ARMSAL STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
CONSTRUCTION PLANS FOR STATE HIGHWAY

BANGS SLOUGH-HWY. 172 (S)

CALHOUN COUNTY
ROUTE 167 SECTION 3
FEDERAL AID PROJ. NHPP-0007(18)
JOB 070283
NOT TO SCALE

VICTORY MAP
PROJECT AREA

STRUCTURES OVER 20'-0"

STA. 123+07' IN PLACE
TH. 10'-6" W. 5'-0" R.G. BOX CULVERT
WTH. 4'-0" R.G. BOX CULVERT
TOP = 12'-0" RT. R.G. BOX CULVERT
TO A COMPLETED LENGTH OF 12'-0"
GROSS = 10' O.S.F. O.A. = 900 ACRES
SPAN = 27'-47"

STA. 308+65' IN PLACE
S.C. BOX CULVERT
WTH. 12'-0" W. 5'-0" R.G. BOX CULVERT
WTH. 4'-0" R.G. BOX CULVERT
TOP = 12'-0" RT. R.G. BOX CULVERT
TO A COMPLETED LENGTH OF 12'-0"
GROSS = 10' O.S.F. O.A. = 250 ACRES
SPAN = 33'-23"

BRIDGE DATA

STA. 182+25.00 BLK END
BLK NO. 0107
125'-0" INTEGRAL CONTINUOUS
COMP. = BEAM UNIT
37.50'-0" @ 37.50'-0"
7.50'-0" CLEAR ROADWAY
STA. 184+61.00 BLK END

STA. 185+61.00 BLK END
BLK NO. 0208
125'-0" INTEGRAL CONTINUOUS
COMP. = BEAM UNIT
37.50'-0" @ 37.50'-0"
7.50'-0" CLEAR ROADWAY
STA. 187+05.00 BLK END

STA. 309+65.00 END JOB 070283
BEGIN JOB 070294
LOG MILE 8.69

STA. 103+15.00
BEGIN JOB 070283
LOG MILE 4.78

DESIGN TRAFFIC DATA

YEAR, 2016
2016 ADT, 45,000
2036 ADT, 55,000
2036 CHV, 600
DIRECTIONAL DISTRIBUTION, 0.60
TRUCKS, 258
DESIGN SPEED, 60 MPH

4-26-2018

APPROVED

DEPUTY DIRECTOR
AND CHIEF ENGINEER
**Detail for County Road Turnouts (Open Shoulder Section)**

- Turnouts shall be modified where necessary to meet local conditions as directed by the engineer.

**Construction Limits**

- ADOTI surface course (1/2") 1200 lbs. per sq. yd. and aggregate base course (Class 7) 7" comp. depth.

**Widening for Guardrail**

- NOTE: Refer to Std. Cng. or GA and cross sections for slope requirements behind guardrail.

**Detail for Driveway Turnouts (Arterials)**

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

**Proposed Driveway to Existing Driveway**

- ADOTI surface course (1/2") 1200 lbs. per sq. yd. and aggregate base course (Class 7) 7" comp. depth. In asphalt or gravel, drive existing or concrete 1' concrete drive existing.

**Detail for Transitions**

- Existing asphalt pavement retain and overlay.

**Cold Mill Existing Asphalt Pavement**

- 100' normal transition.
METHOD OF RAISING GRADE
STA. 128+00.00 - STA. 130+00.00

NOTES:
1. This detail to be used only where directed by the engineer.
2. Quantities for method of grade raise using asphalt were calculated on this project at locations where the distance between the existing asphalt roadway and the proposed subgrade was one foot or less.
3. In locations where the distance between the proposed subgrade and the existing asphalt roadway is more than one foot, the existing asphalt roadway must be removed. The existing asphalt roadway must be removed as stated in Section 210, Subsection 210-023, of the Standard Specifications, Edition of 2014.
DETAILS OF RUMBLE STRIPS

LOCATION PLAN OF RUMBLE STRIPS
LEFT OR RIGHT SHOULDER

GENERAL NOTES

1. Rumble strips shall not be installed on open sections, bridge decks, approach slabs, intersecting streets or roadways, residential or commercial driveways or across transverse joints of concrete shoulders.

2. Rumble strips shall not be installed on a paved shoulder that is used as a deceleration lane for the length deemed appropriate by the engineer.

3. The 4" offset from the edge line may be increased to avoid longitudinal joints. In all cases, the lateral deviation from the planned offset should be kept to a minimum.

4. Rumble strips shall be measured by the linear foot longitudinally along the shoulders. Payment shall only include that portion of the shoulder on which rumble strips have been constructed. No measurement or payment will be made for gaps, driveways, turnouts, or other public road intersections where rumble strips have not been constructed.

5. The 5/8" depth shall generally apply for the entire 12" length. Some variation to suit shoulder slope breaks may be necessary.

DETAIL FOR GAP PATTERN RUMBLE STRIP

NOTES: Gap pattern shall be adjusted by the engineer in the field allowing for driveways to serve as the gap.
DETAIL OF EMBANKMENTS (GREATER THAN 3 FEET)

Note: To be used if and where directed by the engineer

- Material for plating to be considered subsidiary to the pay item "Compacted Embankment".

DETAIL OF EMBANKMENTS (3 FEET OR LESS)

Note: To be used if and where directed by the engineer

- Geotextile fabric to be installed at locations where the grade line is at least three feet above the existing grade.
STAGE CONSTRUCTION

STAGE 1:
- MAINTAIN TRAFFIC ON EXISTING CENTER LANE.
- EXTEND CENTER LANE TO DETOUR NO TOLL TURF.
- EXTEND DRAINAGE DITCHES AND BRIDGE STRUCTURES ON LT. SIDE.
- BUILD DRIVES ON LT.

STAGE 2:
- CONSTRUCT ROADWAY BT. OF EXISTING LANE.
- EXTEND DRAINAGE DITCHES AND BRIDGE STRUCTURES ON RT. SIDE.
- SHIFT TRAFFIC TO LT.

STAGE 3:
- PLACE FINAL 2" ASPHALT SURFACE COURSE AND GUARDRAIL.
- PLACE FINAL STRIPING.

LEGEND
- ☐ SAND BAG DITCH CHECKS
- ☐ ROCK DITCH CHECKS
- ☐ Silt Fence

REVISIONS

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<th>DATE OF REVISION</th>
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NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

STA. 103+15.00
BEGIN JOB 070283
LOG MILE 4.78

TEMPORARY EROSION CONTROL DETAILS - CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS - CLEARING AND GRUBBING

REVOLUTION

DATE OF REVISION

REVISION

NOTED: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.
LEGEND

1. SAND BAG DITCH CHECKS
2. ROCK DITCH CHECKS
3. SILT FENCE

REVISIONS

DATE OF REVISION

REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

TEMPORARY EROSION CONTROL DETAILS - CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS - CLEARING AND GRUBBING
STAGE CONSTRUCTION

STAGE 1: MAINTAIN TRAFFIC ON EXISTING CENTER LANE, IN PASSING LANE SECTION REMOVE AND UTILIZE THE EXISTING MULTIPLE LANES FOR TWO-WAY TRAFFIC.

STAGE 2: CONSTRUCT ADDITIONAL LANE AND BRIDGE STRUCTURES ON LT. SIDE.

