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ROADWAY STANDARD DRAWINGS

DRAW NO. TITLE DATE
PBC-1 PRECAST CONCRETE BOX CULVERTS 01-28-15
PCC-1 CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING 02-27-14
PCM-1 METAL PIPE CULVERT FILL HEIGHTS & BEDDING 02-27-14
PCP-1 PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE) 02-27-14
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PA-1 PAVEMENT MARKING DETAILS 05-01-17
PLU-1 DETAILS OF PIPE UNDERDRAIN 12-08-16
RBC-1 REINFORCED CONCRETE BOX CULVERT DETAILS 07-26-12
RBC-2 EXCAVATION PAYLIMS, BACKFILL & SOLID SODDING FOR BOX CULVERTS 11-20-08
SE-2 TABLES AND METHOD OF SUPPLEMENTATION FOR TWO-WAY TRAFFIC 10-18-98
TC-1 STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION 04-13-17
TC-2 STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION 09-02-15
TC-3 STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION 09-02-15
TEC-1 TEMPORARY EROSION CONTROL DEVICES 11-16-17
TEC-2 TEMPORARY EROSION CONTROL DEVICES 06-23-94
TEC-3 TEMPORARY EROSION CONTROL DEVICES 11-03-94
WF-2 WIRE FENCE WATER GAPS 04-05-70
WF-3 WIRE FENCE TYPE C AND D 08-22-02
GENERAL NOTES

1. GRADE LINE DENOTES FINISHED GRADE WHERE SHOWN ON PLANS.

2. ALL PIPE LINES, POWER, TELEPHONE, AND TELEGRAPH MIES TO BE MOVED OR COVERED 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. ALL LAND MONUMENTS LOCATED WITHIN THE CONSTRUCTION AREA SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 107.12 OF THE STANDARD SPECIFICATIONS.

5. 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 HARMED AS LITTLE AS POSSIBLE DURING THE CONSTRUCTION OPERATIONS.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A FENCE TO CONTROL LIVESTOCK IN AREAS WHERE PASTURES ARE SEVERED. WIRE FENCE MAY BE CONSTRUCTED INTIALLY, OR IN LIEU THEREOF, THE CONTRACTOR AT HIS OWN EXPENSE, MAY ELECT TO PROVIDE TEMPORARY FENCING SUITABLE TO CONTAIN LIVESTOCK.

7. THE PROJECT IS COVERED UNDER A SECTION 404 NATIONWIDE 14 PERMIT. REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS, EDITION OF 2014, FOR PERMIT REQUIREMENTS.

8. THE SEQUENCE AS SHOWN ON THE MANTENANCE OF TRAFFIC PLANS IS A GENERAL OUTLINE FOR THE CONSTRUCTION OF THIS PROJECT, AND IN NO WAY IS IT 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. ALL FLEXIBLE BASE AND ASPHALTIC PAVEMENTS REMOVED SHALL BE PAID FOR UNDER THE ITEM NO. 210 - UNCLASSIFIED EXCAVATION.

10. THE EXISTING ASPHALT PAVEMENT TO BE REMOVED FROM THE REMAINING PAVEMENT SHALL BE SEPARATED BY SAWING ALONG A HEAT LINE. AFTER SAWING, 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 CONTRACTOR'S EXPENSE.
NOTES:

REFER TO CROSS SECTIONS FOR DEVIATION FROM THE NORMAL SLOPES. NO CHANGES SHALL BE MADE FROM THE PLANNED SLOPES WITHOUT THE APPROVAL OF THE ENGINEER.

THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS ONE INCH OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.

AFTER PLACING FINAL 2' OF SURFACE COURSE, THE EXISTING SLOPE SHALL BE REDRESSED AS DIRECTED BY THE ENGINEER PRIOR TO SEEDING IN ORDER TO MAINTAIN A UNIFORM SLOPE. PAYMENT FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR VARIOUS CONTRACT ITEMS.

THE FINAL 2' OF SURFACE COURSE IS TO BE Placed AFTER ALL OTHER COURSES HAVE BEEN LAID. LONGITUDINAL JOINTS SHALL BE AT LANE LINES.

TYPICAL SECTIONS OF IMPROVEMENT
NOTES:
REFER TO CROSS SECTIONS FOR DEVIATION FROM THE NORMAL SLOPES. NO CHANGES SHALL BE MADE FROM THE PLANNED SLOPES WITHOUT THE APPROVAL OF THE ENGINEER.

THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS ONE INCH OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.
**SPECIFICATIONS**

**ACOM**

**NEW SURFACE COURSE (6")**

- **ASPHALT BASE COURSE**
  - **CLASS 7**
  - **COMPACTED DEPTH**

**AGGREGATE BASE COURSE**

- **CLASS 7**
- **COMPACTED DEPTH**

**CONSTRUCTION LIMITS**

**DETAIL FOR**

**DRIVEWAY TURNOUTS**

**EXISTING ASPHALT**

- **PAVEMENT RETAIN AND OVERLAY**
- **100' NORMAL TRANSITION**

**COLD MULL EXISTING ASPHALT PAVEMENT**

**DETAIL FOR TRANSITIONS**

**EXISTING ASPHALT PAVEMENT**

**SHIFT TO**

**EDGE OF SHOULDER**

**EDGE OF PAVEMENT**

**DETAILS OF SILT FENCE**

**AT BOX CULVERTS**

**SILT FENCE TYPE C-12**

**SPECIAL DETAILS**
TYPICAL SECTIONS OF IMPROVEMENT - DETOUR ROAD
STA. 4+50 - STA. 4+90

DUMPED RIPRAP & SYNTHETIC FIBER FABRIC TO ELEV. 280.0

THIS STREAM IS CLASSIFIED AS AN INTERMITTENT STREAM. THE TOP OF THE CHANNEL ELEVATION IS 280.0 FT. NSL. REFER TO SECTION 110.01, STANDARD SPECIFICATIONS FOR HORIZONTAL AND VERTICAL CONTROL DATA.
GENERAL NOTES


LIVE LOADING: HL-93

All concrete shall be Class 5 with a minimum 28-day compressive strength of 5,000 psi and shall be placed in the dry. All exposed corners to have 10" chamfers.

Reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M31 or M322, 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 3-7 of the CRSI Manual shall be minus zero to plus 0.5/24.

Excavation and backfilling shall be in accordance with the requirements of Section B01.

Membrane Waterproofing shall conform to the requirements of Section B05. Membrane Waterproofing shall be Type C and as directed by the Engineer applied to all construction joints in the top slab and the sidewalls of R.C. Box culverts and to the connection joint between wingwall and R.C. Box culvert walls.

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

Weep holes in wingwalls 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) weep holes in each wingwall. The drain 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 pour. For longer culvert construction, the Contractor may use multiple pours with transverse construction joints spaced a minimum of 30 feet apart unless superseded by stage construction or site constraints as approved by the Engineer. Construction joints between footings and walls shall be made only where shown in the Plans. Joints shall be sealed at the inside edge of the barrel and shall be keyed. Longitudinal reinforcing shall be continuous through joints unless shown otherwise. All longitudinal construction joints shall be submitted to the Engineer for approval.

