control devices as specified. EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD OF GREATER THAN 21 DAYS.
3. Place phase 2 embankment with permanent or temporary seeding. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS. EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD OF GREATER THAN 21 DAYS.
4. Place final phase of embankment with permanent or temporary seeding. Place diversion ditches and slope drains and maintain until entire slope is stabilized.

ARIZONA STATE HIGHWAY COMMISSION
TEMPORARY EROSION CONTROL DEVICES

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