STAGE 3: PLACE FINAL 2ND ADJASCENT SURFACE COURSE AND GUTTER.

PLACE FINAL STRIPING.

**REVISIONS**

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NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB.

UNLESS OTHERWISE SPECIFIED.

**TEMPORARY EROSION CONTROL DETAILS - STAGE 1**

**STA. 103+15.00**

**BEGIN JOB 070283**

**LOG MILE 4.78**

**LEGEND**

- (CF) SAND BAG DITCH CHECKS
- (RF) ROCK DITCH CHECKS
- (SL) SLT FENCE
- (SB) SEDIMENT BASIN

**TEMPORARY EROSION CONTROL DETAILS**

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<th>FIGURE PROJ.</th>
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| PT | E73 | 009-36.99 |
| D1 | E74 | 557-36.10 |
| T | E75 | 204-54 |
| H | E76 | 491-100 |
| PT | E77 | 500-21.00 |
| H | E78 | 536-60.29 |
| H | E79 | 536-60.29 |
NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.
REVISIONS

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LEGEND

- SAND BAG DITCH CHECKS
- ROUGH DITCH CHECKS
- SLT FENCE
- SEDIMENT BASIN

NOTES: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

STA. 309+65.00
END JOB 070283
BEGIN JOB 070284
LOG MILE 8.69

TEMPORARY EROSION CONTROL DETAILS - STAGE 1
Stages:

Stage 1:
- Maintain traffic on existing Centerline.
- Maintain lane section in place for utilization of the existing northbound lanes for two-way traffic.
- Extend cross driveways and bridge structures on LT. Sidewalk.
- Build driveways on LT.
- Construct roadway LT. of existing lanes.

Stage 2:
- Construct roadway RT. of existing lanes.
- Extend cross driveways and bridge structures on RT. Sidewalk.
- Construct interim MT. Shift traffic to LT.

Stage 3:
- Place final 3" ADAM surface course and guardrail.
- Place final striping.

Legend:
- Sandbag Ditch Checks
- Rock Ditch Checks
- Drop inlet Silt Fence
- Silt Fence
- Sediment Basin

Note: Maintain all erosion control devices until the end of the job unless otherwise specified.

Temporary Erosion Control Details - Stage 2
STA. 309+65.00
END JOB 070283
BEGIN JOB 070284
LOG MILE 8.69

DATE OF
REVISION
REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

LEGEND

- SAND BAG DITCH CHECKS
- ROCK DITCH CHECKS
- DROP INLET SILT FENCE
- SILT FENCE
- SEDIMENT BASKET

TEMPORARY EROSION CONTROL DETAILS - STAGE 2
MAINTENANCE OF TRAFFIC DETAILS - STAGE I

STAGE 1
MAINTAIN TRAFFIC ON EXISTING CENTERLINE.
IN PROGRESS

STAGE 2
CONSTRUCT ROADWAY LT. OF EXISTING LANES.

VERTICAL PANELS
50' O.C. NORMAL

TRAFFIC DRUMS
10' O.C. NORMAL

EXC. PARA. STAGE TRAFFIC

103-15.00
BEGIN JOB 070283
LOG MILE 4.78

STA.

MAINTENANCE OF TRAFFIC QUANTITIES
STAGE 1
SIGNS = 657.0 SQ. FT.
TRAFFIC DRUMS = 56 EACH 10' O.C.
TRAFFIC DRUMS = 46 EACH 120' O.C.
VERTICAL PANELS = 371 EACH 150' O.C.

CONSTRUCTION PAVEMENT MARKINGS = 45222 L.L/N. FT.
REMOVAL OF PERMANENT PAVEMENT MARKINGS = 4200 L.L/N. FT.
REMOVABLE PAVEMENT MARKINGS = 1008 L.L/N. FT.
RAISED PAVEMENT MARKERS
TYPE 11 (YELLOW/YELLOW 180' O.C.) = 293 EACH

PURSUING AND INSTALLING PRECAST CONCRETE BARRIER = 2194 L.L/N. FT.

MPLS 1083 ED
100 L.L/N. FT.

MAINTENANCE OF TRAFFIC QUANTITIES - STAGE 1

070283 34 226
STA. 309+65.00
BEGIN JOB 070283
END JOB 070283
LOG MILE 8.69
STAGE CONSTRUCTION
STAGE 1
MAINTAIN TRAFFIC ON EXISTING CENTERLINE.
IN PROGRESS LANE, RELOCATE AND MILL 12". 
RE-SUBDIVIDE LANE, EXTEND DRAG RAILS AND BRIDGE STRUCTURES ON LT. SIDE.
BUILD DRIVE ON RT.
CONSTRUCT ROADWAY LT. OF EXISTING LANES.

STAGE 2
CONSTRUCT ROADWAY RT. OF EXISTING LANES.
RESTORE DRIVE LANE AND BRIDGE STRUCTURES ON RT. SIDE.
BUILD DRIVE ON RT.
SHIFT TRAFFIC TO RT.

STAGE 3
PLACE FINAL 2"ACM SURFACE COURSE AND GUARDRAIL.
PLACE FINAL STRIPING.

PERMANENT PAVEMENT MARKING QUANTITIES

THERMOPLASTIC PAVEMENT MARKING
4" WHITE = 9930 L/B, FT.
4" YELLOW = 5388 L/B, FT.

ULTRA PERFORMANCE CONTRAST PAVEMENT MARKING
4" WHITE = 126 L/B, FT.
4" YELLOW = 376 L/B, FT.

RAISED PAVEMENT MARKERS
TYPE I (YELLOW, 100'L O.C.) = 548 EACH
TYPE II (YELLOW, 100'L O.C.) = 561 EACH

STA: 103+15,00
BEGIN JOB 070283
LOG MILE 4.78
PERMANENT PAVEMENT MARKING DETAILS
PERMANENT PAVEMENT MARKING DETAILS

STA. 302+65.00
END JOB 070283
BEGIN JOB 070284
LOG MILE 8.69
### ADVANCE WARNING SIGNS AND DEVICES

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<th>DESCRIPTION</th>
<th>SIZE</th>
<th>STAGE 1</th>
<th>STAGE 2</th>
<th>END OF JOB</th>
<th>MAXIMUM NUMBER REQUIRED</th>
<th>TOTAL SIGNS REQUIRED</th>
<th>VERTICAL PANELS</th>
<th>TRAFFIC DRUMS</th>
<th>BARRIERS (TYPE B)</th>
<th>FURNISHING &amp; INSTALLING PRECAST CONCRETE BARRIER</th>
<th>RELOCATING PRECAST CONCRETE BARRIER</th>
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**VERTICAL PANELS**

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**TOTALS**

741 371 306

### CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS

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<th>DESCRIPTION</th>
<th>STAGE 1</th>
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<th>REMOVAL OF PERMANENT PAVEMENT MARKINGS</th>
<th>CONSTRUCTION PAVEMENT MARKINGS</th>
<th>REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS</th>
<th>REMOVABLE PAVEMENT MARKINGS</th>
<th>THERMOPLASTIC PAVEMENT MARKING</th>
<th>HIGH PERFORMANCE CONTRAST MARKING</th>
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**TOTALS**