Membrane Waterproofing, Weep Holes, Geotextile Filter Fabric, and Drainage Fill Material will not be paid for directly but shall be considered subsidiary to Class 5 Concrete.

When the top side of the box culvert serves as finished roadway surface, curbing and finishing shall be in accordance with subsections B01.17 and B01.20 for bridge roadway surface and the finish shall be applied in accordance with subsection B02.19 for Bridge roadway Surfacing and Finishing. Curbing and finishing shall not be paid for, 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 this unit price bid for "Class 1 Protective Surface Treatment."
LEGEND

- SAND BAG DITCH CHECKS
- SILT FENCE
- ROCK DITCH CHECKS

TEMPORARY EROSION CONTROL

GENERAL NOTES

THE QUANTITIES AND LOCATIONS OF THE EROSION CONTROL DEVICES SHOWN IN THE PLANS ARE ESTIMATED AND MAY BE ALTERED IF AND WHERE DIRECTED BY THE ENGINEER TO MAXIMIZE THEIR EFFECTIVENESS.

THE DEVICES ARE TO BE INSTALLED IN AN AREA ONLY WHEN THE SOL DISTURBING ACTIVITY IN THAT AREA BEGINS.

REFER TO SECTION 80 OF THE STANDARO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

SAND BAG DITCH CHECKS AT STA. 8+76.14

TOTAL NUMBER OF SAND BAGS AT STA. 8+76.14

22 BAGS

CLEARING AND GRUBBING

TEMPORARY EROSION CONTROL DETAILS
**LEGEND**

- **C-**: Sand Bag Ditch Checks
- **H-**: SilT Fence
- **E-**: Rock Ditch Checks

**TEMPORARY EROSION CONTROL GENERAL NOTES**

The quantities and locations of the erosion control devices shown in the plans are estimated and may be altered if and where directed by the engineer to be effective in an area only when the soil disturbing activity in that area begins.

Refer to Section 40 of the Standard Specifications for additional requirements.
TEMPORARY EROSION CONTROL DETAILS

**PERIODICAL DATES**

- STAGE 1: 0.00
- STAGE 2: 8.76.14

**SPECIAL FLOOD HAZARD AREA**

**LEGEND**

- C-5 = Sand Bag Ditch Checks
- C-6 = Salt Fence
- C-7 = Rock Ditch Checks

**GENERAL NOTES**

- The quantities and locations of the erosion control devices shown in the plans are estimated and may be altered during construction to maximize their effectiveness. The devices are to be installed in an area only when the soil disturbing activity in that area begins.

**NOTES**

- Refer to Section 10 of the Standard Specifications for additional requirements.

**DATE OF REVISION**

<table>
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**STAGE 2**

TEMPORARY EROSION CONTROL DETAILS
Temporary erosion control general notes:
The quantities and locations of the erosion control devices shown in the plans are estimated and may be altered to maximize their effectiveness. The devices are to be installed in an area only when the soil disturbing activity in that area begins.

Refer to Section 10 of the Standard Specifications for additional requirements.
SEQUENCE OF CONSTRUCTION

STAGE 1: MAINTAIN TRAFFIC ON EXISTING ROADWAY. CONSTRUCT DETOUR ROADWAY AND TEMPORARY GROUNDS.

STAGE 2: SHIFT TRAFFIC TO DETOUR AND MAINTAIN COMPLETE TEMPORARY GROUNDS. REMOVE EXISTING BRIDGE STRUCTURE. CONSTRUCT NEW BOX CULVERT. COMPLETE SURFACING AND PERFORM FINAL STRIPING AND PERMANENT SEEDING.

STAGE 3: SHIFT TRAFFIC TO PROPOSED ROADWAY. ELIMINATE DETOUR ROADWAY AND COMPLETE PERMANENT SEEDING.
SEQUENCE OF CONSTRUCTION

STAGE 1: MAINTAIN TRAFFIC ON EXISTING ROADWAY. CONSTRUCT DETOUR ROADWAY AND TEMPORARY GRADIENTS.

STAGE 2: SHIFT TRAFFIC TO DETOUR AND MAINTAIN COMPLETE TEMPORARY GRADIENTS. REMOVE EXISTING BRIDGE STRUCTURE, AND CONSTRUCT NEW R.C. BOX CULVERT. COMPLETE SURFACING AND PERFORM FINAL STRIPING AND PERMANENT SEEDING.

STAGE 3: SHIFT TRAFFIC TO PROPOSED ROADWAY, OBLITERATE DETOUR ROADWAY, AND COMPLETE PERMANENT SEEDING.
SEQUENCE OF CONSTRUCTION

STAGE 1: MAINTAIN TRAFFIC ON EXISTING ROADWAY. CONSTRUCT DETOUR ROADWAY AND TEMPORARY DRIVeways.

STAGE 2: SHIFT TRAFFIC TO DETOUR AND MAINTAIN COMPLETE TEMPORARY DRIVeways. REMOVE EXISTING BRIDGE STRUCTURE, AND CONSTRUCT NEW BOX CULVERTS. COMPLETE SURFACING AND PERFORM FINAL STRIPING AND PERMANENT SEEDING.

STAGE 3: SHIFT TRAFFIC TO PROPOSED ROADWAY. OBLECTE DETOUR ROADWAY, AND COMPLETE PERMANENT SEEDING.
SEQUENCE OF CONSTRUCTION

STAGE 1: MAINTAIN TRAFFIC ON EXISTING ROADWAY, CONSTRUCT DETOUR ROADWAY AND TEMPORARY DRIVEWAYS.

STAGE 2: SHIFT TRAFFIC TO DETOUR AND MAINTAIN COMPLETE TEMPORARY DRIVEWAYS, REMOVE EXISTING BRIDGE STRUCTURE, AND CONSTRUCT TEMPORARY DRIVES, COMPLETE SURFACING, COMPLETE BARRIERS AND PERMANENT SEEDING.

STAGE 3: SHIFT TRAFFIC TO PROPOSED ROADWAY, OBLITERATE DETOUR ROADWAY, AND COMPLETE PERMANENT SEEDING.
PERMANENT PAVEMENT MARKING DETAILS

- THE 6" YELLOW STRIPING QUANTITY HAS BEEN ESTIMATED BASED ON A DOUBLE LINE CENTER STRIPING FOR THE ENTIRE PROJECT. THIS ESTIMATE IS SUBJECT TO CHANGE BASED ON THE ACTUAL STRIPING NEEDED 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 STRIPING OF THE PROJECT.
### CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS

<table>
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<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>RAISED PAVEMENT MARKERS</th>
<th>REFLECTORIZED PAINT PAVEMENT MARKING</th>
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<tr>
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<td>LIN. FT. - EACH</td>
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<td>LIN. FT. - EACH</td>
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**TOTALS:** 794 3504 22 1720 1720

**NOTE:** THIS IS A LOW 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/NO 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.