4200 12264 11264 11264 11264 11264 11264 11264 11264

### CONSTRUCTION PAVEMENT MARKINGS

**NOTE:** This is a high traffic volume road as defined in Section 640.20, Standard Specifications for Highway Construction. The 4" yellow striping quantity has been estimated based on a double yellow centerline stripe for the entire project. The project must be marked for passing zones prior to the placement of any final striping. Contact the maintenance division after the final lift of surfacing course has been placed to schedule the zoning of the project.
## GUARDRAIL

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<th>LOCATION</th>
<th>GUARDRAIL TYPE (A)</th>
<th>THREE BEAM GUARDRAIL, TERMINAL (TYPE B)</th>
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TOTALES: 376 4 4

## CULVERT CLEAN OUT

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TOTAL: 5

## EROSION CONTROL MATTING

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TOTAL: 2144.90

## DUMPED RIPRAP AND FILTER BLANKET

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TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER: 14 27

TOTAL: 63 120

## APPROACH GUTTERS

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TOTAL: 118.40 5400

NOTE: USE T = 17.0' FOR B SHAPE

## EROSION CONTROL

### PERMANENT EROSION CONTROL

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<th>WATER</th>
<th>SECOND SEEDING APPLICATION</th>
<th>TEMPORARY SEEDING</th>
<th>MULCH COVER</th>
<th>WATER</th>
<th>SAND BAG DITCH CHECKS</th>
<th>ROCK DITCH CHECKS</th>
<th>SILT FENCE</th>
<th>SEDIMENT BASIN</th>
<th>WRAP</th>
<th>*SEDIMENT REMOVAL &amp; DISPOSAL</th>
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<tbody>
<tr>
<td>ENTIRE PROJECT</td>
<td>CLEARING &amp; GRAVELING</td>
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TOTALS: 27.25 54.50 27.25 277.5 27.25 45.00 45.00 928.2 726 155 6229 5245 5245 6643

### TEMPORARY EROSION CONTROL

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<th>SEDIMENT BASIN</th>
<th>WRAP</th>
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NOTE: THE TEMPORARY EROSION CONTROL DEVICES SHOWN ABOVE AND ON THE PLANS SHALL BE INSTALLED IN SUCH A SEQUENCE AS TO DETEER 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.*
<table>
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<th>PLASTICITY INDEX</th>
<th>AASHO CLASSIFICATION</th>
<th>COLOR</th>
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SOIL CHARACTERISTICS INDIATED ABOVE ARE REPRESENTATIVE OF THE LOCATION OF THE SAMPLE AND FROM SURFACE INDIATIONS ARE TYPICAL FOR THE UNITS 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.

- A = ADDED
- MP = MASON PLASTIC
- NP = NOT DETERMINABLE
- GRAY = GRAY
- BROWN = BROWN
- C = CHALKY
## BASE AND SURFACING

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<th>ACHIM SURFACE COURSE (1/10&quot;)</th>
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## ADDITIONAL FOR LEVELING

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<th>AVG. W.D.</th>
<th>SQ.YD.</th>
<th>POUND/ SQ.YD.</th>
<th>PG 70-32</th>
<th>AVG. W.D.</th>
<th>SQ.YD.</th>
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## METHOD OF RAISING GRADE

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<th>POUND/ SQ.YD.</th>
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<th>AVG. W.D.</th>
<th>SQ.YD.</th>
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## TACK COAT QUANTITIES WERE CALCULATED USING THE EMULSIFIED ASPHALT RATES. REFER TO SS-400-1 FOR THE RESIDUAL ASPHALT APPLICATION RATES.
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**SUMMARY FOR QUANTITIES**

**REVISED DATE**

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**SUMMARY FOR QUANTITIES AND REVISIONS**
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**Constr. Hdg. 145°**

**Point No. | Type | Station | Northings | Eastings |
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**Survey Control Details**

- **Survey Control Type:** SST
- **Survey Control Method:** GPR
- **Survey Control Format:** PDF
- **Survey Control Information:** Project Name: SST-C001
  - Date: 02/01/2001
  - Surveyor: S. Smith
  - Surveyor's License: 01234567
  - Surveyor's Address: 123 Main St., Anytown, USA
  - Phone: 555-555-5555
  - Email: ssurveyor@surveyor.com

**Survey Control Notes:**

- All distances are in feet.
- All angles are in degrees, minutes, and seconds.
- All elevations are in feet MSL.

**Survey Control Records:**

- **Survey Control Book:** SST-C001
  - Date: 02/01/2001
  - Page: 145

**Survey Control Details:**

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  - Date: 02/01/2001
  - Surveyor: S. Smith
  - Surveyor's License: 01234567
  - Surveyor's Address: 123 Main St., Anytown, USA
  - Phone: 555-555-5555
  - Email: ssurveyor@surveyor.com

**Survey Control Addresses:**

- **Survey Control Address:** 123 Main St., Anytown, USA
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**Survey Control Dates:**

- **Survey Control Date:** 02/01/2001
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  - Surveyor's Address: 123 Main St., Anytown, USA
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**Survey Control Coordinates:**

- **Survey Control Coordinate:** SST-C001
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  - Surveyor: S. Smith
  - Surveyor's License: 01234567
  - Surveyor's Address: 123 Main St., Anytown, USA
  - Phone: 555-555-5555
  - Email: ssurveyor@surveyor.com

**Survey Control Elevation:**

- **Survey Control Elevation:** 123.45 feet MSL
  - Surveyor: S. Smith
  - Surveyor's License: 01234567
  - Surveyor's Address: 123 Main St., Anytown, USA
  - Phone: 555-555-5555
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  - Surveyor's Address: 123 Main St., Anytown, USA
  - Phone: 555-555-5555
  - Email: ssurveyor@surveyor.com

**Survey Control Notes:**

- All distances are in feet.
- All angles are in degrees, minutes, and seconds.
- All elevations are in feet MSL.
STA. 103+15.00
BEGIN JOB 070283
LOG MILE 4.78

REFER TO SURVEY CONTROL DETAIL SHEETS FOR HORIZONTAL AND VERTICAL CONTROL DATA.
Refer to survey control detail sheets for horizontal and vertical control data.
Refer to survey control detail sheets for horizontal and vertical control data.
STA. 309+65.00
END JOB 070283
BEGIN JOB 070284
LOG MILE 8.69

REFER TO SURVEY CONTROL DETAIL SHEETS FOR HORIZONTAL AND VERTICAL CONTROL DATA.
For Section A-E, Section B-F, Section "C-C", Bar List, & General Notes, see Dwg. No. 57852.

See "CONSTRUCTION JOINT DETAIL", Dwg No. 57901.

End Bridge Station as shown on Layout

See "TYPICAL ANCHOR BOLT LAYOUT"

6" #11 Stud thru cap (Typ)

For Anchor Bolt, see Dwg.

No. 57860 & 57962.

PLAN - BENT 4

For details of Stage Construction, see Dwg. No. 57895.

ELEVATION - BENT 4

Looking Ahead

Stage 2 shown.
Stage 1 shown.

Membrane Waterproofing System Type C

for unobstructed walks. See Section K-12.

No direct movement shall be made for this work. Placement will be adaptable to the base "4".

Concrete-Bridge.

CONSTRUCTION JOINT DETAIL

Not to Scale

TYPICAL ANCHOR BOLT LAYOUT

Not to Scale
The direction of bevel of the external load plate shall be in accordance with the direction of the external load plate shown in the "Table of Fabricator Variables." 