### ADVANCE WARNING SIGNS AND DEVICES

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<th>SIGN NUMBER</th>
<th>DESCRIPTION</th>
<th>SIGN SIZE</th>
<th>STAGE 1</th>
<th>STAGE 2</th>
<th>STAGE 3</th>
<th>MAXIMUM NUMBER REQUIRED</th>
<th>TOTAL SIGN REQUIRED</th>
<th>VERTICAL PANELS</th>
<th>TRAFFIC DRUMS</th>
<th>BARRICADES (TYPE III)</th>
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<td>WWII-1</td>
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<td>END ROAD WORK</td>
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<td>REVERSE CURVE (LT.)</td>
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<td>W11-7</td>
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**TOTALS:** 328.0 13 19 16 16

**NOTE:** THIS IS A LOW TRAFFIC VOLUME ROAD AS DEFINED IN SECTION 604.03, STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.
SOIL CHARACTERISTICS TABULATED ABOVE ARE REPRESENTATIVE AT THE LOCATION OF THE SAMPLE, AND FROM SURFACE INDICATIONS ARE TYPICAL FOR 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.

Z-AUGER REFUSAL
NP - NONPLASTIC
ND - NOT DETERMINABLE

REMOVAL AND DISPOSAL OF FENCE

REMOVAL OF EXISTING BRIDGE STRUCTURE

ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC

NOTE: QUANTITIES
SEE SECTION 104.03 OF THE STANDARD SPECS.
COLD MILLING ASPHALT PAVEMENT

| STATION | STATION | LOCATION | AVG. WIDTH | COLD MILLING ASPHALT PAVEMENT
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<td>111+47.00</td>
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<td>114+25.00</td>
<td>115+20.00</td>
<td>MAIN LANES</td>
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TOTAL: 444.44

NOTE: AVERAGE MILLING DEPTH 1".

DRIVEWAYS & TURNOUTS

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<th>SIDE</th>
<th>LOCATION</th>
<th>WIDTH</th>
<th>ACHM SURFACE COURSE (1/2&quot;) 200 LBS. PER SQ. YD. (PG64-22)</th>
<th>AGGREGATE BASE COURSE (CLASS T)</th>
<th>STANDARD DRAWINGS</th>
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<td>11+53</td>
<td>LT.</td>
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ENTIRE PROJECT TEMPORARY DRIVES

TOTALS: 32.51 4.07 26.31

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2") 200 LBS. PER SQ. YD. (PG64-22)
AGGREGATE BASE COURSE (CLASS T)

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

PERMANENT EROSION CONTROL

<table>
<thead>
<tr>
<th>STATION</th>
<th>STATION</th>
<th>LOCATION</th>
<th>SEEDING</th>
<th>LIME</th>
<th>MULCH COVER</th>
<th>WATER</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ACRE</td>
<td>TON</td>
<td>ACRE</td>
<td>M.GAL</td>
</tr>
<tr>
<td>ENTIRE</td>
<td>PROJECT</td>
<td>CLEARING AND GRUBBING</td>
<td>0.75</td>
<td>0.75</td>
<td>0.75</td>
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TOTALS: 4.00 0.00 4.00 400.00 4.00 4.00 4.00 4.00 4.00 4.00

BASES OF ESTIMATE:
LIME .......................................................... 2 TONS / ACRE OF SEEDING
WATER .......................................................... 102.0 M.G. / ACRE OF SEEDING
WATER .......................................................... 30.0 M.G. / ACRE OF TEMPORARY SEEDING

SAND BAG DITCH CHECKS .......... 22 BAGS / LOCATION
ROCK DITCH CHECKS ............. 1 CU. YD. / LOCATION

NOTE: THE TEMPORARY EROSION CONTROL DEVICES SHOWN ABOVE AND ON THE PLANS SHALL BE INSTALLED IN SUCH A SEQUENCE AS TO DETER 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.
### Dumped Riprap and Filter Blanket

<table>
<thead>
<tr>
<th>Station</th>
<th>Location</th>
<th>Dumped Riprap</th>
<th>Filter Blanket</th>
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<tr>
<td>113+44</td>
<td>Outlet of Pipe Culvert</td>
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<tr>
<td>4+68</td>
<td>Temporary Pipe Culvert</td>
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<td><strong>Totals:</strong></td>
<td></td>
<td><strong>38</strong></td>
<td><strong>70</strong></td>
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</table>

*Note: Quantity estimated. See Section 104.03 of the Standard Specifications.

Note: Filter blanket shall be geotextile fabric (Type 5).
### BASE AND SURFACING

#### TACK COAT

<table>
<thead>
<tr>
<th>STATION</th>
<th>STATION</th>
<th>LOCATION</th>
<th>LENGTH</th>
<th>AGGREGATE BASE COURSE (CLASS 7)</th>
<th>TACK COAT</th>
<th>ACHM BINDER COURSE (1&quot;)</th>
<th>ACHM SURFACE COURSE (1/2&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>TON / STATION</td>
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<tr>
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<td></td>
<td>TOTAL WID. SQ. YD.</td>
<td>SQ. YD.</td>
<td>TOTAL WID. SQ. YD.</td>
<td>SQ. YD.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>GALLONS / SQ. YD.</td>
<td>SQ. YD.</td>
<td>GALLONS / SQ. YD.</td>
<td>SQ. YD.</td>
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<td>AVG. WID.</td>
<td>SQ. YD.</td>
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<td>SQ. YD.</td>
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<td></td>
<td></td>
<td>POUND / SQ. YD.</td>
<td>SQ. YD.</td>
<td>POUND / SQ. YD.</td>
<td>SQ. YD.</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td>PG 64-22</td>
<td>SQ. YD.</td>
<td>PG 64-22</td>
<td>SQ. YD.</td>
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<td>MAIN LANKS</td>
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</tr>
<tr>
<td>111+87.12</td>
<td>112+87.12</td>
<td>100' TRANSITION</td>
<td>100.00</td>
<td>41.50</td>
<td>18.25</td>
<td>20.00</td>
<td>222.22</td>
</tr>
<tr>
<td>111+90.12</td>
<td>114+20.36</td>
<td>MAIN LANES - FULL DEPTH</td>
<td>133.24</td>
<td>82.00</td>
<td>110.79</td>
<td>40.58</td>
<td>600.16</td>
</tr>
<tr>
<td>114+20.36</td>
<td>115+20.36</td>
<td>100' TRANSITION</td>
<td>100.00</td>
<td>41.50</td>
<td>18.25</td>
<td>20.00</td>
<td>222.22</td>
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<tr>
<td>DETOUR LANES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0+00</td>
<td>1+16.00</td>
<td>DETOUR TRANSITION</td>
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<td>VAR.</td>
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<tr>
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<td>TOTALS:</td>
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</tr>
<tr>
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<td>1376.65</td>
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**Basis of Estimate:**
- ACHM SURFACE COURSE (1/2") 94.8% MIN. AGGR. 5.2% ASPHALT BINDER
- ACHM BINDER COURSE (1") 94.8% MIN. AGGR. 4.2% ASPHALT BINDER
- MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22
- TACK COAT QUANTITIES WERE CALCULATED USING THE EMULSIFIED ASPHALT RATES. REFER TO SS-400-1 FOR THE RESIDUAL ASPHALT APPLICATION RATES.

**Note:** AGGREGATE BASE COURSE SALVAGED FROM DETOUR SHALL BE STOCKPILED AT INTERSECTION OF HWY. 530 AND HWY. 11.
### SUMMARY OF QUANTITIES

<table>
<thead>
<tr>
<th>ITEM NUMBER</th>
<th>ITEM</th>
<th>QUANTITY</th>
<th>UNIT</th>
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<td>REMOVAL AND DISPOSAL OF PENCIL</td>
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<td>EACH</td>
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<td>203</td>
<td>REMOVAL AND DISPOSAL OF DATES</td>
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<td>LIRE.</td>
</tr>
<tr>
<td>204</td>
<td>CARDBOARD AND CARTON</td>
<td>1</td>
<td>EACH</td>
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<tr>
<td>205</td>
<td>DEMOLITION</td>
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<td>CUB. YD.</td>
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<tr>
<td>206</td>
<td>CLEARANCE BASE COURSE (CLASS 3)</td>
<td>1,000</td>
<td>YR.</td>
</tr>
<tr>
<td>207</td>
<td>TANKS COAT</td>
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<tr>
<td>208</td>
<td>UPPER AND INFERIOR COURSES</td>
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<td>YR.</td>
</tr>
<tr>
<td>209</td>
<td>HORIZONTAL PAVEMENT MARKINGS</td>
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<td>YR.</td>
</tr>
<tr>
<td>210</td>
<td>TYPICAL PAVING WORK</td>
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<td>YR.</td>
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<tr>
<td>211</td>
<td>LOWER PAVEMENT MARKINGS</td>
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<td>212</td>
<td>UNLEVELLED GATES</td>
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<tr>
<td>213</td>
<td>LEVELLED GATES</td>
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<td>YR.</td>
</tr>
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<td>SECURITY</td>
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<td>WATER</td>
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<td>YR.</td>
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<tr>
<td>217</td>
<td>SILT FENCE</td>
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<td>YR.</td>
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<tr>
<td>218</td>
<td>DUMP UNLOADING</td>
<td>1,000</td>
<td>YR.</td>
</tr>
<tr>
<td>219</td>
<td>SELECTION OF SETTLEMENT BAND</td>
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<td>YR.</td>
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<td>220</td>
<td>SETTLEMENT REMOVAL AND DISPOSAL</td>
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<td>221</td>
<td>ROCK OR DUMP</td>
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<td>SECOND SELECTION</td>
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<tr>
<td>223</td>
<td>SELECTED UNLOADING</td>
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<td>YR.</td>
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<td>DUMP DUMPING</td>
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<td>YR.</td>
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<tr>
<td>225</td>
<td>SOIL MOIST</td>
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<td>YR.</td>
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<tr>
<td>226</td>
<td>SLAB CONSTRUCTION CONTROL</td>
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<td>YR.</td>
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<tr>
<td>227</td>
<td>SELECTED UNLOADING</td>
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<td>YR.</td>
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<tr>
<td>228</td>
<td>DUMP DUMPING</td>
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<tr>
<td>229</td>
<td>FILTER DUMP</td>
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<td>230</td>
<td>DUMP DUMPING</td>
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* DENOTES ALTERNATE BID ITEMS.

### REVISIONS

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<th>REVISION</th>
<th>SHEET NUMBER</th>
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<tr>
<td>1/18/19</td>
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SUMMARY OF QUANTITIES AND REVISIONS

[SUMMARY OF QUANTITIES AND REVISIONS]
SURVEY CONTROL COORDINATES

Project Name: s020583
Date: 4/12/2017
Coordinate System: ARKANSAS STATE PLANE - SOUTH ZONE BASED ON GPS CONTROL, 400022 - 400022A

PROJECTED TO GROUND.

Units: U.S. SURVEY FOOT

<table>
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<th>Point Name</th>
<th>Northing</th>
<th>Easting</th>
<th>Elev</th>
<th>Feature</th>
<th>Description</th>
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<tbody>
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<td>1</td>
<td>1757548-2127</td>
<td>1344832, 3396</td>
<td>354, 451</td>
<td>CTL</td>
<td>AHTD STD, MON, STAMPED Pt 1</td>
</tr>
<tr>
<td>2</td>
<td>1758028-3410</td>
<td>1344767, 5471</td>
<td>334, 737</td>
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<td>AHTD STD, MON, STAMPED Pt 2</td>
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<td>1758572-5191</td>
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<td>1758897-6982</td>
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<td>1345874, 7347</td>
<td>290, 439</td>
<td>GPS</td>
<td>AHTD GPS • 400022A</td>
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</table>

* Note - Rebar and Cap - Standard - 5/8" Rebar with 2" Aluminum Cap stamped
* Standard markings common to all casals, or as indicated
* (other markings indicated in the point description of the individual point)

ALL DISTANCES ARE GROUND.
USE CAS - 1.0 FOR STAKEOUT FOR THIS PROJECT.
A PROJECT CAS OF 0.99991082591A HAS BEEN USED TO COMPUTE THE ABOVE GROUND COORDINATES.
THIS CAS IS INTENDED FOR USE WITHIN THE PROJECT LIMITS.
GRID DISTANCE = GROUND DISTANCE X CAS.
GRID COORDINATES ARE STORED UNDER FILE NAME s020583g1ctl
HORIZONTAL DATUM NAVD 88 POSITONAL ACCURACY THIRD ORDER, UNLESS SPECIFIED OTHERWISE AT A SPECIFIC POINT.
REFERENCE POINTS (1500 SERIES) ARE TO BE USED TO ESTABLISH CONTROL IF THE PRIMARY CONTROL POINTS LISTED ABOVE HAVE BEEN DESTROYED. REFERENCE POINTS ARE NOT TO BE USED FOR VERTICAL CONTROL.

BASIS OF BEARING:
ARKANSAS STATE PLANE GRID BEARINGS - 0302-SOUTH ZONE DETERMINED FROM GPS CONTROL POINTs4 400022 - 400022A CONVERGENCE ANGLE: 00 03 38.55 RIGHT AT Pt.4 LtN 33-53-35.86 LGh W 091-53-29.52 GRID AZIMUTH + ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.

GRID BEARINGS:

- GRID NAME: s020583g1ctl
- GRID COORDINATES:
  - 1757548-2127 1344832, 3396 354, 451
  - 1758028-3410 1344767, 5471 334, 737
  - 1758572-5191 1344957, 4225 299, 835
  - 1758897-6982 1345366, 1738 279, 951
  - 1759669-3046 1346295, 3092 290, 775
  - 1761161-2782 1347752, 4275 301, 843
  - 1759204-7514 1345874, 7347 290, 439

GRID BEARINGS:

- GRID NAME: s020583g1ctl
- GRID COORDINATES:
  - 1757548-2127 1344832, 3396 354, 451
  - 1758028-3410 1344767, 5471 334, 737
  - 1758572-5191 1344957, 4225 299, 835
  - 1758897-6982 1345366, 1738 279, 951
  - 1759669-3046 1346295, 3092 290, 775
  - 1761161-2782 1347752, 4275 301, 843
  - 1759204-7514 1345874, 7347 290, 439
**CONSTRUCTION SEQUENCE**

1. Plate structural bedding material to grade, do not compact.
2. Install pipe to grade.
3. Compaction of bedding material under and outside the middle third of the pipe.
4. Complete backfill according to subsection 602-01-07.