Unless otherwise approved by the Engineer, welding of the external load plates of expansion bearings to the beam or girder shall be in accordance with AWS D1.1 (or equivalent) and 100% pullout test required during the 24 hour period preceding welding to between 875°F and 900°F and at least 60% of the specified strength of the steel. The weld shall meet the requirements on the anchor bolt and 300 horizontal deflection of the elastomeric pad is evident. If welding on other fabricators is required, the Engineer will provide adjustment details.

All bolts shall be in accordance with the "Table of Fabricator Variables." In anchor bolts, it is to be in place in place, the galvanized Steel Weld Sleeves will not be required.

If anchor bolts are to be drilled and grouted in place, the Galvanized Steel Weld Sleeves shall be in place as shown. Sleeves shall be dry packed with syntactic urethane foam or approved equal prior to pouring of concrete. After pouring of the cap and prior to insertion of the structural steel, the dry pack shall be removed and ports for the concrete bolts shall be accurately drilled into the concrete. Nuts placed in the anchor bolt holes shall be corrosion resistant. The anchor bolts shall be provided and grouted in place whereas the concrete contains a high aluminum or hight manganese that completely fills the hole. Galvanized Steel Weld Sleeves will not be provided for directly, but will be considered supplementary to the item "Structural Steel in Beam Spans M 270 Dr. SEMP".

**Table of Fabricator Variables**

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<td>F2 = (XII)</td>
<td>F1 = (XI)</td>
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<td>10</td>
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**Elastomeric Bearings**

Elastomeric Bearings shall conform to Section 80B and be paid for at the unit price bid for "Elastomeric Bearings." 

**External Load Plates and Shear Blocks**

External Load Plates and Shear Blocks shall conform to AASHTO M 270 Grade B. Elastomeric Bearings shall be in contact with the external load plates and shall be in contact with the elastomeric bearing. The surface in contact with the elastomeric bearing shall be cleaned in accordance with Subsection B 20.40.1(b) for painted steel and B 20.40.1(c) for unpainted Grade B steel. 

Anchor Bolts, Washers, and Nuts shall conform to Subsection B 20.40.1. The anchor bolt grade of steel shall be as specified in the "Table of Fabricator Variables." Indentations shall be circular with rounded bottoms and staggered as shown in the details. 

**Details of Elastomeric Bearings**

Arkansas State Highway Commissioner

Arkansas Bridge Project

Little Rock, AR

Drawn By: [Signature]

Checked By: [Signature]

Approved By: [Signature]

Plan 5:29:2008 Drawing No. 57956
36"-6" Stage I Construction

Bar positions and clearances from the forms shall be maintained by means of stayup ties, hangers, or other approved devices per Subsection R04.4.4.

Longitudinal Sloping Joint

TYPICAL ROADWAY SECTION  -  STAGE 1

Looking Ahead

Working Point to Culvert

Level Line

Tolerance when removable deck forming is used is +1/4", -1/8".

Bottom of Top Flange

FILE FORMATION

Notes:

- Working Point matches Theoretical Roadway Grade.
- Tolerance when removable deck forming is used is +1/4", -1/8".
- Launch forming is required and shall be adjusted to maintain slab thickness tolerance.
- Launch deck may vary within the following tolerances:
  - Maximum - occurs when top flange contacts bottom reinforcing steel.
  - Minimum - top flange thickness plus 1/4".

Table: ADJUSTMENT FOR SLAB THICKNESS TOLERANCE

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<th>Material Thickness</th>
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<td>3/8&quot;</td>
<td>1/4&quot;</td>
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</table>

When a flange width, as shown on the Plans, is larger than the minimum, the first flange shall be that specified for the minimum size of flange width.
### DETAILS OF PARAPET RAIL

**NOTES:** See Dwg. No. 5984 for Bar List.

- Wire shall be smooth 3 gauge.
- Wire shall be galvanized.
- Wire shall be installed as shown.
- Bar to tighten smooth wire shall be fiberglass or epoxy-coated.
- All panels shall be wired as required to prevent cracking. All open joints shall be wired as soon as practical to a minimum width of 1⁄4.

**CONSTRUCTION:**
- Wire shall be installed as shown.
- Bar to tighten smooth wire shall be fiberglass or epoxy-coated.
- All panels shall be wired as required to prevent cracking. All open joints shall be wired as soon as practical to a minimum width of 1⁄4.
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TYPE A

NUMBER OF ELEMENTS PER ROW VARY WITH WIDTH OF PAVING SPECIFIED

ENERGY DISSIPATORS TO BE USED FOR THE ENTIRE LENGTH OF DITCH WHEN SLOPE OF DITCH PAVING EXCEEDS 7%. THE DISSIPATORS WILL NOT BE PAID FOR DIRECTLY BUT SHALL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID FOR CONCRETE DITCH PAVING.

ENERGY DISSIPATORS INDICATED

TYPE B

EXCAVATE TO HEAT LINES TO CONSTRUCT DRAINAGE AND SOLID SEEPING.

THE STEEL AND ADDITIONAL CONCRETE FOR THE WALLS SHALL NOT BE PAID FOR UNDER THE TERMS OF THE BID FOR "CONCRETE DITCH PAVING.”

TOE WALL DEPTH MAY BE ALTERED TO 2'-0" DEPTH AT THE DISCRETION OF THE ENGINEER ON PROX EXCAVATION

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.

2'-WIDE TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE DITCH PAVING AT 40' INTERVALS, THE SPACE SHALL BE FILLED WITH APPROVED JOINT FILLER COMPLIING WITH AWWA M223.

ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE DITCH PAVING

STANDARD DRAWING CDP-1
DETAILS OF W-BEAM GUARD RAIL

RAIL SECTION OF CLOSELY SIMILAR DIMENSIONS AND COMPARATIVE STRENGTH MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.

DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)

TYPE "B"  TYPE "A"

-GENERAL NOTES-

ALL BOLTS SHALL BE SUITABLE LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN 1/8" IN LENGTH SHALL EXCEED THE THICKNESS OF THE NUT.

GUARD RAIL COMPONENTS OF THE SAME MATERIAL FOR ENTIRE JOB.

GUARD RAIL COMPONENTS OF THE SAME TYPE AS THOSE EXISTING SHALL BE USED.

SAND THROUGHOUT TIMBER IN PLACE.

CONTRACTOR SHALL MAKE THE OPTION OF USING WOOD BLOCKOUTS FOR W-BEAM GUARD RAIL COMPONENTS OR PLASTIC BLOCKOUTS FOR W-BEAM GUARD RAIL COMPONENTS WITH NEEDED TEST LEVELS SPECIFICATIONS OR REQUIREMENTS FOR MANUAL FOR ASSURING SAFETY AND BENDS CURVED FOR W-BEAM GUARD RAIL.

ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-8
METHODS OF INSTALLATION OF GUARD RAIL AT LESS THAN FULL SHOULDER WIDTH BRIDGES USING GUARD RAIL TERMINAL (TYPE 2)

NOTE: GUARD RAIL WITH GUARD RAIL TERMINAL (TYPE 2) TO BE INSTALLED ONLY AT LOCATIONS SHOWN ON PLAN.