**NOTES:**
- Haunch and structural bedding material will not be paid for separately but compensation will be considered to be included in the price bid per linear foot of concrete pipe.

---

**MINIMUM HEIGHT OF PIPE OVER CIRCULAR R.C. PIPE CULVERTS**

<table>
<thead>
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<th>CLASS OF PIPE</th>
<th>PIPE ID (IN)</th>
<th>INSTALLATION TYPE</th>
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<td>Type 1 or Type 2</td>
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<td>18-24</td>
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<td>27-33</td>
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<td></td>
<td>36-42</td>
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<tr>
<td></td>
<td>48</td>
<td>Type 2</td>
</tr>
<tr>
<td></td>
<td>54-60</td>
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<td>66-78</td>
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**MAXIMUM HEIGHT OF PIPE OVER CIRCULAR R.C. PIPE CULVERTS**

<table>
<thead>
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<th>CLASS I</th>
<th>CLASS II</th>
<th>CLASS III</th>
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<tr>
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**MINIMUM HEIGHT OF PIPE OVER R.C. ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS**

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<thead>
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<th>CLASS III</th>
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<td>TYPE 1</td>
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<td>21</td>
<td>36</td>
</tr>
<tr>
<td>TYPE 2</td>
<td>10</td>
<td>16</td>
<td>23</td>
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---

**EMBANKMENT AND TRENCH INSTALLATIONS**

1. Materials in the haunch and every structural bedding layer shall be compacted to 95% of the maximum density according to the type of construction material used.
2. For trenches with walls of natural soil, the density of the soil in the lower side of the trench shall be as per M206. The refusal density or field density shall be 95% of the maximum density according to the type of material used.
3. For embankments, the material in the lower side zone shall be compacted to 95% of the maximum density according to the type of material used.

---

**GENERAL NOTES**

1. CONCRETE PIPE CULVERT CONSTRUCTION SHALL COMPLY WITH ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARDS AND SPECIFICATIONS. THE CONTRACTOR, IN ADDITION TO THE SPECIFICATIONS AND REQUIREMENTS SPECIFIED IN THIS SECTION, SHALL COMPLY WITH ARKANSAS LAW AND ANY ADDITIONAL MUNICIPAL, STATE OR FEDERAL REQUIREMENTS.
2. THE DESIGN OF THE PIPE CULVERT SHALL BE IN ACCORDANCE WITH THE STANDARD CONSTRUCTION SPECIFICATIONS.
3. THE DESIGN OF THE PIPE CULVERT SHALL BE IN ACCORDANCE WITH THE STANDARD CONSTRUCTION SPECIFICATIONS.
4. THE DESIGN OF THE PIPE CULVERT SHALL BE IN ACCORDANCE WITH THE STANDARD CONSTRUCTION SPECIFICATIONS.
5. THE DESIGN OF THE PIPE CULVERT SHALL BE IN ACCORDANCE WITH THE STANDARD CONSTRUCTION SPECIFICATIONS.
6. THE DESIGN OF THE PIPE CULVERT SHALL BE IN ACCORDANCE WITH THE STANDARD CONSTRUCTION SPECIFICATIONS.
7. THE DESIGN OF THE PIPE CULVERT SHALL BE IN ACCORDANCE WITH THE STANDARD CONSTRUCTION SPECIFICATIONS.
8. THE DESIGN OF THE PIPE CULVERT SHALL BE IN ACCORDANCE WITH THE STANDARD CONSTRUCTION SPECIFICATIONS.
9. THE DESIGN OF THE PIPE CULVERT SHALL BE IN ACCORDANCE WITH THE STANDARD CONSTRUCTION SPECIFICATIONS.
10. THE DESIGN OF THE PIPE CULVERT SHALL BE IN ACCORDANCE WITH THE STANDARD CONSTRUCTION SPECIFICATIONS.

---

**CONCRETE PIPE CULVERT INSTALLATION**

**STANDARD DRAWING PCC-1**
### Corrugated Steel Pipe (Round)

**Pipe Diameter (Inches)**

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<th>Diameter</th>
<th>Minimum Thickness</th>
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<tr>
<td>6</td>
<td>0.094</td>
<td>0.110</td>
</tr>
<tr>
<td>7</td>
<td>0.100</td>
<td>0.120</td>
</tr>
<tr>
<td>8</td>
<td>0.100</td>
<td>0.120</td>
</tr>
</tbody>
</table>

### Corrugated Aluminum Pipe (Round)

**Pipe Diameter (Inches)**

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Minimum Thickness</th>
<th>Maximum Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>0.060</td>
<td>0.075</td>
</tr>
<tr>
<td>2</td>
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<td>0.090</td>
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<td>0.075</td>
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<tr>
<td>3</td>
<td>0.088</td>
<td>0.100</td>
</tr>
<tr>
<td>4</td>
<td>0.088</td>
<td>0.100</td>
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<tr>
<td>5</td>
<td>0.094</td>
<td>0.110</td>
</tr>
<tr>
<td>6</td>
<td>0.094</td>
<td>0.110</td>
</tr>
<tr>
<td>7</td>
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<td>0.120</td>
</tr>
<tr>
<td>8</td>
<td>0.100</td>
<td>0.120</td>
</tr>
</tbody>
</table>

### Corrugated Steel Pipe Archives

**Pipe Diameter (Inches)**

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Minimum Thickness</th>
<th>Maximum Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0.075</td>
<td>0.090</td>
</tr>
<tr>
<td>2.5</td>
<td>0.075</td>
<td>0.090</td>
</tr>
<tr>
<td>3</td>
<td>0.088</td>
<td>0.100</td>
</tr>
<tr>
<td>4</td>
<td>0.088</td>
<td>0.100</td>
</tr>
<tr>
<td>5</td>
<td>0.094</td>
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<td>0.110</td>
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<tr>
<td>7</td>
<td>0.100</td>
<td>0.120</td>
</tr>
<tr>
<td>8</td>
<td>0.100</td>
<td>0.120</td>
</tr>
</tbody>
</table>

### Construction Sequence

1. **Place structural bedding material to grade, do not compact.**
2. **Compact structural bedding outside the middle third of the pipe.**
3. **Compact structural bedding, operation by working from side to side.**
4. **Differential settlement shall not exceed 24 inches in any 12 inches of the pipe.**
5. **Structural bedding material will not be considered separately, but compensation will be considered to be included in the price bid on per linear foot of metal pipe.**

**Legend**

- **D1:** Outside diameter of pipe
- **D2:** Maximum pipe diameter
- **H1:** Minimum pipe depth
- **H2:** Structural backfill material
- **M1:** Unconsolidated soil

### Equivalent Metal Thicknesses and Gauges

<table>
<thead>
<tr>
<th>Metal Thickness in Inches</th>
<th>Gauge Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.060</td>
<td>2</td>
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<tr>
<td>0.075</td>
<td>3</td>
</tr>
<tr>
<td>0.088</td>
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<tr>
<td>0.100</td>
<td>6</td>
</tr>
<tr>
<td>0.105</td>
<td>7</td>
</tr>
</tbody>
</table>