ONE-WAY TRAFFIC

TWO-WAY TRAFFIC

METHOD OF INSTALLATION OF GUARD RAIL AT FULL SHOULDER WIDTH BRIDGES USING GUARD RAIL TERMINAL (TYPE 2)

NOTE: GUARD RAIL WITH GUARD RAIL TERMINAL (TYPE 2) TO BE INSTALLED ONLY AT LOCATIONS SHOWN ON PLAN.

TWO-WAY TRAFFIC

ONE-WAY TRAFFIC

LEGEND

* THREE BEAM GUARD RAIL TERMINAL
** GUARD RAIL TERMINAL (TYPE 1)

METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERMINAL (TYPE 1)
(FULL SHOULDER WIDTH OR LESS BRIDGES)

ARKANSAS STATE HIGHWAY COMMISSION
GUARD RAIL DETAILS
STANDARD DRAWING GR-9
DETAILS OF WIDENING FOR GUARD RAIL

SECTION A-A

SECTION B-B

DETAILS SHOWING POSITION OF GUARD RAIL ON HIGHWAY

METHOD OF INSTALLATION OF GUARD RAIL AT FIXED OBSTACLE

ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING CR-9A
THREE BEAM RAIL WITH STEEL TUBING BLOCKOUT AND STEEL POSTS 1-7

W-BEAM TO THREE BEAM TRANSITION RAIL WITH WOOD OR PLASTIC BLOCKOUT AND STEEL POST 8

*NOTE: THESE DIMENSIONS WILL NEED TO BE ADJUSTED IN THE FIELD TO MAKE THE TRANSITION FROM W-BEAM TO THREE BEAM AT THE TOP OF FIRST POST.

THREE BEAM RAIL WITH WOOD OR PLASTIC BLOCKOUTS & WOOD POSTS 1-6

THREE BEAM RAIL WITH WOOD OR PLASTIC BLOCKOUT & WOOD POST 7

W-BEAM TO THREE BEAM TRANSITION RAIL WITH WOOD OR PLASTIC BLOCKOUT & WOOD POST 8

GENERAL NOTES:
- Posts shall be set perpendicular to the roadway profile grade and vertically in cross section.
- Wood posts & wood blocks shall be either southern yellow pine or fir No. 3-500.

ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-10A
### Construction Sequence

1. Place structural bedding material to grade, do not compact.
2. Install pipe to grade.
3. Compactly structural bedding outside the middle third of the pipe.
4. Place pipe compact the filling area up to the sides of the pipe.
5. Complete backfill according to subsection 605.4.2.(B).

Notes:
- Launch and structural bedding material will not be paid for separately. Bit compensation will be considered to be included in the price bid per linear foot of concrete pipe.

### Legend

- D = normal inside diameter of pipe
- Ds = outside diameter of pipe
- H = over pipe fill
t - k = normal inside diameter of pipe
- N = invert grade soil
- w = weighted

### Minimum Height of Fill "H" Over Circular R.C. Pipe Culverts

<table>
<thead>
<tr>
<th>Installation Type</th>
<th>Material Requirements for Launch and Structural Bedding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>Aggregate Base Course (Class 6 or Class 7)</td>
</tr>
<tr>
<td>Type 2</td>
<td>Selected Materials (Class 6-B, 6-B, or 6-D) or Type I Installation Material</td>
</tr>
<tr>
<td>Type 3</td>
<td>Weighted Crushed Stone (Class 4-A) or Type II Installation Material</td>
</tr>
</tbody>
</table>

### Maximum Height of Fill "H" Over Circular R.C. Pipe Culverts

<table>
<thead>
<tr>
<th>Installation Type</th>
<th>Material Requirements for Launch and Structural Bedding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 2</td>
<td>Aggregate Base Course (Class 6 or Class 7)</td>
</tr>
<tr>
<td>Type 3</td>
<td>Aggregate Base Course (Class 5) or Class 6 or Class 7</td>
</tr>
</tbody>
</table>

### Minimum Height of Fill "H" Over R.C. Arch & Horizontal Elliptical Pipe Culverts

<table>
<thead>
<tr>
<th>Installation Type</th>
<th>Material Requirements for Launch and Structural Bedding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 2</td>
<td>Aggregate Base Course (Class 5) or Class 6 or Class 7</td>
</tr>
<tr>
<td>Type 3</td>
<td>Aggregate Base Course (Class 5) or Class 6 or Class 7</td>
</tr>
</tbody>
</table>

### Embankment and Trench Installations

1. Material in the launch and over structural bedding shall be compacted to 95% of the maximum density according to the type of class of material used.
2. Trench backfill with banks of natural soil is the density of soil in the lower side of the pipe is not less than 95% of the maximum density according to the type of material used.
3. For embankment, the material in the lower side of the pipe shall be compacted to 95% of the maximum density according to the type of class of material used.

### General Notes

1. Concrete pipe culvert construction shall conform to Arkansas State Highway and Transportation Department standards specified for concrete pipe culvert current edition with applicable revisions noted in the plans section and subsection refer to the standard construction specifications.
3. All pipe shall conform to Section 801.0.1 circular R.C. pipe culverts shall conform to ASHTO W801.0.1 Circular R.C. pipe culverts shall conform to ASHTO W801.0.1.
4. All pipes shall be protected during construction by a cover sufficient to prevent damage from passage of equipment.
5. The maximum allowable trench width shall be the outside diameter of the pipe plus 24 inches. The minimum allowable trench width shall be the minimum width practicable for operating conditions.
6. Multiple pipe culverts shall be installed with a minimum clearance of 24 inches between strings of pipes. Refer to R-301.09 for minimum clearance where flared end sections are used.
7. Interference materials shall be placed as directed by the engineer. At the ends of the culvert to prevent loss of structural bedding when peripheral material is used for structural bedding around backfill.
8. Not more than one lifting hole may be provided in concrete pipe to facilitate handling. Pipe may be cast in place, but the fresh concrete after forming shall be removed from the lifting hole as soon as possible. When ductile iron pipe is used, a lifting hole shall not be placed in the pipe. When a lifting hole is placed in the pipe, the lifting hole shall be filled with mortar, concrete, or other material as approved by the engineer.
9. Welding shall be done by the engineer, surfacing material, that is encountered on the bottom of the excavated trench before the area is identified as structural bedding above will be completed and rebuilt, and shall have the same density as adjacent structural bedding. All bedding allowable excess above will be measured and paid for as per "Selected Pipe Bedding".
10. When the existing material excavated for the pipe trench is determined to be the engineer's approval, the material excavated shall be compacted to 95% of the maximum density according to the type of class of material used.

### Arkansas State Highway Commission

**Concrete Pipe Culvert Fill Heights & Bedding**

**Standard Drawing: PCC-1**
MINIMUM TRENCH WIDTH
BASED ON FILL HEIGHT "H"

<table>
<thead>
<tr>
<th>TRENCH WIDTH (FT)</th>
<th>SECTION &quot;H&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2 x 1.5</td>
</tr>
<tr>
<td>4</td>
<td>4 x 1.5</td>
</tr>
<tr>
<td>6</td>
<td>6 x 1.5</td>
</tr>
<tr>
<td>8</td>
<td>8 x 1.5</td>
</tr>
</tbody>
</table>

MINIMUM COVER FOR CONSTRUCTION LOADS

<table>
<thead>
<tr>
<th>TYPE DIA</th>
<th>6&quot;</th>
<th>8&quot;</th>
<th>10&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOAD</td>
<td>10k</td>
<td>20k</td>
<td>30k</td>
</tr>
<tr>
<td>MINIMUM COVER (FT)</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

GENERAL NOTES

1. PIPE SHALL CONFIRM AS ASST TO VAA, TYPE 1 INSTALLATION SHALL CONFIRM TO JOB SPECIAL PROVISION.

2. PLASTIC PIPE CULVERT DESIGN SHALL CONFIRM TO ASST TO LID/PIPE DESIGN SPECIFICATIONS FOR HIGHWAY CONSTRUCTION CURRENT EDITION

3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUITABLE WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMMISS INSURANCE AND OTHER BACKFILL MATERIAL.

4. MERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS 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, UNUSABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" SHOULD BE EVAILED OR REPREVELED WITH SELECTED PIPE BACKFILL "THE AMOUNT OF MATERIAL NEEDED TO BUFFER, THE UNDERDAM AREA TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNED ABOVE WILL BE MEASURED AND PAY FOR AS "SELECTED PIPE BEDDING"

6. WHEN THE EXCAVATED MATERIAL EVAILED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNUSABLE, IT IS REPAVED WITH THE UNUSABLE MATERIAL. THE USE OF "SELECTED PIPE BACKFILL" IS DESIGNED ABOVE WILL BE MEASURED AND PAY FOR AS "SELECTED PIPE BEDDING"

7. FOR PIPE TYPES THAT ARE NOT AVAILABLE ON THE OUTSIDE CORRELATE, OR THERE IS NO AVAILABLE WHOSE "SELECTED PIPE BACKFILL" SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRELATE OR PROFILE VALLEY

8. HIGH DENSITY POLYETHYLENE PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED

9. JOINTS CAN HARD PIPE WALLS, THE REQUIRED FOR JOINTS, "SELECTED PIPE BACKFILL" SHOULD BE SHOWN IN ASST TO DETAILED MANUFACTURERS AND THE APPICATEABLE POLICIES TO GRADE CORRELATION SPECIFICATIONS. JOINTS SHALL BE INSTALLED FOR MANUFACTURERS AND THE DISPOSITION OF GRADE CORRELATION SPECIFICATIONS.
**MAXIMUM FILL HEIGHT BASED ON STRUCTURAL BACKFILL**

<table>
<thead>
<tr>
<th>PIPE DIAMETER</th>
<th>&quot;H&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>18&quot;</td>
<td>42&quot;</td>
</tr>
<tr>
<td>24&quot;</td>
<td>48&quot;</td>
</tr>
<tr>
<td>30&quot;</td>
<td>54&quot;</td>
</tr>
</tbody>
</table>

**NOTES:**
- 6" MIN. "H" - 16" DIAMETER
- MINIMUM COVER VALUE "H" SHALL INCLUDE A MINIMUM "H"" OF PAVEMENT AND/OR BASE.

**MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"**

<table>
<thead>
<tr>
<th>PIPE DIAMETER</th>
<th>WIDTH &quot;H&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>18&quot;</td>
<td>15&quot;</td>
</tr>
<tr>
<td>24&quot;</td>
<td>21&quot;</td>
</tr>
<tr>
<td>30&quot;</td>
<td>27&quot;</td>
</tr>
</tbody>
</table>

**MULTIPLE INSTALLATION OF PVC PIPES**

<table>
<thead>
<tr>
<th>PIPE DIAMETER</th>
<th>CLEARANCE BETWEEN PIPES</th>
</tr>
</thead>
<tbody>
<tr>
<td>18&quot;</td>
<td>36&quot;</td>
</tr>
<tr>
<td>24&quot;</td>
<td>48&quot;</td>
</tr>
<tr>
<td>30&quot;</td>
<td>60&quot;</td>
</tr>
</tbody>
</table>

**MINIMUM COVER FOR CONSTRUCTION LOADS**

- MINIMUM COVER SHALL BE MEASURED FROM TOP OF PIPE TO TOP OF THE MAINTENANCE CONSTRUCTION ROADWAY SURFACE. THE SURFACE SHALL BE MAINTAINED.

**GENERAL NOTES**

- PVC PIPE SHALL CONFORM TO ASTM F924. PVC CLASS 434 INSTALLATION SHALL CONFORM TO OR SPECIAL PROVISION.
- PLASTIC PIPE AND SECTORS 1 ARE TO THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
- PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO ASHTEC/LINDE CULVERT DESIGN SPECIFICATIONS, FIFTH EDITION.
- USE 2003 W.SM.
- THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUITABLE WIDTH TO INSURE WORKING ROOM TO PREVENT AND NOT SAVE SPACE AND COMPACT HUMUS AND OTHER BACKFILL MATERIAL.
- INTEGERS MATERIALS SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE TRENCH TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
- WHEN DIRECTED BY THE ENGINEER, UNSTABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH SHALL BE FILLED WITH STRUCTURAL BEDDING MATERIAL. INDICATED "H" COVER IS RECOMMENDED.
- WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PVC TRENCH IS DETERMINED TO BE UNSTABLE FOR BACKFILLING, THE AREA EXPOSED BY THE "H" COVER SHALL BE FILLED WITH STRUCTURAL BACKFILL MATERIAL.
- PVC PIPE OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.

**CONSTRUCTION SEQUENCE**

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE, DO NOT COMPACT.
2. INSTALL PVC TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. THE STRUCTURAL BACKFILL SHAL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 6" BY 6" WIDE.
5. THE PVC INSTALLATION MAY REQUIRE THE USE OF RESTRAINTS, MOUNDS OR OTHER APPROVED METHODS IN ORDER TO HELP MAINTAIN GRADE AND ALIGNMENT.

**LEGEND**

- FILL HEIGHT (FT).
- OUTSIDE DIAMETER OF PIPE.
- MAX. 
- MIN.
- 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 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 FEET SPACING UNLESS OTHERWISE SHOWN IN THE PLAN.

**CONCRETE PAVEMENT**

**ASPHALT PAVEMENT**

---

**BROKEN LINE STRIPING**

---

**SOLID LINE STRIPING ON CONCRETE PAVEMENT**

---

**SOLID LINE STRIPING ON ASPHALT PAVEMENT**

---

**APPLYING AT ADJACENT NO PASSING LANES**

---

**CROSSWALK AND STOPBAR DETAILS**

---

**ARMS STATE HIGHWAY COMMISSION**

**PAVEMENT MARKING DETAILS**

**STANDARD DRAWING PM-1**
REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

Concrete shall be Class 5 with a minimum 28 day compressive strength of 3500 psi. Reinforcing steel shall be A-500 Grade 60.

Construction and materials for windwall & culvert drainage, including weep holes and granular material, shall be subsidiary to the 2nd 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 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 (except that the tolerances specified for "curved bars" on page 7-4 of the Manual shall be minus zero to plus 1/8"

Weep holes in box culvert walls shall have a minimum horizontal spacing of 10" and shall be spaced in such a manner that the two bars shall be the same diameter and shall be spaced 12" above the top of the bottom slab.

Weep holes in culverts shall have a maximum horizontal spacing of 10" and shall be spaced to clear all reinforcing steel. There shall be a minimum of two 12" weep holes in each culvert. The drain opening shall be 4" in diameter and shall be spaced 12" above the top of the culvert footing.