### Embankment and Trench Installations

1. **Structural backfill, embankment, and outer structural bedding material shall be compacted to 95% of the maximum density according to the type or class of material used.**
2. **Installation Type 1 or 2 may be used for corrugated steel or aluminum pipe.**
3. **Installation Type 3 shall be used for corrugated steel or aluminum pipe with a "5" by "5" corrugation.**
4. **Installation Type 4 may be used for corrugated steel or aluminum pipe with a 3" by 5" or 3" by 7" corrugation.**

### General Notes

1. **Metal pipe culvert construction shall conform to Arkansas State Highway and Transportation Department (ADOT) Standards.**
2. **Metal pipe culvert design shall conform to AASHTO LRFD Bridge Design Specifications, Fifth Edition.**
3. **All metal pipe shall be protected during construction by a cover sufficient to prevent damage from undue equipment.**
4. **The minimum trench width shall be the outside diameter of the pipe plus 24 inches.**
5. **The maximum allowable trench width shall be the minimum with practical for working conditions.**
6. **Multiple pipe culvert sections shall be installed with a minimum clearance of 24 inches between rows.**
7. **Metal pipe culvert sections shall be installed with a minimum clearance of 24 inches between rows.**
8. **When structural bedding is required, it shall be placed as directed by the engineer.**
9. **When working conditions indicate the use of structural bedding, the material that is used must be identified.**
10. **When working conditions indicate the use of structural bedding, the quantity of material required shall be measured and paid for as selected pipe bedding.**
11. **When working conditions indicate the use of structural bedding, the material that is used must be identified.**
12. **If the quantity of material is not available, the engineer shall be responsible for the quantity of material that is used.**
13. **If the quantity of material is not available, the engineer shall be responsible for the quantity of material that is used.**

### Standard Drawing

**ARKANSAS STATE HIGHWAY COMMISSION**

**METAL PIPE CULVERT FILL HEIGHTS & BEDDING**

**CULVERT INSTALLATION SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Standard Drawing</th>
<th>PCM-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>REV1</td>
</tr>
</tbody>
</table>
INSTALLATION TYPE 2 .SELECTED MATERIALS (CLASS SM-1, STRUCTURAL AGGREGATE TYPE PER LINEAR FOOT)

**NOTE:** BACKFILL MATERIAL SHALL BE USED IN THE PRICE BID PER LINEAR FOOT OF PIPE.

MULTIPLE INSTALLATION OF HIGH DENSITY POLYETHYLENE PIPES

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Number of Pipes</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot;</td>
<td>2</td>
</tr>
<tr>
<td>6&quot;</td>
<td>3</td>
</tr>
<tr>
<td>8&quot;</td>
<td>2</td>
</tr>
</tbody>
</table>

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

MINIMUM COVER FOR CONSTRUCTION LOADS

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Load Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot;</td>
<td>2</td>
</tr>
<tr>
<td>6&quot;</td>
<td>3</td>
</tr>
<tr>
<td>8&quot;</td>
<td>2</td>
</tr>
</tbody>
</table>

GENERAL NOTES

1. PIPE SHALL CONFORM TO ASHTO MCR-69, TYPE 5 INSTALLATION SHALL CONFORM TO THE SPECIAL PROVISION "PLASTIC PIPE AND SECTION 6 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION" EIGHTH EDITION.
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO ASHTO LPG-7 BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (MAY 2014).
3. THE MINIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SURPLUS WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT UNDERLAY AND OTHER BACKFILL MATERIAL.
4. MATTRESSES MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE END OF THE TRENCH TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERIODIC MATERIAL IS USED FOR STRUCTURAL BEDDING AND/or BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNFILLED MATERIAL THAT IS EXCAVATED AT THE BOTTOM OF THE EXCAVATED TRENCH BEYOND THE AREA AIRPLACED AS "STRUCTURAL BEDDING" ABOVE WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDISTURBED AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNACCEPTABLE FOR BACKFILLING, THE AREA IDENTIFIED ABOVE AS "STRUCTURAL BEDDING" MATERIAL WILL BE EXCAVATED AND THE SELECTED PIPE BEDDING PAY LIMIT DESIGNED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE CORRODED OR PROFILE VALLEY BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE PIPE TO CONFORM TO PROFILE VALLEY.
8. HIGH DENSITY POLYETHYLENE PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR HDPE PIPE SHALL MEET THE REQUIREMENTS FOR SOLID TIGHTNESS AS SPECIFIED IN ASHTO SECTION 6.2.4 AND CULVERTS INTO BRIDGE CONSTRUCTION SPECIFICATIONS. JOINTS SHALL BE INSTALLED PER 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 6" IN HEIGHT, ALL LAYERS SHALL BE BURIED IN ONE EIGHTH (1/8) FOOT INTERVALS.
5. PIPE INSTALLATION MAY REQUIRE THE USE OF RESTRAINTS, WEIGHTING OF OTHER APPROVED METHODS IN ORDER TO HELP MAINTAIN GRADE AND ALIGNMENT.
MINIMUM TRENCH WIDTH
BASED ON FILL HEIGHT "H"

<table>
<thead>
<tr>
<th>Pipe Diameter</th>
<th>&quot;H&quot;</th>
<th>&quot;K&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot;</td>
<td>8&quot;</td>
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</tr>
<tr>
<td>10&quot;</td>
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<td>10&quot;</td>
</tr>
<tr>
<td>12&quot;</td>
<td>12&quot;</td>
<td>12&quot;</td>
</tr>
</tbody>
</table>

MINIMUM COVER FOR CONSTRUCTION LOADS

<table>
<thead>
<tr>
<th>Pipe Diameter</th>
<th>&quot;H&quot;</th>
<th>&quot;K&quot;</th>
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</thead>
<tbody>
<tr>
<td>8&quot;</td>
<td>5'-0&quot;</td>
<td>5'-0&quot;</td>
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<tr>
<td>10&quot;</td>
<td>7'-0&quot;</td>
<td>7'-0&quot;</td>
</tr>
<tr>
<td>12&quot;</td>
<td>9'-0&quot;</td>
<td>9'-0&quot;</td>
</tr>
</tbody>
</table>

TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS
1. Structural backfill, embankment, and outer structural bedding material shall be compacted to 95% of the maximum density according to the type of class of material used.

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" in maximum thickness at the end of each working day. The layers shall be compacted to a minimum density of 95% of maximum density according to the type and class of material used.
5. Pipe installation may require the use of restraint, wedging or other approved methods in order to help maintain grade and alignment.

GENERAL NOTES
1. Pipe shall conform to AASHTO LPD-35.40.45. Installation shall conform to job specific provision.
3. The minimum bedding, trench width shall be the minimum width plus a sufficient width to ensure working room to properly and safely place and compact bedding and other backfill material.
4. Improper material should be placed as directed by the engineer at the ends of the culvert to prevent loss of structural bedding when periodic material is used for structural bedding and/or backfill.
5. When directed by the engineer, unstable material that is encountered at the bottom of the excavated trench below the area designated as "structural bedding" area shall be excavated and replaced with selected pipe at a point beyond the quantity of material required to backfill in the underlying area up to the selected pipe backfill pay limits in % of the area designated as "structural bedding" area above will be measured and paid for as "selected pipe bedding."
6. When the existing material excavated for the pipe trench is determined by the engineer to be unstable and/or unsuitable for use as structural bedding, it shall be removed from the excavation area designated as "structural bedding" and not placed in the base layer of the transportation facility. The engineer may designate "unsuitable" material for use as structural bedding.
7. For pipe types that are not smooth on the outside (corrugated or profile pipe) backfill gradation should be selected that will permit the filling of the corrugation or profile valley.
8. PVC pipes of diameters other than shown will not be allowed.
9. Joints for PVC pipe shall meet the requirements for soil tightness as specified in AASHTO LPD-35.40.45. and 30.42. "Asbestos cement construction specifications" joints shall be installed per manufacturer's recommendations.