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

WINGWALL & CULVERT DRAINAGE DETAIL

REINFORCED CONCRETE BOX CULVERT HEADWALL MODIFICATIONS

ARKANSAS STATE HIGHWAY COMMISSION

STANDARD DRAWING RCB-1
SOLID SODDING

PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

SECTION B-B

DETAILS FOR NEW CHANNELS

GENERAL NOTES:
ROADWAY EXCAVATION (CHANNEL CHARGED) WILL BE PAID FOR AT R.C. BOX CULVERT LOCATION. 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 CHARGED) 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 CONFINED TO THAT PORTION OF THE INDICATED AREA THAT IS BELOW THE CHANNEL FLOW LINE.

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

SECTION A-A

DETAILS THROUGH EXISTING CHANNELS

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

STANDARD DRAWING RCB-2

ARKANSAS STATE HIGHWAY COMMISSION
GENERAL NOTES

1. THE RESIDENT ENGINEER WILL MAKE REMEDIAL CALCULATIONS OF QUANTITIES FOR EACH STRUCTURE LENGTHWISE, MAKING NO ALLOWANCE FOR OVERHANG BEYOND THE LINES INDICATED.

2. IN ALL INSTANCES CONCRETE SHALL BE REMOVED SO AS TO FORM FULL DIAMETER SPACED REINFORCING STEEL.

3. REINFORCING STEEL REMOVED FROM EXISTING STRUCTURE SHALL NOT BE BURNED IN CONSTRUCTING EXTENSION.

4. ON R.C. BOX CULVERTS THAT HAVE AN EXISTING CONCRETE APPRON THE CONCRETE APRON SHALL BE REMOVED WITH THE REMOVAL OF REMARKS ALL CONCRETE REMOVED THE CONCRETE SKIRT AND COSTS FOR FILLING THE SPACE RESULTING FROM REMOVAL OF CONCRETE SHALL BE ALLOWED.

5. MATERIALS FOR REPLACING DOWEL BARS SHALL MEET THE REQUIREMENTS OF SECTION 606 OF THE STANDARD SPECIFICATIONS.

6. DOWEL BARS SHALL BE INSTALLED AS FOLLOWS: THE DRILLING PROCEDURE SHALL BE APPROVED BY THE ENGINEER. THE FILLED SYSTEM SHALL BE INSPECTION AND SHALL BE AN INJECTION-TYPE SYSTEM WHERE THE PLUGS SHALL BE COMpletely SURROUNDED BY INJECTION PLUGS AND Fills THE HOLE.

7. THE CONTRACTOR SHALL HAVE THE OPTION OF USING EITHER METHOD 1 OR METHOD 2, REGARDLESS OF WHICH METHOD IS USED, PAY QUANTITIES WILL BE CALCULATED BASED ON METHOD 1.

NOTE:

NO PART OF THIS STANDARD IS TO BE USED FOR ANY DETAILS RELATIVE TO NEW CONSTRUCTION.

SEE STANDARD DRAWING LISTS IN TABULATION OF STRUCTURES FOR ALL NEW CONSTRUCTION DETAILS.

ARKANSAS STATE HIGHWAY COMMISSION

METHOD OF EXTENDING EXISTING R.C. BOX CULVERTS

STANDARD DRAWING RCB-3
**SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC**

<table>
<thead>
<tr>
<th>Degree of Curve</th>
<th>L (ft)</th>
<th>S (ft)</th>
<th>N (ft)</th>
<th>S S (ft)</th>
<th>S N (ft)</th>
<th>N N (ft)</th>
<th>S Sm (ft)</th>
<th>N Sm (ft)</th>
<th>S Sm (ft)</th>
<th>N Sm (ft)</th>
<th>S Sm (ft)</th>
<th>N Sm (ft)</th>
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<th>N Sm (ft)</th>
<th>S Sm (ft)</th>
<th>N Sm (ft)</th>
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</tr>
</tbody>
</table>

**ABBREVIATIONS**

- N = Normal Crown
- L = Pattern Length
- S = Superelevation
- D = Length of Superelevation Transition

**GENERAL NOTES**

1. On pavement with turning radius, the superelevation shall be revolved around the inside pavement edge unless otherwise noted on the plans.
2. Superelevation values shown on cross sections are inclusive of L and D.
3. Lengths for L may be rounded in multiples of 2 ft. or 5 ft.
4. Payments wider than 2 lanes shall have additional transition lengths as follows:

   - 1 lane unlimited - 200 ft.
   - 2 lanes unlimited - 400 ft.
   - 3 lanes unlimited - 600 ft.
   - 4 lanes unlimited - 800 ft.

**SUPERELEVATION FORMULA**

\[ \text{Formula} \]

**UNLESS OTHERWISE NOTED.**

- **MAXIMUM SUPERELEVATION**
- **OUTSIDE SUBGRADE EDGE**
- **ACTUAL PROFILE**
- **NORMAL CROWN PROFILE**
- **INSIDE SUBGRADE EDGE**

**NOTE:** Maintain normal crown on inside until superelevation exceeds P.W.

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

**STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND INNER SUBGRADE POINT OR INNER PAVEMENT EDGE**

**NOTE:** Maintain normal crown on inside until superelevation exceeds P.W.

---

**ARKANSAS STATE HIGHWAY COMMISSION**

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

**STANDARD DRAWING SE-2**

---

FILE STORED:000
4 feet or greater preferred. If less than 4 feet, Precast Units shall be connected to slab (see BARRIER STABILIZATION DETAIL-BRIDGE DECK STD. DRWS, TC-4).

**Offset Distance**

<table>
<thead>
<tr>
<th><strong>Offset Distance for Two Way Traffic Only</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Traffic</strong></td>
</tr>
<tr>
<td>Other Way</td>
</tr>
<tr>
<td>Either Way</td>
</tr>
</tbody>
</table>

**Special End Unit**

- **Special End Unit**
- **Traffic**
- **Either Way**

**Barrier Placement Along Roadway With Offset**

- **Offset Distance Table**

<table>
<thead>
<tr>
<th><strong>Offset Distance</strong></th>
<th><strong>Traffic Only</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>2 feet</td>
<td>2 feet</td>
</tr>
<tr>
<td>3 feet</td>
<td>3 feet</td>
</tr>
</tbody>
</table>

If offset distance is not available, then see "Barrier Placement With Attenuator" Detail shown below.

**Barrier Placement Along Bridge With Offset**

- **Special End Unit**
- **Traffic**
- **Either Way**

**Barrier Placement With Attenuator**

- **Special End Unit**
- **Traffic**
- **Either Way**

**General Notes**

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

INSTALL A VARIETY OF 2 UPRIGHT STAKES AND 6 CONELIKE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF Ditch.

WATTLE DITCH CHECK (E-11)

DROP INLET SILT FENCE (E-7)

SILT FENCE ON R/W FENCE (E-41)

GENERAL NOTES

GEOTEXTILE FABRIC SHALL BE SPACKLED TOGETHER WITH A SEAM SEAM ONLY AT A REASONABLE PROPORTION OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE NEEDED.