LEGEND
- = FULL HEIGHT "H"
- = DIAMETER "K"
= = STRUCTURAL BACKFILL MATERIAL
= = UNDISTURBED SOIL

ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT
(PVC F949)

STANDARD DRAWING PCP-2
NOTES:
1. Refer to the striping details for pavement marking line methods.
2. This drawing shall be used in conjunction with the latest revised edition 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.

CONCRETE PAVEMENT
BROKEN LINE STRIPING

CONTINUOUS YELLOW

CONTINUOUS YELLOW

SOLID LINE STRIPING ON CONCRETE PAVEMENT

CONTINUOUS YELLOW

SOLID LINE STRIPING ON ASPHALT PAVEMENT

ASPHALT PAVEMENT

STRIPING AT ADJACENT NO PASSING LANES

CONCRETE PAVEMENT

WHITE YIELD LINE PERPENDICULAR TO ENTRY LANE

DIRECTION OF TRAVEL

YIELD LINE DETAIL

CROSSWALK AND STOPBAR DETAILS

CROSSWALK AND STOPBAR DETAILS

2' FOR ASPHALT OR CONCRETE PAVEMENT
6" FOR BITUMINOUS SURFACE TREATMENT

CONTINUOUS WHITE

CONTINUOUS YELLOW

DETAIL OF STANDARD RAISED PAVEMENT MARKERS

NOTES:
1. MARKERS SHOWN FOR RAISED PAVEMENT MARKERS ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR MARKERS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR SIMILAR MARKERS MAY BE MADE BY REFERING TO THE AHTD QUALIFIED PRODUCTS LIST.
5. Payment for the Shoulder.

4. The Drop Standard Pipe for 24" I.D.

1. Granular material shall be wrapped with geotextile fabric, lap, or fabric, or the width of the trench at the top.
REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

Concrete shall be Class 5 with a minimum 28 day compressive strength of 3500 psi.

Reinforcement steel shall be AASHTO M 305M #53, Grade 60.

Construction and materials for headwall & culvert drainage, including, rebar holes and grouted material, shall be subsidiary to the bid item, "Class 5 Concrete".

Membrane waterproofing shall conform to the requirements of Section 85 of the Standard Specifications.

Membrane waterproofing shall be applied to all construction joints in the top slab and the sidewalls of R.C. Box Culverts as directed by the Engineer. No payment shall be made for this item unless payment shall be considered to be included in the various items bid for the R.C. Box Culvert.

Reinforcement tolerances for reinforcement steel shall meet those listed in "Manual of Standard Practice" published by Concrete Reinforcement Steel Institute (DRS) except that the tolerance for ties or bars such as Figure 3 on page 7-4 of the CPS/Manual shall be minus zero to plus 0.025 inch.

Weep holes in Box Culvert walls shall have a maximum horizontal spacing of 12" - 0" and shall be spaced to clear the reinforcement steel. The drain opening shall be 4" diameter and shall be placed 0.025" above the top of the bottom slab.

Weep holes in headwalls shall have a maximum horizontal spacing of 12" - 0" and shall be spaced to clear all reinforcing steel. There shall be a minimum of two (2) weep holes in each headwall. The drain opening shall be 4" and shall be placed 0.025" above the top of the headwall footing.

The requirements shown on this drawing shall supersede the corresponding requirements on all reinforced concrete box culvert standard drawings.

REINFORCED CONCRETE BOX CULVERT HEADWALL MODIFICATIONS

ARKANSAS STATE HIGHWAY COMMISSION

REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1


R.C. BOX CULVERT HEADWALL MODIFICATIONS

L = "0" - 3 INCHES


L = "0" - 3 INCHES


L = "0" - 3 INCHES


L = "0" - 3 INCHES


L = "0" - 3 INCHES


L = "0" - 3 INCHES


L = "0" - 3 INCHES

EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS

NOTE: LENGTH MEASURED ALONG THE CENTER OF 2'-0" 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 CONFINED 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 CONFINED TO THAT PORTION OF THE INDICATED AREA THAT IS BELOW THE CHANNEL FLOW LINE.

ROADWAY EXCAVATION SHOWN IN SECTION C-C ABOVE AS SUBSIDIARY WILL NOT BE MEASURED OR PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS OF EXCAVATION.

POINTS TO CONSIDER:
- EMBANKMENT-PLACED IN HORIZONTAL LAYERS
- BACKFILL-PLACED IN HORIZONTAL LAYERS

ARKANSAS STATE HIGHWAY COMMISSION

STANDARD DRAWING RCB-2

EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS
### Superelevation Table for Two-Way Traffic

<table>
<thead>
<tr>
<th>Curve</th>
<th>25 MPH</th>
<th>30 MPH</th>
<th>50 MPH</th>
<th>55 MPH</th>
<th>60 MPH</th>
<th>70 MPH</th>
</tr>
</thead>
<tbody>
<tr>
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<td>MINIMUM</td>
<td>DESIRABLE</td>
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<td>DESIRABLE</td>
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<td>1/2</td>
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<td>D MAX + 0' 0&quot;</td>
<td>D MAX + 0' 0&quot;</td>
<td>D MAX + 0' 0&quot;</td>
</tr>
</tbody>
</table>

### Abbreviations
- NC: Normal Crown
- RC: Reverse Crown
- TC: Transition Crown
- T: Transition
- L: Length of Section
- S: Superelevation
- P: Profile
- L: Control Point

### General Notes
1. In pavement with two-way traffic, the superelevation shall be resolved on the inside shoulder edge unless otherwise noted on the plans.
2. Superelevation values shown on the cross sections are values
   1/2 or 1/2 to be added to or subtracted from the point of control.
3. Lengths L may be measured in multiples of 25 ft or 50 ft.
4. To permit sharper calculations,
   a. Increase superelevation on 2-lane sections
   b. Add additional transition
   c. Increase superelevation lengths as follows:
      - Lane Undivided: ... 500
      - Lane Undivided: ... 500
      - Lane Undivided: ... 500

### Standard Method When Superelevation
- Standard Method When Superelevation Reverses around Inner Subgrade Point or Inner Pavement Edge

### Arkasas State Highway Commission
- Tables and Method of Superelevation for Two-Way Traffic
- Standard Drawing SE-2
**Typlcol placotlon** - 3-lane advisory roadway share lane-OS i closed.

**General Notes:**

1. A speed limit reduction may be implemented only when designated in the plan or when requested by the Roadways Design Division.
2. Where the existing speed limit is 55 mph and the area requires a speed limit of 30 mph, the channelizing devices and the D-3 arrowheads should be installed at the location. Additional 30 mph speed limit signs should be placed at each shoulder and the area should be 82 to 100 mph reduced to match original speed limit. The speed limit should be accompanied by the required channelizing devices.
3. When the channelizing devices are installed on existing speed limit signs, the channelizing devices should be installed at the location. Additional 30 mph speed limit signs should be placed at each shoulder and the area should be 82 to 100 mph reduced to match original speed limit. The speed limit should be accompanied by the required channelizing devices.
4. The road signs should be at least 30 mph reduced to match original speed limit. The speed limit should be accompanied by the required channelizing devices.

**Typical application - construction operations of intermediate to long term duration on a three divided roadway where half of the roadway is closed.**

**Channelizing devices**

**Traffic control devices**

<table>
<thead>
<tr>
<th>Vertical Differential</th>
<th>Locations</th>
<th>Traffic Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 ft to 12 ft</td>
<td>Edge of shoulder</td>
<td>Lane closure required</td>
</tr>
<tr>
<td>6 ft to 10 ft</td>
<td>Edge of traveled lane</td>
<td>Stop and go traffic control</td>
</tr>
<tr>
<td>Greater than 10 ft</td>
<td>Edge of shoulder</td>
<td>Traffic control per MUTCD</td>
</tr>
</tbody>
</table>

**Notes:**

- For the channelizing devices, the Type II barricades should be of sufficient length to extend across the entire roadway.
- The channelizing devices should be placed as requested by the Engineer.
- The channelizing devices should be placed as requested by the Engineer.

**Legend**

- **STOP/SLOW PADDLE**
- **SIGN POSTS**
- **PLACEMENT**
- **PLACING**
- **FLOOR**
- **FLANGE**
- **FRONT OF SHOULDER**
- **REAR OF SHOULDER**
- **BOLTS**
- **SUPPROS.**
- **GROUNO**

**Standard Traffic Control for Highways**

- **REVISED DECIMALS:**
  - **SHOULDER**
  - **BOLTS**
  - **SUPPROS.**
  - **GROUNO**

**Arkansas State Highway Commission**

- **HIGHWAY CONSTRUCTION**
- **STANDARD TRAFFIC CONTROLS**
- **FOR HIGHWAY CONSTRUCTION**
- **STANDARD DRAWING**
- **TC-3**
NOTE: Size of basin to be determined by volume required. However, a minimum length-to-width ratio of 2:1 shall be used.

Sediment Basin with Riprap Outlet (E-9)

Sediment Basin with Pipe Outlet (E-10)

Diversion Ditch (E-8)

Slope Drain (E-12)

Sediment Basin (E-14)

Arkansas State Highway Commission
Temporary Erosion Control Devices
Standard Drawing TEC-2
GENERAL NOTES:

These installations to be used where normal fencing installation would cause the collecting of drift in the channel or the depression will not permit normal installation. Installations will be made only where directed by the Engineer.

When a fence line approaches a ditch, gully or depression, the last post on level ground shall be placed close enough to the edge of the drop off that the fence may be strung to the post in the depression without touching the ground.

In terrain of such extreme irregularity that minor grading will not be feasible, the normal fence shall continue on grade and the gullies or depressions treated by auxiliary fences as shown.

Payment for the type installation used will not be made directly but will be included in the contract unit price bid for wire fence or chain link fence.

100 LBS. MIN. DEADMAN TIE WIRE

6" MIN. DIA. TREATED POST OR TIMBER TO BE FREE SWINGING

2/4 S.G. STEEL OR 3" G.D. ALUMINUM POSTS

NORMAL LINE FENCING TO CONTINUE ON GRADE

8 STRANDS OF TWISTED WIRE OR CABLE (ZINC COATED)

NORMAL LINE FENCING

GRADE IF NECESSARY TO FAN WIRES

ARIZONA STATE HIGHWAY COMMISSION

WIRE FENCE WATER GAPS

STANDARD DRAWING WF-2
GENERAL NOTES:

STEEL LINE POSTS SHALL BE PAINTED OR GALVANIZED. TUBULAR END CORNER, PRO-RIGHT OR DIAGONAL SPACES MUST CONFORM TO THE DIMENSIONS AND VERTICALS SPECIFIED ON THE CARTON. NO. 3 CORRUGATED PIPE, ADDED ALTERNATIVES ARE ACCEPTABLE.

AN ACCEPTIBLE TOLERANCE IN LENGTH OF TUBULAR OR WOODEN POSTS SHALL BE ± 1" TO ± 2". TUBULAR POSTS MUST BE PAINTED OR GALVANIZED.

THE CONTRACTOR SHALL FURNISH AT LEAST ONE SPAN OF TIMBER POSTS OF 7' FOOT LENGTHS IN ORDER TO PROVIDE SUFFICIENT SET IN SOFT GROUND OR SLICK DEPRESSIONS.

DRIVEWAY GATES, EITHER SINGLE OR DOUBLE ATA PROCEEDING, OR THE SAME, AS THE PEDESTRIAN GATE SHALL BE INSTALLLED ON THE RIGHT SIDE OF EACH TRAFFIC MIXTURE. THE TYPE OF CROSS FENCE, FOR USE OF MAINTENANCE EQUIPMENT, LOCATION OF GATES TO BE SHOWN ON PLANS OR AS DESIGNATED BY THE ENGINEER.

AT STREAM CROSSINGS, THE FENCE SHALL NOT BE CONSTRUCTED ACROSS LARGE STREAMS WHERE CLEARANCE IS SUFFICIENT FROM THE TOP OF THE BANK TO THE BRIDGE STRUCTURE A CROSS CONNECTION SHALL BE CONSTRUCTED BETWEEN THE TWO FRAMES WHERE THE CLEARANCE IS NOT SUFFICIENT. THE FENCE SHALL TERMINATE WITH CROSS CONNECTIONS AND END POSTS ADJACENT TO BRIDGE ANCHOR OR CULVERT PIPES.

SPACIAL FOR BARED WIRE BETWEEN PULL POST ASSEMBLY SHALL BE 18" AT THE SITE OF THE END OF THE BURED WIRE SHALL BE BENT TO FORM A LOOP, THE LOOP IS CONNECTED AFTER THE LOOPS ARE CONNECTED THE END OF THE WIRE SHALL BE CONNECTED TO THE BOUNDARY TERMINAL AT LEAST 4 TIMES FOR EACH WIRE LOOP.

SPACIAL FOR WIRE BETWEEN PULL POST ASSEMBLY SHALL BE 18" AT THE WESTERN UNION METHOD AS DESCRIBED AS FALLING THE VERTICAL WIRES FOR EACH END OF THE FENCE SHALL BE PLACED SIDE BY SIDE AND THE WIRES ARE LOOSED AND TENDER PROJECTING WIRES WRAPPED A MINIMUM OF 1 TIMES AROUND THE MEDIAN OF THE VIRTUAL WIRES OF THE WEB. STAPLE AT LEAST TOP, BOTTOM AND ALTERNATE WIRES OF WOVEN FABRIC FOR WOOD LINE POSTS.

THE METHOD OF SECURING GATE LATCH AND OPERATE WILL REDUCE THE IMPACT OF THE ENGINER.