BOILED STRAW FILTER BARRIER (E-2)

SILT FENCE (E-111)

GENERAL NOTES

GEOTEXTILE FABRIC SHALL BE SPACKLED TOGETHER WITH A SEAM SEAM ONLY AT A REASONABLE PROPORTION OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE NEEDED.

ARKANSAS STATE HIGHWAY COMMISSION
TEMPORARY EROSION CONTROL DEVICES
STANDARD DRAWING TEC-1
CLEARING AND GRUBBING

CONSTRUCTION SEQUENCE
1. PLACE PERIMETER CONTROLS (i.e., Silt Fences, Diversion Ditches), Sediment Basins, as Required.
2. PERFORM CLEARING AND GRUBBING OPERATION.

EXCAVATION

GENERAL NOTE
ALL CUT SLOPES SHALL BE DRESSED, PREPARED, SEeded AND MAINTAINED AS THE WORK PROGRESSES. SLOPES SHALL BE GRaded AND STABILIZED IN EQUAL INCREMENTS NOT TO EXCEED 20 FEET, MEASURED VERTICALLY.

CONSTRUCTION SEQUENCE
1. EXCAVATE AND STABILIZE INTERCEPTOR AND/OR DIVERSION DITCHES.
2. PERFORM PHASE 1 EXCAVATION, PLACE PERMANENT OR TEMPORARY SEEDING, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
3. PERFORM PHASE 2 EXCAVATION, PLACE PERMANENT OR TEMPORARY SEEDING, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
4. PERFORM FINAL PHASE OF EXCAVATION, PLACE PERMANENT OR TEMPORARY SEEDING, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.

EMBANKMENT

GENERAL NOTE
ALL EMBANKMENT SLOPES SHALL BE DRESSED, PREPARED, SEeded AND MAINTAINED AS THE WORK PROGRESSES. SLOPES SHALL BE GRaded AND STABILIZED IN EQUAL INCREMENTS NOT TO EXCEED 20 FEET, MEASURED VERTICALLY.

CONSTRUCTION SEQUENCE
1. CONSTRUCT DIVERSION DITCHES DESIGN BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING.
3. PLACE PHASE 2 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING.
4. PLACE FINAL PHASE OF EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING.
5. PERFORM EMBANKMENT SLOPE DATING AND MAINTENANCE. SLOPE IS STABILIZED.

ARKANSAS STATE HIGHWAY COMMISSION
TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-3
### ARKANSAS STATE HIGHWAY COMMISSION

#### DETAILS OF STANDARD WINGS

**FOR REINFORCED CONCRETE BOX CULVERTS**

**15° SKEW**

**Special Notes:**
- Use nailing at each change in section elevation.
- Use a majority of A2600 M.S. and A3000 M.S. W.R. Type A or B. The remainder of nailing shall be A2600 M.S. or A3000 M.S. W.R. Type B.
- The Class B materials shall meet the requirements of AASHTO M222 or AASHTO M226, Class B.

**Class B Concrete**

#### Standard Details:

**Design:**
- The design is based on the AASHTO specifications.
- The culvert sections are designed to withstand the specified loads and pressures.
- The layout and details are compatible with standard highway design practices.

**Construction:**
- Use standard concrete mix proportions.
- Ensure proper curing and finishing techniques are employed.

**Materials:**
- Reinforcing steel: A2600 M.S. and A3000 M.S. W.R. Type A or B.
- Concrete: Class B, meeting AASHTO M222 or AASHTO M226, Class B.

**Erection:**
- Follow the erection guidelines provided by the manufacturer.
- Ensure proper alignment and stability during installation.

**Maintenance:**
- Regular inspection for signs of damage or wear.
-及时 repair any identified issues to maintain structural integrity.

---

**Table of Dimensions and Details:**

<table>
<thead>
<tr>
<th>Section</th>
<th>Dimension</th>
<th>Material</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Culvert 1</td>
<td>15° Skew</td>
<td>A2600 M.S. Type A</td>
<td>Detailed nailing, cured properly</td>
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<tr>
<td>Culvert 2</td>
<td>15° Skew</td>
<td>A3000 M.S. Type B</td>
<td>Follows standard specifications</td>
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<tr>
<td>Culvert 3</td>
<td>15° Skew</td>
<td>A2600 M.S. Type B</td>
<td>Enhanced durability, meets Class B requirements</td>
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</table>

**Additional Notes:**
- Special attention is given to the connection points and nailing methods to ensure structural integrity.
- All design details are in accordance with the AASHTO guidelines for reinforced concrete box culverts.
### Dimensions

<table>
<thead>
<tr>
<th>Section</th>
<th>x</th>
<th>y</th>
<th>z</th>
<th>d</th>
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### Details of Standard Barrel Sections

**ARIZONA STATE HIGHWAY COMMISSION**

**Details of Standard Barrel Sections**

**Reinforced Concrete Box Culverts**

4.5 ft 6 ft spans

310 ft 410 ft slopes

**Class S Concrete**

**Standard Drawing No. R-1000-x1**
### Reinforced Concrete Box Culverts

#### Apparatus State Highway Commission

**Details of Standard Culvert Sections**

<table>
<thead>
<tr>
<th>Section</th>
<th>Flange Width</th>
<th>Flange Depth</th>
<th>Slab Width</th>
<th>Slab Depth</th>
<th>Cover Width</th>
<th>Cover Depth</th>
<th>Reinforcement</th>
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<td>6</td>
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<td>30</td>
<td>6</td>
<td>30</td>
<td>6</td>
<td>2</td>
</tr>
</tbody>
</table>

**Notes:**
- Flange Width: 24
- Flange Depth: 18
- Slab Width: 30
- Slab Depth: 6
- Cover Width: 30
- Cover Depth: 6
- Reinforcement: 2

---

**Diagram:**

- [Diagram of Reinforced Concrete Box Culverts]

---

**Section:**

- Flange Width: 24
- Flange Depth: 18
- Slab Width: 30
- Slab Depth: 6
- Cover Width: 30
- Cover Depth: 6
- Reinforcement: 2

---

**Design Notes:**

- The above details of sections and their behavior have been determined using standard procedures. Any discrepancies or errors should be promptly reported. 

---

**Reference:**

- Design: D-100
- Standard: H-050
- Scale: 1" = 10'
CROSS SECTION STA.170+00 TO STA. 172+00
CROSS SECTIONS

STAGE 1 STAGE 2

CUT AREA 4 50 FT., FILL AREA 63 SQ. FT.
CUT AREA 8 50 FT., FILL AREA 37 SQ. FT.
CUT AREA 6 50 FT., FILL AREA 63 SQ. FT.
CUT AREA 15 50 FT., FILL AREA 33 SQ. FT.
CUT AREA 17 50 FT., FILL AREA 45 SQ. FT.
CUT AREA 37 50 FT., FILL AREA 23 SQ. FT.

CUT VOLUME 24 CU. YD., FILL VOLUME 294 CU. YD.
CUT VOLUME 55 CU. YD., FILL VOLUME 160 CU. YD.
CUT VOLUME 26 CU. YD., FILL VOLUME 121 CU. YD.
CUT VOLUME 60 CU. YD., FILL VOLUME 63 CU. YD.
CUT VOLUME 118 CU. YD., FILL VOLUME 109 CU. YD.
CUT VOLUME 185 CU. YD., FILL VOLUME 59 CU. YD.

CROSS SECTION STA. 275+00 TO STA. 277+00